Assessment of follow-up care received by patients with hypertension at primary health care facilities in Tshwane district of Gauteng Province, South Africa

by

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DECLARATION

Student number: 62008072

I declare that assessment of follow-up care received by patients with Hypertension at Primary Health Care facilities in Tshwane district of Gauteng province, South Africa is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references. I also declare that I have no knowledge of any similar work been submitted before.

Signature
Mmamoeketsi Julia Manyelo

11/06/2019
Date

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DEDICATION

This study is dedicated to my community in Tshwane District whom I served for many years as a professional nurse in the clinics. I continue to serve in another capacity as a lecturer for Primary Health Care student nurses and I am grateful to get an opportunity to contribute to improving the health care service that is rendered in the clinics with regards to hypertension follow-up care.

ASSESSMENT OF FOLLOW-UP CARE RECEIVED BY PATIENTS WITH HYPERTENSION AT PRIMARY HEALTH CARE FACILITIES IN TSHWANE DISTRICT OF GAUTENG PROVINCE, SOUTH AFRICA

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ABSTRACT

Introduction. The purpose of this study was to evaluate the follow-up care received by patients with hypertension at Primary Health Care (PHC) facilities in Tshwane District of Gauteng Province, South Africa. **Method**. A quantitative, descriptive and retrospective design methods were adopted, and a simple random sampling technique was used where ten PHC facilities were selected. Ten files from each selected PHC facility were then conveniently sampled from which data were collected using a checklist. Data were analysed using the Statistical Package for Social Sciences (SPSS) version 25. **Results** were divided into adherence and non-adherent attributes.

- Adherent: Blood pressure measurement were recorded at (100%), pulse rate (96%), Estimated Glomerular Filtration Rate (eGFR) (70%), Cholesterol (66%) and evaluation of whether the patient had oedema or not was done at (64%).
- Non-adherence: Where patients were not assessed adequately: Patients not assessed for dyspnoea (99%), Raised Jugular venous pressure (99%), Apex beat (100%) and basal crepitations (83%). Number of pillows used (100%) to check development of Nocturnal Paroxysmal Dyspnoea, which is a reliable sign of left ventricular failure. Cyanosis (72%), clubbing (72%), history of chest pains (100%), body mass index (BMI) (82%), waist circumference (100%), blood glucose (77%), urine test and eye test in the past 12 months were (68%) and (100%) not recorded respectively. Adherence as well as side effects to prescribed medication were (100%) unrecorded. On lifestyle modification, smoking (90%), alcohol use (91%), exercise

(99%), salt and fat reduction (100%) unrecorded. **Conclusion**. The study found a significant percentage (93.4%) of non-adherence to Hypertension Guidelines by consulting nurses at selected PHC facilities.

Key concepts: Assessment; follow-up care; hypertension; Primary Health Care

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LIST OF ABBREVIATION

APC	Adult Primary Care
BMI	Body Mass Index
CHC	Community Health Centre
CVA	Cerebro vascular accident
CVD	Cerebro vascular Disease
DBP	Diastolic Blood Pressure
eGFR	Estimated Glomerular Filtration Rate
EML	Essential Medicine List
NDP	National Development Plan
NHRD	National Health Research Database
PHC	Primary Health Care
SBP	Systolic Blood Pressure
STG	Standard Treatment Guideline
WBOTS	Ward Based Outreach Teams
WHO	World Health Organization

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

One of the nine long-term health care goals in the National Development Plan (NDP) is to increase life expectancy of all South Africans to at least 70 years by 2030 (Republic of South Africa, 2014: 13). While this target is noble and has good intentions, the exploding prevalence of chronic, non-communicable diseases like hypertension may hinder attainment of this goal. According to the National Strategic Plan of the Department of Health 2014 – 2019, non-communicable diseases form one of the quadruple burdens of diseases facing South Africa and they account for 40% of all deaths in the country (Republic South of Africa, 2014: 27). In order to extend life expectancy of all South Africans to at least 70 years by 2030, chronic/ non-communicable diseases like hypertension need to be managed effectively and adequately, particularly at Primary Health Care (PHC) level. The ideal follow-up setting for these conditions should provide for early detection of complications by adequate and relevant history taking, physical examination and appropriate investigations. PHC nurses should be adequately trained to assess and manage patients with common chronic non-communicable diseases like hypertension.

If no interventions are put in place, the reported burden could escalate thereby defeating the vision 2030 goal of raising life expectancy of all South Africans to at least 70 years. Besides fatalities that are associated with complications of hypertension, there is also more burden on the individual patient, the economy and the community at large. Uncontrolled hypertension can cause stroke with subsequent loss of income for those who must stop working owing to physical impairment. These complications also cause poor quality of life for the individual patients and their families who must take care of them. The state will also have to increase its budget for disability grants which will further put strain on the already overstretched fiscus.

It is therefore very imperative that an assessment of care received by patients with hypertension, particularly on follow-up visits or routine care, is checked to evaluate it against set standards. This evaluation will provide guidance with regards to whether the

health system is heading in the right direction or not in terms of hypertension follow-up care.

1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

1.2.1 The source of research problem

In one of the diabetes workshops the researcher attended, the Deputy Minister of Health in South Africa Dr Joe Phaahla raised concerns about the quality of records he has seen in some clinics when they were auditing patients' records. He reported that all the medical history of patients was captured in about two lines, for example "***Patient came for follow up. Treatment given".*** As a lecturer for Clinical Nursing Science Health Assessment Treatment and Care (R48), the researcher noted that development with concern as students following the Regulation 48 are taught comprehensive health assessment which includes proper history taking and physical examination as well as management of conditions. Surely, if health assessment and management are done adequately, medical history cannot be captured in two lines, which brings the assumption that if it is not written, it was not done. Adherence to National Treatment Guidelines is also emphasised throughout the R48 training programme to ensure that there is standardisation in terms of how patients are managed at PHC level. During clinical accompaniment of students, the researcher also observed that chronic services are regarded as fast tract and sometimes very inexperienced nurses are allocated in these services as it is regarded as predominantly treatment collection. South Africans' health care system is predominantly nurse-based and requires nurses to have appropriate competence and expertise to manage the country's quadruple burden of diseases which hypertension forms a significant part of (Republic of South, 2013:9). To this end, Nursing education and training must produce safe and competent nursing professionals capable of making a meaningful contribution in this regard (Republic of South, 2019: 7). This evoked the researcher's interest to assess the follow-up care received by the patients with hypertension at PHC facilities in Tshwane District.

1.3 AIM OF THE STUDY

1.3.1 Research purpose

To evaluate the follow-up care received by patients with Hypertension at PHC facilities in Tshwane District.

1.4 RESEARCH OBJECTIVES

1. To describe the follow-up care received by patients with hypertension at PHC facilities in Tshwane District.
2. To determine adherence or non-adherence to National Guidelines by nurses with regard to hypertension follow-up care.

1.5 RESEARCH QUESTIONS

1. How can follow-up care received by patients with hypertension at PHC facilities in Tshwane District be described?
2. How should adherence or non-adherence to National Guidelines by nurses with regard to hypertension follow-up care be determined?

1.6 SIGNIFICANCE OF THE STUDY

Improving quality of follow-up care of patients with hypertension using evidence is one of the priorities that must be achieved by 2030 (Republic of South Africa, 2014: 14). The researcher believes that the findings of this study will provide the evidence needed to prove that gaps do exist in the assessment and management of patients with hypertension on follow-up in Tshwane District of Gauteng Province, South Africa. Identification of gaps that could be existing in clinical management of hypertension in PHC facilities will enable the system to put improvement plans in place. These improvement plans could include among others, refining the PHC curriculum so that it responds to the needs identified. Findings will also provide practicing PHC nurses with useful information to improve their practice.

Implementation of recommendations will improve the overall follow-up care of patients with hypertension and thereby preventing complications, premature deaths and thus

contributes to the attainment of the NDP goal of extending life expectancy of all South Africans to at least 70 years.

1.7 DEFINITIONS OF TERMS

1.7.1 Assessment

Cambridge English Dictionary (2017) defines assessment as an act of judging or deciding the amount, value quality and importance of something, or the judgment or decision that is made. In the context of this study, assessment refers to taking relevant patient's history, conducting physical examination, investigations, and prescribing appropriate treatment.

1.7.2 Follow-up care

Follow-up care is a routine examination of a patient at various intervals after medical or surgical treatment (Collins Dictionary, 2017). In this study, follow-up care means scheduled visits that patients with hypertension are given to come back to the clinic for review.

1.7.3 Hypertension

Hypertension is a condition characterised by persistent elevated blood pressure measured on three separate occasions (Republic of South Africa, 2014: 4.13). In the context of this study, hypertension means a diagnosis given to adults, non-pregnant patients who had elevated blood pressure and are on drug treatment.

1.7.4 Primary Health Care facilities

PHC is defined in the Alma-Ata Declaration as essential health care that is based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation, and at the cost that the country can afford to maintain (WHO, 1978:16). PHC facilities are therefore establishments from which PHC service is delivered.

In this study, PHC facilities will include the clinics which are facilities that provide PHC services and are normally open for eight hours during the day and Community Health

Centres (CHCs) which offer similar services, but also include maternity, emergency services and so forth and they are open for 24 hours.

1.8 OPERATIONAL DEFINITIONS

1. Assessment of follow-up care means checking files of patients who have been consulted by professional nurses in PHC facilities to determine if there was compliance or non-compliance to Standard Treatment Guidelines (STGs) for hypertension.
2. Patients with hypertension are those who have been diagnosed with hypertension for more than six months and they are on drug treatment.
3. Follow-up care is a consultation for patients who have been given a date to come back for check-up.

1.9 RESEARCH DESIGN AND METHOD

This study is a quantitative and descriptive as there is neither treatment nor examination of relationships (Grove, Burns & Gray, 2013:257). It is also retrospective as the researcher assessed the files of patients with hypertension who have been consulted for follow-up care by professional nurses at selected PHC facilities. The patients were consulted between April 2017 and April 2018.

1.9.1 Unit of analysis

The unit of analysis is defined as the who or what constitutes one unit (Patten & Newhart 2018: 71). It comprises of elements of a given population. These elements may be individuals, groups, organisation and social artefacts. Social artefacts do not occur naturally but are created by human beings. Examples of artefacts include books, letters, drawings and so forth. Patient's files also fall into the category of artefacts. Bless, Higson-Smith and Sithole (2016: 134) believe that a systematic analysis of such artefacts may provide valuable information about the individuals who created and used them. In this context it would be nurses who create and use patient's files to provide follow-up care for patients with Hypertension. Therefore, the unit of analysis in this study were all files of patients diagnosed with hypertension in Tshwane District**.**

1.9.2 Sample and sampling

Researchers often limit their study to a part of the population as it may be impractical to study the entire population. This part or subset of the population is called a sample (Brink, van der Walt & van Rensburg 2013: 131). Sampling is a process of selecting cases to represent the entire population so that inferences about the population can be made (Polit & Beck 2017: 275).

PHC facilities in Tshwane District were randomly selected after creating a sample frame of all facilities using the National Health Research Database (NHRD). The names of these facilities were put in a hat where an independent person was asked to select the required number. The list of names of selected facilities is attached as annexure E. In Tshwane District, there are Provincial and Municipality PHC facilities. These are further divided into clinics as well as CHCs.

An attempt was made to ensure that the sample is adequately representative of all PHC facilities in Tshwane District by using the following selection criteria:

- Two out of eight CHCs were randomised separately.
- Provincial and Municipality clinics were also randomised separately to increase the probability of including Municipality clinics because they are fewer than the Provincial clinics.
- Six out 43 Provincial clinics were selected while two out of 23 Municipality clinics were also selected.
- A total number of ten PHC facilities in Tshwane District were selected. From the ten facilities, the researcher established how many patients with hypertension were served per month in each facility. A proportional sample was then drawn from which data were collected.

1.9.3 Inclusion criteria

Files of patients diagnosed with hypertension were included if:

- The patient has been on drug treatment for 12 months or more.
- It must be patients who were seen between April 2017 and April 2018 as the researcher wanted to focus on recent practices only.

- The patients were adults, aged above 30 years because all those who were below 30 years could be having secondary Hypertension and must ideally be referred to the doctor for evaluation.
- Males and females.

1.9.4 Exclusion criteria

Files of patients diagnosed with hypertension were excluded if:

- The patients were recently diagnosed, that is, less than 12 months.
- The patients were still on non-pharmacological interventions.
- The patients were last seen in the clinic or CHC before April 2017 and after April 2018.
- Pregnant patients.
- Age less than 30 years, male and females.

Sampled files were assessed using a structured checklist to collect data. Indirect observation was used where the researcher used evidence of consulting nurses' behaviours recorded in patients' files to demonstrate whether an expected standard of follow-up care was rendered to patients diagnosed with hypertension or not. Focus of this record assessment was on the entire file that is all entries in the file were checked. According to Digno (2013), a checklist is a tool for identifying the presence or absence of conceptual knowledge, skill or behaviour. It itemises task descriptions in one column and provides a space besides each item to check off items that were done or not done. The researcher also assessed the availability of essential medicines, equipment and other supplies that are needed for an optimum follow-up care for hypertension. An additional checklist for this purpose was developed. See annexure F.

Data were collected over a period of ten days. One PHC facility was assessed per day from April 2018 to July 2018.

1.9.5 Content validity

Content validity was ensured by aligning concepts with hypertension treatment Guidelines of the Department of Health of South Africa. Before the full-scale research study was conducted, one clinic which was not included in the final real study sample was used as a pilot to test the data collection process. Inputs from clinicians were used to refine and

modify the data collection tool where necessary. The pilot test was done between January 2018 and February 2018.

1.9.6 Reliability

Reliability of an instrument is a major criterion for assessing quality (Polit & Beck 2017: 330). It is defined as the consistency and accuracy with which an instrument measures the target attribute. When used on repeated trials, an instrument with high reliability will produce the same results (Bless et al. 2016: 222). To improve the reliability of the instrument, the researcher has used the hypertension treatment guidelines of the Department of Health of South Africa. The National Guidelines provide for a consistent standard of care across all PHC settings in the country. The measuring instrument is therefore reliable as it contains attributes that are nationally acceptable as a standard of care that should be received by patients with hypertension on their follow-up visits.

1.9.7 Data analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS) computer software version 25 created by Nie, Bent and Hull (Wikipedia 2017). After analysis, data were presented using tables and graphs.

The following ethical principles were observed throughout the study:

- **Respect for persons** – It was not possible to request permission from individual patients because the researcher will not have known in advance which files will be selected so as to obtain consent from the patients themselves**.** However**,** permission was requested and obtained from Gauteng Provincial Department of Health as a custodian of all patients' files**.**
- **Beneficence** – Patients identities were not disclosed on any document to protect their wellbeing and prevent harm which may arise from accidental disclosure of their health status.
- **Justice** – Patients' files were selected solely to assess the nature of follow-up care they have received. Their identities were protected by not linking their names to any documentation.
- There was no name of a patient that was linked to the information obtained. Files were allocated using numbers. For example, file number one in facility one (F1) or file number two in facility two (F2) and so forth.

1.10 SCOPE OF THE STUDY

The study focused on how follow-up care of patients with hypertension is conducted by professional nurses in PHC facilities of Tshwane District, Gauteng Province. The standard laid down by the Adult Primary Care (APC) and Essential Medicine List (EML) Guidelines in the management of hypertension in PHC facilities was central in determining whether practitioners are compliant or not. Hundred (100) files from ten PHC facilities were audited using a checklist.

1.11 STRUCTURE OF THE DISSERTATION

This dissertation's layout is as follows:

Chapter 1: Orientation to the study

Chapter 2: Literature Review

Chapter 3: Research design and method

Chapter 4: Analysis, presentation and description of the research results

Chapter 5: Conclusions and recommendations.

1.12 CONCLUSION

This chapter gave an introduction, an overview of the research background and discussed the aim, objectives, questions, the design, and methods of the study. Inclusion and exclusion criteria were explained as well as ethical considerations.

In the following chapter, literature that is relevant to this study is reviewed.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

"Prevention and control of hypertension requires political will on the part of government and policy makers" (WHO, 2013:23). In South Africa, health care service may not be perfect, but the view of the researcher is that there is political will as evidenced by an attempt to strengthen the PHC system through implementation of Operation Phakisa ideal clinic programme realisation and maintenance. This initiative was started in July 2013 as a way of systematically reducing the deficiencies in PHC facilities in the public service (Department of Health, 2018:1). An ideal clinic is a clinic with good infrastructure, adequate staff, adequate medicine and supply, good administrative processes and sufficient bulk supply of medical consumables. It also uses applicable clinical policies, protocols and guidelines (Department of Health, 2018: 1). According to the Department of Health Annual Report 2016/17, 786 clinics qualified as ideal clinics in the country, majority (75%) of which are in Gauteng Province, with Tshwane at 86.3%, Ekurhuleni 88%, Sedibeng 74%, Johannesburg 72.6%, and West Rand at 45% (Department of Health 2018). Another commitment by government is highlighted in the NDP which outlines the five goals aimed at improving the health and wellbeing of the population of South Africa (Department of Health, 2017:19). These goals are as follows:

- Address the social determinates that affect health and diseases such as smoking, abuse of alcohol and obesity etcetera;
- Strengthen the health care system;
- Prevent and reduce the disease burden and promote health;
- Improve human resources in the health sector; and
- Improve quality by using evidence.

The outcome of this research may contribute to this goal by producing evidence on how follow-up care of hypertension is conducted at PHC facilities in Tshwane District of Gauteng Province in South Africa.

Over and above the political will that governments should have in order to tackle hypertension, WHO (2013:23) further recommends concerted efforts of the following stakeholders:

- Health workers;
- The academic research community;
- Civil society;
- The private sector; and
- Families and individuals.

In this study, the focus is on health workers who are professional nurses who consult patients with hypertension in PHC facilities, academic research community, and private sector as well as files of individual patients suffering from hypertension.

