KNOWLEDGE OF HYPERTENSIVE PATIENTS AND THE PRACTICE OF PHARMACISTS IN THE MANAGEMENT OF HYPERTENSION AT THE DIKGALE PRIMARY HEALTH CLINICS, LIMPOPO PROVINCE

by

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DISSERTATION

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DECLARATION

I, **Masoto Mapula Setshekgamollo**, declare that the research reported in this thesis **"Knowledge of hypertensive patients and the practice of pharmacists in the management of hypertension at the Dikgale primary health clinics, Limpopo Province"** is my original work.

This dissertation hereby submitted to the University of Limpopo for the degree of Master of Pharmacology (M PHARM) in Pharmacy has not been submitted for a degree at any other university or institution, that it is my own work in design and execution, and that all material contained herein has been duly acknowledged.

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Signature   Date

Masoto Mapula Setshekgamollo

DEDICATION

This study is dedicated to my parents, Maite and Gilbert Setshekgamollo; my siblings Molebatsi, Mokgadi and Mokati; and my son Kabelo.

ABSTRACT

Background: Non-communicable diseases (NCDs) which are chronic diseases in nature, have been the most common cause of death and disability globally for the last three decades. The prevalence of hypertension in South Africa has been estimated to be 20% of the adult population with over six million people being affected. Patient's knowledge and awareness of blood pressure plays an important role in achieving successful control of hypertension. Although it is important for a physician to be involved in this educational process, pharmacists also have a role to play in this regard. Given their accessibility and drug therapy expertise, pharmacists are a logical choice and a valuable asset to improve hypertension management via team-based care and also when they are in direct consultation with the patients.

Methods: The study involved both qualitative and quantitative research methods. A pre-validated questionnaire was used to collect data from 341 patients attending the 4 clinics at Ga-Dikgale. A semi-structured one-on-one interviews were used as data collection for 20 pharmacists working at Mankweng hospital until saturation was reached.

Results: On the knowledge about definition, 30.7% were knowledgeable and 5.8% were highly knowledgeable. On the knowledge about treatment, 48% were highly knowledgeable. With regards to lifestyle modifications 77.8% were highly knowledgeable. For complications of hypertension, 63.2% were highly knowledgeable. Amongst the participants level of education proved to play a significant role on the knowledge of hypertension.

The study also revealed that pharmacists shared similar practices in the management of hypertension. The following themes emerged from the data analysis, using Tesch's inductive, descriptive coding technique of qualitative data analysis: Perceived roles of pharmacists during the management of hypertensive patients, expectations of pharmacists during provision of medication to hypertensive patients, and challenges related to pharmacists' practices during care of hypertensive patient}s.

Conclusions: The results of the quantitative study indicated that participants at Dikgale have good knowledge about hypertension, although previous studies indicate high rates of cardio-metabolic risk factors for hypertension. Further studies need to be conducted to determine reasons for patients not practicing lifestyle modifications. The results of the qualitative study indicated that there are common practices of pharmacists in the management of hypertension. More attention should be focused on training pharmacists on how to provide comprehensive counselling to hypertensive patients. There should also be workshops for pharmacists on how to efficiently educate patients on hypertension.

Keywords: Chronic diseases, hypertension, knowledge.

DEFINITION OF KEY CONCEPTS

Dispensing- In terms of the Pharmacy Act 53 of 1974, means "the interpretation and evaluation of a prescription, the selection, manipulation or compounding of the medicine, the labelling and supply of the medicine in an appropriate container according to the Medicines Act and the provision of information and instructions by a pharmacist to ensure the safe and effective use of medicine by the patient (GPP, 2010). In this study dispensing refers to one or more phases of dispensing, done by either a nursing personnel or pharmacy personnel.

Hypertension- Is sustained elevation of resting systolic blood pressure of ≥ 140mmHg and diastolic blood pressure of ≥ 90mmHg (Porter & Kaplan, 2011). In this study, patients who have been clinically diagnosed with hypertension will be researched on the knowledge about hypertension.

Knowledge- Refers to the fact or condition of knowing something with familiarity gained with experience or association (Merriam-Webster, 2017). In this study, it refers to the knowledge with regard to the definition, treatment, lifestyle modifications and complications of hypertension.

Lifestyle modification interventions- Refers to the nonpharmacological approach to the epidemic of elevated blood pressure and its complications which include exercise, weight reduction, alcohol consumption, dietary modification, and stress management (Appel, 2003). In this study, patients will be researched on their knowledge regarding lifestyle modification in hypertension management.

Pharmacist- According to the Pharmacy Act 53 of 1974 as amended, pharmacist is a person registered with the South African Pharmacy Council (SAPC) as such in terms of the Act. In this study, pharmacists registered as such will be researched on the role that pharmacists play in the management of hypertension.

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ACE   -   Angiotensin converting enzyme

AIDS   -   Acquired Immune Deficiency Syndrome

BP   -   Blood pressure

DALYS   -   Disability adjusted life years

DASH   -   Dietary approach to stop hypertension

DBP   -   Diastolic Blood Pressure

DHS   -   District Health System

GPP   -   Good Pharmacy Practice

HIV   -   Human Immunodeficiency Virus

NCDs   -   Non- Communicable Diseases

PHC   -   Primary Health Care

SBP   -   Systolic Blood Pressure

USA   -   United States of America

WHO   -   World Health Organisation

CHAPTER 1
INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Non-communicable diseases (NCDs), also called chronic diseases, have been the most common cause of death and disability globally for the last three decades (Richards, Gouda, Durham, Rampatige, Rodney & Whittaker, 2016). According to World Health Organisation, NCDs kill 38 million people each year and this is a clear indication that they remain a global leading cause of death. Among the NCDs, cardiovascular disease is the most common cause of death, accounting for 17.5 million deaths annually, followed by cancers with 8.2 million, respiratory diseases with 4 million and 1.5 million for diabetes (WHO, 2010).

Hypertension alone is responsible for 7.6 million deaths per annum worldwide, more than any other risk factors. Around 54% of stroke and 47% of coronary heart disease are attributable to hypertension. In South Africa, NCDs and associated injuries account for 49% of mortality and approximately 2 out 5 deaths were attributable to NCDs in the country. It has been ranked 3rd out of the top ten contributors to Disability Adjusted Life Years (DALYS). Hypertension affects 42.2% of the population, 10.6% suffer from elevated blood glucose and 34.0% have high cholesterol (Richards *et al.*, 2016).

Hypertension, which is the most common type of cardiovascular disease, is sustained elevation of resting systolic blood pressure of ≥ 140mmHg and diastolic blood pressure of ≥ 90mmHg (Porter & Kaplan, 2011). Hypertension with no cause is the most common (primary hypertension), whilst hypertension with an identified cause (secondary hypertension) is usually due to renal artery stenosis, chronic kidney disease, sleep apnoea and adrenal diseases (Williams, 2015). Usually, no symptoms develop unless hypertension is severe or long-standing. It is considered a silent killer and is usually diagnosed incidentally (WHO, 2013).

The goal of antihypertensive therapy is the reduction of cardiovascular and renal morbidity and mortality, the focus on controlling the systolic blood pressure through appropriate drug utilisation. Pharmacologic interventions involve the use of antihypertensive drugs, including diuretics, β-blockers, angiotensin-conversion enzyme (ACE) inhibitors, angiotensin II receptors blockers and calcium channel blockers (Weber *et al.*, 2014). The benefits of antihypertensive therapy, in terms of reducing cardiovascular mortality and morbidity, are clearly established. There is scientific evidence from 17 randomised trials of antihypertensive therapy that indicate that antihypertensive treatment decreases the risk of stroke by approximately 38%, of coronary heart disease by 16% and vascular death by 21% (Lindholm, 2002).

There are a number of lifestyle modifications that can help with the reduction of blood pressure in combination with pharmacological interventions. These strategies contribute to the management of high blood pressure by managing most of the other cardiovascular risk factors. Although proven to be effective, these interventions should be considered more as a supplementation to antihypertensive therapy, not as an alternative. These non-pharmacological interventions include weight loss, salt reduction, physical exercise, reduction of alcohol consumption and cessation of cigarette smoking (Weber *et al.*, 2014).

According to Ragot et al (2005), patient knowledge and awareness of blood pressure plays an important role in achieving successful control of hypertension. Since systemic arterial hypertension is often totally asymptomatic, it is essential for the patient to receive clear information about both the risks associated with high blood pressure, and the benefits expected from lifestyle changes and antihypertensive treatment. The side effects associated with the antihypertensive medication have to be properly conveyed to the patients. Although it is important for a physician to be involved in this educational process, pharmacists also have a role to play in this regard.

The role of pharmacists and their responsibilities have changed significantly from the primary focus on dispensing and compounding of medication to extended pharmaceutical care services. As observed by (Tsuyuki & Paradis, 2015)., "Given their accessibility and drug therapy expertise, pharmacists are a logical choice and a valuable asset to improve hypertension management alone or via team-based care." In a response to the ever increasing health demands coupled with a complicated range of chronic medication and poor adherence to prescribed medicines, pharmacist have been obligated to take a patient centred approach (Azhar *et al.*, 2009). The patient centred approach includes monitoring of patient's adherence to medications, practice of life style modifications and frequent monitoring of blood pressure, which can be achieved by proper education and counselling of the patient (Shrestha *et al.*, 2015)

1.2 PROBLEM STATEMENT

The prevalence of hypertension in the Dikgale community was found to be 38% in a study conducted by Maimela et al (2016). The study further indicated that prevalence is associated with several cardio-metabolic risk factors such as smoking (14%), alcohol intake (16%), low fruit and vegetable diet (88%) and low physical activity (66.5%). The presence of these cardio-metabolic risk factors at high rates amongst hypertensive patients at Dikgale could be associated with lack of knowledge concerning the management of high blood pressure. Thus it is important to assess the knowledge of hypertensive patients with regard to symptoms, treatment and lifestyle modifications that help in managing their blood pressure at levels that will eliminate risks to their heart, brain and kidneys.

Pharmacists from Mankweng hospital visit these clinics once a week to deliver essential health services to patients in Dikgale. With the burden and pressure of visiting three clinics in a day with an overwhelming number of patients, with few pharmacy personnel available, have got limited time to actively interact with the patients. As discussed above pharmacist play an important role in the management of the condition. However, with the challenges given, it is of interest to evaluate the role of the pharmacist in improving both patients' education and BP control rate.

1.3 PURPOSE OF THE STUDY

1.3.1 Aim

The aim of the study is to assess the knowledge of hypertensive patients and also assess the practice of pharmacists in the management of hypertension at the at Dikgale public health clinics.

1.3.2 Objectives

- To determine the knowledge of hypertensive patients about hypertension

- To determine the practice of pharmacists in the management of hypertension

1.3.3 Research questions

- What is the level of knowledge in hypertensive patients with regard to risk factors, treatment, compliance, and lifestyle modifications in the management of hypertension?

- What are the practices followed by pharmacists in the management of hypertension?

1.4 CONCLUSION

This chapter discussed the overview, the problem statement, and the aims and the objectives of this study. The research methodology was summarised and will be discussed in chapter three. Chapter two will discuss the literature review and theoretical framework of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Chapter 2 is comprised of literature review which is relevant to Knowledge of Hypertensive Patients and the Practice of Pharmacists in the Management of Hypertension at Dikgale Primary Health Clinics, South Africa. Literature review is defined as a process involving reading, understanding, and forming conclusions about literature regarding the problem under investigation (Brink *et al.*, 2012). Polit and Beck (2012), further elaborate that literature review is a tool that provides people with known evidence executed by other researchers and may contribute to the results of the new study. Literature review addressed the aspects relating to the knowledge of hypertensive patients and the practice followed by pharmacists in the management of hypertension in South Africa and other countries. It also focused on the effects of educational interventions by pharmacists in the knowledge of hypertensive patients.

2.2 OVERVIEW OF HYPERTENSION

Hypertension is defined as a systolic blood pressure equal to or above 140 mm Hg and/or diastolic blood pressure equal to or above 90 mm Hg (Porter & Kaplan, 2011). It is of importance to maintain both the diastolic and systolic blood level within the normal level for the efficient function of vital organs such as the heart, brain and kidneys and for overall health and wellbeing (WHO, 2013).

According to the WHO, hypertension remains the commonest chronic disease, with 1 billion people affected worldwide in 2008. The epidemic of NCDs in Africa remains hidden as compared to that of communicable disease (Marquez & Farrington, 2013). Its prevalence in the African region is on the rise, with a prediction of 3.9 million deaths in 2020 (WHO, 2010).

In South Africa, NCDs are considered to be one of the top leading cause of death, accounting for 39% of the total deaths in the country (Nojilana *et al.,* 2016). The prevalence of hypertension in the country has been estimated to be 20% of the adult population with over six million people being affected (Adebolu & Naidoo, 2014). It accounts for at least 45% to 51% of the global deaths from ischaemic heart diseases and strokes. Most of the deaths occur in developing countries like South Africa (Batubenga *et al.*, 2014). World Health Organisation has a set target goal of reducing the risk of NCDs premature death by at least 25% globally, and it is thus beneficial to invest in the proper management of the NCDs (WHO, 2014).

2.3 PREVALENCE OF HYPERTENSION

Hypertension remains the leading cause death, despite the fact that it is preventable (Bloch, 2016). A set of observational studies were conducted by Mills et al (2016), from a period between years 2000-2010. The results of the study concluded that the prevalence of hypertension worldwide was at a staggering 1.39 billion, with 31% representing all adults. This means that there was an increase of 5.2% in the worldwide prevalence between 2000 and 2010. The study further indicated that there was an increase in prevalence in low and middle-income countries in that period, which was 7.7%. This makes hypertension the most important cause of morbidity and mortality, and requires for interventions to be done to solve the problem (van de Vijver, 2013)

The epidemic of NCDs in Africa remains hidden as compared to that of communicable disease (Marquez & Farrington, 2013). Its prevalence in the African region is on the rise, with a prediction of 3.9 million deaths in 2020 (WHO, 2010). Gómez-Olivé et al (2017), conducted a study with the objective of reporting the prevalence of hypertension among older adults in rural and urban settings in 6 sites located in West, East, and Southern Africa. The prevalence ranged from 15.1% in Nanoro, which is in Burkina Faso, to 54.1% in Soweto in South Africa. A breakdown of these results also revealed that the 3 sites in South Africa, namely Agincourt, Dikgale and Soweto, had a mean prevalence of 40%, which was the highest in all the studied sites.

2.4 LIFESTYLE MODIFICATIONS AND ASSOCIATED CARDIO-METABOLIC RISK FACTORS

Lifestyle modifications play a key role in both hypertensive and non-hypertensive individuals. They serve as the first line treatment before initiation of drug therapy and as a supplement to medication to individuals who are already on drug therapy (Appel, 2003). There are several risk factors that are associated with hypertension including; age, gender, race, decreased physical activity, obesity, smoking, dietary and hormonal changes that play a critical role in the development of hypertension. Discerning these risk factors is important in the creation of strategies that will lead to the reduction of preventable risk factors such as weight, excess salt intake, cigarette smoking and alcohol use (El-hay & El Mezayen, 2015).

2.4.1 Weight Reduction

A significant loss of weight in patients who are obese will help in the treatment of hypertension and other co-morbidities (Weber *et al.*, 2014). Obesity is associated with many health problems, and predisposes patients to cardiovascular diseases, with hypertension being included (Aucott *et al.*, 2005). Various studies give evidence of the benefits weight loss on blood pressure. An example of such a study was conducted by Fogari et al (2010), in a prospective 12-month trial. The results of the study showed that not only does the reduction of weight lead to a reduction in blood pressure, but it also has a beneficial effect of reversing the endocrinological changes that were caused by the initial obesity.

Another study conducted by Aucott et al (2005), which involved the systematic review of the long term effects of weight loss in hypertension, the researchers agreed that weight loss results in decreased blood pressure. They also speculated that the decrease in blood pressure is more significant in the initial stages of weight loss, and concluded that the relationship between weight and blood pressure is complicated, and requires more research in well-conducted studies. Even though it would be of benefit to conform patients to a specific diet for weight loss, it tends to be very costly for patients. This then requires a very strong support system in order for it to be effective (Weber *et al.*, 2014).

2.4.2 Excess Salt Intake

In previous studies, it was proven that salt reduction lowers blood pressure and the need for antihypertensive treatment in patients who are considered to be "salt sensitive". This condition has been found to be common in black communities (Weber *et al.,* 2014). In Africa, the consumption of salt is much more common, especially in the preservation of food, or even to make it tastier (Cappuccio *et al.*, 2006). The overall benefits of salt reduction also include the reduction in cardiovascular risk including reduction of stroke, left ventricular hypertrophy, aortic stiffness, and chronic kidney disease and proteinuria (Frisoli *et al.,* 2012).

A study conducted by He et al (2013), to determine the effects of longer-term salt reduction on blood pressure. It involved systematic review of various data sources, including the Cochrane Hypertension Group Specialised Register. The results indicated a reduction of 4.4g/day salt yielded a mean change of −4.18 mm Hg in systolic blood pressure and −2.06 mm Hg in diastolic blood pressure. This is further supported by Frisoli et al (2012), which suggests that salt reduction is not only beneficial to hypertensive subjects, but also delays or prevent hypertension in normotensive patients.

2.4.3 Alcohol Intake

Limiting alcohol intake has also been reported to lower blood pressure in normotensive and hypertensive men who are heavy drinkers (Appel, 2003). It can also reduce the risks of cardiovascular events since excessive amounts of alcohol tend to raise blood pressure. This was supported by a study conducted by McFadden et al (2005), which involved a systematic review of trials that measured blood pressure after a period of sustained alcohol intake (defined as daily intake of at least one alcoholic drink daily) in one group and that also had a control group of individuals who consumed no alcohol. The results of the review revealed that there was a significant rise in systolic blood pressure (SBP) and diastolic blood pressure (DBP) of 2.7 mm and 1.4 mm Hg, respectively, after the consumption of alcohol.

Roerecke et al (2017), conducted a study with the aim of assessing the effect of a reduction in alcohol consumption on change in blood pressure. This was stratified by initial amount of alcohol consumption and sex in adults. The results showed that in patients who drink more than two drinks per day, there was significant reduction in blood pressure due to reduction in alcohol intake. And the study further proclaimed that the reduction in both systolic and diastolic blood pressure was the strongest in participants who drink more than six drinks a day, who reduced their alcohol intake by 50%. It is therefore of great importance to communicate to patients the importance of reducing alcohol intake as a measure to control hypertension.

2.4.4 Physical Activity

Regular exercising also helps in lowering blood pressure, and is an important supplementation in the management of cardiovascular diseases (Weber *et al.,* 2014; Wen & Wang, 2017*).* Physical activity has been proven as having many beneficial effects in overall health and plays in role in reducing hypertension (van de Vijver *et al*, 2013). This can be supported by a study conducted by Alsairaf et al (2010), which was conducted with the aim of demonstrating the effects of exercise on controlling blood pressure in hypertensive patients from Mishref, Kuwait. The results of the study revealed that hypertension was uncontrolled in participants who reported that they do not engage in physical activity as compared to those who reported to be engaging in it.

Another study conducted by Wen and Wang (2017), the researchers conducted a meta-analysis of various studies to explore the effects of aerobic exercise on blood pressure in hypertensive patients. The study included two groups, aerobic and the control group. The results indicated that there was significant reduction in blood pressure in the aerobic group. The researchers further concluded that aerobic exercise may be considered a nonpharmacological adjunct in controlling blood pressure. Although these studies support physical activity in the management of hypertension, it is not simple for patients to adhere to a prescribed exercise regime. It is therefore more beneficial to encourage them to engage more in everyday physical activities like walking (Weber *et al.,* 2014*).*

2.4.5 Cigarette Smoking

The effect of tobacco smoking on blood pressure has conflicting views in the research field. Weber et al 2014 stated   that smoking has no direct effect on blood pressure, but patients should be discouraged from continuing with the habit because it is associated with major cardiovascular events. On the contrary, van de Vijver et al (2013), mentioned that smoking affects blood pressure directly by its immediate increase in the blood pressure, which results in elevated ambulatory blood pressure levels for smokers. It can be agreed though, that the cessation of smoking can lead to reduce the risk of cardiovascular events such as stroke, thrombosis and heart attacks.

Takami and Saito (2011), conducted an observational study to determine whether cessation smoking treatment had any effect on central blood pressure. It was conducted on 70 patients receiving smoking cessation treatment, with the results being compared between those who successfully quit smoking and those who failed to quit. The results of the study indicated that there was a significant improvement in central blood pressure. This study proves that cessation of smoking is one of the factors that can help manage hypertension.

2.4.6 Consumption of Fruits and Vegetables

Another approach that can be effectively used to lower hypertension is the dietary approach to stop hypertension (DASH). This should be encouraged in hypertensive patients, and it emphasizes the intake of fruits and vegetables, low-fat dairy products, reduction in fat and cholesterol, and encourages a greater intake of protein or monounsaturated fatty acids, and these may also reduce blood pressure (El-hay & El Mezayen, 2015). There are recent trials that have been conducted that prove that a six-month intervention of consumption fruits and vegetables to up to 5 servings a day, lowered both systolic and diastolic blood pressure (Wang *et al.,* 2012).

In their study, Wang et al (2012), assessed the association between baseline intake of fruits and vegetable and the risk of hypertension in middle-aged and older women. The participants were free from cancer and any cardiovascular diseases, including hypertension. The results of the study showed that the consumption of all fruit, but not all vegetables, was associated with a reduction in the risk of hypertension after modifications of lifestyle and dietary factors. The researchers concluded that higher intake of fruits and vegetables may play a significant role in the prevention of hypertension.

2.5 PATIENTS' KNOWLEDGE ABOUT HYPERTENSION

The knowledge about hypertension with regard to its control and management influences the patients' blood pressure control (Samal *et al.*, 2007). Accurate assessment about high blood pressure knowledge is an important first step to identify individuals in need of high blood pressure education, since knowledge is often a prerequisite for a patient to perform appropriate high blood pressure self-care as shown in previous research (Han *et al.*, 2011).

There is scientific evidence that has shown that patients tend to have certain beliefs about diseases and the treatment and this ultimately affects their overall health-related behaviour such as adherence to therapy. The beliefs are influenced by a number of factors such as demographics, personality, cultural norms, socioeconomic status, and also the condition and its treatment. It is not easy, or it could be considered that it is impossible to change the demographics, cultural norms, personality, and the socioeconomic status of patients (Erkoc *et al*, 2012). By increasing patients' levels knowledge about their diseases and therapy, it is a step in the right direction as a way of positively influencing their beliefs about medicines (Magadza *et al.*, 2009).

The beliefs that patients have about their diseases are usually influenced by past experiences, especially that of acute illnesses. It is an expectation from patients that they will get cured of their ailments from taking medicines, and this is properly reflected by the perception that patients have that the fading away of symptoms

constitutes the elimination of the need for therapy. Chronic conditions such as hypertension require adherence to medication and change of lifestyle for the rest of their lives and since it is asymptomatic, there are no clear indicators that can present therapy benefits to patients. The lack of awareness about the nature of their condition and its management by patients, as well as the role that therapy plays, may lead to incorrect use of their medication. (Magadza *et al.*, 2009).

2.5.1 Global Perspective on Patient's Knowledge about Hypertension

A cross-sectional study was conducted among 447 patients in Pakistan (Almas *et al.*, 2012) to assess the knowledge about hypertension in hypertensive patients, and also to compare the knowledge of those with uncontrolled hypertension and controlled hypertension. The categories were based on their initial readings on presentation, where uncontrolled hypertension was defined as ≥140/90 mmHg and controlled hypertension as <140/90 mmHg in patients on treatment.

The comparison between uncontrolled and controlled patients with regard to specific questions related to knowledge showed a significant statistical difference in; the meaning of hypertension, target systolic blood pressure, target diastolic blood pressure, importance of systolic blood pressure versus diastolic blood pressure, hypertension being asymptomatic, lifestyle modification improves hypertension, hypertension being a lifelong disease, lifelong treatment with antihypertensive treatment and hypertension being part of aging.

The study showed that the knowledge scores in hypertensive patients were not up to mark. Furthermore, the score in patients whose blood pressure was not controlled was alarmingly low. According to the results of this study, poor knowledge is associated with poor blood pressure control whilst formal education did not show any relation to high scores. More emphasis has to be made on educating these patients on more hypertension specific basis.

Another study was conducted by Ragot et al (2005), among 1015 participants in the middle-West of France, to assess the knowledge that hypertensive patients have about their hypertension. The results of study showed that 88% of the patients were aware of their blood pressure figures, though 68% of them don't know what should be the normal figures of blood pressure. Another factor that favored awareness of blood pressure was family history of high blood pressure, as well as educational level. Although previously stated that those who could provide a numerical value for their blood pressure were younger, age did not appear to be an independent predictor in this study.

The multivariate analysis showed that the predictive independent factors of the awareness of blood pressure figures were the male gender, the high educational level, and a family history of high blood pressure. A total of 77% were able to give the names of their drugs without the help of the pharmacist and treatment-related unwanted effects were reported by only 8% of the patients.

From the results of the study, the researchers concluded that the implementation of management programs in hypertension in accordance with current guidelines needed the participation of the patients themselves.

Khothatso et al (2013), conducted a study at Seboche Hospital, in Lesotho. It was an observational cross-sectional study with the aim of assessing patients' knowledge regarding drug treatment of hypertension and to identify self-reported reasons for poor adherence to treatment. The study included 100 patients who were conveniently selected and asked to complete questionnaires to assess their knowledge of hypertension and its management.

The results of the study indicated that the knowledge of patients at this hospital was significantly poor. Only 44 patients were able to report that medication lowers blood pressure, with 36% admitting to have missed doses of their medications in the previous two months. The most common reason for missing doses were that they

forgot (18%) Eleven percent also admitted to not taking treatment when they felt better, whilst 54% reported to not have received any education about hypertension and how the medications worked. Thirty-four patients believe that hypertension can be cured, and that ongoing treatment is not necessary. Eighty-eight patients could name the drugs that they were taking. The researchers concluded that it is of importance to provide patients with the necessary information regarding hypertension, its complications and even side effects of the medication. This is imperative because more than 50% of the patients reported to have had no education at all, and this could be the reason why there is also poor adherence and misconceptions about the disease.

2.5.2 Patient's Knowledge about Hypertension in South Africa

A study was conducted at Katleho District Hospital in Free State province in South Africa by Mpinda et al (2014). It was an exploratory descriptive qualitative study and it was conducted to explore the knowledge of and beliefs held by patients attending the hospital. The exploratory question asked of participants was: "Could you please explain to me your beliefs on, and what you understand about, high blood pressure?"

From this exploratory question, themes were identified as correct knowledge about hypertension, incorrect knowledge of hypertension, lack of knowledge regarding hypertension, beliefs about it and misconceptions about it. The results of the study showed that patients had good knowledge about hypertension with regard to its cause, symptoms and management. However, their beliefs and misconceptions have an influence on their interpretation and response to hypertension.

Another similar study was conducted by Rampamba et al (2017), the knowledge and management among hypertensive patients receiving chronic medication from primary health care (PHC) facilities. It was a descriptive quantitative study that involved patients having face-to-face interview with pharmacist using a structured questionnaire. The results of the study indicated that 53.7% of the patients had uncontrolled blood pressure, and only 27.7% of the patients knew what hypertension.

The researchers concluded that because the majority of the patients have insufficient knowledge with regard to hypertension, and half of them had controlled blood pressure, interventions are necessary to increase the knowledge of the patients. This, in turn, will lead to better-controlled blood pressure rates in the patients.

2.6 STRUCTURE OF THE SOUTH AFRICAN HEALTH SYSTEM

The South African health system is considered to be a two-tiered system that conveniently cuts across socioeconomic lines (Young, 2016). The public sector comprises 16 tertiary hospitals, 698 specialized hospitals (such as psychiatric or tuberculosis hospitals), 55 regional hospitals, 254 district hospitals, 282 community health centers, and 3075 PHC clinics. Together, the public sector hospitals provide almost 87 000 beds (Gray *et al.,* 2016).

Although citizens in the country are offered free healthcare which is funded by the government, some citizens still choose to pay for private health care via a medical aid system (Young, 2016). The private sector is very parallel to the public sector, and this is because of the difference in structure of the two systems. The private sector is comprised of 216 private facilities, with just a mere 31000 beds (Gray *et al.,* 2016).

Over 8 million of South African citizens, which is about 17% of the total population, are covered by medical aids and access there aforementioned private health care. Most private healthcare facilities in South Africa include community pharmacies, where a majority of community pharmacists practice. These facilities are either self-owned or owned by pharmacy chains (Gray *et al.,* 2016).

Pharmacists who are employed in the public sector in South Africa are expected to, serve a majority of the population (80%), whilst they are at 29% of the total population of pharmacists (Bheekiea & Bradley, 2016). They also work in a different health care environments which include hospitals of variable size and complexity,

larger community health centers, medical stores, and district, provincial, and national offices (Gray *et al.,* 2016).

In South Africa, the principal role of pharmacists at PHC facilities is the dispensing of medication prescribed by an authorised prescriber and stock control (Gray *et al,.* 2016). According to Good Pharmacy Practice manual (GPP, 2010), dispensing is comprised of three phases which must be clearly adhered to when dispensing medication. These three phases include;

Phase 1: Interpretation and evaluation of the prescription.

Phase 2: Preparation and labeling of the prescribed medicine.

Phase 3: Provision of information and instructions to the patient to ensure the safe and effective use of medicine.

The District Health System (DHS) is an initiative which forms part of PHC which is aimed at improving health care services, access to care and also to reduce inequity in South Africa. Currently, PHC services are provided by registered nurses based at the clinics and doctors visiting PHC clinics offer the necessary support and on-going in-service education for primary health care nurses, as well as improving teamwork and communication between clinics and the district hospital (Nkosi *et al.*, 2009). Due to the low pharmacist-patient ratio, which is currently 1:3849, coupled with the uneven distribution of work between the private and public sectors; these registered nurses have had to partake in additional dispensing and stock management duties on top of their clinical responsibilities (Bheekiea & Bradley, 2016).

The district and sub-district pharmacists were introduced from 1994 in accordance with the health sector reform was done based on the DHS (Bradley *et al.,* 2015). The increasing burden of NCDs that require regular medication such as hypertension and diabetes mellitus; and human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), have shed light on the crucial roles of the district and sub-district pharmacists (Bradshaw *et al.*, 2006*).* Bradley et al (2005),

conducted a participatory action research in Cape Town Metro District in a period between 2008 and 2011, with the objective of describing new roles and related competencies of district and sub-district pharmacists in Cape Town.

From the results of the research, it was evident that the researchers were able to identify 5 main roles for the district and sub-district pharmacists. The roles were identified as district/sub-district management; planning, coordination and monitoring of pharmaceuticals; information and advice; quality assurance and clinical governance; and research (district pharmacists)/dispensing at clinics (sub-district pharmacists).

Competency clusters were also identified and they include professional pharmacy practice; health system and public health; management; leadership; and personal, interpersonal and cognitive competencies. The researchers even concluded that other sub-districts in South Africa can benefit from the results of the research, and other countries with the same health system as South Africa can use the information for workforce planning and capacity development

2.7 PHARMACISTS' ROLE IN THE MANAGEMENT OF HYPERTENSION

WHO has played a major part in effectively encouraging and defending the role of pharmacists globally. Special consideration in the role of pharmacists, especially where quality assurance and the safe and effective use of drugs is concerned, has been recommended by WHO despite the fact that other health care providers and public are involved in the use of drugs in this regard. Although pharmacists have played a significant role in pharmaceutical services, it is perceived that they can make great contribution in the provision of PHC (Azhar *et al.*, 2009).

In the light of the latter statement, it could be agreed that because pharmacists are positioned as the most accessible health care providers in the community, they could help in the improvement of patients' knowledge and adherence to the

management of hypertension. Their involvement could also result in an increase of hypertension control rates (Ragot *et al.,* 2005).

2.7.1 Global Perspective on Role of Pharmacist in the Management of Hypertension

In recent years, developed countries such as United States (USA), United Kingdom (UK), and Australia have embraced the new emerging role of community pharmacists in the concept of team-based care in the provision of healthcare (George *et al.,* 2010). This is because community or retail pharmacies are the most common and convenient at rendering health care services (Malangu, 2014). Community pharmacists have been isolated to primarily retailing and dispensing medicines, unlike hospital pharmacists who are integrated in the clinical care teams and thus rewarded for their involvement (Mossialos *et al.*, 2015).

In a study conducted by George et al (2010), a systematic review was conducted where the researchers appraised the roles and responsibilities of community pharmacists internationally and in Singapore. This involved the search of peer-reviewed articles using various search engines, from the period 01 January 1991 to 30 July 2009. The total number of articles reviewed was 115 and the literature revealed the various roles of community pharmacists, which included the management of diseases such as asthma, arthritis, cardiovascular diseases, diabetes, depression, hypertension, osteoporosis and palliative care. These roles were indicated to have been accomplished by the community pharmacists either alone or in the disease management team.

Chilsom-Burns et al (2010), conducted a systematic review with the objective of examining the effect of pharmacist-provided direct patient care on therapeutic, safety and humanistic outcomes in USA. The data was extracted from various databases, and was extracted by multidisciplinary study review teams. The studies that were reviewed included those which reported pharmacist-provided care, comparison groups, and patient-related outcomes. The total number of studies

reviewed was 298, and the results were positive for therapeutic and safety outcomes.

This favoured pharmacists' direct patient care because the meta-analyses conducted for glycated haemoglobin, low-density lipoprotein cholesterol, blood pressure, and adverse drug events were found to be significant. Other factors that were found to be significant were patient knowledge, quality of life and general health. The researchers concluded that from the results of the review, incorporating pharmacist in a healthcare team for direct patient care can be beneficial in the management of overall patient care (Chilsom-Burns *et al*, 2010).

In a study conducted by Ragot et al (2005), also studied the knowledge and involvement of pharmacists in the management of the hypertensive patients. From the results of the pharmacists' questionnaire, only 18% of the pharmacists gave an exact definition of high blood pressure, which is blood pressure above or equal to 140/90mmHg. Four pharmacists provided the former WHO standard of 160/95mmHg, whilst 103 gave non referenced figures.

Majority of the pharmacists indicated that they wished that side effects of the antihypertensive treatment should be conveyed to the patient at initiation of the treatment both by the doctor and the pharmacist. Interestingly, 25% of them considered that this information should be given by doctor whilst only 4% considered the pharmacist to provide the information. About 19 pharmacists, who amount to 11%, considered the information regarding side effects as being irrelevant.