The purpose of this literature review is to examine what is already published or not about hypertension and the care that patients who are diagnosed with it receive at PHC facilities. The review also examines background of hypertension disease and its prevalence in South Africa and other countries. The South African Department of Health Treatment Guidelines, called PHC level STG and EML as well as the APC are also examined as they inform among other conditions, the care and management of patients with hypertension in PHC facilities. According to the former Minister of Health Dr Aaron Motsoaledi, South Africa is facing a quadruple burden of diseases of which non-communicable disease such as hypertension (Department of Health 2014: iv). Therefore, the review also looks at this burden in South Africa and elsewhere in the world. Literature is also searched to check how an assessment of follow-up care of patients with hypertension must be conducted. What to ask, examine and which investigations to conduct. The outline of this review follows broad thematic approach whereby the following themes are covered:

- Background information of hypertension;
- Risk factors for primary hypertension;
- The burden of hypertension disease;
- An overview of hypertension guidelines in the Republic of South Africa (RSA);
- Comprehensive assessment of the patient with hypertension;
- Common hypertension medicines used in PHC facilities of South Africa;

- Background information about common hypertension medicines used in PHC facilities; and
- Patient adherence.

2.2 BACKGROUND INFORMATION OF HYPERTENSION

Blood flows from the heart to all parts of the body through blood vessels. Each time the heart beats, it pumps blood into the vessels. The force of the blood pushing against walls of the blood vessels as the heart pumps it, it creates what is referred to as blood pressure (WHO, 2013: 17). The higher the pressure in blood vessels, the harder the heart has to work in order to pump blood.

Hypertension is defined as a condition characterised by an elevated blood pressure (BP) measured on three separate occasions, a minimum of two (02) days apart (Department of Health 2014: 10). The Department of Health 2014 further stresses that BP should not exceed the systolic of 140mmHg and the diastolic pressure of 90mmHg.

Hypertension is a major risk factor for cardiovascular diseases (CVDs) like stroke, heart failure, Myocardial infarction, renal failure, and so forth. According to Lewis, Dirksen, Heitkemper, and Bucher (2014:709), as BP raises, so does the risk of CVDs. It is classified in two categories, namely, primary and secondary hypertension. Primary or essential hypertension is when the BP is elevated without an identified cause and it account for 90% to 95% of all cases of hypertension (Lewis et al., 2014: 709). In secondary hypertension, the cause is often identifiable and can be corrected. This category constitutes 5% to 10% of hypertension cases in adults. These percentages suggest that primary hypertension is more common than secondary hypertension and Mabey, Gill, Parry, Weber, and Whitty (2013:512) support the assertion.

Hypertension is often called a silent killer owing to its asymptomatic and yet progressive nature. It causes narrowing and hardening of the blood vessels causing decreased blood flow to the target organs such as the kidney, heart, eyes, and brain. Decreased blood flow leads to ischemia.

2.2.1 The kidneys

If the hardening and narrowing of vessels happen in the kidney, the renal tubules atrophy and the glomeruli of the kidney are damaged leading to death of nephrons and eventually renal failure (Lewis, et al., 2014:714). These authors further recommend the following investigations to assess the patient's renal function, namely, micro albuminuria, proteinuria, haematuria, and elevated serum creatinine. These microscopic compounds can be easily and promptly be analysed by a urine dipstick on a fresh urine specimen.

Creatinine is a waste product produced by muscle breakdown and its clearance from the kidneys is the most accurate indicator of renal function (Lewis et al., 2014: 1061). Normal creatinine clearance values range from 70 – 135 m/L/min. Therefore, any creatinine that is less than 60 is suggestive of kidney malfunction.

2.2.2 The eyes

If this hardening and narrowing of vessels happens in the eyes, the blood vessels of the retina get damaged causing visual problems and eventually blindness. This is called Retinopathy. The impairment is usually gradual in onset, but in sustained severe hypertension, it could be sudden owing to swelling of the optic disc and nerve (Lewis et al., 2014: 395). In this case, an emergency treatment is focused on lowering the blood pressure. Once the blood pressure is lowered, normal vision may be restored, but if blood pressure remains high, total blindness may occur. It is therefore, recommended that hypertension be controlled in order to prevent blindness. Health Systems Development Trust (2018: 312) concurs and even highlights that blindness in eight out of ten blind people can be avoided. Regular visual acuity testing using a Snellen chart can detect this complication early and prevent further deterioration.

2.2.3 The heart

Reduced blood flow in the heart causes the left ventricle to thicken at first to overcome the increased workload. A thickened heart may not pump blood effectively (WebMD 2016). This prevents normal forward blood flow (from the lungs into the left atrium, then left ventricle and out through the aorta to the systemic circulation) and causes blood to back up into the left atrium and pulmonary veins. When this happens, it causes pulmonary congestion and oedema. The patient will present with breathing problems such as dyspnoea, orthopnoea or paroxysmal nocturnal dyspnoea. There may be coughing with pink frothy sputum, tachycardia and extra heart sounds that is S3 and S4 (Lewis et al., 2014: 771).

2.2.4 The brain

Inadequate blood flow to the brain or ischemia causes death of cells resulting in stroke or Cerebral Vascular Accident (CVA). Lewis et al. (2014: 1388) report that 28% of strokes occur in people younger than 65 years old in the United States. In South Africa, stroke is the second most common cause of death after HIV/AIDS and the leading cause of disability (Maredza & Chola, 2016: 26). In their study titled "*Economic burden of stroke in rural South Africa",* conducted in Agincourt Sub-District of Mpumalanga Province, it was found that the total direct costs of stroke were between R2.5 million and R4.2 million in that Sub-District. Stroke incidence and mortality rate were found to be at 144 per 100,000 persons.

2.2.5 Blood vessels

According to Lewis et al. (2014:741), hypertension speeds up the process of atherosclerosis in blood vessels, leading to development of peripheral vascular disease and aortic aneurism. The patient will complain of leg pain which is aggravated by physical activity and relieved by rest. This is called intermittent claudication. Relevant history on follow-up visit may identify this complication early and intervention instituted.

2.3 RISK FACTORS FOR PRIMARY HYPERTENSION

Lewis et al. (2014: 713) tabulated the risk factors of hypertension as follows:

- Age: Systolic Blood Pressure (SBP) progressively increases with age.
- Alcohol: Excessive alcohol consumption is strongly associated with Hypertension.
- Tobacco use: Nicotine contained in cigarette causes vasoconstriction and further restricts blood flow within the blood vessels. Lewis et al. (2014: 713) concur with Department of Health (2014:4.14) that this habit is a risk factor for hypertension.
- Family history: Positive family history of hypertension in a close blood relative increases the risk of developing it.
- Diabetes Mellitus: Hypertension is more common in people with diabetes and when these conditions co-exist, the complications are more severe.
- Elevated serum lipids: Increased levels of cholesterol and triglycerides are primary risk factors in atherosclerosis.
- Excess dietary sodium: High sodium intake can contribute to development of hypertension as well as decrease the effectiveness of certain antihypertensive medication.
- Gender: Hypertension is more prevalent in men in young adulthood and early middle age <55 years of age and for women, it is more prevalent after age 64 years.
- Obesity: Weight gain is associated with increased frequency of development of hypertension. The risk is greatest in central abdominal obesity.
- Ethnicity: Incidence of hypertension is two times more in African Americans than in whites.
- Sedentary lifestyle: Physical exercise can control weight and reduce the risk of development of hypertension.
- Socioeconomic status: Hypertension is more prevalent in lower socioeconomic groups and among the less educated. The reason for this is unclear, but in the study titled “Socio-economic Determinants on Hypertension in a Cardio metabolic At-Risk European Country”, education level, which is considered as the most stable determinant of socioeconomic status, was found not be associated with development of Hypertension (Cuschieri, Vassallo, Calleja, Pace & Mamo, 2017).

- Stress: People exposed to prolonged or repeated stress may develop Hypertension more frequently than others.

2.4 THE BURDEN OF HYPERTENSION DISEASE

South Africa is having the highest prevalence of people with hypertension (between 42% and 54%) compared to East (15%) and West (25%) of Southern Africa. Sadly, these patients are still not controlled even whilst on treatment (Ramsay & Sankoh 2017). This disturbing discovery was made by two Wits University researchers in their study titled: "Stark regional and sex differences in the prevalence and awareness of Hypertension: An H3Africa AWI-Gen study across six sites in sub-Saharan Africa. A recommendation from this study was that a regionally tailored intervention be made in order to prevent a ticking time bomb related to hypertension mortality and morbidity. Recent patterns of causes of death in South Africa suggest an increase in causes of deaths related to non-communicable diseases of which hypertension is part of. Statistics show that there is a shift in the main causes of death with non-communicable diseases overtaking communicable diseases in recent times (Statistics South Africa, 2017: 27).

Department of Health (2014: iv) uses even a stronger terminology when referring to the prevalence of non-communicable diseases in the country. It uses the word **"exploding"**, meaning blowing out. If the prevalence of non-communicable diseases is exploding in South Africa, it means that hypertension prevalence may also be exploding as it accounts for a significant part of non-communicable diseases according to District Health Information System (DHIS). Department of Health (2014: iv) further highlights that the burden of disease associated with non-communicable disease disproportionately affects poor people living in urban settings. These are people who predominantly use the public PHC facilities. In Tshwane District, these poor urban settings would include places like Soshanguve, Atteridgeville, Mamelodi, Ga-Rankuwa, Mabopane, and Hammanskraal among others.

Jing, Cheng, Chong, and Hua (2015: 331) also found that more than 80% of hypertension's attributable burden of disease occurs in low and middle-income countries like South Africa. In China, hypertension is reported to be reaching epidemic proportions (Jing et al., 2015: 331) where the hypertension prevalence was at 33.5% in 2010. The

direct economic burden was calculated at 32 billion Renminbi (RMB) in 2002, which is equivalent to 64 056 672 247, 68 South African rands.

In response to this burden of diseases, the Chinese government implemented some health reforms which prescribed that hypertension screening and patients' management services be delivered from PHC facilities. Furthermore, the reforms dictated that the package of care for hypertension includes the following:

- All residents aged 35 and above to be screened for hypertension each time they visit the clinic.
- The clinic must provide at least four follow-up care services per year to ensure continuity of care and management for those diagnosed with hypertension.

In South Africa, a similar approach is being implemented whereby health care delivery is through the PHC model. All adult patients visiting the clinics are screened for hypertension. The number of visits that patients are required to come back for follow up is predominantly dictated by the general condition of the patient. Those who are stable are the ones who may be seen four times in a year. The South African Department of Health has also come up with an innovative programme called Central Chronic Medicines Dispensing and Distribution (CCMDD) (The Health System Trust 2017). The CCMDD programme allows the patient attending public PHC clinics to collect repeat medicines from convenient pick up points such as Clicks and Dischem pharmacies. This is what is sometimes referred to as public – private partnership where the government enters into a contractual arrangement with private sector to enhance service delivery.

According to the National Heart Foundation of Australia (2015), about 34% of Australian population aged 18 and older had elevated blood pressure or were taking medicine for hypertension in 2014/2015. Two-thirds (22.6%) of this cohort had uncontrolled or unmanaged hypertension. This implies that only 11.4% of patients with hypertension in Australia were controlled. While the foundation did not elaborate on the causes of this unprecedented finding, it however reported that hypertension was found more in males than females and it was also prevalent in the lower income households.

2.5 AN OVERVIEW OF HYPERTENSION GUIDELINES IN RSA

Two National Guidelines are used in the PHC facilities of Tshwane District of Gauteng Province. These include:

- The PHC level Standard Treatment Guidelines and Essential Medicine List (2014); and
- The Adult Primary Care (2016/2017).

These guidelines have been aligned to each other (meaning they do not contradict each other). The only difference is that the latter uses symptoms based integrated approaches which the researcher find to be more user friendly particularly for nurses who have not been trained in PHC.

2.5.1 Hypertension in adults, non-pregnant women and non-diabetic patients

Hypertension is defined as a condition characterised by an elevated blood pressure measured on three separate occasions, a minimum of two days apart (Department of Health, 2014: 10). Blood pressure should not exceed the systolic of 140mmHg and the diastolic pressure of 90mmHg. About 95 per cent of hypertension is of unknown etiology (Mabey, Gill, Parry, Weber & Whitty 2013:512), and is referred to as essential hypertension. Essential hypertension is the one that is managed in PHC facilities because secondary hypertension is hypertension that has a cause; for example; kidney disease and should be referred to secondary level. Further tests and confirmation of the cause need to be done in tertiary facilities like hospitals.

2.5.2 Levels of Hypertension (Department of Health 2014:4.14*).*

Table 2.1: Levels of hypertension

Level of hypertension	Systolic blood pressure	Diastolic blood pressure
Mild	140 - 159	90 - 99
Moderate	160 - 179	100 - 109
Severe	≥180	≥110

The target blood pressure to be achieved when patients are on treatment is a systolic blood pressure of < 140mmHg and a diastolic blood pressure of <90mmHg (Department of Health 2017: 81).

2.5.3 Modifiable risk factors and the relevant interventions

Genetic factors like foetal origin hypothesis, salt intake and sodium retention, environment and habits are among risk factors documented by Mabey et al. (2013: 512). Among all the risk factors listed above, lifestyle and behavioural factors are the most important in the etiology of hypertension. Examples of these lifestyle and behavioural factors are:

- High body weight and central obesity;
- High sodium intake;
- Excessive alcohol intake; and
- Insufficient physical activity.

While Mabey et al. (2013:512) outlined the lifestyle and behavioural factors, the researcher is surprised by the omission of smoking as one the lifestyle problems. Cigarette smoking has been confirmed as a factor that increases arterial blood pressure (Leskiv, Provoznyk, Mulka, Cherevychnyk & Dzyaman, 2015). Adequate and sustainable management of hypertension is centred on lifestyle modification.

The South African National Department of Health Standard Treatment Guidelines and Essential Medicine List for PHC level (2014: 4.14) outline the following as general measures or lifestyle modifications for management of hypertension:

- Lose weight if overweight. Overweight is measured by the BMI of > 25kg/m and a waist circumference of 94 centimetres for men and 80 centimetres for women respectively.
- Regular physical exercise like brisk walking for 40 minutes three times a week.
- Stop smoking.
- Reduce alcohol consumption to not more than two standard drinks per day for males and one drink for females.
- Restrict salt intake in the diet and increase potassium intake from fresh fruits and vegetables. Processed meat contains too much hidden fat; therefore, its consumption must also be restricted.

- Restrict fat intake in the diet.

2.5.4 When is medicine started in the management of hypertension?

While lifestyle modification is the cornerstone and the first step in hypertension management, medicines are also as important where lifestyle modification alone fails to control the blood pressure. For mild hypertension with no risk factor, but poor response to lifestyle modification measures in three months, medicine therapy is initiated (Department of Health, 2014: 4.14). If there is a risk factor and mild hypertension, medicine treatment should be started once a diagnosis is made. Treatment is started at step two. Moderate hypertension should also start medicine treatment at step two. In severe hypertension where there are no symptoms of target organ damage, medicine treatment is started at step three and a diagnosis must be confirmed within one hour.

2.5.5 Step wise management of hypertension (Department of Health 2014: 4.16)

Table 2.2: Stepwise management of hypertension

STEP 1	**TREATMENT**	**TARGET**
Diastolic BP of 90 – 99 and/ or systolic BP140 – 159 mmHg without any existing disease **AND** no major risk factors	-Lifestyle modification	BP control in 3 months to <140/90mmHg.
STEP 2	**TREATMENT**	**TARGET**
Diastolic BP 90 – 99 and/or systolic BP 140 – 159 mmHg without any existing disease **AND** No major risk factor **AND** Failure of lifestyle modification alone to reduce the BP in 3 months. **OR** Mild hypertension with major risk factors or existing disease **OR** Moderate hypertension at diagnosis	Lifestyle modification **AND** Hydrochlorothiazide oral 12.5mg daily	BP control within 1 month to BP <140/90mmHg
STEP 3	**TREATMENT**	**TARGET**
Failure to achieve targets in step 2 after 1 month despite adherence to therapy	Lifestyle modification **AND** Hydrochlorothiazide 12.5mg oral, daily	BP control within 1 month to BP <140/90mmHg

OR Severe hypertension	**ADD** ACE inhibitor e.g. enalapril 10mg daily **OR** Long acting calcium channel blocker e.g. amlodipine oral, 5mg daily	
STEP 4	**TREATMENT**	**TARGET**
Failure to achieve targets in step 3 after 1 month of adherence	Lifestyle modification **AND** Hydrochlorothiazide oral, 12.5 mg daily **ADD** ACE inhibitor e.g. enalapril, increase to 20mg daily **OR** Long acting calcium channel blocker e.g. amlodipine, oral 5mg daily	BP control within 1 month to BP <140/90mmHg with no adverse medicine reactions
STEP 5	**TREATMENT**	**TARGET**
Failure of step 4 after 1 month of adherence	Lifestyle modification **AND** Hydrochlorothiazide oral increase to 25mg daily **ADD** ACE inhibitor e.g. Enalapril increase to 20mg daily **AND ADD** Atenolol oral 50mg daily	BP control within 1 month to BP <140/90mmHg with no adverse medicine reactions.

2.5.6 Routine care of patient with Hypertension at PHC facilities in South Africa

According to APC guidelines (2016/2017: 81), the following routine care should be offered during a follow-up/ routine care of patients with hypertension at PHC facilities:

Table 2.3: Routine follow-up care guide

What to assess	When to assess	Notes
Symptoms	Every visit	Ask about symptoms of stroke or transient ischaemic attacks
Blood pressure	Every visit	BP is controlled if <140/90
Body Mass Index (BMI)	At diagnosis and yearly or three monthly if trying to lose weight	If BMI is >25, calculate target weight.
Waist circumference	At diagnosis and yearly or three monthly if trying to lose weight	Target for males <94cm Target for females < 80cm
Cardiovascular diseases (CVD) risk assessment	At diagnosis and every five years	Calculate the 10 years risk % using current BP, BMI and smoking status
Glucose	Yearly or sooner if glucose is found on urine dipstick	Check random finger- prick glucose.
eGFR	Yearly	If <60 refer to doctor
Urine dipstick	Yearly	Refer to doctor if repeat blood/protein on dipstick. If glucose on dipstick, screen for Diabetes
Cholesterol	At diagnosis	Refer if total cholesterol is > 7.5mmol/dL

2.5.7 Body Mass Index (BMI) ranges

Table 2.4: BMI ranges

BMI	**Interpretation**
Less than 18.5	Underweight
Between 18.5 and 24.9	Normal weight
25 – 29.9	Overweight
30 and higher	Obese

2.5.8 Calculation of the target weight

BMI that is greater than 25 is regarded as a risk factor for cardiovascular diseases. Therefore, if the patient has it, she/he must be assisted to achieve the target weight that correlates with her/his height. The following formula is used to determine the patient's target weight (Department of Health, 2017: 81).

- 25 x height x height (in meters) = expected weight
- If the patient's height is 1.6 meters(m) for example:
- 25 x 1.6m x 1.6m = 64 kilograms.

The target weight for a patient whose height is 1.6 metres is 64 kilograms. If this patient's weight is 70kg, she/he needs to lose 6kg. This is a tangible and focused goal. It assists the patients and their health providers to monitor and track down progress of weight management. Health education also becomes focused on specific target weight for each individual patient.

2.6 COMPREHENSIVE ASSESSMENT OF THE PATIENT WITH HYPERTENSION

2.6.1 History taking

When a patient with known hypertension attends a follow-up visit, it is important to obtain his/her detailed health history. According to the Department of Health (2017: 81), these patients must be assessed for symptoms at every visit and history taking forms the initial step of the assessment.

The purpose of history taking is to gain understanding of the patient's experiences of his/her health, ill-health or recovery. It is also to identify strengths that promote health or

need to be enhanced for optimal functioning. It is also to identify needs and clinical problems that form the basis of care and interventions. Lastly, it is to evaluate the effects of therapeutic interventions.

Health Systems Development Unit (2016: 166) outlines symptoms that must be assessed by history as follows:

- Breathlessness particularly if worse when lying flat.
- Oedema of the ankles for ambulant patients or on the sacrum for those who are bedridden.
- Chest pain on exertion and relieved by rest. This type of pain suggests Angina Pectoris.
- Ask about symptoms of diabetes for example polyuria (passing urine frequently) and polydipsia (drinking water excessively).
- Temporary paralysis or Transient Ischaemic Attack (TIA). This is similar to stroke, but the symptoms resolve within one day as the clot in the brain dislodges. The patient who experiences this symptom is at high risk and needs to be monitored closely.
- Pain in the calf muscle which is aggravated by walking and relieved by rest. It is most common in patients who smoke.
- Ask if there is history of poor eyesight.

2.6 2 Examination

Examination is the second step in the health assessment process. It validates what has been found during history taking. It is also objective as it is measured with quantifiable measurements like BP, raised jugular venous pressure etcetera. Hypertension is a condition that affects the cardiovascular system. Therefore, a cardiovascular examination should be conducted on all patients coming for follow-up of hypertension. This is particularly important as many stable patients are collecting their repeats treatment at convenient pick up point like Clicks pharmacies and so forth (Health System Trust, 2017). When these patients come to the clinic for renewal of their scripts, they should be physically examined too. Cardiovascular examination should be conducted.

2.6.2.1 Physical examination

- **General condition of the patient**

The first step in physical examination is assessment of the general condition of the patient. This assessment of the general condition of the patient assists clinicians to identify those who needs urgent attention like those having difficulty in breathing and altered level of consciousness and so forth (Department of Health 2017: 1). The presence or absence of dyspnoea is an important assessment to make in all patients with hypertension as it is an important feature of heart failure. Other signs of heart failure that must be assessed include distension of the veins of the neck, displaced apex beat, ankle oedema, enlarged liver, and crepitations at the bases of the lungs (Health Systems Development Trust, 2016: 168). It is also recommended that signs of other diseases are checked as comorbidity is common particularly Diabetes Mellitus, kidney disease and peripheral vascular diseases.

- **Vital signs**

  Vital signs are important indicators of the patient's essential body functions (Medline Plus, 2018). They include blood pressure, pulse, respiration, and temperature. For the purpose of this study, only vital signs that evaluate the function of the heart (cardiovascular system) will be explored that is pulse and blood pressure.

  - **Blood pressure**

According to the Department of Health (2017: 81), blood pressure must be taken at all visits and it is regarded as controlled when the SBP is less than 140 mmHg and the DBP less than 90 mmHg. If the patient has comorbidities like Diabetes Mellitus, kidney disease or heart failure, the BP must be kept even lower at 140/80 mmHg. Therefore, it is very important to take comprehensive history from the patient who is coming for follow-up so that each patient's target blood pressure is monitored according to its own merits. In this study, patients with comorbid Diabetes Mellitus are excluded though however, screening of Diabetes Mellitus in patients with Hypertension must be done yearly or if there is proteinuria (Department of Health, 2017: 81).

- **Pulse**

To measure the heart rate (the number of times the heart beats in a minute) simply check the pulse. A fast or irregular pulse may be a sign of a heart disease (Health Systems Development Unit, 2016: 168) such as heart failure and cardiac tamponade. A normal pulse rate in adults should be between 60 beats and 100 beats per minute (Lewis et al., 2014:696).

- **Side room investigation**

The following side room investigations must be taken:

- Body Mass Index (BMI)
- Urinalysis
- Blood glucose

- **Laboratory blood tests**

PHC facilities that have access to laboratory services should collect blood specimen for Creatinine to evaluate the patient's kidney function. According to the Department of Health Adult Primary Care Guidelines (2017: 81), the eGFR should be taken on a yearly basis. Clinicians are advised to refer all patients to the doctor if their eGFR is greater than 60. Another recommended laboratory blood test is cholesterol. All patients must be assessed for cholesterol levels at diagnosis (Department of Health, 2014:81).

2.7 COMMON HYPERTENSION MEDICATION USED IN PHC FACILITIES IN SOUTH AFRICA

In the introduction of the PHC STG and EML, the Director General called upon all health care professionals in South Africa to use and promote the implementation of the revised guidelines (Department of Health, 2014: ii). It is therefore expected of all nurses in the PHC facilities who prescribe medicine for hypertension to do so in line with the STG and EML.

The following medicines can be prescribed by nurses for control and management of essential hypertension in adults and non-pregnant patients in PHC facilities:

2.7.1 Hydrochlorothiazide (HCTZ)

2.7.2 Enalapril

2.7.3 Amlodipine

2.7.4 Atenolol

These medicines are referred to as essential and the WHO guidelines were used to select them as such. Essential medicines must always be available in adequate quantities, in appropriate dosage forms, with assured quality and adequate information and at the prize the individual and community can afford (Department of Health, 2014: xvi). Disease prevalence, evidence of efficacy and safety as well as cost were considered in selection of these medicines.

2.8 BACKGROUND INFORMATION ABOUT COMMON HYPERTENSION MEDICINES USED IN PHC FACILITIES

As indicated earlier, 90% of hypertension cases are essential/primary hypertension meaning that the etiology is not known. However, the international journal of molecular sciences reckons the renin-angiotensin-aldosterone system (RAAS) as central to the maintenance of normal blood pressure and targets of several antihypertensive drugs (Munoz-Durango, Fuentes, Castillo, et al., 2016). This mechanism includes vasoconstriction of blood vessels, regulating fluid volume and sodium – potassium balance. Therefore, knowledge of these mechanisms will enhance understanding of how different antihypertensive drugs work in control and maintenance of normal blood pressure. This RAAS mechanism is explained further when dealing with specific drugs.

2.8.1 Hydrochlorothiazide

HCTZ is a thiazide diuretic, (water pill for patient's better understanding), a sulphonamide derivative that acts by inhibiting the reabsorption of sodium chloride (NaCl) in the distal convoluted tubules of the kidney. It removes excess fluid in the circulatory system though increased urination. As water moves out of the kidney, sodium binds to the water

molecules and moves along with. This mechanism reduces the blood volume and subsequently contributes to a reduction in blood pressure.

HCTZ is a recommended first line drug therapy in uncomplicated primary/essential hypertension in general and black patients in particular (Rossiter, 2016: 143). The use of high doses is discouraged as they increase the risk of adverse metabolic effects. These adverse metabolic risks include among others:

- Gout;
- Dyslipidemia; and
- Impaired glucose tolerance.

  It is therefore important that these risk factors are regularly monitored as mandated by the National Guidelines (Department of Health, 2017: 81).

  The standard initial dose is 12.5mg which is increased to maximum dose of 25mg only when target BP control is not achieved at step five (Department of Health, 2014: 4.17). It is preferable that other types of antihypertensive drugs are introduced in this regard before considering to increase the dose of HCTZ to maximum levels. Prescribers must also take note that the antihypertensive effect of HCTZ is slow and therefore patients need to be given reasonable time to achieve the target and this timeframe is at least two months (Rossiter, 2016: 143). The PHC STG and EML recommend that patients be given one-month trial on the low dose before stepping up treatment (Department of Health, 2014: 4.16). Adherence must also have been evaluated and found to be good before stepping up. This allows clinicians to use some discretion in deciding whether to step up drug therapy or give one more month. The guidelines are there to provide guidance and standardisation. However, clinicians are still required to exercise their clinical judgment to make such decisions. That is why it is profoundly important that nurses who work in hypertension/ chronic services are properly trained and are competent in discharging this function. Newly qualified nurses as well as those who have been working in hospital settings need in-service training and mentoring until such time that they can be independent practitioners. Efforts should be made by PHC facility managers to achieve this developmental imperative. Adverse effects of HCTZ are rare if used in low doses (Rossiter, 2016: 144), but with higher doses clinicians must look out for electrolyte imbalance signs and symptoms. The risk of type

2 Diabetes must be assessed regularly as HCTZ predisposes to Diabetes Mellitus as well as lipid profile.

The lower the dietary sodium, the lower the dosage of HCTZ may be required to control the blood pressure (Rossiter, 2016: 143). Hence, the health education of low salt in the diet becomes central to the whole management regimen. There are other thiazide diuretics available but for the purpose of this study, the focus is on the first line choice as outlined in the National Guidelines. HCTZ interacts with the following drugs and therefore, their concomitant use is discouraged:

- Ante diabetic agents for example glimepiride; and
- Non-steroidal anti-inflammatory drugs like ibrufen.

Individual patients must be educated in order to understand the rationale behind life style modification for them to get better outcomes. If they do not understand why certain things need to be done differently, there is little chance of getting good adherence. Over and above adherence to treatments, the use of other drugs like ibrufen which is commonly available over the counter, may be responsible for poor hypertension control. Therefore, it is important to explore all these factors before stepping up treatment.

2.8.2 Enalapril

The second preferred drug to be added to hypertension therapy when blood pressure control is not achieved despite good adherence and other things excluded, is Enalapril. According to Rossiter (2016: 159), Enalapril is an Angiotensin-converting enzyme (ACE) inhibitor which acts by blocking the conversion of angiotensin I to angiotensin II. Angiotensin II is a potent vasoconstrictor which causes blood vessel's lumen to narrow resulting in less blood passing through. This leads to compensatory mechanism to set in causing the heart to pump harder and therefore elevate the pressure of blood against the inner walls of the blood vessels. Angiotensin II also stimulates the releases of aldosterone. Aldosterone is a hormone that causes an increase in sodium reabsorption and potassium excretion. This mechanism leads to increased blood volume and subsequent elevation of blood pressure (Fountain & Lappin, 2017). This Renin-angiotensin conversion mechanism is a naturally occurring phenomenon when there is a drop in arterial blood pressure to restore normal body functions. Enalapril therefore acts

by inhibiting the conversion of angiotensin I to II and when there is no angiotensin II, there will be no vasoconstriction and the release of aldosterone. Blood pressure will therefore, not elevate. While ACE inhibitors like Enalapril are safe for treatment of hypertension, (Rossiter, 2016: 159) advises that they may not be as effective when used alone in black patients. A diuretic must be added to the treatment regimen in order for ACE inhibitors to work better in this population group. This implies that diuretics have an additive hypotensive effect on this drug. The National Guidelines Committee must have considered this fact when they put HCTZ as the first line followed by an ACE inhibitor.

For treatment of hypertension, the dose of Enalapril is started at 10mg daily with incremental adjustment of up to the maximum of 20mg daily when indicated (Department of Health, 2014: 4.17).

Patients who are on an ACE inhibitor are also required to reduce dietary salt as a lifestyle modification. This is to prevent sodium reabsorption which increases blood volume and subsequently increases blood pressure. Patients must be educated about side effects of Enalapril which include among others, the swelling of the tongue, face and lips (Angioedema) as well as difficulty in breathing. Patients who are on this drug must be urged to report these adverse effects immediately, not to wait for the next follow up visit (Department of Health, 2017: 81).

There are other ACE inhibitors available in the market, but this study focuses on those which are on the EML for PHC level and that is currently Enalapril. Perindopril used to be on the EML, but it has since been excluded in the 2014 PHC level STG and EML.

Like HCTZ, Enalapril also interacts with commonly used over the counter drugs and therefore, their concomitant use should be discouraged:

- Non-steroidal anti-inflammatory drugs like ibrufen or aspirin may reduce the hypotensive effect of Enalapril; and
- Antacids like Gaviscon reduce the bioavailability of Enalapril and therefore reduces its effects (Rossiter, 2016: 160).

2.8.3 Amlodipine

According to Rossiter (2016: 155), Amlodipine is a calcium channel blocker (CCB). It limits calcium ion entry into the smooth muscle, reduces electrical conduction within the heart, decreases the force of contraction of the muscle cells, and dilates the arteries. Dilatation of arteries reduces the blood pressure and therefore causes the heart to pump with less effort (Ogbru, 2017). In the PHC level STG and EML (Department of Health, 2014: 4.17), Amlodipine should be added to hypertension drug therapy if blood pressure control is not achieved at step three or four. The prescriber is yet again given discretion to choose between Enalapril and Amlodipine at this step. The question is what will assist the prescriber to make a rational decision in this regard? According to the Department of Health (2017: 81), Enalapril should be avoided in renal artery stenosis and Amlodipine should be avoided if the patient has possible heart failure. However, Amlodipine is preferable if the patient has history of angina pectoris. This confirms the assertion that nurses who have no clinical experience or competence should not conduct a follow-up care or routine care of patients with hypertension. How will they identify signs of renal artery stenosis or possible heart failure? A comprehensive cardiovascular examination must have been conducted to enable the nurse to make a rational choice between Enalapril and Amlodipine. Unlike other CCBs like Nifedipine, Amlodipine has a slower onset and therefore reduces blood pressure gradually which is what is desirable because rapid blood pressure drop can potentially cause a stroke. The initial dose of Amlodipine is usually 5mg daily according to the PHC level STG and EML guidelines of the Department of Health (Department of Health, 2014: 4.17). This can be increased as indicated to a maximum dose of 10mg daily. Side effects of Amlodipine include oedema (that is why it must be avoided in heart failure because it has a potential of aggravating that problem), dizziness and palpitations. Patients should be asked and told about these unintended effects of this drug and encouraged to report them promptly. Patients must also be educated to avoid concomitant use of Cimetidine as it potentiates the effects of Amlodipine. Cimetidine is currently off the EML list of 2014, but patient can obtain these medicines elsewhere. That is why drug history is important as it will also inform the drug choices and health education to be given to patients.

2.8.4 Atenolol

Atenolol is a beta-blocking agent. It blocks the beta adrenoceptors in the heart, the bronchi, peripheral vasculature, pancreas, and liver (Rossiter, 2016: 150). It blocks the effects of adrenalin and when this happens, the heart pumps more slowly, with less efforts thereby reducing blood pressure (Mayo Clinic, 2018). According to Rossiter (2016: 150), beta-blocking agents like atenolol have an increased risk of type 2 Diabetes Mellitus and significantly less cardiovascular benefit than any other antihypertensive drug. This is interesting to note and it brings to light the rationale for using this drug as a last resort (unless if there are compelling reasons to use it earlier in therapy) in the stepwise management of hypertension in PHC facilities. This drug is contraindicated in asthma, severe bronchospasm for example chronic obstructive airway disease (COAD) and symptomatic heart failure. Patients should be screened properly to exclude these conditions before initiating them on Atenolol.

2.8.5 Other antihypertensive medicines available on the EML are:

- Methyldopa. A centrally acting antiadrenergic agent. Not used anymore for general patient population. It is recommended for treatment of hypertension in pregnancy.
- Spironolactone. A potassium-sparing diuretic. This is doctor initiated.
- Carvedilol. A beta-blocking agent. It is also doctor initiated.

2.8.6 Risk factors for cardiovascular disease

Major Risk factors for cardiovascular disease are listed by the Department of Health (2014: 4.2) as:

- Diabetes Mellitus;
- Hypertension;
- Central obesity;
- Smoking;
- Dyslipidaemia (fasting levels);
- Family history of early onset of cardiovascular disease in males relative < 55 years and females relative of < 65 years old; and
- Age – Men >55 years of age and women > 65 years of age.

The majority of these CVDs risks can be modified. For example, smoking can be stopped; diabetes can be controlled; hypertension can be controlled; and obesity can be modified by weight loss programme. Dyslipidaemia can be modified by diet and some drugs where indicated.

The only risks that cannot be modified are family history and age.

2.8.7 Medicines used for prevention of cardio vascular disease (CVD) risks

- Simvastatin.

Simvastatin is a lipid-lowering drug used in adjunct to dietary therapy for lowering cholesterol level. It must be prescribed for patients who have a high risk for CVD (>20%).

- Aspirin.

The Department of Health (2017: 81) recommends the use of aspirin for prevention of CVD and or Diabetes. It is however doctor initiated, but nurses should know how it works because they do issue repeats of this drug to patients. It should not be given in a patient who is - less than 30 years of age; has history of peptic ulcers; and if blood pressure is >180/110 mmHg.

2.9 PATIENT ADHERENCE TO TREATMENT

Adherent to treatment does not only refer to medicines. It includes all recommended interventions like following a recommended diet and executing other lifestyle modification such as stopping smoking, exercising, keeping appointment and so forth. Patient adherence is central to achieving better health outcomes of hypertension (Department of Health, 2014: xxiii). Poor adherence is often the primary reason for suboptimal clinical benefit and poorer health outcomes that is why it must be assessed regularly during patient follow-up visit. On every visit, patients should be asked about the progress of the agreed lifestyle modification, if they ever missed a dose of their medication and the like. Some of the reasons tabulated by the Department of Health (2014: xxiv) on why patients are not adherent are as follows:

- Misunderstanding of the disease or denial

Patient must be reminded that hypertension is a chronic disease and require treatment to control and prevent CVD risk which could be fatal. Very little can be done about the patient who denies the existence of a disease. However, attempts should be made to persuade the patient. Evidence of this should appear in the file for reference.