As evaluated in the study, the knowledge of the pharmacist appears to be insufficient. Pharmacists, being the most accessible health professional in the community, have the ability to improve the patients' knowledge and adherence to the management of hypertension. The researchers suggest that training programs should be implemented in order to incorporate them as the core components of the health care system.

2.8 EDUCATIONAL INTERVENTIONS BY PHARMACISTS

Interventions are necessary in the effective modifying of patient's belief and attitudes and may result in population-wide behavioural changes. Patients benefit from these interventions because they present a great opportunity for them to better understand their conditions and clarify any misconception they might have of their disease and treatment. Because the attitude of patients towards disease and the understanding of its management are not static, it is possible that their beliefs could have been derived from misconceptions about the disease and medication use (Magadza *et al.*, 2009).

The results from the study conducted by George et al (2010) also highlighted that there was also evidence that pointed out the effectiveness of interventions by community pharmacists on lipid, diabetes, and hypertension management and for preventive services such as weight management, osteoporosis prevention and flu immunization service. It can therefore be hypothesized that conveying information to patients through a well-orchestrated intervention could result in an increase in knowledge and awareness of the disease, coupled with increased medication adherence (Magadza *et al.*, 2009)

2.8.1 Effects of Educational Interventions on Patients' Knowledge

A non-clinical randomized control trial carried by Saleem et al (2013), to evaluate whether an intervention by pharmacists can result in a better understanding about hypertension and improve adherence to antihypertensive therapy. Three hundred and eighty-five hypertensive patients were randomly assigned, with 192 in the control group and 193 in the intervention group, to the study.

Unlike in the previous studies, there were no differences in the baseline knowledge about hypertension management observed for age, gender, income, locality, education, occupation or duration of disease in both the control and the intervention group. In the intervention group, a significant increase was observed in the patient's level of knowledge and also medication adherence after completing the intervention.

There was a significant decrease in both systolic and diastolic blood pressure observed in the intervention group after completion of the intervention.

In a study conducted (Magadza *et al.*, 2009) at Rhodes University, aimed at assessing the effect of an educational intervention on selected hypertensive participants' level of knowledge about hypertension, their beliefs about medication and adherence to hypertensive therapy. The participants involved in the study were the Hypertensive Rhodes University support staff from the various departments at the university: housekeeping, grounds and gardens, catering and engineering. The participants were all on medicinal therapy and most of them had low literacy.

The study involved a six-month educational intervention comprising of three parts: presentations, a summary information leaflet and individual monthly meetings with the researcher. The presentations included 4 topics which are the nature of hypertension, antihypertensive medicine, adherence and the recommended diet and lifestyle for hypertensive patients. The patient's level of knowledge and beliefs were measured before, during and after the intervention, using interviews and self-administered questionnaires. The levels of adherence were assessed by the use of pill counts, self-reports and also the punctuality in collecting monthly refills. The results of the study indicated that the educational intervention significantly increased the participants' level of knowledge and awareness about hypertension and antihypertensive treatment. It also led to a positive influence on their beliefs about medication, although the researchers concluded that behavioral changes and significant adherence need more time before they could be adequately observed.

Shayesteh et al (2016), also conducted a study with the objective of surveying the effect of educational intervention on the lifestyle of patients with hypertension in the rural population of Lorestan Province, Iran. It was a case-control study that involved 86 hypertensive patients who were divided into the case and control groups, whom were selected using simple random sampling from the rural regions of Aligoudarz County in Lorestan Province. The patients in both groups completed the standard Health Promoting Lifestyle Profile II (HPLP II) questionnaire before the intervention,

and the same questionnaire was filled out by both groups two weeks after intervention.

The results of the study showed that educational interventions had a significant effect on the lifestyle of patients. There were significant changes in the overall factors that represented lifestyle in the case groups. There was an increase in stress management in the case group as compared to the control group. Another factor that showed a significant increase in the case group after intervention was physical activity, and the intake of fruits and vegetables. Salt intake and the consumption of fatty foods decreased significantly in the case group as compared to the control group.

From the results of the study, it is quite evident that educational interventions play a very important role in the management of hypertensive patients. The authors concluded that the correlation between hypertension and lifestyle is of importance. They advised that organising educational workshops and interventions on diet, physical activity, and stress management is required to improve patient knowledge and modify their behaviours.

2.9 CONCLUSION

In conclusion, this chapter has explained the literature on the Knowledge of hypertensive patients and the practice of pharmacists in the management of hypertension. Hypertension remains the leading cause death, despite the fact that it is preventable (Bloch, 2016). Lifestyle modifications play a key role in both hypertensive and non-hypertensive individuals. They serve as the first line treatment before initiation of drug therapy and as a supplement to medication to individuals who are already on drug therapy (Appel, 2003). There are several risk factors that are associated with hypertension including; age, gender, race, decreased physical activity, obesity, smoking, dietary and hormonal changes that play a critical role in the development of hypertension.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter presents the research methods that were followed in this study which include the description of research setting, population and sampling, data collection, data analysis, validity, reliability, and ethical standards that were maintained throughout the study. This chapter further intends to provide an understanding and logic behind the method used in the context of the research study.

3.2 RESEARCH METHODOLOGY

Research design is a method that is used for the purpose of selecting a specific direction for processes to guide the methods carried out during a research study, that include qualitative, quantitative and mixed research methods (Cresswell, 2014). In this study, both qualitative and quantitative research methods were employed in order to achieve the aim of the study. The aim of the study was to assess the knowledge of hypertensive patients and also assess the practice of pharmacists in the management of hypertension at the at Dikgale primary health clinics, Limpopo Province, South Africa.

3.2.1 Research Design

In this study a cross-sectional descriptive, quantitative and a qualitative method was employed to achieve the objectives of the study. Quantitative methods are characterized by the collection of data which can be analyzed numerically, the results of which are typically presented using statistics, tables and graphs (Cohen, 2007). It is further defined by Babbie and Mouton (2010), as a method that emphasizes objective measurements and the statistical, mathematical or numerical analysis of data collected through polls, questionnaires and surveys, or by manipulating pre-existing statistical data using computational techniques. This study employed a quantitative method of research where the researcher administered

questionnaires to participants following their consent to collect data. The pre-validated questionnaires were used to determine the knowledge of hypertensive patients about hypertension.

This study was descriptive because it complied with the characteristics of descriptive research as stipulated by Shuttleworth (2009), which are as follows, "A descriptive research design is a scientific method which involves observing and describing a behavior of a subject without influencing it in any way".

Cross-sectional study design is an observational study in which the possible cause and its outcome are measured at the same time and no follow-up will be made on the participants (Olsen & St. George, 2004; Bonita *et al.,* 2006). Because this is Masters Study to be completed in two years, a cross-sectional method was employed as it allowed for analysis of data at a specific time, and did not allow time to study the population over a period of time.

A qualitative research method was also employed to achieve objectives of the study. A qualitative research is defined as research that shows participants' accounts of meaning, experiences or perception, thus elicits the participants' beliefs and values with regards to the phenomenon (de Vos *et al.*, 2012). Joubert and Ehrlich (2012) explained that it involves the description of certain characteristics which and detailed and verbal, and uses observation, interviews and document review as sources of data. Qualitative research with pharmacy practice is concerned with understanding the behavior of pharmacy staff, pharmacy owner, patients, other health professionals and politicians; to explore various types of existing practices and beliefs in order to improve them. In this study, pharmacists were interviewed to determine their practices in the management of hypertension.

3.2.2 Research Study Setting

The study was conducted in the Limpopo Province, which is one of the nine provinces in South Africa. Previously named the Northern Province, it is located in

the far Northern part of the country. The Limpopo province has 30 district hospitals, 5 regional hospitals, 2 tertiary hospitals, 3 specialized hospitals, and 14 private health facilities.

The province is divided into 5 districts, namely; Capricorn, Waterberg, Vhembe, Mopani and Sekhukhune. The Capricorn district, which is the area of the study, is further divided into 5 local municipalities. Polokwane municipality is the largest, and is comprised of 44.02% of the total population. The second largest is Lepelle-Nkumpi with 19.74%, then Blouberg with 13,97%, Aganang with 12,79% and Molemole with 9,5%. The Polokwane local municipality is further divided into 21 main places, with Mankweng and Dikgale included.

Mankweng, which is 27km from Polokwane City, is the homestead of Mankweng Tertiary Hospital. It is the feeder hospital for 21 clinics situated around the area. All of these clinics receive pharmaceutical stock from the pharmaceutical depot located at Seshego Township. Seshego, the biggest township in Limpopo Province, is 15km away from Polokwane City.

The study was conducted at the four clinics that fall within the Mankweng Tertiary Hospital feeder system namely, Seobi Dikgale clinic, Dikgale clinic, and Sebayeng clinic. Ga-Dikgale is roughly 20km from Mankweng, and is situated along R81 road north of Polokwane. The study was also conducted at Mankweng Tertiary Hospital as the pharmacists providing services at the clinics are based at the hospital. Mankweng Hospital is located at Houtbos Road, Sovenga 0727.

3.2.3 Population and Sampling

A population is defined as the group of people, events, or thing of interest that a researcher wishes to investigate (Sekaran, 2000 page 266). It is further described as a well-defined collection of individuals or objects known to have similar characteristics (ref). In this study, there will be two populations of interest. The first population included patients currently on hypertension medication attending the 4

clinics at the Dikgale area. The table below (Table 3.1) indicates the number of hypertensive patients at each clinic.

Table 3.1: Number of hypertensive patients at each clinic.

Name of clinic	Number of hypertensive patients per month
Dikgale clinic	592
Seobi clinic	169
Sebayeng clinic	451
Makotopong clinic	370
Total	1582

The second population included pharmacists from Mankweng Hospital visiting these clinics as part of Chronic Care Model. There are 20 pharmacists at Mankweng Hospital.

3.2.3.1 Sampling

According to Trochim (2006), "Sampling is the process of selecting units from a population of interest so that by studying the sample we may fairly generalize the results back to the population from which they were chosen". Burns and Grove (2011) defined sampling as the process of selecting a group of people, events, behaviors or other elements with which to conduct a study Sampling provides the researcher a representation of a particular picture of the population, without having to study the whole population. A number of hypertensive patients attending the four local clinics at Dikgale were selected. A simple random sampling was employed for the sample of patients. Selecting a sample of these patients instead of attempting to study the entire population of hypertensive patients was beneficial due to time and financial constraints

A consecutive sampling technique was employed for the pharmacists at Mankweng hospital. A consecutive sampling is a technique that includes all accessible subjects as part of the sample (Roach, 2001). This sampling technique was used because the population size for the pharmacists was too small.

3.2.3.2 Sample size

The sample size for patients at all the clinics was 310. The sample size was calculated using the Raosoft sample size calculator, with a confidence of 95% and a margin of error of 5%, and is available from the following link http://www.raosoft.com/samplesize.html. The following table (Table 3.2) indicates the sample size for individual clinics, which was calculated proportionate to the population size based on the total sample size of 310.

Table 3.2: The sample of hypertensive patients at each clinic.

Name of clinic	Number of hypertensive patients per month
Dikgale clinic	117
Seobi clinic	33
Sebayeng clinic	88
Makotopong	72
Total	**310**

3.2.4 Inclusion and Exclusion Criteria

According to Garg (2016), specific group of participant population of the same characteristics needs to be selected in clinical research. Additionally, the inclusion and exclusion criteria can help identify who can be part of the study sample and who

cannot be part of the study sample (Garg, 2016). Furthermore, the inclusion and exclusion criteria can also assist in preventing bias that could arise due to the contamination of data brought about by limitation of the evidence in relation to the sampling plan and design of the study (Lobiondo -Wood & Haber, 2010). The inclusion and the exclusion criteria that were used in this study are as follows:

3.2.4.1 Inclusion criteria

- Patients of all age groups, who are hypertensive and currently on antihypertensive treatment that were registered under the particular clinics.

- Pharmacists working at Mankweng Hospital that were involved in providing dispensing services at PHC clinics associated to Mankweng Hospital as part of the Chronic Care Model.

3.2.4.2 Exclusion criteria

- Patients of all age groups that were not hypertensive and patients with other chronic conditions.

- Other pharmacy personnel who were registered as pharmacist intern, pharmacist assistant post-basic, pharmacist assistant basic or any category of learner pharmacist assistant.

3.3 DATA COLLECTION

Data collection was defined by Burns and Grove (2011), as a precise, systematic gathering of information relevant to the research purpose or the specific objectives, questions, or hypothesis of the study. Data collection is not only meant to collect and record correct data in a study, it is also used to emphasize how the study was carried about (Grove *et al.*, 2015). Data was collected from pharmacists and patients. Consent forms were signed before participation.

3.3.1 Quantitative study

Hypertension-Knowledge Scale questionnaires were handed to patients who were identified as hypertensive patients, and these were used to collect data. The questionnaire was in two versions, English and Sepedi for those patients who did not understand English. It was also divided into two sections, Section A and Section B. Section A included demographic information; such as age, gender, race and level of education. Section B included questions related to knowledge of the management of hypertension, which was subdivided as knowledge related to definition of hypertension, treatment, influence of lifestyle modification and diet, and the complications of untreated hypertension.

The researcher went to the clinics on Thursday mornings before the Mankweng clinical team arrived to dispense medication to the patients. During the routine monthly blood pressure monitoring sessions, the researcher sampled the population using simple random sampling method until the target sample size was reached. The questionnaire was then administered.

3.3.2 Qualitative study

The data collection for pharmacists was conducted at Mankweng Hospital. This is because the pharmacists based at the hospital work on a rotational basis at the clinics. Arrangements were made with the pharmacy manager at Mankweng hospital to conduct interviews with the pharmacists on the less busy days at the hospital. These arrangements ensured that service rendered to patients would not be compromised as stated in the approval letter from the Department of Health in Limpopo. The data collection was conducted using semi-structured one-on-one interview sessions to determine the practice of pharmacists in the management of hypertension.

3.3.2.1 The interview site

The interviews were arranged to be conducted in the morning before 10:00 am as this was a less busy time in the pharmacy, and pharmacists were available to

participate in the study during that time. An office in the pharmacy was arranged as the interview site because the pharmacists could easily move in and out after each individual interview. The office contained table to place a voice recorder on and for writing purposes, two chairs to promote comfort (Polit & Beck, 2008), and the office was well ventilated. The researcher ensured that necessary materials for the interview were available, i.e. a voice recorder, interview guides, consent forms for participation, and pens. The seating arrangement provided a relaxed atmosphere. The table was on the right-hand side of the researcher and the left-hand side of the interviewee, and this instituted free communication between them (Burns & Grove, 2005; Joubert & Ehrlich, 2012). The researcher and the participant were facing each other during the interview session.

3.3.2.2 The interview

A semi-structured, one-on-one interview methods was used to collect data for the study. The interviews were in-depth for the purposes of obtaining sufficient information on the practice of pharmacists in the management of hypertension at Dikgale primary health clinics. The interviews were conducted in English and the interview sessions ranged from 10-20 minutes. The researcher issued consent forms to be signed by the interviewee prior to the interview session. The researcher obtained the participants' permission to record the details of the interview sessions using a voice recorder. The researchers also wrote field notes for the non-verbal cues she observed.

Pre-planned, open-ended questions were used to guide the interview process. The following question was asked of all participants **"Could you kindly describe how is it for you to provide assistance to hypertensive patients on treatment?"** after the response to the central question, the researcher then asked probing questions in order to obtain additional information on areas which needed clarity, until saturation of data was reached. The probing questions were as follows:

- Could you kindly describe what you understand by the help you should provide to hypertensive patients on treatment as a pharmacist?

- What are the self-management strategies you can advise the hypertensive patients on treatment to employ in order to maintain quality of life as a pharmacist?
- Can you kindly describe the role of pharmacists in managing hypertension?
- What are your expectations from you as a pharmacist to assist in maintaining quality of life for hypertensive patients?

The process of asking probing questions assisted the researcher to elicit more information about the phenomenon studied (Burns & Grove, 2011).

3.4 Pilot Study

A pilot study was done before the main study was conducted, in order to improve the data collection methods, according Burns and Grove (2007). According to Brink et al (2006), the pilot study used to identify problems and assists in improving the data collection tool. To test if the research methodology will work, a pilot study was conducted on 10 patients at each clinic forming part of the population. Since all the pharmacists at Mankweng hospital form part of the main study, five pharmacists at Seshego Hospital who visit clinics as part of the Chronic Care Model were included in the pilot study. The study was piloted for timing and ambiguities and adjustment were made as necessary. The results of the pilot study were not included as part of the results of the main study.

3.5 Reliability

Reliability refers to the degree to which an assessment tool produces stable and consistent results (Phelan & Wren, 2006). In an article by Golofshani (2003), Joppe (2000) stated that "The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable". To ensure reliability or generalizability of the study, clearly defined measurements and a well-detailed questionnaire will be used. The questions in the questionnaire for patients were adopted from a study by (Erkoc *et al.*, 2012), which developed a Hypertension

Knowledge Level Scale(HK-LS). It was generated based on content, face, and construct validity, internal consistency, test re-test reliability.

Reliability was ensured by avoiding participant error or bias through collecting the data at the same time, preferably in the morning, further only one researcher was used for data entry to improve reproducibility.