- Lack of support at home

Encourage support groups. Refer to social workers.

- Complex medication regimen

Hypertension regimen on the PHC level STG and EML guidelines are all daily doses. They are not complicated (Department of Health, 2014: 4.16). There are no eight hourly or 12 hourly doses.

- Adverse effects

Patients must be told about common side effects of hypertension medications they are on to promote understanding and knowledge of those that needs prompt attention. Patients must also be educated that sometimes, especially if side effects are severe, the offending medication can be switched whenever possible. This knowledge will encourage the patient to report and adhere to treatment.

- Busy schedule making it difficult to remember to take medication

This patient can be assisted by educating him/her about reminders. Most hypertension medication are taken in the morning therefore, taking them can be aligned to the patient's morning routine; for example, brushing teeth and eating breakfast.

- May not have money to travel to the clinic and thus misses appointments.

Patients should be encouraged to use facilities closest to where they live so that they walk to the clinic. Those who have physical challenges may be referred to the ward based outreach teams (WBOTS) for continuity of care.

All these challenges must be addressed based on their own merits. There is no blanket approach to promoting adherence. It may seem time consuming to assess and educate the patients about adherence. However, the investment has proven very rewarding over time.

2.10 CONCLUSION

From the literature reviewed in this chapter, it is apparent that hypertension is a big problem, and not just in South Africa, but globally. The concern of the researcher is that in some instances, hypertension is still not controlled even if patients are on treatment. People continue to die from complications related to hypertension. In South Africa, statistics show that deaths from non-communicable diseases like hypertension are increasingly overtaking those caused by communicable diseases, which is a complete opposite of what used to happen. The researcher believes that the result of this study may share some light with regards to this changing phenomenon.

The South African health care system is driven through a PHC model with facilities referred to as ideal clinics. This means that these clinics have good infrastructure, adequate staff, adequate medicines and supplies, good administrative processes and adequate bulk supplies of medical consumables that use applicable clinical policies, protocols, guidelines to ensure the provision of quality health services to the community. The researcher is interested in the implementation of these policies and guidelines with regards to hypertension management, availability of hypertension medicines and equipment. The South African National Guidelines on management of hypertension in PHC facilities were also reviewed and the treatment regimen are consistent with most of the literature reviewed. The next chapter outlines the research methodology.

CHAPTER 3

RESEARCH DESIGN AND METHOD

3.1 INTRODUCTION

The research design and methodology for this study was directed by the topic which is "**Assessment of follow-up care received by patients with Hypertension in PHC facilities in Tshwane District of Gauteng Province**". The study objectives were to describe the follow-up care received by patients with hypertension and determine adherence/non-adherence to National Guidelines by nurses working in PHC facilities. The design and methodology discussed in this chapter are congruent with the purpose of the study. This chapter also covers population, sampling ethical considerations and pilot study.

3.2 RESEARCH DESIGN

3.2.1 Quantitative

The research design used in the study was quantitative, non-experimental, descriptive, and retrospective. It is quantitative because it seeks to measure the phenomenon by attaching numeric values to express quantity (Polit & Beck, 2017: 12). Quantitative research is further described as a formal, objective, systematic methodology to describe variables, test relationships, and examine cause and effect (Burns, Grove & Grey, 2013: 3). However, in this study, only the former is applicable. The rationale for choosing this type of design was directed by the question that needed to be answered. The question was "how can follow-up care received by patients with Hypertension at PHC facilities in Tshwane District be described"? "Quantitative researchers believe that all human behaviour is objective, purposeful and measurable" (Burns, Grove & Grey 2013: 24). Writing notes in the patients file is indeed objective as it stands to prove activities that were done or not done to the patient. It is also purposeful because keeping accurate patients' records forms the integral part of holistic patient care. If it is not written, it is assumed to have not been done. Over and above providing continuity of care and writing accurate notes in the patient's file also provide evidence that the particular activities were done. Lastly, writing notes in patients' files can provide a measure of how well the

activities/ interventions were done. To deduce these absolute truths, the researcher must develop an accurate instrument or tool to measure the phenomenon (Burns, Grove & Grey 2013: 24). A structured checklist was used for this purpose.

3.2.2 Non-experimental / observational

The design was non-experimental as there was no manipulation or any intervention administered to the study subjects (Brink, van der Walt & van Rensburg, 2013:102). Compliance/noncompliance to National Guidelines was evaluated through observation of entries in the patients' files. The observation was carried out in the natural settings that is, the PHC facilities, whereby nurses wrote entries during the course of routine clinical care (Burns, et al., 2013: 337).

3.2.3 Descriptive

According to Polit and Beck (2017: 206), the purpose of descriptive design is to observe, describe and document aspects of a situation as it occurs naturally. In this study, follow-up care received by patients with hypertension in PHC facilities in Tshwane District of Gauteng Province was observed through perusal of patients' files and documented using the checklist. The description of the phenomenon will be covered in the next chapter during data analysis.

3.2.4 Retrospective

The study was retrospective in that the patients whose files were perused have experienced a particular event that is "a follow-up consultation for Hypertension" (Burns, et al. 2013: 310). Clinical record review has been touted as one of the valuable methods of obtaining retrospective data to answer current clinical question (Sarkar & Seshadri, 2014).

3.3 RESEARCH METHODS

3.3.1 Sampling procedure

3.3.1.1 Unit of analysis

The study unit of analysis was all files of patients above 30 years old, males and females, who were diagnosed with hypertension at PHC facilities in Tshwane District of Gauteng Province. This was the entire aggregation of cases in which the researcher was interested as Polit and Beck (2017: 249) recommended.

3.3.1.2 Sampling technique

Brink, et al. (2013: 132) define sampling as a process of selecting a sample from a population in order to obtain information about a phenomenon in a way that represents a population. In this study, both random and non-random sampling methods were used. Ten out of 74 PHC facilities in Tshwane District were randomly selected from the list on the NHRD. All clinics in Tshwane District appear on that list. Names were put in a bowl, stirred several times, and then the first facility was selected. The names were stirred again and the second facility was selected. The process was repeated until all ten facilities were selected. At the time of the study, about 300 patients diagnosed with hypertension were seen in each of the ten facilities per month according to the monthly statistics. Therefore, a proportional sample of ten files was conveniently selected per facility.

3.3.1.3 Research setting

The setting of this study was guided by the research questions as well as the type of data that ware needed to answer the questions (Brink, et al., 2013: 59). These questions were:

- How can follow-up care received by patients with hypertension at PHC facilities in Tshwane District be described?
- How should adherence or non-adherence to National guidelines by nurses with regard to hypertension follow-up care be determined?

Research setting is the physical location and conditions in which data collection takes place (Polit & Beck, 2017:744). In the context of this study, a multisite approach was used whereby ten different physical locations were selected. Using multiple sites offers a larger and more diverse sample (Polit & Beck, 2017:47) and this improves external validity. Data

collection took place at two CHCs and eight clinics. The total number of PHC facilities were ten. The settings were natural, real life and uncontrolled as the researcher did not attempt to manipulate them in any way.

3.3.1.4 Sample

As the researcher could not study the entire units of analysis, a fraction or subset of the whole was selected (Brink, et al., 2013: 131). This subset is called a sample and it consists of selected group of elements from the units of analysis. In this study, the sample was a selected batch of patients' files at selected PHC facilities in Tshwane District of Gauteng Province. The PHC facilities were randomised from a list obtained from the NHRD where all facilities are listed. A sample frame of 74 PHC facilities was made whereby CHCs were grouped together to ensure that not only small clinics were selected. Provincial and municipal clinics were also separately randomised to enhance representation from both sides. The sample was obtained from two CHCs, two municipal clinics and six provincial government clinics. Ten files were conveniently selected from the ten PHC facilities which made a total number of 100 files. This was the size of the sample from which data were collected.

Inclusion criteria

Files of patients diagnosed with hypertension were included if:

- The patient has been on drug treatment for at least 12 months.
- The patient was seen between January 2017 and June 2018 as the researcher wanted to focus on recent practices only.
- The patients were adults and aged above 30 years because all those who were below 30 years could be having secondary Hypertension and must ideally be referred to the doctor for evaluation.
- Males and females.

Exclusion criteria

Files of patients diagnosed with hypertension were excluded if:

- The patients were recently diagnosed, that is in less than 12 months.
- The patients still on non-pharmacological interventions.
- The patients who were last seen in the clinic or CHC before January 2017.
- Pregnant patients.
- Age less than 30 years, males and females.

3.3. 1.5 Ethical issues related to sampling

The researcher obtained ethical clearance from the Department of Health Studies Higher Degrees' Committee at the University of South Africa (UNISA) which was the prerequisite for requesting permission from the Department of Health of South Africa. After obtaining the university ethical clearance, (Annexure A), the researcher went on to register on the NHRD under the Gauteng Provincial Government after which the reference number was given (GP_ 201804_003). A request for permission to conduct the study was subsequently submitted to Tshwane District Research Committee which responded promptly by issuing some forms for the researcher to take to the selected PHC facilities (Annexures B & C). The forms are a declaration of intent from the facility managers that they give preliminary permission pending the final approval by the Tshwane Regional Research Ethics Committee. It was not practical to obtain informed consent from individual patients whose files were perused. However, approval was obtained from the Tshwane Research Committee on behalf of the Department of Health in Gauteng Province as the legal custodian of all patients' records in the Province (Annexure D).

- **Beneficence**

Brink et al. (2013: 35) remind researchers about the need to protect the wellbeing of participants by doing good and avoiding harm. Much as informed consent from individual patients was not sought because the researcher would have not known beforehand whose file was going to be selected, attempts were made to protect the patients whose files were perused. This was done by not using the patients' names or addresses on any document. No part or copy of the patients' files was removed from the facility whether original or reproduced copies.

- **Justice**

  According to Brink, et al. (2013: 36), justice refers to participant's right to fair selection and treatment. This principle was observed by randomly selecting facilities which included facilities from provincial government as well as municipal facilities, big and small ones.

3.3.2 Data collection

3.3.2.1 Data collection approach and method

In this study, the method used for data collection was auditing of patients' files. This constituted indirect observation of nurses' actions in the course of caring for the patients during a follow–up visit of hypertension. The advantage of using patients' files as a method of data collection method is that it is economical (Brink, et al., 2013:161). Fewer resources are required and that is why the researcher was able to collect data alone. It also eliminates the need to seek cooperation from the participants. However, auditing patients' records was not without problems. According to Brink, et al. (2013:161), there may be a risk of errors related to institutional biases, record keeping may be erratic or certain information may be missing or omitted. The challenge that the researcher came across during this phase was the size of some of the patients' files. Patients who have been attending the clinic for many years had big files with many loose pages which were not arranged in sequence. This needed to be arranged before an audit can commence and this activity took some time.

A structured observation tool in a form of a checklist was used as recommended by Polit and Beck (2017: 282). A checklist was the most appropriate technique for this type of study as it identified the presence or absence of behaviours, actions or events that needed to be assessed. A checklist itemises tasks descriptions in one column and provides a space besides each item to check off items that were done or not done (Digno, 2013). The checklist was administered by the researcher in person at selected PHC facilities. Some adjustments and amendments were made to the checklist following the pilot study. Data were collected over a period of two months in June and July 2018 and all 100 checklists were completed.

3.3.2.2 Development and testing of data collection instrument

One of the objectives of this study was to determine adherence or non-adherence to National Guidelines. To this effect, there had to be a standard against which follow-up care received by patients with hypertension was measured. The checklist that was used was developed in line with the APC Guidelines 2016 to 2017 of the national Department of Health of South Africa as it provides guidance as to how consulting nurses should conduct a follow-up care to patients with hypertension. All items on the checklist were based on the Guidelines.

Testing the checklist was done through the pilot study. A pilot study is defined as a small-scale version or dummy run of the major study (Brink et al., 2013: 56). This was carried out in Jack Hindon Street Clinic on 25 May 2018. Six files were audited. During the pilot study, few issues with data collection tool were identified and subsequently corrected. Some questions needed to be redesigned. For example, there were questions that previously required a Yes/No, but it was discovered that it may not just be ticked as No, but as not recorded (NR). This was done to maintain the reliability of the tool. On a Yes/No answer to the question that sought to find out if urinalysis was done in the past 12 months, a “No” answer seemed a bit biased as if the researcher knows this for a fact, but NR was a better option. Therefore, all questions and answers which were found to be confusing were amended.

The other key learning area from the pilot study was the timing of visiting the facilities for data collection. The researcher avoided going in the morning from prior knowledge that PHC facilities are much busier at that time of the day. She went at about 15h00, but the clinic also utilised the afternoons for their meetings as the number of patients has reduced. The time needed to complete the audit was also underestimated. Two hours were not adequate, but at least four hours were needed to complete ten files.

3.3.2.3 Characteristics of the data collection instrument

The checklist contained 55 questions which included demographic data, history of the patient, physical examination findings, vital signs, investigations, lifestyle history of the patient as well as management of the patient.

3.3.2.4 Data collection process

Following the result of the pilot study, the checklist was adjusted and was ready to be used in a full study. Managers of PHC facilities were consulted to inform them of the date for data collection. Some clinics were visited on Saturdays while others were visited during the week. Ten files were selected per PHC facility from which data were collected. Hard copies of files were physically retrieved from the filling room with the assistance of the clinic's clerical staff. The researcher had to go through each file to ensure that it belonged to an adult patient with hypertension, non-diabetic and non-pregnant to comply with the inclusion criteria. Once ten files that complied with inclusion criteria were found, the data collection commenced. All 54 questions on the checklist were ticked off according to whether the attribute was done or not recorded.

3.3.2.5 Ethical consideration related to data collection

Total anonymity of the patients' names on the file was maintained, only using numbers as references for example file number one from this facility and so forth. Files were audited on the premises of the PHC facility. No part of the file was reproduced in any way or removed from the facility. There was no question on the data collection instrument that required the names of the patients, their addresses or their identity numbers. This was done to ensure that no part of any patient's medical record is linked to any patient in any way. The researcher also made a commitment to share the results of this study with the District Management so that recommendations can benefit the community at large if implemented.

3.3.3 Data analysis

Polit and Beck (2017:725) define data analysis in quantitative studies as the systematic organisation and synthesis of research data and the testing of hypothesis using those

data. After data were collected from selected PHC facilities in Tshwane District of Gauteng Province, several processes were conducted before the actual data analysis:

3.3.3.1 Data set

Developing a dictionary data set is where a collection of values is made to represent a variable as shown in the example below.

1. Was urine tested in the last 12 months?

   Yes = 1

   NR = 3

Following the data set development, coding of the raw data on an excel spreadsheet was done. Polit and Beck (2017: 426) describe coding as a process of transforming data into symbols which are usually numbers as it is the case in this study. Pre-coding is usually advisable where data collection instrument is structured, but in this case, the researcher missed it and therefore had to do it after data were collected. All 55 variables from 100 files were coded.

The codes ranged from one up to nine as shown in the table below:

Table 3.1: Variables codes

Code number	Definition
1	Yes
2	No
3	Not recorded
4	Normal finding
5	Abnormal finding
6	Missing data
9	Not applicable

The data ware then analysed using the Statistical Package for the Social Sciences version: 25.

3.4 INTERNAL AND EXTERNAL VALIDITY

Validity

Polit and Beck (2017:161) describe validity as a measure that determines whether the methods are really measuring the concept they seek to measure.

Content validity

Content validity was ensured by aligning concepts with Hypertension Treatment Guidelines of the Department of Health of South Africa. A pilot study also enhanced validity of the data collection tool by detecting the weaknesses that were there in the original checklist.

Bias

Burns et al. (2013: 197) warn researchers against the following factors that can lead to bias:

The researcher

The researcher's experiences, expectations or hypotheses have been identified as some of the risks in this regard ((Brink, et al., 2013: 98). However, in this study, the researcher had no contact with either patients or health professionals in those selected facilities. Therefore, no undue influence was caused.

The measurement methods

The observation done using a checklist was more appropriate unlike if the researcher was to sit there and observe nurses as they work. It would have been intimidating and a great source of bias. The checklist was designed in such a way that it collects and measures what is currently an expectation from nurses who conduct follow-up care to patients with hypertension in PHC facilities according to National Guidelines of the Republic of South Africa.

The individual subjects

Patients' files were audited using structured checklist. Aspects which were not included on the checklist were not captured, but there was a comment column where only relevant information to clarify some findings was captured.

3.5 RELIABILITY

Reliability of an instrument is a major criterion for assessing quality (Polit & Beck 2017: 330). It is defined as the consistency and accuracy with which an instrument measures the target attribute. When used on repeated trials, an instrument with high reliability will produce the same results (Bless et al 2016: 222).

To improve the reliability of the instrument, the researcher has used the hypertension treatment guidelines of the National Department of Health of South Africa. The National Guidelines provide for a consistent standard of care across all PHC settings in the country. The measuring instrument is therefore reliable as it contains attributes that are nationally acceptable as a standard of care that should be received by patients with hypertension on their follow-up visits.

3.6 CONCLUSION

The design and methodology for the study were outlined in this chapter including how ethical principles, biases and the pilot study were handled. The two main objectives of the study that were to describe the follow-up care received by patients with hypertension and determine adherence/non-adherence to National Guidelines by nurses working in PHC facilities have also been elaborated. The next chapter will share some light with regard to what the collected data revealed.

CHAPTER 4

ANALYSIS, PRESENTATION AND DESCRIPTION OF THE RESEARCH RESULTS

4.1 INTRODUCTION

The purpose of this study was to evaluate the follow-up care received by patients with hypertension at PHC facilities in Tshwane District of Gauteng Province, South Africa.

The research questions were:

1. How can follow-up care received by patients with hypertension at PHC facilities in Tshwane District be described?
2. How should adherence or non-adherence to National Guidelines by nurses with regards to hypertension follow-up be determined?

To this end, data were collected using a checklist. The results were analysed by the researcher with the assistance of a statistician using SPSS version 25. This chapter presents details of the results.

4.2 DATA MANAGEMENT AND ANALYSIS

Data were collected using a checklist, and coded and checked for correctness before entered into a Microsoft Excel codebook. The checklist consisted of 55 questions of which all, but one was answered. A tick was made in the appropriate column to indicate the presence or absence of an attribute. Ticks were either for a yes, no and not recorded or not applicable. Question 55 could not be answered adequately as it required disclosure of the qualifications of the person who was consulting the patient. This could not be done without identifying nurses by name and this posed an ethical problem as individual nurses were not asked for consent. Therefore, the question was captured as ‘missing data.

Data were analysed according to the following sections:

- The year in which the patient was last seen in the facility;
- The sample characteristics;
- History of the patient;
- Physical examination;
- Vital signs;
- Side room investigations;
- Routine blood tests;
- Life style assessment;
- Management of the patients; and
- Health worker knowledge and skills.

4.3 RESEARCH RESULTS

4.3.1 Sample characteristics

4.3.1.1 The last visit of the patient at the facility

All files studied (100%) had recent entries for 2018 as shown in figure 4.1.

Table 4.1: The last visit of the patient at the facility

	Frequencies	**Percentage**
2017	0	0.0
2018	100	100.0
Total	**100**	**100.0**

The researcher wanted to evaluate recent practices only. One of the objectives of this study was to determine adherence or non-adherence to the APC Guidelines of 2016 - 2017. Therefore, it was important that the evaluation not be extended to cover the period before the current guidelines.

In a study conducted in an Academic Hospital of South Africa to determine whether the introduction of a new structured record form would improve the quality of patients' records, it was found that from one to three months there was no significant improvement. However, after three months, there was a noticeable improvement exceeding (90%)

(Motara, Bentley, Mahomed & Moolla, 2013:438) This finding demonstrates that after introducing an intervention, a certain time period should elapse before one can expect a significant change in behaviour. The APC Guidelines were introduced in 2016 and it is the researcher's view that evaluating them after two years was reasonable and appropriate. The results of this study also indicate that there is quite a low defaulter rate as all files audited had a 2018 entry. This is very good and demonstrates that patients are doing their part in managing their conditions.

4.3.1.2 Age

An overwhelming majority (98%) of the patients whose files were audited, were above 30 years of age, with only 2% not recorded. Age is a risk factor for hypertension. Systolic blood pressure is known to rise progressively with increasing age (Lewis et al., 2014:731). In clinical practice, patients who present with hypertension at a younger age are usually referred to the secondary level of care as there is an increased likelihood that their hypertension may be secondary to an underlying medical problem like kidney disease and so forth. Therefore, the target sample was appropriate for this assessment.

Table 4.2: Age of subjects

	Frequencies	**Percentage**
<30yrs	0	0.0
>30yrs	98	98.0
Not Recorded	2	2.0
Total	**100**	**100.0**

4.3.1.3 Gender

Gender was generally not indicated on the files, but the researcher used identity numbers to determine whether the patient was male or female. In 2% of the cases, gender could not be determined in this way as the identity number was not written in full. Only the first six digits were written which is the date of birth. In the 13-digit number of the South African identity number, the first six numbers represent the date of birth while the next four digits are for identifying the gender. The eleventh digit is for identifying citizenship, with South African citizens allocated a zero (0) and permanent residents allocated a one (1) (Western Cape Government, 2016). Of those whose gender could be determined, 27% were males while 71% were females. There is a possibility that the 2% not recorded could be foreign nationals who had no identity documents as they also utilise the PHC facilities in Tshwane District. In their study titled "knowledge and lifestyle practices of hypertensive patients attending a PHC clinic", Zungu, Djumbe and Setswe (2013:125) also found that there were more females (65.7%) than males (34.3%) who were attending follow-up care for hypertension in a selected PHC facility in Gaborone, Botswana.

Table 4.3: Gender of subjects

	Frequencies	**Percentage**
Male	27	27.0
Female	71	71.0
Not Recorded	2	2.0
Total	**100**	**100.0**

4.3.1.4 Patient name appearing on file

No (0%) file had no name of the patient on it. A file without a name would make retrieval very difficult or even impossible resulting in missing patients' medical information. Marutha and Ngoepe (2017: 7) added that missing files contribute to patients waiting long to be assisted. According to the Guidelines of the Health Professions Council of South Africa on keeping of patients' records (2016:2), it is compulsory to enter and maintain their personal (identifying) particulars in all the files. These personal particulars must include the name of the patient. All files studied (100%) had names of the patients on the outside cover and therefore making retrieval possible. In his article titled "The application of legislative frameworks for the management of medical records in Limpopo Province, South Africa", Marutha (2018: 1) concurs that prompt health care delivery depends on information contained in the medical records, which are referred to as files in this study.

Table 4.4: Patient name appearing on the file

	Frequencies	**Percentage**
Yes	100	100.0
No	0	0.0
Total	**100**	**100.0**

4.3.2 Patients' history

4.3.2.1 Duration on hypertension treatment

Majority of patients (99%) were on hypertension treatment for more than 12 months which is a reasonable amount of time to determine the patients' progress and or development of complications as depicted in table 4.5. According to the EML Guidelines (Department of Health South Africa 2014: 4.16), progress must be evaluated after three months if the patient is newly diagnosed and monthly until the patient is stable on treatment.

Table 4.5: Duration on hypertension treatment

	Frequencies	**Percentage**
>12 months	99	99.0
<12 months	0	0.0
Incomplete	1	1.0
Total	**100**	**100.0**

4.3.2.2 Current Patient's medication

Majority of patients (95%) were on Hydrochlorothiazide tablets, followed by Enalapril (67%), and Amlodipine (47%) as shown in figure 4.1 on the next page. This follows the stepwise treatment of hypertension according to the EML Guidelines (Department of Health South Africa, 2014: 4.16) where Hydrochlorothiazide is the first drug in the management of essential Hypertension in patients with no contraindications. This is followed by Enalapril and Amlodipine in that order. Ethiopia is using a similar approach to manage patients with hypertension where Hydrochlorothiazide, Enalapril and Nifedipine are commonly prescribed antihypertensive medications in the same order (Berisa & Dedefo, 2018: 66).

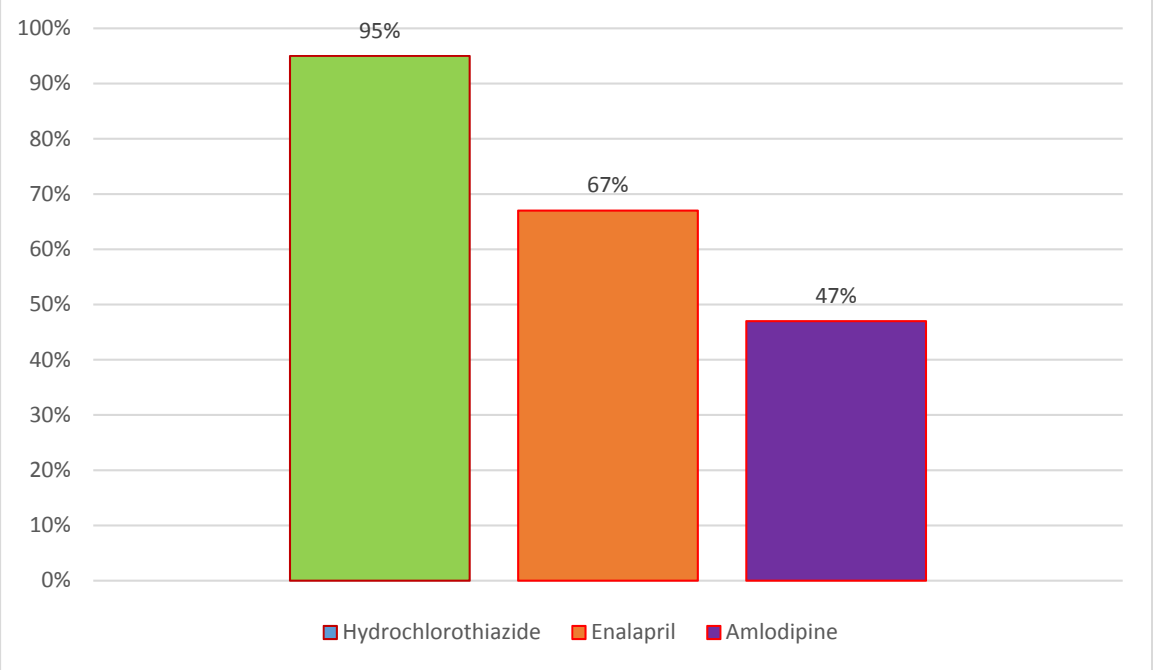

Figure 4.1: Commonly used antihypertensive medications

4.3.2.3 Patient's assessment of his/her own health

Majority of patients (59%) reported to be well, which is good while (19%) were not. A challenging finding is the (22%) that was not asked. Patients are the ones who can best describe their progress or deterioration, and this will direct physical examination. Bickley and Szilanyi (2017:65) believe that clinicians should follow the lead of the patient in order to understand their problems better. The reason for not asking patients how they felt could be knowledge deficit on the part of the consulting nurses, pressure of time created by long queues and so forth. Definitive reasons need to be investigated though. The interview of patients who seek care for an ongoing chronic problem like hypertension follow-up focuses on patient's self-assessment of his or her condition as well as response to treatment, functioning capacity and quality of life (Bickley & Szilanyi, 2017:67). Subjective information from the patient can provide the clinician with valuable clues as to where to focus the examination.

4.3.2.4 Adherence

This study found no record (100%) of patients ever asked about adherence to treatment. This is a worrying finding as adherence is the pillar of any chronic disease management including hypertension. Poor adherence to treatment was reported as the main cause of failure to control hypertension and subsequent premature deaths and disability (Berisa & Dedefo, 2018:63). Their study found that only 31.4% of the participants were adhering to antihypertensive medication. Factors influencing non-adherence to treatment were among others, low level of education, rural residence, unemployment, and lack of knowledge about hypertension and treatment (Berisa & Dedefo, 2018:67). That is why when clinical outcomes are unsatisfactory, adherence assessment becomes the starting point of investigation. According to the EML guidelines, adherence should be assessed on a regular basis even if there is no gold standard of doing it.

It is believed that multiple approaches should be used (Department of Health South Africa 2014; xxiii) including the self-reporting where patients are asked the following four questions:

1. Do you sometimes find it difficult to remember to take your medicine?
2. When you feel better, do you sometimes stop taking your medication?
3. Thinking back over the past four days, have you missed any of your doses?
4. Sometimes if you feel worse when you take the medicine, do you stop taking it?

Patients should be asked about adherence to treatment at every consultation because (Usherwood, 2017:147) found that even in developed countries like Australia, 50% of patients were not adherent to treatment. Boima, Ademola, Odusola, et al. (2015: 3) found similar findings in Ghana and Nigeria where 66.7% of patients were not adherent to their medication. The use of traditional preparations, which is also prevalent in South Africa, was found to be associated with non-adherence. A conclusion was drawn that a major problem in the long-term management of patients with hypertension was poor adherence to the prescribed treatment plan, leading to poor clinical outcomes with subsequent serious complications. The results of this study suggest that more work needs to be done to address this non-conformity.

Table 4.6: Patient adherence to medication

	Frequencies	**Percentage**
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**

4.3.2.5 Side effects of treatment

In (100%) of files audited, there was no record of patients who were asked if they were experiencing any side effects of prescribed medications as depicted in Table 4.7. The presence of side effects can affect adherence and subsequent clinical outcomes (Department of Health South Africa, 2014: xxv). The guidelines further emphasise that patients be screened for side effects from time to time. This was not done and constituted absolute non-adherence to Guidelines.

In a study titled "A qualitative study on hypertension care behaviour in PHC setting in Malaysia", participants/patients lamented the fact that they were not given adequate information including information about side effects of the medications they were on (Shima, Farizah & Majid 2014: 1602). One participant was quoted as saying '***I don't share my problem regarding taking medication with the doctor. They usually say a few words like okay, just take your medication and you can go. It is not even five minutes compared to the long time spent for waiting'.*** The same phenomenon observed in Malaysia could be responsible for the results of this study where communication between consulting nurses and their patients with regards to side effects of prescribed medications was found to be very poor.

Table 4.7: Medication side effects

	Frequencies	**Percentage**
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**

4.3.2.6 Can the patient still walk fast/climb?

The results from this study revealed no record (100%) of patients being asked if he or she could still walk fast or climb stairs as shown in table 4.8 below. This is in contravention of the APC Guidelines (Department of Heath South Africa, 2017:81) which require that patients be screened for symptoms at every visit.

Dyspnoea (shortness of breath) is a common symptom of heart failure, particularly the left side of the heart and may be mild evident during mild exertion like walking or climbing (Soweto Trust, 2017:81). Hypertension is a primary risk factor for heart failure. It is therefore, recommended that patients with hypertension be regularly screened for development of heart failure (Health System Development Unit, 2016: 131) through appropriate and relevant questioning during consultation.

Table 4.8: Patient's ability to still walk fast or climb

	Frequencies	**Percentage**
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**

4.3.2.7 Number of pillows used at night

This study found no record (100%) of patients being asked about the number of pillows they use when sleeping at night, as depicted in table 4.9 below. Inability to lie flat (orthopnoea) in a patient with hypertension could be suggestive of fluid accumulation in the lungs causing congestion, which is worsened by lying flat (Lewis et al 2014:770; Soweto Trust, 2017:81). This is one of the signs of heart failure. The number of pillows the patient use to sleep at night can give an indication of the presence or absence of fluid accumulation in the lungs and the health provider can identify development of the complication promptly and provide appropriate management like referral to the doctor (Health System Development Unit, 2016: 132). The more pillows the patient use to sleep at night, the more likely possibility that the patient is developing heart failure.

Table 4.9: Number of pillows used to sleep at night

	Frequencies	**Percentage**
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**

4.3.2.8 Chest pain

In this study, no chest pain (0%) was recorded during history taking from the files that were audited. This result is concerning as chest pain is one of the major symptoms of Coronary Artery Diseases (CAD) and hypertension is a risk factor thereof (Department of Health South Africa, 2014:4.2).

In their study published in the Indian Heart Journal, Gupta and Roy (2017:432) found that hypertension was responsible for 24% of CAD deaths in India. Like India, South Africa is also a low resource setting country which means that a similar percentage of deaths related to CAD may be contributing to the total mortality rate in South Africa.

Table 4.10: History of chest pains

History of chest pain recorded	**Frequencies**	**Percentages (%)**
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**

4.3.3 Physical examination

Many attributes touted as important by literature during physical examination on a follow-up care of a patient with hypertension were not recorded as shown in table 4.11 below.

According to the Health System Development Unit (2012: 131) and Department of Health South Africa (2014: 4.10), the following are important attributes that should be assessed regularly because their presence is suggestive of complications related to Hypertension:

- Dyspnoea;
- Raised Jugular venous pressure;
- Shifted apex beat;
- Oedema, particularly of the lower extremities;
- Basal crepitation in the lungs;
- Abnormal heart sounds;
- Central or peripheral cyanosis; and
- Digital clubbing.

In a study conducted in Kinshasa, Democratic Republic of Congo (DRC), it was found that hypertension-related complications are only diagnosed at secondary and tertiary levels of care, like hospitals (Lulebo, Mapatano, Kayembe et al., 2015: 1). This result indicates that the PHC in DRC is not as effective as it should be. The study concluded that task shifting of hypertension management to nurses was feasible if appropriate guidelines and training were provided.

In South Africa, the national Department of Health designed two sets of guidelines to assist nurses working in the PHC facilities to be able to diagnose these complications promptly. These guidelines are the APC and the EML. What is unclear is whether training on these guidelines is provided to nurses or not.

Like history taking, physical examination in hypertension follow-up care is also important to detect the presence or absence of complications particularly target organs damage like heart failure, coronary artery disease or kidney failure (Lewis et al., 2014:713). If performed adequately and thoroughly, physical examination can lead to accurate diagnosis (Muhrer, 2014). Muhrer (2014) further emphasises that certain signs cannot be detected with scans and other sophisticated diagnostic machines, but only with

physical examination. In the context of this study, such signs are dyspnoea, clubbing, raised jugular venous pressure, apex beat and so forth.

Table 4.11: Signs of complications of Hypertension

Attributes	**Frequencies**	**Percentages (%)**
Dyspnoea		
Yes	1	1.0
No	0	0.0
Not recorded	98	98.0
Missing/Incomplete	1	1.0
Total	**100**	**100.0**
Attributes	**Frequencies**	**Percentages (%)**
Jugular venous pressure		
Yes	1	1.0
No	0	0.0
Not recorded	99	99.0
Total	**100**	**100.0**
Attributes	**Frequencies**	**Percentages (%)**
Apex beat recorded		
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**
Oedema	**Frequencies**	**Percentages (%)**
Yes	64	64.0
No	0	0.0
Not recorded	36	36.0
Total	**100**	**100.0**
Crepitations	**Frequencies**	**Percentages (%)**
Yes	17	17.0

No	0	0.0
Not recorded	83	83.0
Total	**100**	**100.0**
Heart sounds recorded	**Frequencies**	**Percentages (%)**
Yes	53	53.0
No	0	0.0
Not recorded	47	47.0
Total	**100**	**100.0**
Cyanosis	**Frequencies**	**Percentages (%)**
Yes	28	28.0
No	0	0.0
Not recorded	72	72.0
Total	**100**	**100.0**
Clubbing	**Frequencies**	**Percentages (%)**
Yes	28	28.0
No	0	0.0
Not recorded	72	72.0
Total	**100**	**100.0**

The results of this study are as follows:

4.3.3.1 Dyspnoea

Majority of records (98%) did not have an assessment of dyspnoea. This means that patients were not examined for this attribute. Therefore, patients who had developed heart failure in this cohort of patients might have been missed. Dyspnoea is primarily of cardiac (caused by heart failure) or respiratory origin (Coccia, Polkowski, Schweitzer, et al., 2016: 32) and it accounts for nearly half of hospital admissions. Patients with dyspnoea need specialised care like cardiologist at tertiary hospitals. Therefore, efforts should be made to avoid delay. To illustrate the importance and the seriousness of dyspnoea, the study conducted in the Netherlands recommended that a dyspnoea clinic be started in that country (Rietbroek, Slats, Kies, et al., 2018: 9). The study found that an

integrated approach where a cardiologist and a pulmonologist were present, the exact cause of dyspnoea was promptly identified and appropriate management instituted without delay. However, in South Africa, where a PHC approach is adopted and is predominantly nurse driven, consulting nurses need to assess this attribute wherever it is indicated like in hypertension follow-up care so that appropriate intervention like referral to hospital is done promptly, thereby reducing mortality related to cardiovascular diseases like hypertension.