3.6 Validity

Validity refers to whether or not a study is well designed and provides results that are appropriate to generalize to the population of interest (Phelan & Wren, 2006).

3.6.1 Internal Validity

Internal validity is defined as the degree to which one can conclude that the independent variables, not extraneous variables, produced changes in the dependent variable (Schmidt & Brown 2012). In this study, the researcher used a simple random sampling technique which is an effective way of controlling extraneous variables therefore achieving validity. In addition, the researcher used inclusion criteria which brought elements of the same characteristics into the study. Consistency was maintained in sampling and data collection to avoid instrumentation as only one researcher will be used for data entry to improve reproducibility.

3.6.2 External Validity

External validity is defined as the degree to which the results can be generalised to other subjects, settings and times (Schmidt & Brown, 2012). In this study, results could be generalised to patients being treated for hypertension at the Ga-Dikgale primary health clinics because simple random sampling was used, a strong technique that allows generalizability.

3.6.3 Construct Validity

Construct validity "examines the fit between conceptual and operational definitions of variables and determines whether the instrument actually measures the theoretical construct that it purports to measure" (Burns & Grove, 2005). In this study, a pilot study was run to check if the questionnaire was comprehensive to achieve the research objectives, which ensured the construct validity. The questions in the questionnaire for patients were adopted from a study by (Erkoc *et al.*, 2012), which developed a Hypertension Knowledge Level Scale (HK-LS). It was generated based on content, face, and construct validity, internal consistency, test re-test reliability, and discriminative validity procedures.

3.7 Trustworthiness

For the purpose of ensuring trustworthiness in this study, Guba's Four Criteria for Trustworthiness were followed throughout the qualitative aspect of this research (Shenton, 2004).

3.7.1 Credibility

Polit and Beck (2008), defined credibility as confidence in the truth of the data and interpretation of the results. Credibility will be ensured by the prolonged period in which the researcher will be engaging the participants. The period was from May 2018 to end of June 2018 (two-month period). The researcher also used different data collection methods so as to ensure the in-depth information on the practice of pharmacists in the management of hypertension at the Dikgale clinics. The data collection methods included a voice recorder to record all the interviews conducted, and also the writing of field notes which assisted in analyzing the non-verbal cues that cannot be captured by use of a voice recorder. All collected data was submitted to the supervisor and external examiner as evidence, which was also be sent to an independent coder.

3.7.2 Dependability

Dependability refers to the stability of data over time, the degree to which data changes over time and alterations that could be made during the analysis process (Polit & Beck, 2008). The compilation the raw data, the analysis of the data collected and its additional information, and observations made by the researcher during interviews was used to ensure dependability in the study. An audit inquiry was performed by the supervisor in order to ensure internal consistency of the data collected from the participants. This involved checking the researcher's collected data, analysis and also the result (de Vos *et al.,* 2012; Polit & Beck, 2008). Dependability was also ensured by involving an independent coder, who validated the legitimacy of the transcripts.

3.7.3 Confirmability

Confirmability refers to objectivity for potential congruency between two or more independent people on the accuracy of data, and relevancy or meaning (Polit & Beck, 2008). Shelton (2004), indicates that steps must be taken as a means of ensuring that the study's findings accurately represents the ideas and experiences of participants, and not that of an expectations from the researcher. In this study, confirmability was ensured by the submission of all raw data that was presented in the voice recorder, to the supervisor for verification. It was also ensured by the prolonged period of engaging with the participants, the use of observational notes and the proper recording of dates and times of the interviews. The interviews were conducted over a period of two months, which was May 2018 to June 2018.

3.7.4 Transferability

Shelton (2004) states that transferability involves the extent to which the findings of one study can be applied or transferred to another study. A consecutive sampling method was used in the study for the purpose of involving all pharmacists that work at Mankweng Hospital and visit the Dikgale clinics on a rotational basis as part of the Chronic Care Model. Furthermore, the researcher disclosed the full description of the research methodology employed for this study. This was done so that other researchers can explore the applicability of the information provided in other

settings. The researcher also collected proper data related to the practice of pharmacist in the management of hypertension (Babbie & Mouton, 2009).

3.8 Bias

In research, bias occurs when "systematic error is introduced into sampling or testing by selecting or encouraging one outcome or answer over others (MerriamWebster, 2017). Bias can occur at any phase of research, including study design or data collection, as well as in the process of data analysis and publication. Bias is not a dichotomous variable. Interpretation of bias cannot be limited to a simple inquisition: is bias present or not? Instead, reviewers of the literature must consider the degree to which bias was prevented by proper study design and implementation (Pannucci & Wilkins, 2008).

3.8.1 Selection Bias

The selection bias is a statistical bias in which there is an error in choosing the individuals or groups to take part in a scientific study. Most often, it refers to the distortion of a statistical analysis, resulting from the method of collecting samples. To minimize this bias, the researcher selected eligible hypertensive patients registered at the clinics using a systematic random sampling method.

3.8.2 Translation Bias

The use of English questionnaires (for the patients) only could lead to miscommunication and misunderstanding of some respondents who do not understand English, and their answers to the questionnaire can also be affected. To minimize this bias, the researcher used English and a Sepedi questionnaire, which was translated by an accredited translator in order to accommodate patients who preferred using Sepedi. The answers were also translated by an accredited translator.

3.8.3 Respondent Bias

Some respondents could answer favourably to please the interviewers or to hide any lack of knowledge. To minimize this bias, the questionnaires were completed anonymously.

3.9 ETHICAL CONSIDERATIONS

According to Polit & Beck (2008), ethics is considered to be the branch of philosophy that deals with morality.

3.9.1 Approval

Ethical clearance certificate was obtained from the University of Limpopo. The research proposal was submitted to the School of Healthcare Sciences Senior Degrees' committee (SDC) for approval. After approval by the SDC, it was then submitted to the Faculty Higher Degrees Committee for further approval and then to the Turfloop Research Ethics Committee (TREC) for an ethical clearance certificate. The ethical clearance certificate together with the research proposal was used to seek authorization from the management of Mankweng Hospital and the National Department of Health, to conduct the research. The certificate was further submitted to the Capricorn District office to seek approval to conduct the research at clinics. The approvals were then handed to the researcher, for the purposes of commencing with the data collection at the respective sites.

3.9.2 Informed Consent and Voluntary Participation

Participation was voluntary and participants had the right to withdraw at any time without any penalty. Healthcare professional participants and the patients were given informed consent forms to sign as an agreement that they understood what the study was all about and were voluntarily participating in the research study. All participants signed a consent form before participation in this study. The consent form included the title of the research study; the name of the researcher; the research supervisor; purpose, objective, and brief description of the study; and its

procedure. Therefore, no subjects formed part of the study unless they fairly consented.

3.9.3 Anonymity and Confidentiality

Participants were assured of the confidentiality of the study. No participant who took part in the study were allowed to furnish their names or identity, unless such identity points out to basic demographics such as age, gender and others. The information obtained was not going to be used for any other purposes other than for research purposes.

The participants were informed that information they provided during one-to-one interviews would not be accessed nor disclosed to any unauthorized person, unless the participant has provided explicit permission to do so. All collected information in the voice recorder and field notes would be stored in a safe place that will only be accessible to designated members of the research team, i.e. the researcher, research supervisor, researcher's co-supervisor and independent coder. The participants were informed that no form of identity would appear on either voice recordings or transcripts.

No names or any other information taken from the files or obtained from the questionnaires will potentially identify any participant shall be published in the research. The data collected will be stored in the University of Limpopo pharmacy department for a period of not less than five years.

3.10. DATA ANALYSIS AND INTERPRETATION

3.10.1 Quantitative Data

All the raw data collected in this study was captured into a SPSS Version 25 spreadsheet. Data capturing was verified and validity checks were performed as part of the data cleaning process. The data was then appropriately presented in graphs and in tables that were presented in the results section of the dissertation. Data analysis was done in consultation with the statistician. One-way analysis of

variance (ANOVA) was used for data analysis to obtain descriptive statistics and inferential statistics. Inferential statistics refers to person correlation while descriptive statistics refers to percentages of data, table and graphical representation of data.

3.10.2 Qualitative Data

The data collected using the voice recorder was transcribed, and field notes were used as a supplementation to the transcribed data from the interview. The transcriptions indicated the totality of the interview processes that were conducted (Polit & Beck, 2008). The researcher used Tesch's proposed eight steps (Creswell, 2014) to analyse the data gathered from participants as follows:

- The researcher carefully read the entire verbatim transcriptions in order to obtain a sense of the whole, i.e. reviewing all the data, making sense of it and wrote down ideas that came to mind while reading.

- The researcher then selected one interview which was the first on and read through it for the purpose of processing the information, i.e. what general ideas the participants were discussing? The qualitative researcher should establish an understanding related to the underlying meaning of the collected information. The researcher wrote down any ideas and thoughts that came to mind.

- After reading all transcripts, the researcher made a list of all the topics compiled and similar topics are clustered together into columns. The columns are then arranged into major, unique and leftover topics (Creswell, 2014) to form categories and sub-categories in all transcribed verbatim transcripts of all interview sessions conducted.

- The researcher then takes the compiled list of topics and returns to the data. The topics were abbreviated as codes, which were then written next to the appropriate segments of the transcribed text.

- The researcher selected the most descriptive wording for the topics and the various topics were categorized. The list of categories was then reduced by grouping the related topics by drawing lines between categories showing

interrelationships. This assisted the researcher to verify whether new topics and codes emerged or not.

- The researcher made a final decision on the abbreviation for each category and alphabetised the codes according to importance in a table.

- The researcher assembled the data material belonging to each category into one column and performed preliminary analysis.

- Re-coding of the existing material was done by the researcher and the co-coder after reaching a consensus on the themes and sub-themes identified. Finally the themes and sub-themes that emerged were written in columns to show clear distinction and interrelationship.

The recordings from the voice recorder and field notes were used during data analysis. An independent coder was requested to analyse the collected data and to reach a consensus on the categorization of themes and sub-themes, identified independently.

3.11 CONCLUSION

In this study, cross-sectional descriptive, quantitative method was employed to achieve the objectives of the knowledge of hypertensive patients at Dikgale primary health clinics. Also a qualitative method was employed to achieve the objectives of the study of determining the practice of pharmacists in the management of hypertension. A simple random sampling was employed for the sample of patients for quantitative research method and a consecutive sampling technique will be employed for the pharmacists at Mankweng hospital for the qualitative research method. Hypertension-Knowledge Scale questionnaires were handed to patients who were identified as hypertensive patients, and these were used to collect data. Semi-structured one-to-one interviews were used to collect data from the participants until data saturation was obtained. The interviews were recorded on a voice recorder and were transcribed. Analysis of data was done using Tesch's coding process (Cresswel, 2003; Botma *et al.*, 2010). Trustworthiness was ensured by using Lincoln and Guba's framework, according to Polit and Beck (2008), throughout this study.

CHAPTER 4

RESULTS & DISCUSSION

4.1 INTRODUCTION

This chapter presents the results of a quantitative (Section A) and qualitative (Section B) descriptive study conducted to investigate the knowledge of hypertensive patients and the practice of pharmacists in the management of hypertension at Dikgale primary health clinics, South Africa. Data was collected from 348 randomly selected hypertensive patients using a pre-validated questionnaire adapted for the Hypertensive – Knowledge Scale. Data was also collected from 20 pharmacists at Mankweng Hospital who visit the Dikgale clinics on a rotational basis. This data was collected using semi-structured one-on-one interviews with the pharmacist to determine the practice of pharmacists in the management of hypertension.

SECTION A: RESULTS FOR QUANTITATIVE STUDY

4.2 DEMOGRAPHIC DATA

This section presents information about participants' demographic characteristics obtained through questions in the demographic section of the questionnaire. These included participants' gender, age, race, educational level and the name of the clinic. A total of 342 participants, being treated at the 4 clinics at Dikgale area, participated in the study.

4.2.1 Gender

Majority of the participants were female, with a percentage of 79% (n=269) whilst only 21% (n=73) were males (see Table 4.1).

Table 4.1: Participants' gender

		Frequency	Percent
Valid	**MALE**	73	21.3
	FEMALE	269	78.7
Total		**342**	**100.0**

These results correlate with a study conducted by Galdas et al (2005), which reviewed literature regarding men's health-related help seeking behaviour in the United Kingdom (UK). The results indicated that men tend to delay to seek health care even when they are ill, and this is attributed to the 'traditional masculine behaviour'. This is further substantiated by a study conducted by Nteta et al (2010), which aimed to investigate the accessibility and utilization of the PHC services in three community health care centres in the Tshwane of the Gauteng Province, South Africa. Of the 285 patients who participated in the research, only 90 were males. Another study was by conducted by Olowe (2017) to assess patient-related variables associated with hypertension control among patients attending a peri-urban PHC clinic in Kwa-Zulu Natal, South Africa. The results indicated that 78.5% of the participants were female.

According to an article by Gudmundsdotti et al (2012), the pathophysiologic reasons for gender differences in high blood pressure are both multifactorial and are poorly understood. There are several hypotheses available, which include the role of sex hormones, renin-angiotensin system, oxidative stress, endothelin, weight gain and sympathetic activation.

4.2.2 Age

The majority of participants, which is 61% were above the age of 60, with 25% being within the age range of 51 to 60. The lowest age range of 20 to 30 years, which was only 1% of the participants (see Figure 4.1). The reason for these results could be the fact that population of the Dikgale area consists of pensioners (Alberts *et al.*, 2002). Lloyd-Sherlock et al (2014), conducted a study to examine patterns of hypertension prevalence, awareness, treatment and control for people aged 50

years and over in China, Ghana, India, Mexico, the Russian Federation and South Africa. The results of the study indicated that hypertension was prevalent in older adults in South Africa and Ghana.
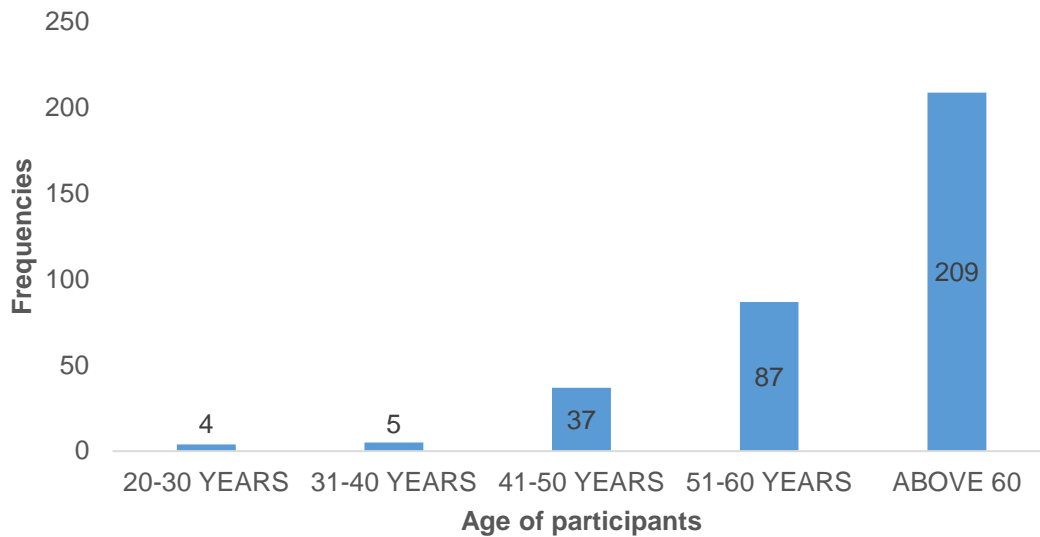
Figure 4.1: Age distribution of the participants

4.2.3 Level of Qualification

From figure 4.2, only 2.9% of the total number of the participants had tertiary education. The majority of the participants, which is 44.4%, had secondary education whilst 32.2% had primary education. Twenty one percent of the participants indicated that they did not go to school at all. Ga-Dikgale is a peri-urban area, and most of the adult population in the area are migrant farm worker and others work as domestic workers in neighboring towns (Alberts *et al.*, 1999). The unemployment rate at Dikgale is very high.
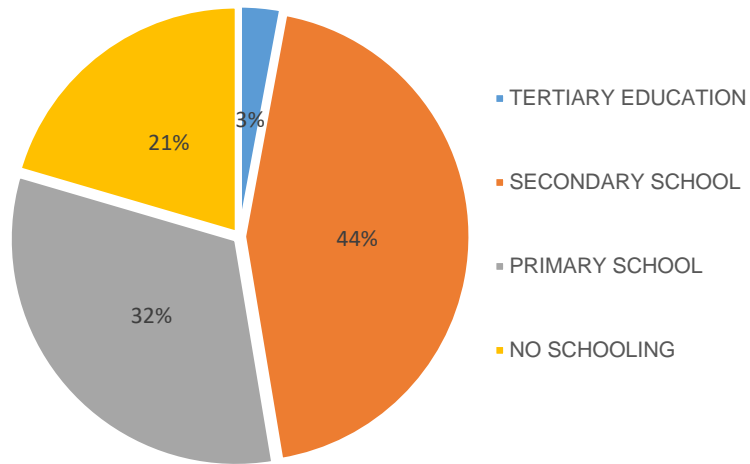
Figure 4.2: Level of education of participants

4.3 KNOWLEDGE OF HYPERTENSION

The results below describes the knowledge of hypertensive patients in relation to the knowledge about definition of hypertension, treatment of hypertension, lifestyle modifications and complications of hypertension. When computing the results on SPSS, to measure the level of knowledge on hypertension, a scale of 1-5 was used where;

1- Highly not knowledgeable (HNK)

2- Not knowledgeable (NK)

3- Neutral (N)

4- Knowledgeable (K)

5- Highly knowledgeable (HK)

4.3.1 Definition of Hypertension

Majority of the participants, 52%, were able to identify normal blood pressure as 120/80mmHg, whilst 44% did not know the value at all. Sixty-three percent (63%), agreed that blood pressure is high when it is at or above 140/90mmHg, with 33% percent also not knowing the value. Also, 53% of the participants agreed that high blood pressure is symptomatic, with 22% disagreeing and 25% indicating that they don't know. Most of the participants, 80% agreed that high blood pressure is a life-

long disease, and 83%, disagreed that hypertension is a man's problem. Eleven-point one percent (11.1%) were highly not knowledgeable and 19.6% were not knowledgeable. Thirty-two-point seven (32.7%) were neutral, 30.7% were knowledgeable and 5.8% were highly knowledgeable (see Table 4.2). From these results, it can be concluded that only a total of 36.5% of had knowledge about the definition of hypertension.