4.3.3.2 Jugular venous pressure

Only (1%) of the patients assessed were examined for raised jugular venous pressure (JVP) while (99%) were not. Raised JVP reflects right arterial pressure and it gives clinicians an important clinical indicator of right heart failure (Bickley & Szilagyi, 2017: 354). It is therefore, concerning to note that the majority of patients were not checked for this while hypertension is known to cause heart failure, both right and left ventricular failure or both (biventricular failure also known as congestive heart failure).

4.3.3.3 Apex beat

No (0%) patient was checked for displaced apex beat as evidenced by no record of this. Apex beat is normally felt in the fifth intercostal space midclavicular area (Bickley & Szilagyi, 2017: 384). However, it can be misplaced laterally as a result of cardiac enlargement owing to congestive heart failure. If physical examination is performed at regular intervals and performed well, patients with heart failure could be identified promptly and managed appropriately to prevent mortality related to heart failure.

4.3.3.4 Oedema

The majority of patients (64%) in this study were assessed for this attribute, with only (36%) not checked. This is a satisfactory finding as the researcher made (60%) as a cut off for adherence and less than 60% as non-adherence. According to Potter, Kaplan, Lynn and Reddy (2018: 717) and Talley and O'Connor (2018: 71), ankle swelling is a common symptom of right ventricular failure. The oedema is usually pitting (when applying pressure the skin is indented and only slowly refills).

4.3.3.5 Crepitations

About 17% of patients were assessed for basal crepitations while 83% were not. Those who were assessed (17%), their notes read as “chest clear” and an assumption was that they had no crepitations.

As fluid accumulates in the lungs because of heart failure, it causes abnormal sound which can be heard with a stethoscope when put at the base of the lungs (Health System Development Unit, 2012:134). These sounds are called crepitations.

4.3.3.6 Heart sounds

The records showed that 53% of patients were assessed for heart sounds while 47% were not. This was categorised as non-adherence as the result was less than (60%).

The first (1^{st}) and the second (2^{nd}) heart sounds normally referred to as the lub (1^{st}) and dub (2^{nd}) are normal heart sounds reflecting the closure of mitral valves and aortic valve respectively. The presence of the third or fourth heart sounds is said to be pathological and in hypertension could be a sign of heart failure (Talley & O’Connor, 2018: 99). Auscultation of the heart for heart sounds can reveal the presence or absence of heart failure and interventions can be instituted promptly.

4.3.3.7 Cyanosis

In the majority (78%) of files audited, there was no record of patients' assessment for cyanosis with only (28%) assessed. This finding also constituted non-adherence as patients with mild to moderate cyanosis may have been sent home without being noticed that their condition was deteriorating.

Cyanosis is the bluish/purplish discoloration of the skin and mucus membrane caused by reduced oxygen in the blood (Bickley & Szilagyi, 2017: 318). It is categorised as central cyanosis (seen on mucous membrane of the mouth) as well as peripheral, which is observed on the nail beds (Talley & O'Connor, 2018: 44).

4.3.3.8 Clubbing

Only 28% of records showed that patients were assessed for clubbing of the fingers while 72% had no record. In the context of this study, the causes of clubbing were limited to those related to heart diseases such as infective endocarditis or congenital heart defects (Lewis et al., 2014:696). Even if the results of this study suggest that the majority of patients studied may have essential or primary hypertension (hypertension with no known cause), this does not exclude the possibility that some patients may have secondary hypertension (Hypertension caused by the presence of an underlying condition) in the same cohort of patients, particularly those who were down referred from hospitals. Physical examination in hypertension follow-up care should include all relevant aspects related to the heart.

4.3.4 Vital signs

The results of vital signs monitoring were (100%) for blood pressure and (96%) for pulse rate as tabulated in table 4.12. This constitutes good adherence as the APC Guidelines 2016-2017 require that blood pressure be measured at all visits. However, pulse rhythm and volume were (100%) unrecorded.

Vital signs include blood pressure, pulse, temperature, and respiration. They provide information that often influences the direction of the consultation (Brickley & Szilagyi, 2017:123). However, for the purpose of this study, focus was only on blood pressure and pulse as they relate to the cardiovascular system. Vital signs form part of physical examination and give an indication about the bodily function of a patient. Nurse's timely response to abnormal vital signs is one of the critical aspects of patient's safety (Watkins, Whisman & Booker, 2016) because it enables prompt and appropriate intervention. There are cardiac conditions that can cause the pulse to be weak in volume for example heart failure or aortic stenosis. Other conditions affect the regularity of the pulse for example cardiac dysrhythmias. It is therefore important that the pulse be assessed for all its characteristics when conducting a cardiovascular examination.

Table 4.12: Vital signs

Blood Pressure	**Frequencies**	**Percentages (%)**
Yes	100	100.0
No	0	0.0
Not recorded	0	0.0
Total	**100**	**100.0**
Pulse rate, rhythm and character		
Pulse rate		
Yes	96	96.0
No	0	0.0
Not recorded	4	4.0
Total	**100**	**100.0**
Pulse rhythm		
Yes	0	0.0

No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**
Pulse volume		
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**

4.3.5 Side room investigations

In the context of hypertension, side room investigations include BMI, waist circumference, rapid blood glucose, urine test, and visual acuity testing. According to the APC Guidelines, these measurements should be done at least once a year. The results of this research indicate non- adherence to the guidelines by consulting nurses as shown in table 4.13.

Table 4.13: Side room investigations

BMI recorded	**Frequencies**	**Percentages (%)**
Yes	18	18.0
No	0	0.0
Not recorded	82	82.0
Total	**100**	**100.0**
Waist Circumference recorded	**Frequencies**	**Percentages (%)**
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**
Blood glucose measured	**Frequencies**	**Percentages (%)**
Yes	23	23.0
No	77	77.0
Total	**100**	**100.0**
Urine tests	**Frequencies**	**Percentages (%)**
Yes	32	32.0
No	0	0.0
Not recorded	68	68.0
Total	**100**	**100.0**
Eye test done or recorded	**Frequencies**	**Percentages (%)**
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**

4.3.5.1 Body Mass Index

The study found that (82%) of files audited there was no BMI recorded in the past 12 months as required by the Guidelines (Department of Health South Africa, 2017:81). Only (18%) were done. In calculating the risk of developing heart attack or stroke over the period of ten years, the APC Guidelines uses BMI, age and blood pressure (Department of Health South Africa, 2017: 75) to determine the risk therefore, BMI is an important measurement to be done in hypertension follow-up care. Only one facility was found to be regularly measuring the patients' BMI with nine out of ten. While this result is highly commendable for this facility, the BMI of those patients was not interpreted. This is also problematic because if investigations are not interpreted, appropriate measures will not be taken, and this defeats the whole purpose. The findings of this study suggest that the majority of patients (82%) consulted were not assessed for the risk of having a heart attack or stroke in ten years. This constituted non-adherence.

4.3.5.2 Waist circumference

In this study, there was no record (0%) of patients' waist circumference in the past 12 months. According to the APC Guidelines, waist circumference should be done yearly or three monthlies if trying to lose weight (Department of Health South Africa, 2017: 81). It is an indicator of health risk associated with excess fat around the waist. The APC further provides guidelines for waist circumference targets for males and females respectively.

4.3.5.3 Blood glucose

In 77% of files, there were no records of patients having been screened for Diabetes Mellitus in the past 12 months. Only (23%) were screened. Diabetes Mellitus is a risk factor for cardiovascular diseases like heart attack or stroke so is hypertension (Department of Health South Africa, 2017: 75). Therefore, when the two conditions co-exist, the risk increases even further (Lewis et al., 2017: 712). That is why all patients with hypertension should be regularly screened for Diabetes Mellitus. According to the APC Guidelines, rapid glucose finger prick test should be performed yearly.

4.3.5.4 Urine test

Only 32% of files audited had a urine test done in the past 12 months with majority (68%) not tested. Urine dipstick is another important side room investigation in routine hypertension follow-up care (Department of Health South Africa, 2017: 81). It must be done yearly and if abnormalities like blood or protein are detected on a repeat specimen, the guidelines advise that the patient be referred to the doctor. Urine test can also show glucose in which case further assessment for Diabetes Mellitus should be instituted.

4.3.5.5 Eye test

Out of 100 files audited, there was no (0%) record of eye test that was done. This constituted non-adherence as target organ damage caused by uncontrolled hypertension includes eye diseases like blindness. The APC Guidelines do not include eye testing in routine care of patients with hypertension. However, it is known that uncontrolled hypertension can damage the small arteries of the retina causing poor vision (Health Systems Development Unit 2012: 155; Talley et al., 2018: 125).

4.3.6 Routine blood tests

While routine blood specimen for eGFR and cholesterol were satisfactorily recorded at 70% and 66% respectively, the results were not all available. Nearly half (49%) of cholesterol blood and 43% of eGFR were not in the files at the time of the audit, even though the laboratory sticker showed that blood specimen were taken several months earlier. Of those whose results were available, 33% had a normal cholesterol levels while 18% had abnormal levels. Furthermore, 45% of eGFR blood was normal and 13% was abnormal. Of the abnormal blood results found, there was no action taken in 17% of cases. Abnormal eGFR reflects kidney problem while abnormal cholesterol, especially high cholesterol levels indicate risk factors associated with atherosclerosis (Lewis et al., 2017: 715). According to the APC Guidelines, patients with abnormal cholesterol and eGFR results should be referred to the doctor for further management. This intervention (referral to the doctor) is missed and could results in further complications.

Table 4.14: Routine blood tests

eGFR	**Frequencies**	**Percentages (%)**
Yes	70	70.0
No	0	0.0
Not Recorded	30	30.0
Total	**100**	**100.0**
Cholesterol	**Frequencies**	**Percentages (%)**
Yes	66	66.0
No	0	0.0
Not Recorded	34	34.0
Total	**100**	**100.0**

4.3.7 Lifestyle assessment

There was 70% record of health education been given. However, this was captured as "**health education given"** with no specific reference to a particular lifestyle targeted. For effective control of hypertension and reduction of complications, drug treatment must be combined with appropriate lifestyle modification **(**Lewis et al., 2014: 715)**.** If the patient smokes, he or she must be encouraged to stop. If obese, he or she must reduce weight and so forth. Each patient has the relevant lifestyle that is applicable to him or her therefore, a blanket approach to health education is not desirable as it was found in this study. If there is no record of whether the patient is smoking or not, uses alcohol or not has reduced salt and fat in his or her diet then health education will be general and this usually does not produce desired outcomes.

Table 4.15: Lifestyle modification

Smoking	**Frequencies**	**Percentages**
Yes	2	2.0
No	8	8.0
Not recorded	90	90.0
Total	**100**	**100.0**
Alcohol Use	**Frequencies**	**Percentages**
Yes	1	1.0
No	8	8.0
Not recorded	91	91.0
Total	**100**	**100.0**
Exercise	**Frequencies**	**Percentages**
Yes	1	1.0
No	0	0.0
Not recorded	99	99.0
Total	**100**	**100.0**
Salt reduction	**Frequencies**	**Percentages**
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**
Fat reduction	**Frequencies**	**Percentages**
Yes	0	0.0
No	0	0.0
Not recorded	100	100.0
Total	**100**	**100.0**

The results of lifestyle modification in this study are as follows:

4.3.7.1 Smoking

In 90% of files audited, there was no record of whether the patient was smoking or not. Only (2%) were recorded as smoking and (8%) not smoking as shown in table 4.15**.** Smoking cigarette is a major risk factor for CVD (Department of Health South Africa 2014:4.2; Lewis et al. 2014: 716). Therefore, cigarette smoking should always be assessed in all patients who are consulted for hypertension. The EML guidelines recommend that all patients with hypertension be advised to stop smoking (Department of Health South Africa, 2014: 4.14).

4.3.7.2 Alcohol use

This study found that only 1% was recorded as using alcohol, 8% not using alcohol and 91% was not recorded for this attribute as shown in table 4.15. All patients with cardiovascular disease risk like hypertension should be encouraged to reduce alcohol intake to at least two standard drinks per day for men and one standard drink for females (Department of Health South Africa, 2014: 4.2). Reductions of alcohol to these levels reduce the risk of other CVD risks including stroke. It also makes it easier for the patient to lose weight (Health Systems Development Unit, 2012:165) which is also a recommendation if the patient is overweight. Hydrochlorothiazide, Enalapril and Amlodipine all interact with alcohol (National Institute on Alcohol Abuse and Alcoholism 2014) and these drugs are commonly used in management of hypertension in PHC facilities as shown in figure 4.1. It is therefore, important that patients with hypertension are screened for alcohol use or misuse so that appropriate and relevant health education can be given.

4.3.7.3 Exercise

In this study, the majority (99%) of files audited patients were not asked if they were exercising or not. Only (1%) indicated that they were exercising. Exercise constitutes a vital component of lifestyle modification and is supposed to be emphasised in every visit. It is recommended that all patients with hypertension do regular moderate aerobic

exercises like brisk walking for 159 minutes per week (Department of Health South Africa, 2014: 4.14) as part of lifestyle modification. In the study conducted in Anambra State of Nigeria titled “Perception, knowledge and attitude towards physical activity behaviour: Implications for participation among individuals with essential hypertension”, Maruf, Ojukwu and Akindele (2018: 59) found that increasing the knowledge about physical activity among individuals with hypertension by creating awareness about benefits and utilisation of physical activity improved their attitude towards physical activity. It is therefore important that an awareness of physical activity or exercise is created among patients with hypertension at all follow-up visits to create and increase their attitude and participation in physical activity.

4.3.7.4 Salt reduction

This study found no record (100%) of patients been asked about whether they have reduced the intake of salt in their diet. This constitutes non-adherence to the Guidelines as salt reduction must form part of a comprehensive management plan for patients with hypertension. Healthy adults should restrict their salt intake to less that 2300mg per day while those with hypertension should restrict it even lesser to at least 1500mg per day (Lewis et al., 2014: 716). This is equivalent to one teaspoon of salt per day.

4.3.7.5 Dietary fat reduction

In this study, no patient (0%) was asked if he or she has reduced fat in their diets as this information was not recorded in the files. The finding constitutes non-adherence to the EML guidelines because one of the general measures in the guidelines is to encourage the patients to restrict fat in their diets (Department of Health South Africa, 2014: 4.2).
Reducing fat in the diet not only contributes to weight loose (Health System Development Unit, 2012: 164), it also prevents ischemic heart diseases and atherosclerosis (Department of Health South Africa, 2014: 4.2). These conditions can make hypertension worse and lead to death. Therefore, reducing fat in the diet is a preventative measure that must be included in patients’ health education. If the use of fat is not assessed during follow-up visit, clinicians will not be able to know which patient is succeeding in this life style modification and who needs up-scaling of counselling with regards to this attribute.

4.3.8 Management of the patients

The majority of the records (95%) showed that patients were on the first line drug treatment, which is Hydrochlorothiazide 12.5mg orally daily. This was following the APC and the EML Guidelines of management of hypertension.

While the majority of patients (62%) did not need treatment adjustment, a significant percentage (12%) needed a referral to the doctor and they were not referred. These were predominantly patients with abnormal cholesterol and eGFR blood. Elevated cholesterol level and triglycerides are known risk factors for atherosclerosis and hyperlipidaemia and are common in people with Hypertension (Lewis et al., 2014: 713).

Drug management of essential hypertension at PHC facilities in South Africa starts with a low dose of a Thiazide diuretic unless there are contraindications (Department of Health South Africa, 2017: 81). Figure 4.1 on page 53 indicates adherence to this attribute.

With regards to stable patients who must collect their medication at convenient pick-up points like Dischem, Clicks and so forth, only 39% of patients were collecting their medication at the Centralized Chronic Medicine Dispensing and Distribution (CCMDD). (61%) of patients still come to the clinic for their medicines. Does this suggest that many patients are not stable in Tshwane District? This question may need further exploration because the purpose of the CCMDD programme is to reduce the number of stable patients who come to the clinics only to collect their chronic medicines (Maseko, 2017).

4.3.9 Health provider's knowledge and skills

This question sought to establish whether nurses who consulted the patients were duly trained in clinical nursing science, health assessment, treatment, and care. The researcher had to identify the nurses by their signatures on the files and then approached the manager to check these facts. The researcher realised that the question had a potential to harm the reputation of those affected and therefore abandoned the question. Data related to this question were captured as missing represented by number six.

4.4 OVERVIEW OF RESEARCH RESULTS

A quantitative, non-experimental, descriptive and retrospective study was conducted to describe follow-up care received by patients with hypertension in Tshwane District. The study also sought to determine adherence or non-adherence to the National Guidelines by nurses who are conducting these follow-up consultations.

From the data that were analysed, follow-up care received by patients with hypertension can be described as being available in all selected PHC facilities, but lacks the quality required as evidenced by 93.40% of non-adherence to guidelines. There were several aspects that must have been done but were not done and it is the view of the researcher that reasons for this non-adherence be investigated and the root cause be isolated so that the follow-up care received by patients with hypertension at PHC facilities in Tshwane District can be improved.

Tables 4.16, 4.17 and figure 4.2 demonstrate the distribution of adherent and non-adherent attributes.

Table 4.16: Adherent attributes

Attributes	Yes (%)	No (%)	Odds ratio
Blood Pressure	100.0	0.0	0.000
Pulse rate	96.0	4.0	0.074
EGFR	70.0	30.0	0.762
Cholesterol	66.0	34.0	0.916
Oedema	64.0	36.0	1.000

Attributes that were performed at above 60% and were considered as adherent to the Guidelines were blood pressure measurement at 100%, pulse rate measurement at 96%, eGFR blood at 70%, cholesterol at 66% and checking whether the patient has pitting oedema at 64%.