Table 4.2: Overall knowledge about definition of hypertension

		Frequency	Percent
Valid	**HIGHLY NOT KNOWLEADGEABLE**	38	11.1
	NOT KNOWLEADGEABLE	67	19.6
	NEUTRAL	112	32.7
	KNOWLEADGEABLE	105	30.7
	HIGLY KNOWLEADGEABLE	20	5.8
Total		342	100.0

4.3.1.1 Relationship between gender and knowledge about definition

From the results of the study, in the male category, 27.4% (n=20) were not knowledgeable, 34.2% were neutral, and 23.3% were knowledgeable. Only 2.7% were highly knowledgeable in the male category. For females, 32.3% were neutral, 32.7% (n=88) were knowledgeable and only 6.7% (n=18) were highly knowledgeable (Table 4.3).

Table 4.3: Relationship between gender and knowledge on definition

		HNK	NK	N	K	HN	Total
GENDER	**MALE**	9	20	25	17	2	73
	FEMALE	29	47	87	88	18	269
Total		**38**	**67**	**112**	**105**	**20**	**342**

From the results, most of male participants are not knowledgeable as compared to female participants. Although there were more female participants than male, both categories need extensive education in order to improve their knowledge relating to the definition of hypertension. There was no significant relationship between gender and knowledge about the definition of hypertension because the Chi-square value was 0.180.

4.3.1.2 Relationship between age and knowledge about definition

As illustrated in Table 4.4, participants of age group 20-30, 25% (n=1) were highly knowledgeable and 25% (n=1) were knowledgeable. Twenty-five percent were not knowledgeable and 25% were knowledgeable.

In the age group 31-40, 60% (n=3) were neutral and there were 20% were knowledgeable. In the 41-50 age group, 29.7% were neutral and 40.5% were knowledgeable. Only 10.8% were highly knowledgeable in this group.

In the 51-60 age group, 32.2% were neutral and 40.2% were knowledgeable, with only 5.7% being highly knowledgeable. The age group of above 60, which had the most participants (n=209), only 4.9% were highly knowledgeable. Additionally, only 25.4% were knowledgeable in this group.

Table 4.4: Relationship between age and knowledge on definition

		HNK	NK	N	K	HK	Total
AGE	BETWEEN 20-30	0	1	1	1	1	4
	BETWEEN 31-40	1	0	3	1	0	5
	BETWEEN 41-50	5	2	11	15	4	37
	BETWEEN 51-60	5	14	28	35	5	87
	ABOVE 60	27	50	69	53	10	209
Total		38	67	112	105	20	342

Although there was no significant relationship between age and knowledge about the definition (p= 0.107), these participants need educational interventions to improve their knowledge. This is especially crucial to the above 60 age group as there a majority and have a low level of knowledge.

4.3.1.3 Relationship between level of education and knowledge on the definition

From Table 4.5 and Figure 4.3, participants who had tertiary education, 60% (n=6) were knowledgeable and 10% were highly knowledgeable. For those that had secondary education, 32.2% (n=49) were neutral, 35.6% (n=54) were knowledgeable and only 7.2% were highly knowledgeable. These participants were in the majority (n=152). For the participants that had primary school education, 31.8% were neutral and 32.7% were knowledgeable. Only 3.6% were highly knowledgeable in this group. For the participants who had no schooling, 37.1% were neutral, 12.9% were knowledgeable and 5.71% were highly knowledgeable.

Table 4.5: Level of education versus knowledge about definition

		HNK	NK	N	K	HK	Total
LEVEL OF QUALIFICATION	TERTIARY EDUCATION	0	1	2	6	1	10
	SECONDARY SCHOOL	13	25	49	54	11	152
	PRIMARY SCHOOL	11	24	35	36	4	110
	NO SCHOOLING	14	17	26	9	4	70
Total		38	67	112	105	20	342

From these results, there was a significant relationship between level of education and the knowledge about the definition of hypertension, p= 0.024 (see Table 4.6). The participants who were more educated had more knowledge about definition. The participants with no schooling were of the minority (n=70), but they still need to be educated on the definition of hypertension.

Table 4.6: Chi-square results for level of education vs definition knowledge

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	23.433[a]	12	.024
Likelihood Ratio	25.245	12	.014
Linear-by-Linear Association	16.072	1	.000
N of Valid Cases	342		
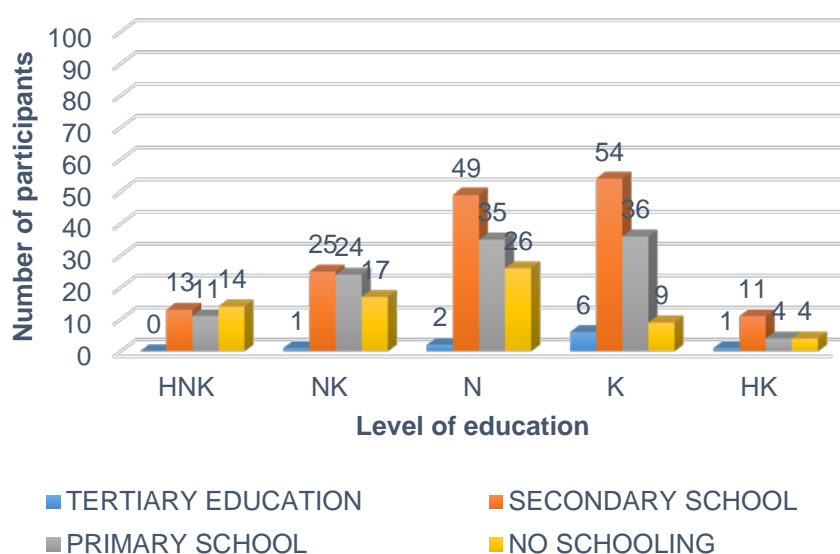
Figure 4.3: Level of education versus knowledge of definition

4.3.1.4 Relationship between the clinic and knowledge on the definition

The results of the study, as portrayed in Figure 4.4, showed that;

➢ At Sebayeng clinic, 40.7% (n=44) were neutral and 24.1% were knowledgeable. Only 4.6% (n=5) were highly knowledgeable at this clinic.

➢ At Dikgale clinic, 31% (n=36) were neutral, 32.8% (n=38) were knowledgeable and only 6% (n=7) were highly knowledgeable.

➢ At Seobi-Dikgale clinic, 26.7% were neutral, 34.1% were knowledgeable and only 2.4% were highly knowledgeable.

➢ At Makotopong clinic, 27.3% were neutral, 35.1% were knowledgeable and only 9.1% were highly knowledgeable.

There was no significant relationship between clinic and the knowledge about definition, with a Chi-Square value of 0.331(p=0.331). It is evident from these results that participants lack significant knowledge about the definition of hypertension. The majority of the participants at all 4 clinics had neutral knowledge and this means that they should be educated extensively about the definition of hypertension.
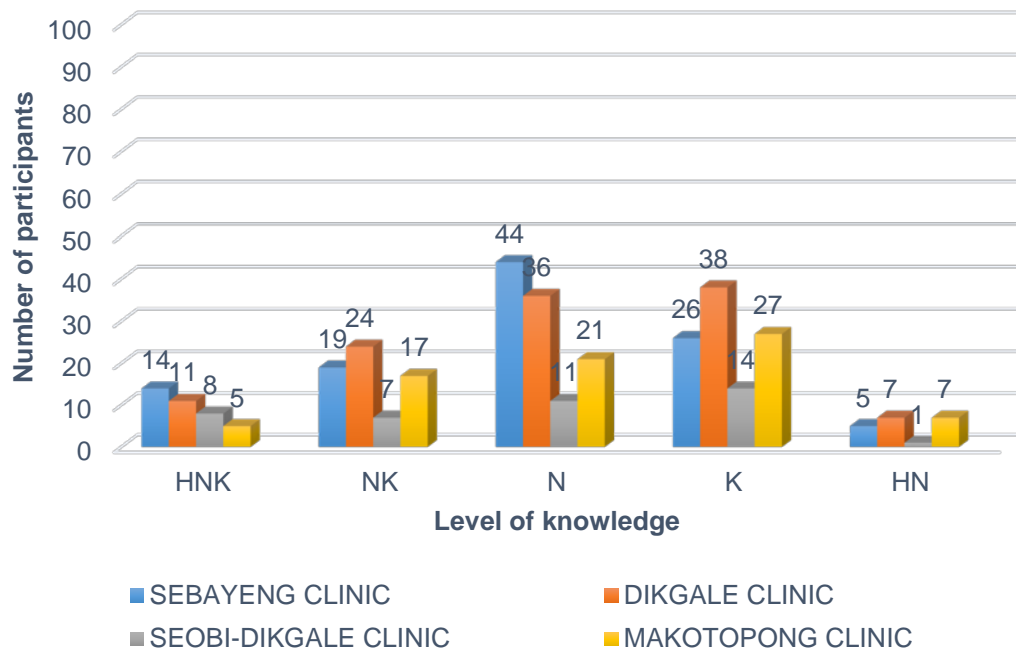
Figure 4.4: Clinic versus knowledge on definition

4.3.2 Knowledge about treatment of hypertension

The majority of participants, 75.4 % disagreed that high blood pressure can be treated without medication, with 12% agreeing and 12.6% indicating that they don't know. Ninety-five point six percent (95.6%) agreed that medication for blood pressure must be taken every day, with 2.6% disagreeing and 1.8% indicating that they don't know.

Eighty-three point six percent (83.6%) of the participants disagreed that medication for increased blood pressure should be taken only when they feel ill, with 12% agreeing and 4.4% of the participants indicating that they don't know.

Most of the participants (71.9%), disagreed that one can stop taking blood pressure medication when the blood pressure is normal, with 17.5% agreeing and 10.5% indicating that they don't know whether medication can be stopped or not. Seventy-six point nine percent (76.9%), which is a total of 263 participants disagreed that high blood pressure is a result of aging, which means that they also disagree that the treatment of hypertension is not necessary. Eleven-point seven percent (11.7%) agreed that high blood pressure is a result of aging and 11.4% indicated that they don't know.

The overall knowledge about treatment of hypertension using the scale from 1-5 as previously described, 4.4% of the participants were highly not knowledgeable and 9.4% were not knowledgeable. Twelve percent were neutral, 26% were knowledgeable and 48% were highly knowledgeable (Table 4.7).

Table 4.7: Overall knowledge about treatment of hypertension

		Frequency	Percent
Valid	HIGHLY NOT KNOWLEADGEABLE	15	4.4
	NOT KNOWLEADGEABLE	32	9.4
	NEUTRAL	42	12.3
	KNOWLEADGEABLE	89	26.0
	HIGLY KNOWLEADGEABLE	164	48.0
Total		342	100.0

4.3.2.1 Relationship between gender and knowledge about treatment

From the results of the study (Table 4.8), in the male category, 28.8% were knowledgeable and 42.5% were highly knowledgeable. For females, 25.3% were knowledgeable and 49.4 % were highly knowledgeable.

Table 4.8: Gender versus knowledge about treatment

		HNK	NK	N	K	HK	Total
GENDER	MALE	4	6	11	21	31	73
	FEMALE	11	26	31	68	133	269
Total		15	32	42	89	164	342

There was no significant relationship between gender and knowledge about treatment of hypertension (p=0.769). The female participants were in the majority and were more knowledge than the male participants.

4.3.2.2 Relationship between age and knowledge on treatment of hypertension

The participants from the age group 20-30 years were highly knowledgeable, with a percentage of 50%. Twenty-five percent were not knowledgeable and 25% were knowledgeable. In the age group 31-40, 60% were highly knowledgeable and 20% were knowledgeable. In the 41-50 age group, 60% were highly knowledgeable and 18.9% were knowledgeable. In the 51-60 age group, 25.3% percent were knowledgeable and 51.7% were highly knowledgeable. The age group of above 60, 27.8% were knowledgeable and 44% were highly knowledgeable.
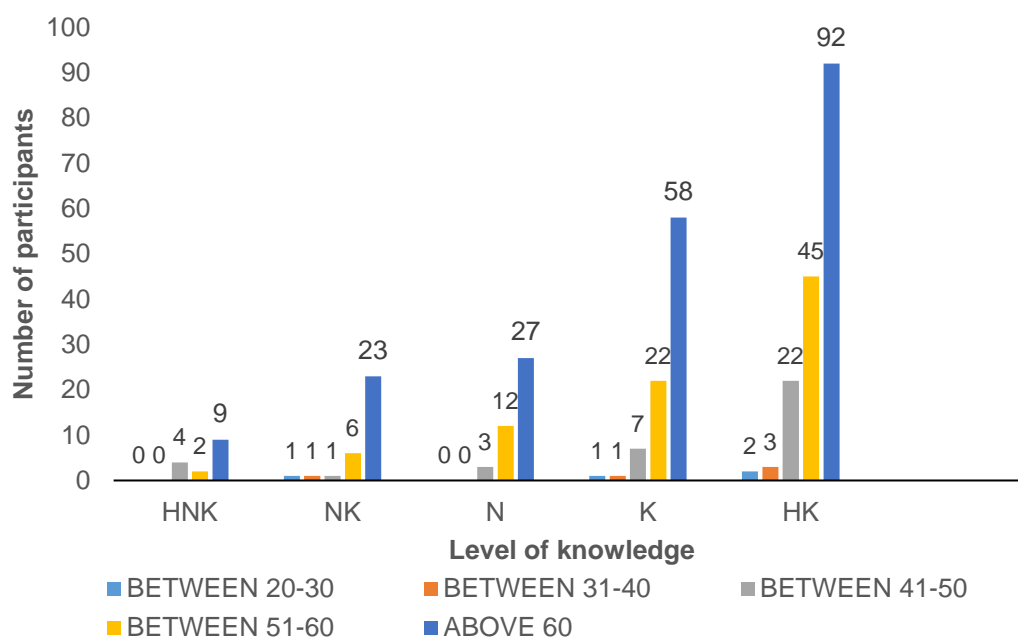
Figure 4.5: Age versus knowledge on treatment of hypertension

There was no significant relationship between age and knowledge of treatment, with p= 0.574. The participants had significant knowledge relating to the treatment of hypertension despite the fact that there was no relationship between age and knowledge of treatment. The age group of above 60 had the majority of participants, and were highly knowledgeable (Figure 4.5). The highest percentage of participants that are highly knowledgeable was in age group 31- 40 and 41-50.

4.3.2.3 Relationship between level of education and knowledge on treatment

For participants who had tertiary education, 10% (n=1) were neutral, 20% (n=2) were knowledgeable and 70% (n=7) were highly knowledgeable. There were no participants who were highly not knowledgeable and those who were knowledgeable in this group. For those that had secondary education (n=152), 22.4% were knowledgeable and 58.6% (n=89) were highly knowledgeable (Table 4.9). For the participants that had primary school education, 29.1% were knowledgeable and 37.3% (n=41) were highly knowledgeable. For the participants who had no schooling, 30% were knowledgeable and 38.6% (n=27) were highly knowledgeable.

Table 4.9: Level of education versus knowledge of treatment

		HNK	NK	N	K	HK	Total
LEVEL OF QUALIFICATION	TERTIARY EDUCATION	0	0	1	2	7	10
	SECONDARY SCHOOL	6	9	14	34	89	152
	PRIMARY SCHOOL	8	13	16	32	41	110
	NO SCHOOLING	1	10	11	21	27	70
Total		15	32	42	89	164	342

From these results, there was a significant relationship between level of education and the knowledge on the treatment of hypertension, p= 0.038 (Table 4.10). The participants with the highest level of knowledge were those that had tertiary education, although they were a minority (n=10). The majority of the participants were knowledgeable and highly knowledgeable (see Figure 4.6). Overall, these

patients have significant knowledge regarding the treatment of hypertension, which means that there will be fewer incidences of mortality and morbidity caused by complications of hypertension.

Table 4.10: Chi-square results for level of education versus knowledge of treatment

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	21.934[a]	12	.038
Likelihood Ratio	23.441	12	.024
Linear-by-Linear Association	9.207	1	.002
N of Valid Cases	342		
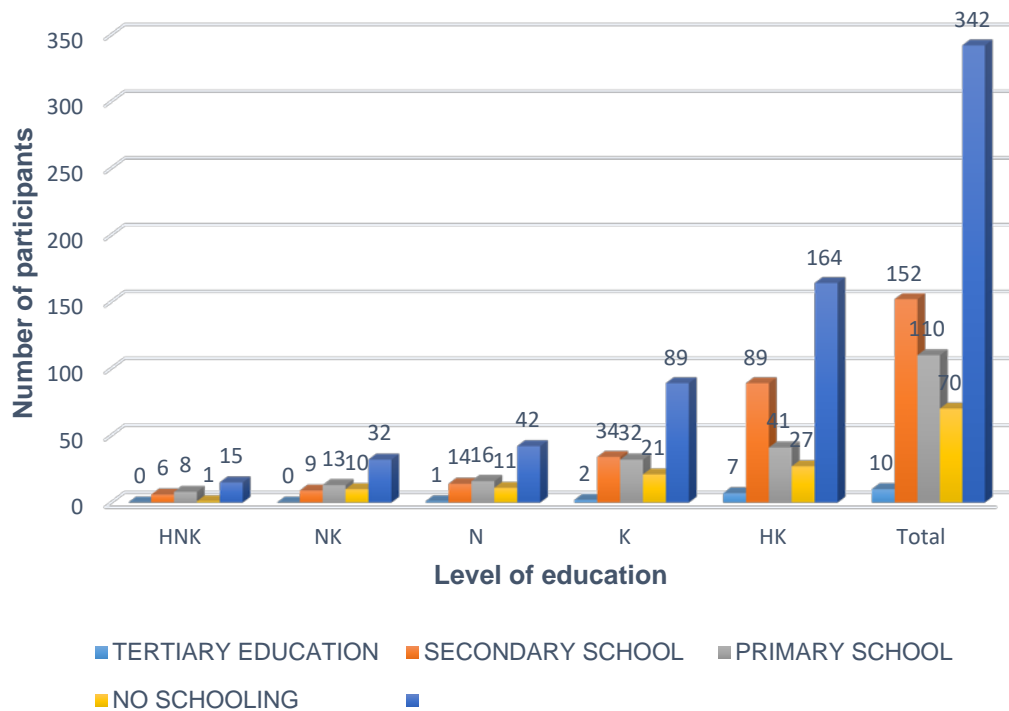
Figure 4.6: Level of education versus knowledge on treatment

4.3.2.4 Relationship between the clinic and knowledge on the treatment

The results of the study showed that;

- At Sebayeng clinic, 25.9% (n=28) were knowledgeable and 41.7% (n=45) were highly knowledgeable.

- At Dikgale clinic, 18.9% (n=22) were knowledgeable and 54.3% (n=63) were highly knowledgeable.

- At Seobi-Dikgale clinic, 36.6% (n=15) were knowledgeable and 39% (n=16) were highly knowledgeable.

- At Makotopong, 31.2% (n=24) were knowledgeable and 51.9% (n=40) were highly knowledgeable.

Table 4.11: Clinic versus knowledge about treatment of hypertension

		HNK	NK	N	K	HK	Total
NAME OF THE CLINIC	**SEBAYENG CLINIC**	10	8	17	28	45	108
	DIKGALE CLINIC	3	13	15	22	63	116
	SEOBI-DIKGALE CLINIC	1	7	2	15	16	41
	MAKOTOPONG CLINIC	1	4	8	24	40	77
Total		**15**	**32**	**42**	**89**	**164**	**342**

There was a significant relationship between clinic and the knowledge on treatment, with a Chi-Square value of 0.018 (Table 4.12). Dikgale clinic had the highest percentage of participants that were highly knowledgeable on the treatment of hypertension (see Table 4.11).

Table 4.12: Chi-square results for clinic versus knowledge about treatment

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	24.344[a]	12	.018
Likelihood Ratio	24.048	12	.020
Linear-by-Linear Association	4.825	1	.024
N of Valid Cases	342		
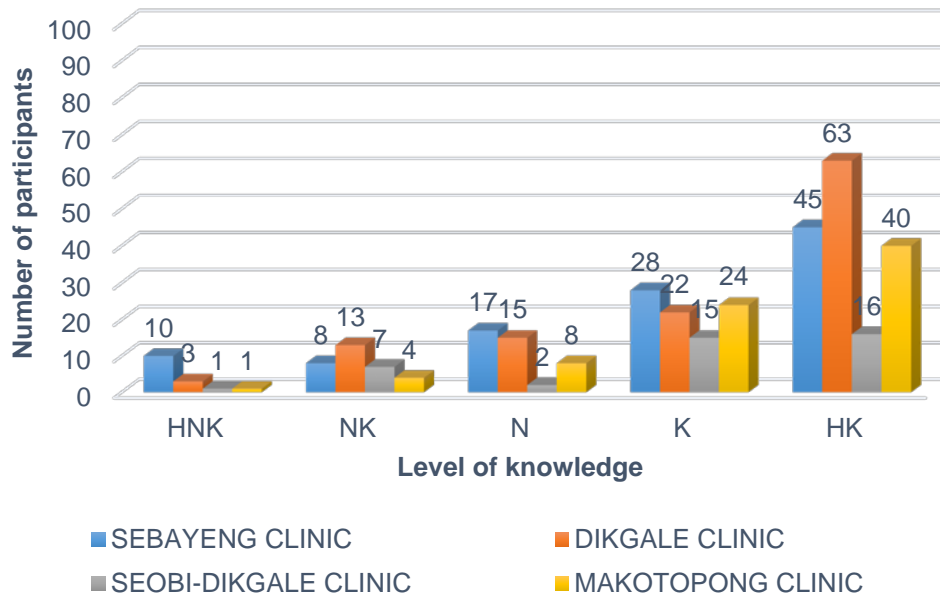
Figure 4.7: Name of clinic versus knowledge on treatment

4.3.3 Knowledge about lifestyle modifications

A total number of 246 (71%) of the participants were able to identify the importance of lifestyle modifications in high blood pressure, as they disagreed that there is no need to change lifestyle if medication can control increased blood pressure. Still, only 67% of the participants disagreed that if they changed their lifestyle, there is no need for medication for hypertension. The majority of the patients, 94%, agreed that salt reduction can help in controlling high blood pressure, but only 85% disagreed that individuals with increased blood pressure can eat salty foods as long as they are on treatment.

Eighty-five percent (85%) disagreed that individuals with increased blood pressure can smoke at times, and 79% also disagreed that individuals with increased blood pressure can drink alcoholic beverages at times. The majority of the participants, 93%, agreed that regular exercise can help in controlling high blood pressure and 85% agreed that reducing stress can also help in reducing high blood pressure.

Almost all the participants, 341, agree that individuals with increased blood pressure must eat fruits and vegetables frequently, with only 1 participant not knowing. Ninety-four percent (94%) of the participants agreed that the best cooking method for individuals with increased blood pressure is boiling or grilling, but 88% disagreed that frying is the best method. The overall knowledge about lifestyle modifications using the scale from 1-5 as previously described, 0.6% of the participants were highly not knowledgeable and 1.5% were not knowledgeable. Three-point eight percent (3.8%) were neutral, 16.4% were knowledgeable and 77.8% were highly knowledgeable (see Table 4.13)

Table 4.13: Overall knowledge about lifestyle modification

		Frequency	Percent
Valid	HIGHLY NOT KNOWLEADGEABLE	2	0.6
	NOT KNOWLEADGEABLE	5	1.5
	NEUTRAL	13	3.8
	KNOWLEADGEABLE	56	16.4
	HIGLY KNOWLEADGEABLE	266	77.8
Total		342	100.0

4.3.3.1 Relationship between gender and knowledge about lifestyle modifications.

From the results of the study (Table 4.14), in the male category, 19.2% were knowledgeable and 75.3% (n=55) were highly knowledgeable. For females, 15.6% were knowledgeable and 78.4% (n=42) were highly knowledgeable.

Table 4.14: Gender versus knowledge about lifestyle modifications

		HNK	NK	N	K	HK	Total
GENDER	MALE	1	0	3	14	55	73
	FEMALE	1	5	10	42	211	269
Total		2	5	13	56	266	342

There was no significant relationship between gender and knowledge about lifestyle modifications because the Chi-square value was 0.579. These results indicate that both male and female participants have significant knowledge about the lifestyle modifications

4.3.3.2 Relationship between age and knowledge about lifestyle modifications

All of the participants from the age group 20-30 years were highly knowledgeable (n=4). Also in the age group 31-40, 100% were highly knowledgeable (n=5). In the 41-50 age group, there were no highly not knowledgeable and not knowledgeable participants. Eight-point one percent (8.1%) were neutral, 27% were knowledgeable and 64.9% (n=24) were highly knowledgeable. In the 51-60 age group, 11.5% percent were knowledgeable, with 87.4% being highly knowledgeable. The age group of above 60, 17.2% were knowledgeable and 75.1% (n=157) were highly knowledgeable (see Table 4.15).

Table 4.15: Age versus knowledge about lifestyle modifications

		HNK	NK	N	K	HK	Total
AGE	**BETWEEN 20-30**	0	0	0	0	4	4
	BETWEEN 31-40	0	0	0	0	5	5
	BETWEEN 41-50	0	0	3	10	24	37
	BETWEEN 51-60	0	0	1	10	76	87
	ABOVE 60	2	5	9	36	157	209
Total		2	5	13	56	266	342

There was no significant relationship between age and knowledge of lifestyle modifications, with p= 0.430.

4.3.3.3 Relationship between level of qualification and lifestyle modifications

For participants who had tertiary education 40% were knowledgeable and 60% were highly knowledgeable. For those that had secondary education, 14.5% were

knowledgeable and 82.2% (n=125) were highly knowledgeable. For the participants that had primary school education, 11.8% were knowledgeable and 82.7% (n=91) were highly knowledgeable. For the participants who had no schooling, 24.3% were knowledgeable and 62.9% (n=44) were highly knowledgeable.

Table 4.16: Level of qualification versus knowledge about lifestyle modifications

		HNK	NK	N	K	HK	Total
LEVEL OF QUALIFICATION	**TERTIARY EDUCATION**	0	0	0	4	6	10
	SECONDARY SCHOOL	0	0	5	22	125	152
	PRIMARY SCHOOL	1	1	4	13	91	110
	NO SCHOOLING	1	4	4	17	44	70
Total		2	5	13	56	266	342

From these results, there was a significant relationship between level of education and the knowledge on the treatment of hypertension, p= 0.013 (see Table 4.17). The majority of participants that were highly knowledgeable were those that had primary and secondary education. The participants with no schooling were also highly knowledgeable, despite not having any formal education (Table 4.16).

Table 4.17: Chi-square values for level of education versus lifestyle modifications

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25.380[a]	12	.013
Likelihood Ratio	24.033	12	.020
Linear-by-Linear Association	10.066	1	.002
N of Valid Cases	342		
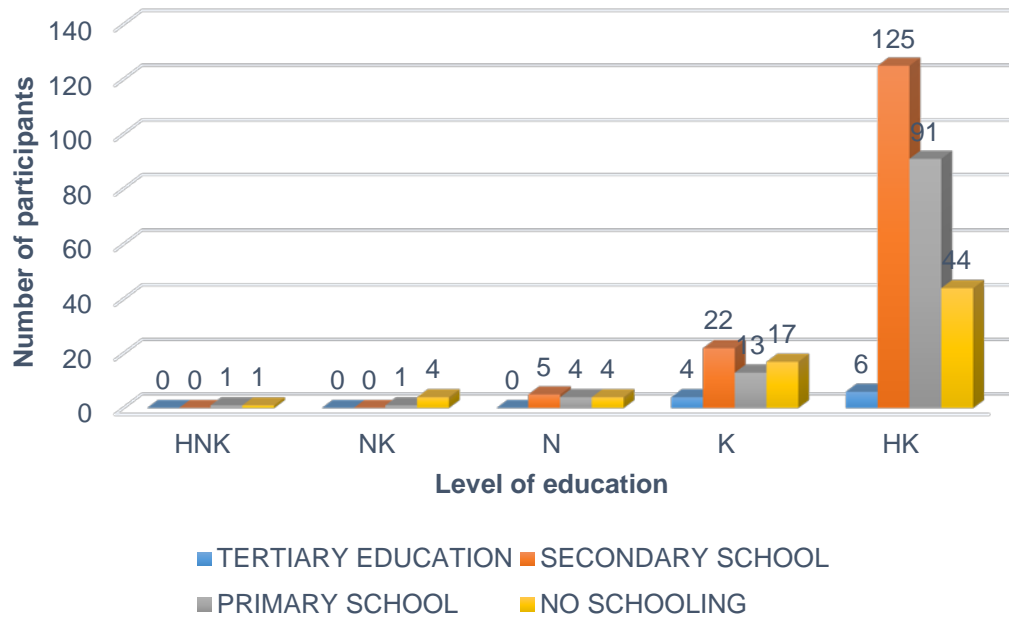
Figure 4.8: Level of education versus knowledge about lifestyle modifications

4.3.3.4 Relationship between the clinic and knowledge about lifestyle modifications

The results of the study revealed that;

- At Sebayeng clinic, 13% were knowledgeable and 80.6% (n=87) were highly knowledgeable.

- At Dikgale clinic, 19.8% were knowledgeable and 75% (n=87) were highly knowledgeable.

- At Seobi-Dikgale clinic, 19.5 % were knowledgeable and 73.2% (n=30) were highly knowledgeable.

- At Makotopong clinic, 14.3% were knowledgeable and 80.5% (n=62) were highly knowledgeable.

Table 4.18: Clinic versus knowledge about lifestyle education

		HNK	NK	N	K	HK	Total
NAME OF THE CLINIC	**SEBAYENG CLINIC**	1	0	6	14	87	108
	DIKGALE CLINIC	0	2	4	23	87	116
	SEOBI-DIKGALE CLINIC	0	3	0	8	30	41
	MAKOTOPONG CLINIC	1	0	3	11	62	77
Total		2	5	13	56	266	342

There was no significant relationship between clinic and the knowledge on lifestyle modifications, with a Chi-Square value of 0.086 (p=0.086). Sebayeng clinic and Makotopong clinic had the highest number of participants that were highly knowledgeable on the lifestyle modification, despite the fact that their participants were not in the majority (Table 4.18).

4.3.4 Knowledge about complications of hypertension

The participants were able to identify complications related to high blood pressure, especially the point that high blood pressure can cause premature death, with 93% agreeing. Ninety-one percent (91%) agreed that increased blood pressure can cause heart diseases, and 95% agreed that increased blood pressure can cause strokes if left untreated. Although most of the patients, 71%, were aware and agreed that high blood pressure can cause kidney failure, 28% indicated that they don't know if high blood pressure causes kidney failure.

The overall knowledge on complications of hypertension using the scale from 1 - 5 as previously described, 3.8% were highly not knowledgeable and 1.8% were not knowledgeable. Eight-point eight percent (8.8%) were neutral, 22.8% were knowledgeable and 63.2% were highly knowledgeable (Table 4.19).

Table 4.19: Overall knowledge on complications

		Frequency	Percent
Valid	**HIGHLY NOT KNOWLEADGEABLE**	13	3.8
	NOT KNOWLEADGEABLE	6	1.8
	NEUTRAL	30	8.8
	KNOWLEADGEABLE	77	22.5
	HIGLY KNOWLEADGEABLE	216	63.2
Total		342	100.0

4.3.4.1 Relationship between gender and knowledge about complications

From the results of the study, in the male category, 19.2% were knowledgeable and 74% were highly knowledgeable. For females, 23.4% were knowledgeable and 60.2% were highly knowledgeable.

There was no significant relationship between gender and knowledge about complications because the Chi-square value was 0.199. Both genders have high levels of knowledge about complications of hypertension.

4.3.4.2 Relationship between age and knowledge about complications

The participants from the age group 20-30 years, 50% had neutral knowledge with 25% being knowledgeable and 25% (n=1) being highly knowledgeable. In the age group 31-40, 20% were neutral and 40% were knowledgeable, with 40% (n=2) being highly knowledgeable. In the 41-50 age group, 27% were knowledgeable and 56.8% (n=21) were highly knowledgeable.

In the 51-60 age group, 26.4% were knowledgeable, with 65.5% (n=57) being highly knowledgeable. The age group of above 60, 4.8% were highly not knowledgeable and 1.9% were not knowledgeable, 9% were neutral, 19.6% were knowledgeable and 64.6% (n=135) were highly knowledgeable.

Table 4.20: Age versus knowledge about complications

		HNK	NK	N	K	HN	Total
AGE	BETWEEN 20-30	0	0	2	1	1	4
	BETWEEN 31-40	0	0	1	2	2	5
	BETWEEN 41-50	1	2	3	10	21	37
	BETWEEN 51-60	2	0	5	23	57	87
	ABOVE 60	10	4	19	41	135	209
Total		13	6	30	77	216	342

There was no significant relationship between age and knowledge about complications, with p= 0.240. The participants in the age group 20-30 have a high percentage in neutral knowledge (Table 4.20), and this means that they need to be educated on the complications of education. This group is considered to be in young adulthood, and improving their knowledge will lead to reduced hospitalization due to complications of hypertension.

4.3.4.3 Relationship between level of qualification and knowledge about complications

For participants who had tertiary education, 20% had neutral knowledge, 20% were knowledgeable and 60% (n=6) were highly knowledgeable. There were no participants who were highly not knowledgeable and those who were knowledgeable in this group.