Table 4.17: Non-adherent attributes

Attributes	**No (%)**		**Yes (%)**
Dyspnoea	99.0		1.0

Jugular venous pressure	99.0		1.0
Apex beat recorded	100.0		0.0
Crepitations	83.0		17.0
No of pillows used	100.0		0.0
Cyanosis	72.0		28.0
Clubbing	72.0		28.0
Chest pain recorded	100.0		0.0
Walk/climb	100.0		0.0
Pulse rhythm	100.0		0.0
Pulse volume	100.0		0.0
BMI	82.0		18.0
Waist Circumference recorded	100.0		0.0
Blood glucose measured	77.0		23.0
Urine tests	68.0		32.0
Eye test done or recorded	100.0		0.0
Smoking	98.0		2.0
Alcohol Use	99.0		1.0
Exercise	99.0		1.0
Salt reduction	100.0		0.0
Fat reduction	100.0		0.0
Adherence to medication recorded	100.0		0.0
Side Effects of treatment	100.0		0.0
Heart sounds recorded	47.0		53.0

The results in table 4.17 are concerning particularly those attributes which were not done at all (100%) by nurses who are consulting the patients for a follow-up care of hypertension in PHC facilities in Tshwane District. Patients were not asked if they have side effects of prescribed anti-hypertensive drugs, an attribute that must be assessed regularly in patients who come for follow-up care as this could lead to poor adherence (Department of Health South Africa 2014: xxiv). Patients were not assessed if they were taking prescribed medication correctly to ensure better outcomes. Patients were not

asked if they have reduced salt and fat in their diets. No eye test was done in the past 12 months, even when it is known that eyes are among the target organs susceptible to damage by hypertension. Loss of vision is one of the clinical manifestations of retinal damage (Lewis et al., 2014: 714).

Waist circumference was not done in all patients (100%) studied. Therefore, it is not known if these patients had an additional risk factor for CVD or not. In their study, Owolabi, Goon and Adeniyi (2017:1) found that one in three adults of normal weight had central obesity. This indicates that waist circumference is a significant measure of obesity. Using BMI alone is not adequate in clinical assessment. In another study conducted on adults in Buffalo City: Eastern Cape, obesity was found to be significantly associated with many CVDs including Hypertension (Owolabi, Goon, Adeniyi, Adedokum & Seekoe, 2017). Obese individuals were likely to be hypertensive and or diabetic in that study.

Pulse was not assessed for volume and rhythm (100%), apex beat was also not palpated to check if it is in the correct position to exclude heart enlargement which will cause the heart to fail. All patients (100%) studied were not asked if they experience any chest pains to exclude coronary artery disease, which could be caused by hypertension particularly if it is not controlled. Dyspnoea was also not assessed as evidenced by no record (100%) of how many pillows the patient uses to sleep at night as well as ability of the patient to can still climb or walk fast. Auscultation of heart sounds was also done below (60%) which constitutes non- adherence.

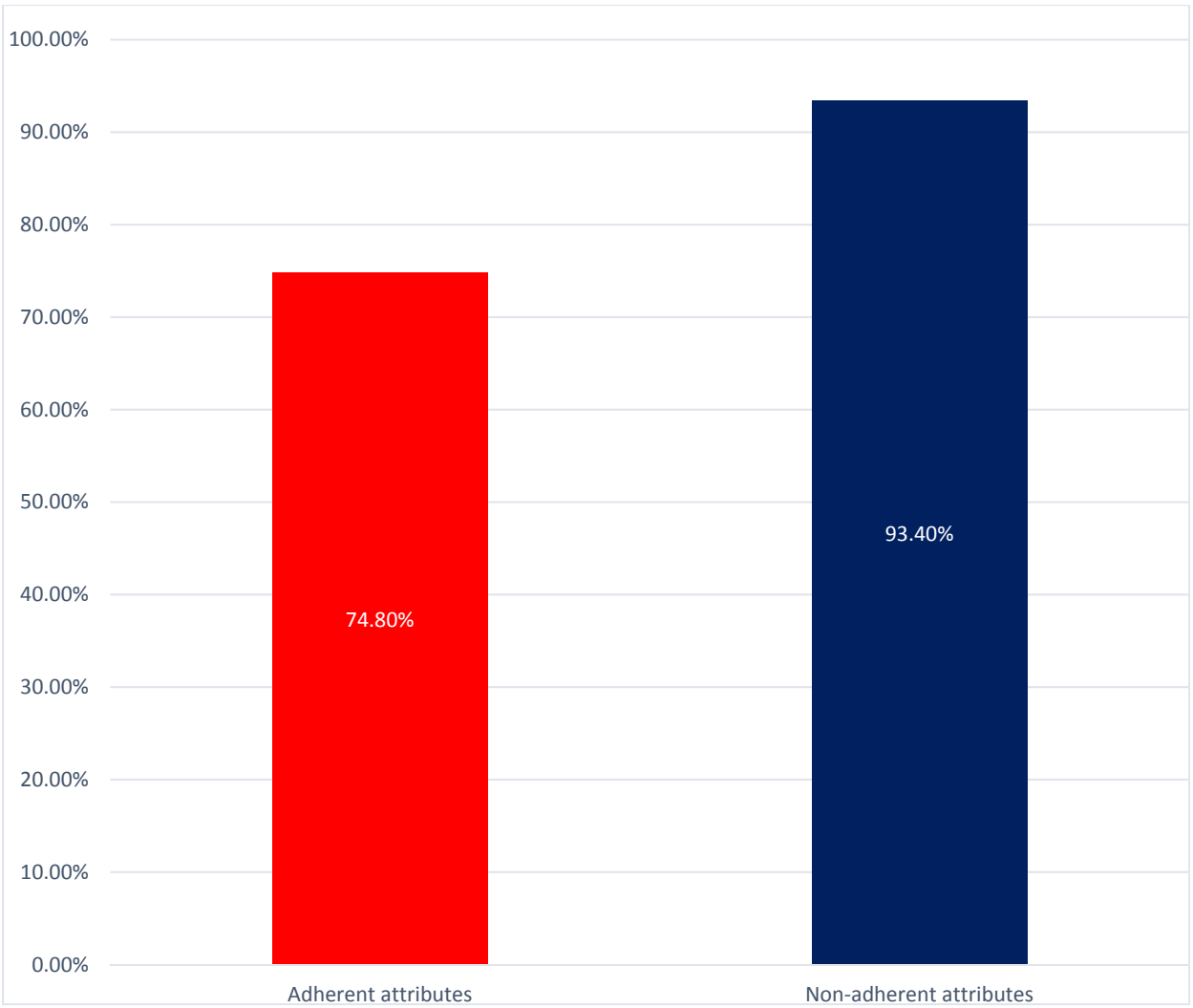

Figure 4.2: Adherent and non-adherent attributes

About 74.80% of adherent attributes is commendable. However, 93.40% non-adherence has a potential to defeat the efforts of an ideal clinic realisation which seeks to systematically improve and correct deficiencies in PHC clinics in the public sector. An ideal clinic is a clinic that must use applicable clinical policies, protocols and guidelines (Department of Health South Africa 2018:1). Continuous failure to adhere to guidelines may result in non-attainment of an ideal clinic status for PHC facilities in Tshwane District, which is not desirable.

4.5 CONCLUSION

This chapter presented data analysis, presentation, description and discussion of the research results. Tables and figures were used to elicit the results. The overall results are somewhat positive even though there are some challenges identified. Literature review was conducted to support the results. In the next chapter, conclusions and recommendations will be discussed.

CHAPTER 5

INTERPRETATION OF RESULTS, LIMITATIONS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

In the previous chapter, the results were analysed and presented predominantly in tabular and figure formats and were also described in frequencies and percentages. In this chapter, conclusions and recommendations in relation to the research questions are discussed.

5.2 RESEARCH DESIGN AND METHODS

The study design was quantitative, non-experimental, descriptive, and retrospective**.** The population included all files of patients diagnosed with hypertension in selected PHC facilities in Tshwane District**.** PHC facilities were randomly selected from the NHRD and ten facilities were selected. For the purpose of this study, these facilities were referred to as facility number one (F1) up to facility number ten (F10). F1 means the first facility where data were collected and F2 is the second facility up to F10 in that order. A convenient sample of 100 files was subsequently selected from the listed PHC facilities where ten files were selected per facility. In chapter three, inclusion and exclusion criteria were discussed in detail.

Data were collected after obtaining clearance from relevant authorities using a checklist where attributes of adherence and non-adherence were collected. The checklist consisted of 55 items which the PHC nurse must execute when consulting a patient on a follow-up visit for hypertension. The researcher ticked off all items as having been done, not done or not recorded. The items on the checklist were extracted from the APC Guidelines of 2016 to 2017 as well as the EML Guidelines of 2014 because these are Guidelines that must be used to guide nurses who are consulting the patients in PHC facilities.

Data collection was done over a period of two months during May and June 2018 by the researcher in person. It was collated, checked for correctness and analysed using SPSS

version 25 with the assistance of a statistician. Data were analysed according to broad sections which were listed in Chapter 4. These broad sections contained several aspects, for example, the sample characteristics included items like the age of the patient, gender and so forth. However, in this chapter, only a summary of these broad sections are discussed as they relate to the research questions.

According to literature, these broad sections adequately covered aspects that must be checked on patients who are diagnosed with hypertension and are coming to the clinic for a follow-up visit.

5.3 SUMMARY AND INTERPRETATION OF THE RESEARCH RESULTS

5.3.1 Patient's history

5.3.1.1 Duration on hypertension treatment

The question assessed for how long the patient was on hypertension medication. The study found that majority of the patients was on hypertension treatment for more than 12 months. This was a reasonable time to assess progress on these patients including routine blood tests analysis (which are taken annually) as well as lifestyle modification successes or failures.

5.3.1.2 Patient's medication

The question sought to assess if stepwise management of hypertension (according to the EML Guidelines) was followed. The result was 95% of the patients were on Hydrochlorothiazide, followed by Enalapril (67%) and Amlodipine (47%). This result is in line with the stepwise management of hypertension according to the EML guidelines where Hydrochlorothiazide should be the first line of hypertension drug management. The results also indicated that many patients had no contraindications to Hydrochlorothiazide as evidenced by the number of patients on this drug.

5.3.1.3 Patient's assessment of his/her own health

The question assessed if patient was asked how he or she was feeling on the day of consultation. The result was non- adherent in that (22%) of patients were not asked how they were feeling. This result supported the allegations made by the Deputy Minister of

Health in the Diabetic workshop that the researcher attended on 14 May 2015 at Birchwood Hotel that nurses in PHC facilities were very brief in their notes. Only capturing notes as “patients came for follow-up, treatment given” (Phaahla, 2015). It also supports the finding of the Malaysian study on hypertensive care behaviour in PHC settings where participants lamented the fact that their health care providers usually say a few words like “okay, just take your medication and you can go” (Shima, Farizah & Majid, 2014: 8).

5.3.1.4 Patient’s adherence to medication

The question sought to determine if patients were assessed for adherence to prescribed medication. The result was that no patient was asked about how he or she was taking the prescribed medication. This was considered as non-adherent to the guidelines as adherence to treatment must be assessed at all visits. Therefore, it is recommended that consulting nurses be trained on this aspect as adherence to medication is a corner stone of any chronic disease management.

5.3.1.5 Side effects of treatment

The question assessed if patients were asked about side effects of prescribed medication. The results were that no patient was asked about this attribute. Side effects have been identified as the contributory factors of non-adherence to medication. Therefore, patients who suffer side effects of medication may not adhere to their medication and this will result in their hypertension being uncontrolled. Uncontrolled hypertension almost always leads to complications like heart failure and death which could be prevented.

5.3.1.6 Can the patient still walk fast/climb?

The question sought to determine if development of right ventricular failure was assessed in the patients who came for follow-up care of hypertension. Out of 100 files audited, no patient was asked if he or she could still walk fast or climb stairs. This was considered as non-adherence to the Guidelines as patients should be assessed for symptoms at all visits.

5.3.1.7 Number of pillows used at night

The result of this question was also non-adherent as no patient was asked about how many pillows he or she was using to sleep at night. The more pillows the patient use to sleep at night, the more likely the possibility that the patient is developing heart failure. Therefore, nurses who were consulting the patients were considered non-adherent to this attribute.

5.3.1.8 Chest pain

The question determined if consulting nurses assessed patients for the presence or absence of chest pain as hypertension is known to be a risk factor for Coronary Artery Diseases (CADs). The result was that no patient was asked about this attribute and this was non-adherence.

5.3.2 Physical examination

The question assessed if physical examination was conducted and particular aspects of the examination were covered as prescribed by literature. The question had eight items and the results were as follows:

5.3.2.1 Dyspnoea

The question assessed if patients were examined for breathlessness or dyspnoea. The majority (98%) of the patients were not assessed for this attribute. This was considered as non-adherence.

5.3.2.2 Jugular venous pressure

The question assessed if patients were examined for raised jugular venous pressure. Only one out of 100 patients was examined for this attribute. This was considered non-adherence because 99 patients who may have had a complication were probably missed.

5.3.2.3 Apex beat

The question assessed if patients were examined for the position of the apex which must be in the fifth interspace midclavicular. No patient was assessed if his or her apex beat was in the correct position. This was considered as non-adherence.

5.3.2.4 Oedema

The question assessed if patients were examined for swelling of the extremities also known as oedema in medical terminology. This physical examination attribute was done at 64% which was considered as adherence because in this study, the cut off for adherence was 60% and above while anything below 60% was considered non-adherence.

5.3.2.5 Crepitations

The question assessed if patients were auscultated for crepitations at the base of their lungs. Only 17% was examined for this attribute. The consulting nurses were considered non-adherent in this regard.

5.3.2.6 Heart sounds

The question assessed if patients were auscultated for heart sounds. As many as 53% of the patients were assessed for this attribute, but this was not good enough as it did not reach the 60% mark. Therefore, this also constituted non-adherence.

5.3.2.7 Cyanosis

The question assessed if patients were examined for cyanosis. The majority of patients (72%) were not assessed for cyanosis and this was considered as non-adherence.

5.3.2.8 Clubbing

The question assessed if patients were examined for clubbing of the fingers. Only (28%) of the patients were assessed for this attribute which constituted non-adherence.

5.3.3 Vital signs

The question assessed if vital signs were measured. It comprised of two items.

5.3.3.1 Blood pressure

The question assessed if patients' blood pressure was measured. The result was (100%) adherent. All patients had their blood pressure recorded.

5.3.3.2 Pulse rate, rhythm and volume

The question assessed if patients' pulse rates and rhythms were measured. While majority of patients (96%) were assessed for this attribute, the pulse rhythm was not done at all. Therefore, nurses were not adherent on assessing the pulse rhythm.

5.3.4 Side room investigations

The question assessed if relevant side room investigations were done at appropriate intervals. It had five items.

5.3.4.1 Body Mass Index

The majority of patients had no BMI done on them in the past 12 months. Of those whose BMI was measured, it was not interpreted which suggest that it was just measured for compliance as oppose to better patient's management.

5.3.4.2 Waist circumference

No single patient's waist circumference was measured in the past 12 months. This constituted non-adherence to the APC Guidelines.

5.3.4.3 Blood glucose

The results for the question showed that majority of patients were not assessed for Diabetes Mellitus in the past 12 months as required by the APC guidelines.

5.3.4.4 Urine test

The majority 68% of the patients did not have their urine tested in the past 12 months as required by the APC Guidelines.

5.3.4.5 Eye test

While all facilities indicated to be having the Snellens' chart (eye testing chart), no patient had an eye test in the past 12 months. This constituted non-adherence.

5.3.5 Routine blood tests

The question sought to check if routine blood tests were collected, results interpreted and abnormalities acted upon. It had two items.

5.3.5.1 eGFR

The study found that nurses were adherent on collecting blood for eGFR at appropriate intervals. However, follow-up was not done on the results. Many files had a sticker to show that blood specimen were taken, but no results were available in the file. Some abnormal results were not acted upon.

5.3.5.2 Cholesterol

While consulting nurses were adherent on collecting blood specimen for cholesterol at appropriate intervals, measures to mitigate abnormal results were not taken.

5.3.6 Life style assessment

The question sought to determine if appropriate lifestyle modification was adequately addressed. The question had five lifestyles modification attributes.

5.3.6.1 Smoking

There was non-adherence on this attribute in that only 2% was asked while 8% was not asked. However, 90% was not recorded. The result constituted non-adherence.

5.3.6.2 Alcohol use

The majority 91% of patients were not asked if they were using alcohol which constituted non-adherence.

5.3.6.3 Exercise

The majority 99% of patients were not asked if they were exercising or not so that appropriate recommendations can be made. This constituted non-adherence.

5.3.6.4 Salt reduction in the diet

No single patient was asked, if he or she has reduced salt in the diet. This showed non-adherence.

5.3.6.5 Fat reduction in the diet

No single patient was asked if he or she has reduced fat in the diet. This showed non-adherence.

5.3.7 Management of the patients

There was adherence to prescription of drug treatment as Hydrochlorothiazide was mainly used as a recommended first line. In addition, the nurses could adequately manage majority of patients as they did not need referral to the doctor. However, the minority that needed referral, like those who had elevated cholesterol levels were not referred as required by the Guidelines. The percentage of patients receiving treatment at the CCMDD is also non-adherent with (61%) of patients still coming to the facility for their medicine collection.

5.4 CONCLUSION

The conclusion drawn in this research is that follow-up care received by patients with hypertension at PHC facilities in Tshwane District of Gauteng Province: South Africa can be described as available in all PHC facilities in Tshwane District and predominantly nurse driven. Patients receive reasonable care they need in that their blood pressure is measured in all visits. The majority of patients are recommended antihypertensive

medication and their routine blood tests are done at stipulated time frames. However, gaps were identified and these gaps need to be attended to in order to improve the quality of follow-up care received by patients with hypertension. The study also revealed that not all professional nurses at PHC facilities in Tshwane District are able to conduct a proper hypertension follow-up consultation on the patients.