For those that had secondary education, 28.9% were knowledgeable and 56.6% (n=86) were highly knowledgeable. For the participants that had primary school education, 14.5% were knowledgeable and 74.5% (n=82) were highly knowledgeable. For the participants who had no schooling, 29% were not knowledgeable, 8.6% were neutral, 21.4% were knowledgeable and 60% (n=42) were highly knowledgeable.

Table 4.21: Level of education versus knowledge about complications

		HNK	NK	N	K	HK	Total
LEVEL OF QUALIFICATION	**TERTIARY EDUCATION**	0	0	2	2	6	10
	SECONDARY SCHOOL	3	3	16	44	86	152
	PRIMARY SCHOOL	5	1	6	16	82	110
	NO SCHOOLING	5	2	6	15	42	70
Total		13	6	30	77	216	342

From these results, there was a no significant relationship between level of education and the knowledge on complications, with a Chi-square value of p= 0.121. The participants with the highest percentage of knowledge were those that had primary school education (Table 4.21).

4.3.4.4 Relationship between clinic and knowledge about complications

The results of the study revealed that;

- At Sebayeng clinic, 22.2% were knowledgeable and 67.6% were highly knowledgeable.
- At Dikgale clinic, 22.4% were knowledgeable and 60.3% were highly knowledgeable.
- At Seobi-Dikgale clinic, 24.4 % were knowledgeable and 63.4% were highly knowledgeable.
- At Makotopong clinic, 22.1% were knowledgeable and 61% were highly knowledgeable.
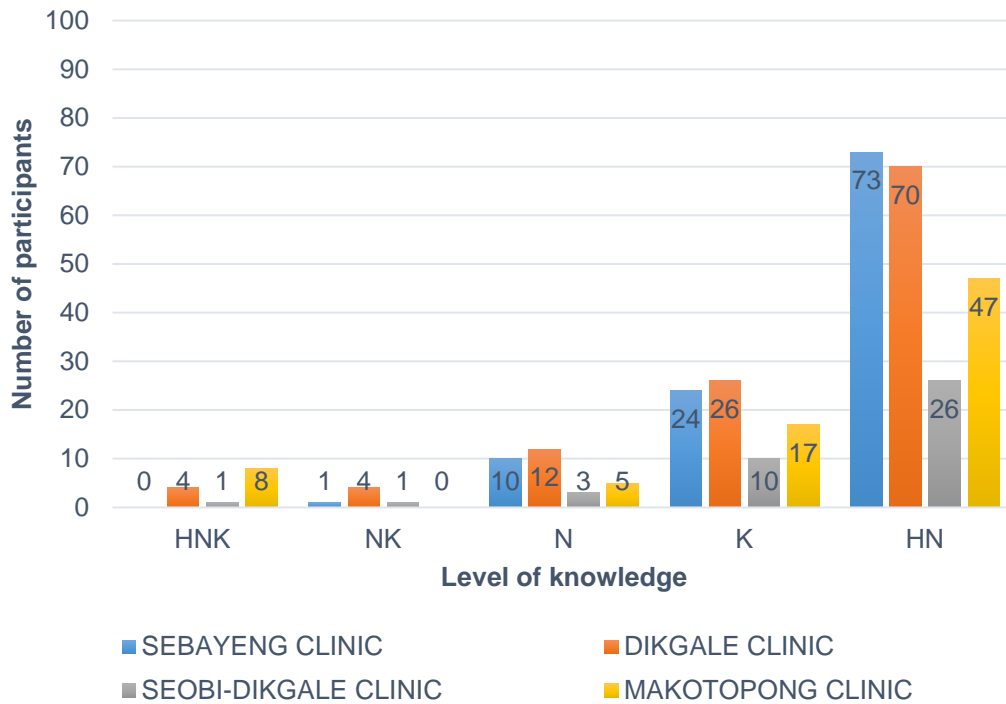
Figure 4.9: Clinic versus knowledge about complications

There was a no significant relationship between clinic and the knowledge on complications, with a Chi-Square value of 0.103 (p=0.103). Sebayeng clinic (Figure 4.9) had the highest number of participants that were highly knowledgeable on the complications of hypertension.

4.4 KNOWLEDGE OF HYPERTENSION: DISCUSSION

In section B, question 4 (Questionnaire for patients; Appendix 3) under knowledge of the definition of hypertension, the participants were asked if most times hypertension has symptoms. The majority of the participants, n=183 (53%), agreed with the statement whilst 25% indicated that they don't know. This seems to be a common misconception, because hypertension is often asymptomatic hence it is deemed a silent killer. The findings of the study also revealed that only 36.5% of the participants were knowledgeable about the overall definition of hypertension. This larger percentage of the group of participants need extensive education about the definition of hypertension because they are more at risk of developing complications of hypertension. Ragot et al (2010), indicated that patients' knowledge and

awareness of blood pressure plays a significant role in achieving successful control of hypertension.

On the knowledge about treatment of hypertension, the majority of the participants, 75.4 % indicated that high blood pressure cannot be treated without medication with 96% agreeing that blood pressure medication should be taken every day. Antihypertensive medication should always be taken every day as prescribed by the medical practitioner. These participants understand this and this indicates that there will be fewer incidences complications caused by non-compliance.

Eighty-four percent (84%) of the participants disagreed that medication for increased blood pressure should be taken only when they feel ill. Hypertension is often asymptomatic, so it very important for patients to continue taking their medication everyday regardless of whether they feel ill or not. Cessation of medication or habitual skipping of medication can lead to complications of hypertension such as renal and heart failure. Most of the participants, 72%, disagreed that one can stop taking blood pressure medication when the blood pressure is normal, with 18% agreeing and 10% indicating that they don't know whether medication can be stopped or not.

Seventy-seven percent (77%), which is a total of 263 participants disagreed that high blood pressure is a result of aging, which means that they also disagree that the treatment of hypertension is not necessary. Although blood pressure tends to increase rapidly in individuals as they age (Mondzinger, 2012), this does not mean that it is only aging individuals who can have hypertension.

The majority of the participants, 48%, were highly knowledgeable on the treatment of hypertension, with 26% being knowledgeable. About 9.4% of the participants were not knowledgeable, and 4.4% being highly not knowledgeable. Twelve percent (12%) of the participants were neutral. This group of participants are good candidates for controlled hypertension because they are aware of the importance of treatment of hypertension. The majority of them are aware that hypertension is a chronic disease, which means that the treatment is life-long.

It is only a small percentage of participants that need to be educated on the importance of treatment of hypertension. Smeltzer et al (2010), emphasized the importance of patients having the knowledge of the disease process and also medication that helps in the control of hypertension.

On the knowledge about lifestyle modifications, A total number of 246 (71%) of the participants were able to identify the importance of lifestyle modifications in high blood pressure, as they disagreed that there is no need to change lifestyle if medication can control increased blood pressure. The majority of the patients, 94%, agreed that salt reduction can help in controlling high blood pressure, but only 85% disagreed individuals with increased blood pressure can eat salty foods as long as they are on treatment.

Salt intake is considered a preventative risk factor of hypertension, and it has shown to reduce blood pressure in hypertensive patients (Turlova & Feng, 2013). These participants understand the importance of reducing salt intake, which means they are not at risk of developing complications such as strokes and renal failures.

Although the majority of the participants(85%) disagreed that individuals with increased blood pressure can smoke at times, the prevalence of smokers among patients at Dikgale area was found to be 13.7%, with 81,3% being daily smokers (Maimela *et al*, 2016). Smoking tends to increase the chances of the clotting of blood, an increase in blood pressure and introduces free radicals (Houston, 2012). Furthermore, smoking is associated with major cardiovascular events and should be emphasised to patients that cessation of smoking is of importance (Weber *et al.*, 2014).

Seventy-nine (79%) disagreed that individuals with increased blood pressure can drink alcoholic beverages at times. Alcohol reduction leads to a reduction in blood pressure in normotensive and hypertensive patients who are heavy drinkers (Appel, 2003).

The majority of the participants, 93%, agreed that regular exercise can help in controlling high blood pressure and 85% agreed that reducing stress can also help in reducing high blood pressure.

Almost all the participants, 341, agree that individuals with increased blood pressure must eat fruits and vegetables frequently, with only 1 participant not knowing. According to a study conducted by Maimela et al (2016), 88.6% of participants at the Dikgale area had low dietary intake of fruits and vegetables.

Ninety-four percent (94%) of the participants agreed that the best cooking method for individuals with increased blood pressure is boiling or grilling, but 88% disagreed that frying is the best method.

Most of the participants, 53.5%, were highly knowledgeable about lifestyle modifications, with 28% being knowledgeable. Eleven percent (11%) were neutral and 1.2% were not knowledgeable. These candidates could be considered as compliant to lifestyle modifications, which could lead to improved blood pressure control. But according to the study by Maimela et al (2016), the prevalence of the cardio-metabolic risk factors could be an indicator that although the participants have knowledge about lifestyle modifications, they might not be practicing them accordingly.

In the knowledge about complications of hypertension, 93% of the participants agreed that high blood pressure can cause premature death. Ninety-one percent (91%) agreed that increased blood pressure can cause heart diseases, and 95% agreed that increased blood pressure can cause strokes if left untreated. Although most of the patients, 71%, were aware and agreed that high blood pressure can cause kidney failure, 28% indicated that they don't know if high blood pressure causes kidney failure.

The overall knowledge on complications indicated that 3.8% were highly not knowledgeable and 1.8% were not knowledgeable. Eight-point eight percent (8.8%) were neutral, 22.8% were knowledgeable and 63.2% were highly knowledgeable.

SECTION B: RESULTS FOR QUALITATIVE STUDY

This section of the study findings will first present the central storyline which gives the overall idea of what the results entail and direct participants' excerpts are presented to support the idea. Thereafter, themes and sub-themes that have emerged during data analysis are presented and supported by direct participants' excerpts and literature.

4.5 DEMOGRAPHIC DATA

The aim of presenting the demographic data is to provide a description of the participants' characteristics that may have an influence on the findings as presented in Table 4.22.

Table 4.22 Demographic characteristics of pharmacists

Participants	Gender	Age	Race	Years of experience
13 pharmacists from Mankweng Hospital. This number excludes	Females=**08** Males=**05**	Below 20=**0** 20-30=**9** 31-40=**4** 41-50=**0** 51--60=**0** Above 60=**0**	All black	Less than 1 year= **0** 1-3 years=**3** 3-5 years= **6** More than 5 years= **4**

4.6 CENTRAL STORYLINE

In this study, the participants reflected on how it is like for them to provide assistance to hypertensive patients who are on treatment. The participants expressed their experience with patients when they provide pharmaceutical care to the patients, and this is evident from the subthemes that emerged from the three main themes identified. They agreed that the practice of pharmacist in the management of hypertension includes provision of good counselling regarding both pharmacological and non-pharmacological strategies to patients to assist in the management of hypertension. This was confirmed by statements such as:

"Okay, my experience is to make sure that they understand what I'm telling them because it's important that they know it's not only the medication they need to understand, but also the lifestyle. Yes, and making sure that they will implement, so their overall health is my concern."

This was further substantiated by participants expressing the same views relating to their understanding on the help that they should provide to hypertension patients on treatment as pharmacists;

"Okay, I feel like my role in helping them is in emphasizing that it's (hypertension) a lifestyle disease, you know. Like even though some people may have gotten it because of genes and stuff, but it's mostly lifestyle. You need to be mindful of what you eat, always take your medication, importance of exercise and taking a proper diet."

There were also challenges that the participants expressed that were identified as hindering them from providing patients with hypertension with the care that they deserve. This was confirmed by one participant saying:

"The only challenge I will say from the clinic level is that there's no follow –up….so it becomes very difficult for me as a pharmacist with regard to the help that I'm offering because I'm appearing as like I'm just issuing medication only…"

4.7 DISCUSSION OF THEMES AND SUB-THEMES

There are three themes (Table 4.23) and subthemes that have emerged that during data analysis, which reflects on the practice of pharmacists in the management of hypertension at the Dikgale primary health clinics, Limpopo.

Table 4.23: Themes and sub-themes reflecting the practice of pharmacists in the management of hypertension at the Dikgale primary health clinics

MAIN THEMES	SUB-THEMES
1. Perceived roles of pharmacists during the management of hypertensive patients.	1.1. Inclusion of counselling role by pharmacists related to pharmacological profile of hypertensive drugs (dosage, benefits, side effects, etc). 1.2. Provision of correct and understandable medication instructions to patients. 1.3. Monitoring of quality of life for patients on treatment. 1.4. Good communication with hypertensive patients is expected. 1.5. The provision of pharmacological and non-pharmacological management of hypertensive patients is expected. 1.6. Collaboration with Doctors for the benefit of patients.
2. Expectations of pharmacists during the provision of medication to hypertensive patients	2.1. Self-management strategies by the hypertensive patients geared towards improving quality of life are expected. 2.2. Consistency in taking the same treatment regimen is expected. 2.3. Adherence to health instructions by patients is expected.

	2.4. The importance of maintenance of normal blood pressure levels is expected.
	2.5. Understanding medication and health-related instructions are expected.
	2.6 Transfer of information by patients to other patients is expected.
3. Challenges related to pharmacists' practices during the care of hypertensive patients.	3.1. Lack of confidence in other professionals to provide care to hypertensive patients.
	3.2. Changes in the packaging of hypertensive medication.
	3.3. Shortage of hypertensive medications at clinics.
	3.5. Limited time for interaction with patients.
	3.5. Unwillingness by patients to listen to counselling offered by pharmacists.

4.7.1 Theme 1: Perceived Roles of Pharmacists during the Management of Hypertensive Patients

The findings of the study revealed that there are common roles perceived by pharmacists during the management of hypertensive patients. This is reflected by the following sub-themes which emerged under this theme:

SUB-THEMES
1.1. Inclusion of counselling role by pharmacists related to pharmacological profile of hypertensive drugs (dosage, benefits, side effects, etc).
1.2. Provision of correct and understandable medication instructions to patients.
1.3. Monitoring of quality of life for patients on treatment.
1.4. Good communication with hypertensive patients is expected.

> 1.5. The provision of pharmacological and non-pharmacological management of hypertensive patients is expected.
>
> 1.6. Collaboration with other health professionals for the benefit of patients.

4.7.1.1 Sub-theme 1.1

The results of this study revealed that pharmacists play a role in counselling hypertensive patients treatment by ensuring that the dosage prescribed is the right dose, the benefits of medication and also side effects related to the medication are fully outlined to patients. This was confirmed by a participant who stated:

"*I think what I have observed is that counselling should be emphasized to all the patients, they have to know the importance of taking their medication and then the benefits and also the side effects that come with the medication. So that they are informed that if something like this is happening, is because of this kind of drug. Yeah, counselling is very important.*"

Another participant further stated that: --------- "*Okay, actually we have to, give them good pharmaceutical care, which includes, you know, lifestyle modifications and then when to take the medication, why should they take that medication…. Then we should also tell them the side effects of such medication so that if they experience such side effects they are not surprised.*"

The findings conducted by George et al. (2010) indicated the important and multifaceted role that community pharmacists play in the management of chronic diseases. It revealed that pharmacists are an integral part of chronic disease management, and the effects of pharmacists' intervention were proven to exist in multiple disease management.

4.7.1.2 Sub-theme 1.2

In the study, the participants agreed that it is important to give patients correct and understandable medication instructions to patients. This is evident from the participants making remarks such as:

"*I think we just have to follow up on the patient if they are taking their medication correctly on time, maybe like we have to make sure when we dispense because of the patients that we see are chronic patients. So just ask them if they do take medication on time, and at what time they are taking them. If they're taking them in the morning at 8:00 make sure that they take them in the morning at the same time every day and they don't skip a dose.*"

Another participant further explained: …….. *"Okay, now what I understand is how they take their medication, and how times because no matter what we just say in the morning, but then it's not really specific, in the morning can be at 10. In the morning can be at 10 today and then 12 tomorrow. The time, the frequency, the time being specific with the time or you take it at the same time because it takes 24 hours in the body…"*

The importance of providing correct and understandable medication instructions to patients is supported by a study conducted by Magadza et al. (2009). The researcher agreed that by increasing patients' level of knowledge about their disease and therapy, it will be the step in the right direction in positively influencing the patients' beliefs about medicine.

4.7.1.3 Sub-theme 1.3

The results of the study revealed that the participants shared a common interest in monitoring the quality of life of the patients. They expressed the acceptance of this responsibility in the monitoring of hypertensive patients, and this was reflected by statements such as:

"So it's important to always do a follow-up on patients with hypertension to make sure that they're taking treatment and also to tell them that taking medication doesn't mean that they are being cured and it's just managing the disease condition"

Another participant went further to state that:

"….maybe I think we have to talk in order to monitor these patients properly. We have to monitor them especially every month because most of the Doctors they just write the prescription and say the patient should collect for six months. Then when they come back to collect their medication the following month, most of them don't want to go and check their BPs like, you know, the blood pressure those vital signs."

Another participant agreed with the above-mentioned statement by concluding:

"Okay, what I expect is for their lifespan to increase of course…..basically, so there must be improvement in quality of life."

These results are consistent with a few studies that indicate that providing patients with adequate counselling and monitoring can positively influence a patients' quality of life. Ramanath et al. (2012) conducted a study with the objective of assessing the effects of interventions by clinical pharmacists on patients' medication adherence and quality of life. The results of the study showed that there was improvement in the quality of life of the patients after interventions by the pharmacist.