5.5 RECOMMENDATIONS

5.5.1 Recommendations for nursing practice

- It is recommended that professional nurses who do not have clinical skills should not be allocated in hypertension follow-up care or chronic section. Even if guidelines are available, they will yield better results if they are used by professional nurses who have basic understanding of consultation skills like history taking, physical examination and interpretation of investigations. Based on the results of this study, it is clear that some professional nurses could not interpret the danger related to elevated eGFR or cholesterol. Where BMI was measured, it was not interpreted so that interventions could be implemented. There is absolute misunderstanding of lifestyle modification and how it must be implemented in the management of hypertension during follow-up visit.
- Facility managers must conduct routine audits of patients' files as part of their oversight function to identify discrepancies in patients' management. They should not wait until there is a formal investigation related to suboptimal care received by patients with hypertension.
- There should be a remediation programme for professional nurses who have been trained, but are found to be non-adherent to the guidelines. In a similar study conducted in Kinshasa, Congo, where consulting nurse's knowledge was assessed, 84% of nurses reported to have received training (Lulebo, et al., 2015: 1). The results suggest that training alone may not be enough, but continuous support and remedial actions may be necessary.
- Facility managers should investigate why stable hypertensive patients are not collecting their medication at the CCMDD outlets. Stable patients must be referred to these sites so that PHC facilities can have a manageable workload. The larger the

patients' volumes at a given time in the PHC facilities, the poorer the service they will receive owing to fatigue of health providers.

- Professional nurses who have been trained in clinical skills like R48 should demonstrate commitment to the profession in the manner in which they document their findings and management of the patients with hypertension. Detailed history, physical examination and interpretation of investigations should form an integral part of routine care of patients with hypertension.
- Health education should be tailor made to suit the prevailing circumstances of each patient. A blanket approach that says "health education given" should be avoided. Health education should be specific for example a patient who still struggles to quit smoking, those who have not been able to start an exercise programme, or salt reduction and so forth, should be easily identifiable when checking their files because when this information is not documented, it appears as if it was not done.

5.5.2 Recommendations for nursing education

- It is the view of the researcher that just as Nurse Initiated Management of Anti-Retroviral (NIMART) training enabled nurses to initiate many patients with HIV on treatment and are able to monitor them adequately, other chronic diseases like hypertension should receive the same attention and momentum.
- The Regional Training Centres (RTCs) should ensure that professional nurses working in PHC facilities receive intensive on the job training on comprehensive management of hypertension as it is the most common chronic disease in PHC facilities.
- Nursing colleges and universities should include a module on hypertension management in all nursing programmes from basic to post basic in the new programmes.

5.5 3 Recommendations for further research

- It is recommended that a similar research be conducted in the other four districts of Gauteng Province to check if a similar trend can be found.
- This study may be repeated after three to five years to check if the recommendations have been implemented.
- It is further recommended that a similar study be conducted but using the mixed methods so that individual professional nurses could be interviewed to assess their understanding of the guidelines in as far as hypertension follow-up care of patients should be carried out.

5.6 CONTRIBUTIONS OF THE STUDY

This study found a significant percentage (93.4%) of non-adherence to the National Guidelines in the management of hypertension follow-up care at PHC facilities. It is also evident that Guidelines alone do not improve the quality of care because guidelines are available, but not adhered to completely. Therefore, PHC facilities that will implement the recommendations suggested in this study could significantly improve the quality of care received by patients with hypertension. Complications related to hypertension can be greatly reduced and the goal of extending life expectancy of all South Africans to at least 70 years by 2030 could be realised sooner than later.

5.7 LIMITATIONS OF THE STUDY

- The findings of this study are valid for specific context only that is Tshwane District and cannot be generalised to the entire Province of Gauteng or the whole country for that matter.
- The question that was intended to assess if the nurses who consulted the patients were duly trained in clinical skills was abandoned owing to its sensitive nature. However, the researcher believes that if it was answered it was going to provide some light with regard to training of consulting nurses or lack thereof so that training is removed from the list of recommendations if it was found that nurses were trained.

5.8 CONCLUDING REMARKS

The objectives of the study were to describe the follow-up care received by patients with hypertension at PHC facilities in Tshwane District and determine adherence or non-adherence to National Guidelines by nurses with regard to hypertension follow-up care. The conclusion drawn is that follow-up care received by patients with hypertension in PHC facilities in Tshwane District was found to be suboptimal, characterised by some degree of non-adherence to National Guidelines. This showed a considerable gap in knowledge and practice in the management of Hypertension in PHC facilities. Lulebo et al. (2015: 1) came to a similar conclusion in their study titled" Assessment of Hypertension management in Primary Health Care settings in Kinshasa, Congo". Recommendations were made based on the results of the study to improve follow-up care received by patients with hypertension in PHC facilities in Tshwane District of Gauteng Province: South Africa. The results of the study also confirmed the earlier observation made by the researcher in the problem statement that chronic services were regarded as fast tract and sometimes very inexperienced nurses were allocated in these services as it is regarded as predominantly treatment collection with no specialised skills required.

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7. ANNEXURES

ANNEXURE A: UNIVERSITY APPROVAL CERTIFICATE

UNISA university of south africa

RESEARCH ETHICS COMMITTEE: DEPARTMENT OF HEALTH STUDIES
REC-012714-039 (NHERC)

7 March 2018

Dear Mmamoeketsi Julia Manyelo

Decision: Ethics Approval

HSHDC/839/2018
Mmamoeketsi Julia Manyelo

Student: 62008072
Supervisor: Dr DSK Habedi
Qualification: D Litt et Phil
Joint Supervisor: -

Name: Mmamoeketsi Julia Manyelo

Proposal: Assessment of follow up care received by patients with Hypertension at Primary Health care Facilities in Tshwane District

Qualification: **MPCHS94**

Thank you for the application for research ethics approval from the Research Ethics Committee: Department of Health Studies, for the above mentioned research. Final approval is granted from 7 March 2018 to 7 March 2020.

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the Research Ethics Committee: Department of Health Studies on 7 March 2018.

The proposed research may now commence with the proviso that:

1) *The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.*

2) *Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the Research Ethics Review Committee, Department of Health Studies. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.*

RECEIVED
2018 -03- 13
Executive Dean
College of Human Sciences

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
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ANNEXURE B: REQUEST FOR PERMISSION TO CONDUCT THE STUDY

77 Hardekool Street
Chantell ext 3
Boordfontein West
0182
13/October/2017

The Chief Director
Gauteng Department of Health
Tshwane District
427 Hilda Street
Hatfield
0083

Dear Sir/ Madam

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH STUDY

My name is Julia Manyelo. I am a registered student at the University of South Africa (Unisa) doing Masters' of Arts in Nursing Science.

The title of my study is "Assessment of follow-up care received by patients with Hypertension at Primary Health Care (PHC) facilities in Gauteng Province of South Africa.

The objectives of the study are to:

1. Describe the follow-up care received by patients with Hypertension at PHC facilities in Gauteng Province, South Africa.
2. Determine adherence or non-adherence to National Guidelines by nurses with regard to hypertension follow-up care.

Population and sampling

Medical records/files of patients with Hypertension will be sampled conveniently at selected Primary health care facilities in Tshwane district.

Ethical issues

Human rights of the patients whose medical records will be perused will be protected in the following ways:

(1) Right of privacy and confidentiality

- Patients names or addresses will not appear in any research document.
- Nothing will link the information obtained with the individual owner of the medical record.

(2) Right to fair treatment

- Medical records of patients with Hypertension will be selected for the purpose of study only. Other patients' records will not be tempered with.
- No copy of medical record will be removed from the health facility or reproduced in any way.

(3) Protection from discomfort and harm

- No harm or discomfort is envisaged to be suffered by the patients as confidentiality and anonymity will be maintained throughout the study.

To further assist you in decision making, the copy of ethical clearance certificate from the university is attached as well as the data collection tool.

I am therefore requesting permission to conduct this study, the results of which are expected to identify gaps in follow-up care received by patients with Hypertension at PHC facilities in Tshwane district.

My supervisor and I can be contacted at the following contact details should you need to do so:

Supervisor – Dr. DSK Habedi at 012 429 -6180

Email address – habeddsk@unisa.ac.za

Researcher – Manyelo MJ at 082 686 0053

Email address – juliamanyelo@gmail.com

The findings of this research will be shared with you before publication.

Your permission to conduct this study will be highly appreciated.

Yours faithfully

---------- ----------

Signature Date

ANNEXURE C: DECLARATION LETTER FROM FACILITY MANAGERS

Annexure 1

Declaration of intent from the clinic manager or hospital CEO

I give preliminary permission (name of researcher) to do his or her

Research on _____ (Research topic) in

_____ (Name of clinic) or

_____ (Name of CHC) or

_____ (Name of hospital).

I know that the final approval will be from the Tshwane Regional Research Ethics Committee and that this is only to indicate that the clinic/hospital is willing to assist.

Other comments or conditions prescribed by the clinic or CHC manager or hospital CEO:

_____

Signature

Clinic Manager/CHC Manager/CEO

_____

Date

ANNEXURE D: CLEARANCE CERTIFICATE: TSHWANE RESEARCH COMMITTEE

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Enquiries: Dr. Robert Oyedipe
Tel: +27 12 451 9036
E-mail: Robert.Oyedipe@gauteng.gov.za

TSHWANE RESEARCH COMMITTEE: CLEARANCE CERTIFICATE

MEETING: 03/2018
PROJECT NUMBER: 30/2018
NHRD REFERENCE NUMBER: GP_ 201804_ 003

TOPIC: Assessment of follow - up care received by patients with Hypertension at Primary Health Care facilities in Tshwane District.

Principal investigator:	Mrs. Mmamoeketsi Julia Manyelo
Supervisor:	DSK Habedi
Facility:	Block JJ clinic Boikhutsong clinics Laudium CHC Kgabo CHC Mandesa Shiceka clinic Dilopye Clinic Phedisong 6 Bophelong clinic East Lynne clinic Dr. FF Rebeiro Clinic
Name of the Department:	UNISA

NB: THIS OFFICE REQUEST A FULL REPORT ON THE OUTCOME OF THE RESEARCH DONE AND

NOTE THAT RESUBMISSION OF THE PROTOCOL BY RESEARCHER(S) IS REQUIRED IF THERE IS DEPARTURE FROM THE PROTOCOL PROCEDURES AS APPROVED BY THE COMMITTEE.

DECISION OF THE COMMITTEE: APPROVED

.....
Dr. Robert Oyedipe
Acting Chairperson: Tshwane Research Committee
Date: 2018.05.03

.....
Mr. Pitsi Mothomone
Chief Director: Tshwane District Health
Date: 28.05.04

ANNEXURE E: DATA COLLECTION TOOL

HYPERTENSION FOLLOW-UP CHECKLIST

TITLE: Assessment of follow-up care received by patients with Hypertension in Tshwane District of Gauteng Province.
NAME OF FACILITY:
DATE:
NAME OF RESEARCHER: Manyelo M. J

<u>INSTRUCTIONS</u>: Tick with an x in appropriate box and complete information where indicated.

KEYS: Not recorded = NR

Not applicable = NA

1. When was the last visit of this patient in this clinic?	**2017**	**2018**

2. DEMOGRAPHIC DATA			
2.1 Is the name of the patient written on the file?		Yes	No
2.2 Gender of the patient	M	F	NR
2.3 Age	<30 yrs.	>30yrs	NR
3. HISTORY OF THE PATIENT			
3.1 When did the patient start Hypertension treatment in this clinic?	<12/12	>12/12	
3.2 Current medication the patient is on.			

Name of current medicine	Dosage	Duration on this dose

3.3 Patient's own assessment of his/her condition is recorded as**:**	Well	Not well	NR
3.4 Patient's adherence to treatment established as:	Satisfactory	Unsatisfactory	NR
3.5 History of side effects of medicines.	Present	Absent	NR
3.6 Can the patient still walk fast/climb stairs?	Yes	No	NR
3.7 How many pillows does the patient use to sleep at night?	1 pillow	2 or more	NR
4. PHYSICAL EXAMINATION			
4.1 General appearance of the patient	Acutely ill	Well	NR
4.1 2 Signs of heart failure excluded?	Yes	N/R	
4.1.2.1 Exertional dyspnea/ Orthopnea			
4.1.2.2 Pedal Oedema			
4.1.2.3 Abdominal pain/discomfort			
4.1.2.4 Chest pains			
4.1.2.5 Raised JVP			
4.1.2.6 First heart sound (S1) and second heart sound (S2) normal?			
4.1.2.7 Apex beat position			
4.1.2.8 Digital clubbing			
4.1.2.9 Central or peripheral cyanosis			
4.1.2.10 Basal crepitation			
5. VITAL SIGNS CHECKED?		Yes	NR
5.1 Blood pressure taken in the latest 2 visits?			
5.2 What was the readings		1st	2nd
5.3 Were measures taken to address uncontrolled BP?		Yes / NR	NA
5.4 Was pulse assessed for:		Yes	NR
5.4.1 Rate			
5.4.2 Rhythm			

5.4.3 Volume				
6. SIDE ROOM INVESTIGATIONS.		Yes		NR
6.1 Was urine dipstick done in the past 12 months?				
6.1.1If yes, were abnormalities detected?		Yes		No
6.1.2 Was action taken to address abnormalities?		Yes	NR	NA
6.2 Was Body Mass Index (BMI) done in the past 12 months?		Yes		NR
6.2.1 If yes, was interpreted?				
6.2.2 Were measures taken to address deviation in BMI?		Yes	NR	NA
6.3. Was waist circumference measured in the past 12 months?		Yes		NR
6.3.1 Was it within target for this patient?		Yes	No	NR
6.3.2 Were measures taken to address deviation?		Yes	NR	NA
6.4 Rapid blood glucose in the last 12 months		Yes		No
6.5 Visual acuity test done in the past 12 months.				
6.6 Were the following laboratory blood tests done in the past 12 months?		Yes		NR
6.6.1 Blood for cholesterol				
6.6.1.1 If yes, what was the results?				
6.6.2 Blood for eGFR				
6.6.2.1 If yes, what was the results?				
6.6.3 Were measures taken to address deviation?	Yes	NR		NA
7. LIFESTYLE ASSESSMENT	Yes	No		NR
7.1 Does the patient smoke?				
7.2 Does the patient drink alcohol?				
7.2.1 If yes, was the amount quantified?				
7.3 Does the patient exercise?				
7.4 Did the patient reduce salt in the diet?				
7.5 Did the patient reduce fat in the diet?				
7.6 Is there evidence of health education given to the patient in relation to risk factors identified?	Yes	N/R		

8. MANAGEMENT			
8.1 Was the treatment ever adjusted where indicated?	Yes	No	
8.2 Was the patient ever referred to the doctor/hospital where indicated?	Yes	No	N/A
8.3 Is the patient on Central Chronic Medicine Dispensing and Distribution programme (CCMDD)?	Yes	No	
9. HEALTH WORKER'S KNOWLEDGE AND SKILLS			
9.1 Is the nurse who consulted the patient duly trained in Clinical Nursing Science, health assessment, Treatment and Care (48)?	Yes	No	

Comments: ----------

ANNEXURE F: ADDITIONAL DATA COLLECTION TOOL

MEDICINE, EQUIPMENT AND OTHER SUPPLIES CHECKLIST

TITLE: Assessment of follow-up care received by patients with Hypertension in Tshwane District of Gauteng Province.
NAME OF FACILITY : Boptelong Clinic
DATE: 15/06/2018
NAME OF RESEARCHER: Manyelo M.J

INSTRUCTIONS: Tick with an x in appropriate box

1. MEDICINE AVAILABILITY ACCORDING TO THE PHC LIST		
Are the following medicines available in the clinic today?	Yes	No
1.1 Thiazide diuretics e.g. Hydrochlorothiazide	✓	
1.2 ACE inhibitor. E.g. Enalapril	✓	
1.3 Calcium channel blocker e.g. Amlodipine	✓	
1.4 Beta blocker e.g. Atenolol	✓	
1.5 Statins e.g. Simvastatin	✓	
Subtotal	/5	/5
2. EQUIPMENTS AVAILABILITY AND FUCTIONALITY		
Are the following equipment's available and functional in the clinic?	Yes	No
2.1. Blood pressure machine available?	✓	
2.1.1 Are they working well?	✓	
2.1.2 All cuff sizes available?		
2.1.3 Do the machines have to be serviced?	✓	
2.1.4 If yes, were they serviced according to recommended time frames		
2.2 Weight measurement scales available?	✓	
2.2.1 Are they working well?	✓	
2.2.2 Do they have height measuring device?	✓	
2.3 Measuring tapes available in consulting rooms?	✓	
2.4 2.4 Blood sugar machine	✓	
Subtotal	/10	/10
3. OTHER SUPPLIES		
Are the following supplies available in the clinic today?	Yes	No
3.1 Urine dipsticks?	✓	

8/10

3.2 Snellen's charts in consulting rooms?	✓	
Subtotal	/2	/2
4. LABORATORY SERVICES		
Are the following services available?	Yes	No
4.1 Is this clinic having laboratory services?	✓	
4.2 Are laboratory services off site?	✓	
4.3 If yes, to 4.2, is there a courier service?	✓	
4.4 Does the courier come more than once per day to collect specimen in the clinic?	✓	
4.5 Is courier service available on weekend and public holidays?	✓	
4.6 Does the laboratory comply with agreed turnaround time for blood specimen?	✓	
Subtotal	/6	/6

TOTAL SCORE = 22

Medicine availability: ...5... **+ 5 x 100 =** 100 **%**

Equipment's availability and functionality: .....8...**+ 10 x 100 =** ...80.... **%**

Other supplies: .....2...**+ 2 x 100 =** ...100..... **%**

Laboratory services: .....6...**+ 6 x 100 =** ...100..... **%**

TOTAL PERCENTAGE: 95.42

ANNEXURE G: EDITING AND PROOFREADING CERTIFICATE

EDITING AND PROOFREADING CERTIFICATE

7542 Galangal Street

Lotus Gardens

Pretoria

0008

05 August 2019

TO WHOM IT MAY CONCERN

This certificate serves to confirm that I have edited and proofread Ms MJ Manyelo's dissertation entitled, **"ASSESSMENT OF FOLLOW-UP CARE RECEIVED BY PATIENTS WITH HYPERTENSION AT PRIMARY HEALTH CARE FACILITIES IN TSHWANE DISTRICT OF GAUTENG PROVINCE, SOUTH AFRICA".**

I found the work easy and intriguing to read. Much of my editing basically dealt with obstructionist technical aspects of language, which could have otherwise compromised smooth reading as well as the sense of the information being conveyed. I hope that the work will be found to be of an acceptable standard. I am a member of Professional Editors' Guild.

Hereunder are my particulars:

Jack Chokwe (Mr)

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Professional EDITORS Guild