4.7.1.4 Sub-theme 1.4

In this study, the participants expressed the importance of maintaining good communication with hypertensive patients. They agreed that good communication with the patients ultimately leads to compliance resulting in patients' blood pressure readings going to normal ranges. Participants confirmed this when they said:

"….you have to explain why you're giving the medication, you have to know if they were told her that they are hypertensive first because if they're not told by the doctor

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when they come in when you have to tell them it's a different case, how they respond to it. And they telling them what it means to be hypertensive, what the medication is going to do, what they need to eat, what they need to change and then if they need a dietician. But then with returning patients, we check their previous blood pressure readings, and then you compare them with that day's readings…"

Another participant further stated that:

"*Give the patient the information about hypertension like the things that I've mentioned before like the intake of salt, and smoking cigarettes and trying to exercise. If the patient takes those things into consideration some of them they get better. Like if they start exercising and use less salt and all those things then their health improves. But if they don't, most of them come back with their BPs still high so we have a challenge with that one. But if you give enough education to patients I think it helps a lot. Because most of them do tell us that if you didn't tell me about this I would have been dead by now because they know that now they are better because of the advice we give.*"

The results were similar to a study conducted by Saleem et al. (2013), which aimed at assessing whether interventions by pharmacists result in a better understanding of hypertension and improve adherence to antihypertensive therapy. The results of the study showed that there was a decrease in both systolic and diastolic blood pressure in the group that the pharmacist provided educational interventions. Olsson et al. (2014) also pointed the importance of good communication between a pharmacist and patients. The researcher indicated that it is important for pharmacists to counsel patients on their medication as this can lead to better therapeutic outcomes, compliance and reduces incidences of confusion.

4.7.1.5 Sub-theme 1.5

The study revealed that the participants agreed that as pharmacists, they are responsible for the provision of both pharmacological and non-pharmacological counselling to hypertensive patients. All of the participants mentioned the following

aspects when asked about the self-management strategies that they can advise patients with hypertension, with statements such as:

"*Firstly, we show them and we also advise them to take none pharmacological advice such as to exercise, advise them to reduce some of the kind of food that might contribute to blood pressure. And then the other thing is the issue of compliance. Like I've mentioned, taking the treatment almost at the same time because this thing of when you say take one tablet a day, the person will just take one tablet in the morning today, tomorrow takes around 12 in the afternoon, as long as it's once a day. So emphasizing the importance of these half-lives of medication might assist them…*"

Although very briefly, some participants gave responses such as ------- "*Lifestyle modifications, exercising and eating righ*t."

The same participant further elaborated: ------- *"By diet we mean eating the right quantities, reduce it. Basically, it's salt, reducing the salt intake but then we know that there are other things that have potassium that would be high like your bananas tell them to also reduce on that because it affects the potassium levels which later affects your hypertension."*

Another participant explained the non-pharmacological strategies for managing hypertension and also admitted that they do not know the direct effects of the strategies on high blood pressure. This participant stated:

"*Actually. We just want to, eh, like we were focusing more on diet whatever they are eating especially when they eat something with salt they have to limit the salt and then what else? I think I have forgotten some of the things but then we focus more on the salt because I don't know the mechanism of action how they salt you know, I mean, how can I put it? I don't know how the salt increases the high blood pressure*

or affect high blood pressure. Okay, but then we just tell them to limit it, you know less salt or maybe they think they can just stop salt at all."

According to Weber et al. (2014), hypertensive patients can benefit from both pharmacological and non-pharmacological management of hypertension. These practices have shown to effectively reduce hypertension and should be encouraged in hypertensive patients. Appropriate drug utilisation has been shown to effectively reduce cardiovascular and renal morbidity, and it involves pharmacologic interventions. Weber et al. (2014) further elaborated that pharmacologic interventions involve the use of antihypertensive drugs, including diuretics, β-blockers, angiotensin-conversion enzyme (ACE) inhibitors, angiotensin II receptors blockers, and calcium channel blockers.

4.7.1.6 Sub-theme 1.6

The results of the study also revealed that the participants know the importance of team-based care, that is, they acknowledge that they function in collaboration with other health professionals for the benefit of the patients. The participants expressed the roles that other professionals have to play in the management of hypertension. This is substantiated by statements such as:

"I remember of yeah, most of the clinics that I visit them I am not sure about the other clinics, but clinics like Dikgale, Sebayeng , they do have a dieticians on site. So normally there are cases where I actually refer. In cases of where I see that maybe this patient needs dietician's advice because they are those who would actually mention questions such as you know, what kind of food should I eat? Because you are mentioning that I should eat healthily, but I'm eating healthy anyway. We all say we eat healthily but from my dietician point of it might be something else. So normally referral is what I do but if there's no dietician I just indicate some of the food that I think about health."

The participants view other health professionals as important parts of care during the management of hypertension. This is confirmed by a participant stating:

"*We have to ensure that they use the medication wisely and ensure that they modified their lifestyle if it's possible because most of the patients are compliant, some are not so but if we try our best to monitor them in that way if they are taking their medication. Or sometimes if we can see on the prescription and that the medications that are written by the doctor are not working well together we can advise the Doctor that can you switch this to this I order to try and improve the patients' condition.*"

Another participant went further to say:

"*You must also you now teach them to say manage your social factors around you very, well. If you within the facility where you're able to refer them you can say we have counsellors that side goes and talk to them because in some days they'll just come and then it's up there and they saying I had this and that problem. Do you need someone to talk to if your if you're within that facility, were you able to talk to someone, in most cases we do that.*"

Although pharmacists are viewed as the most accessible health professionals in the society, according to Ragot et al. (2005), their involvement is most effective when they operate within a patient's care team(Di Palo & Kish, 2018). This was further elaborated by Carter et al. (2009), who reviewed the potency of team-based care in high blood pressure control. The results of his study showed that there was improved high blood pressure control which was associated with team-based care.

4.7.2 Theme 2: Expectations of Pharmacists during Provision of Medication to Hypertensive Patients

The findings of the study revealed that the participants had the same expectations during the provision of medications to hypertensive patients. This is evidenced by the subthemes that emerged during data analysis and are presented as follows:

SUB-THEMES
2.1. Consistency in taking the same treatment regimen is expected.
2.2. Adherence to health instructions by patients is expected.
2.3. The importance of maintenance of normal blood pressure levels is expected.
2.4. Understanding medication and health-related instructions are expected.
2.5. Transfer of information by patients to other patients is expected.

4.7.2.1 Sub-theme 2.1

The study revealed that the participants expected patients to remain on the same treatment regimen of hypertensive medication. This, as they further explained, would be a sign that there is an improvement in the patient's condition. This is supported by statements such as:

"…*to make sure they don't need to keep on increasing their medications because if it's not well managed we keep on adding and adding...one regimen, that shows what it is progress because they're people that I know that had hypertension but because of lifestyle modification they had to stop medication altogether.*"

Another participant stated:

"*Let not have them you know on 6 tablets for hypertension if possible. Let it go down to an extent where we are able to now take out others, that's I'm saying. It will also depend on whether are they doing your non-pharmacological interventions. Because if they're not and they're strictly relying on the pharmaceutics, it means we'd have to keep at that point. But if we really we are winning and see now the BP is stabilized and when we add those antihypertensives, it's starting to go now to hypo, then we know we can cut down the agents. I think that's great. Ideally would like to see anything you like to see them with fewer drugs and going home with more possible than being managed with just your Ridaq or with Ridaq and Enalapril just to you simple basic stuff and also for easy access if it's those two they can get them at the PHC level…*"

4.7.2.2 Sub-theme 2.2

In the study, the results indicated participants also shared common expectations regarding the adherence to health instructions by patients. Participants expected patients to adhere to the instruction that they give during provision of care. This was evidenced by a participant stating:

"….to make sure that the patient is taking medication every month. Then they don't skip taking their medication which is also important because if you are taking this month then next month you are not coming is also a concern."

Another participant went further and elaborated:

"Basically is to advise the patients how to prevent further incidences like stroke and other conditions and also to monitor that they're taking their medications correctly. For example, if they come to the hospital we must ask them if they came after 28 days, check if all they finished their medication. If some they are like "I still have these ones left", then it means that they're not taking their medications correctly. Yeah. So it's important to always do follow up on patients with hypertension."

One participant also stated: -------- *"I'm expecting these patients to actually comply with what I'm telling them and also to give me feedback on with regard to what I gave."*

The effects of patients not adhering to medication instructions can prove to be detrimental to patients' outcomes. This is substantiated by Jimmy and Jose (2011), who stated the effects of non-adherence to medication instructions, which include worsening of the disease, death and also an increase in health care cost. The researchers also mentioned that the consequences of non-adherence to health instructions does not only affect the patients but has a direct effect on the health system as well.

4.7.2.3 Sub-theme 2.3

From the results of the study, the participants expressed the importance of maintenance of normal blood pressure levels. They agreed that the maintenance of normal high blood pressure would result in good outcomes regarding the health of the patients.

This was supported by a participant who stated: ------"*Okay. What I expect is for their lifespan to increase of course, for hypertension to be within the normal range, to make sure they don't need to keep on increasing their medications because if it's not well managed we keep on adding and adding.*"

This was further elaborated by another participant who said: ------ "*I expect few complications, few strokes, reduced more reduced levels of blood pressure expected to see is actually to see reduction in there. And then I expect to see happy patients each month like there must be a difference in how the patient is doing. That is my expectation.*"

The benefits of controlled hypertension through antihypertensive therapy has been clearly established. Not only would patients have a reduction in cardiovascular mortality (Beckett *et al.*, 2012), but would also prevent mobility caused by uncontrolled hypertension. Another study by Youssef et al. (2005) also highlighted the importance of achieving adequate high blood pressure control as it ensures an improved quality of life of a patient.

4.7.2.4 Sub-theme 2.4

The results of the study indicated that the participants expect patients to have an understanding regarding medication and health-related instructions. This was indicated by a participant who said:

"*So with them I would say we really expect them to understand but then at the same time, it's also up to us make them understand gore should we take these on also they I think maybe we they are not necessarily aware of the complications that come with having an elevated BP.*"

Another participant elaborated further:

"*Okay, just expect the patient to understand what I'll be telling that patient though. They advise that I'll be giving adhere to all those things that can help the patient to improve their hypertension condition. And then to ask questions wherever they do not understand.*"

One participant went further to support the above statement by saying:

"*I expect them to you know to understand whatever I'm giving them. I am issuing the prescription they must maybe understand every item that I'm giving them. I have to explain to them and then I must also ask them if they've understood or why are they taking such medications. So I expect them to understand everything that I'm issuing yeah.*"

According to Richard and Keenan (2005), the ability of a patient to understand health-related instructions is influenced by the health literacy that a patient possess. The researchers define health literacy as a skill constituting of both numerical and reading, that can allow for a person to function within the health care environment. Health literacy in the patients of Dikgale area has not been established.

4.7.2.5 Sub-theme 2.5

The results of the study indicated that participants had expectations regarding the transfer of information to other patients. They expected that after receiving information from them as pharmacists, the patients should be able to educate other patients in the community. This is substantiated by statements such as ------ "*I expect the patients to share with others who don't get the chance to meet us and to*

be consulted about those things. Yeah it is they can share the information with others."

Another participant further indicated:

"*My expectation is that they don't tire to take their medication that they can also teach others what I taught them because you don't have the luxury of time to teach all the patients everything. So if you getting an opportunity, maybe because of a loophole that you identified you make sure that you teach that patient so that even when they are in society at home in a social gathering they can at least reciprocate this because you don't say it in difficult terms. So in their basic language, they can also tell others, they don't sit with the information.*"

4.7.3 Theme 3: Challenges Related to Pharmacists' Practices during Care of Hypertensive Patients

There are several challenges that the participants experienced relating to the practice during the care of hypertensive patients. This is reflected by sub-themes which have emerged under this theme discussed as follows:

SUB-THEMES
3.1. Lack of confidence in other professionals to provide care to hypertensive patients.
3.2. Generic substitution of hypertensive medication confuses patients.
3.3. Shortage of hypertensive medications at clinics.
3.4. Limited time for interaction with patients.
3.5. Unwillingness by patients to listen to counselling offered by pharmacists.

4.7.3.1 Sub-theme 3.1

The results of the study revealed the participants lacked confidence in other health professionals to provide care to hypertensive patients. This was confirmed by a participant who stated:

"*So okay, I will say what I have experienced up to so far is that most of the people most especially the clinics because you have asked about Dikgale. I think they kind of are not knowledgeable about the medication that they're taking. What is it for and then some of the most of the time even the instructions are not properly written by the nurses or people who are providing medication to those people. So you find that that they are taking the medication promptly. And then the other thing if we are out of stock, if I can give an example if we have Amlodipine uhm, 5 mg then but the person is taking 10 milligrams. You find that the sister doesn't show the box that this wasn't supposed to take two tables to determine 10 milligrams and examples like that. So there's a lot of challenges regarding compliance of medication.*"

The same participant elaborated further: --------- "*When it comes to areas like you the one that you have mentioned go to Dikgale, we don't have full-time pharmacists there, who are sort of custody is off medication. They go there only once a week. So throughout the week other days, these people only meet the nurses there. Then it's clear that the instructions and even the nurses themselves when you arrive there they will ask you about a product. What is this for but they have it in this stock. So and they're moving it, but they don't know what it is for, so I'll say one of the challenges shortage of pharmacists or even pharmacists assistants who can be full-time at a public institution, especially the clinics. So the secondly some of the Clinic they don't even have, you know when it comes to issuing of medication. Some nurses should have certificate to do that. But some clinics don't even have a nurse who's qualified to can give you medication. So that's another thing that I think might be for those are other challenges that we experienced when it comes to the clinics.*"

One participant said: --------- "*I understand that it is very important for me, as a practitionarer, to educate on how to take their medication. Because not all practitioners offer advice about such kind of things. So because I am the last person*

whom they get into contact with, I think it's vital that I provide that information to the patient."

These results can be disputed by a study conducted by Hacihasanoğlu and Gözüm (2011), which aimed to assess the effect of anti-hypertensive patient-oriented education and in-home monitoring for medication adherence and management of hypertension in a primary care setting, by providing education on healthy lifestyle behaviours and medication adherence. The researchers concluded that nurses had an important role to play by detecting uncontrolled hypertension early and can also play a role in educating patients with regard to medication adherence and healthy lifestyle behaviours.

4.7.3.2 Sub-theme 3.2

The results of the study revealed that the participants agreed that patients get confused by the constant generic substitution, or changes in the packaging of hypertensive medication. This is evident from a participant who said:

"*…the challenges that we usually see at the clinic level is that you see this packaging issue it actually confused patients because they are those patients who actually don't know their medications. So whenever they see the change of a box so it becomes a problem some will find that they are retaining that medication the following visit only to find that actually is not like I did a mistake during dispensing some of the others who we actually explain to them*"

Another participant stated:

"*Yes, and just to ask questions. Sometimes like for instance now, we have new packaging for furosemide. So sometimes when I give to a patient with this new packaging I and I ask do you recognize this and then if they do then I know for sure that they are compliant. But then sometimes it could be that they are old, but if they don't ask it raises an eyebrow.*"

A study was conducted by Johnston et al. (2010) to assess the effectiveness, safety, and cost of drug substitution in hypertension. The researchers found that although drug substitution may be cost-effective, it may have a negative effect on patient adherence and also the persistence to remain on the therapy. In a similar study conducted by Håkonsen and Toverud (2011), the researchers found that patients were uneasy about switching to generics. They also found that poor awareness of generic substitution confused patients and affected their ability and willingness to stay on the medication. These findings were consistent with the results of this study, especially because the participants do not have control over generic substitution. They dispense whatever medication that is readily available to patients, regardless of generic substitution.

4.7.3.3 Sub-theme 3.3

The results of the study indicated that the participants had concerns about the shortage of hypertensive medication that could lead to non-compliance. This was evident from statements such as:

"*And then the other thing if we are out of stock, if I can give an example if we have Amlodipine uhm, 5 mg then but the person is taking 10 milligrams. You find that the sister doesn't show the box that this wasn't supposed to take two tables to determine 10 milligrams and examples like that. So there's a lot of challenges regarding compliance of medication.*"

Another participant said: -------- "*So it becomes a problem and the other thing recently which I think this is the perfect moment that we have been experiencing with regard to a shortage of hypertensive medications. They've been a lot of prescription rewritten by those prescribers because they were there was a shortage especially for Amlodipine, Enalapril and Ridaq. Those are the major hypertension medication we prescribe quite a number of times. Okay, and those patients were not getting their treatment. So what I've seen happening is that doctors were increasing either the medication or the doses of those medications, thinking that the patients are not responding to their treatment only to find that the real problem is that those patients were not taking their medication because of shortage.*"

These results were similar to those of a study conducted by Al-Mehza et al. (2009), which aimed, among other objectives, to find out the reasons for non-compliance among hypertensive patients. The result stated the shortage of medications as one of the reasons for non-compliance

4.7.3.4 Sub-theme 3.4

The results of the study revealed that participants have limited time to actively interact with patients. This was confirmed by participants who said:

"*I feel like pharmacists' role is very limited in that regard because you hardly ever have time to like get to hear their history with the disease see, okay. How long have you been at this? Are you seeing any Improvement? Is it getting any better or is it worsening or what more do you need assistance with because of the high volume of patients that you see most times, It's just taking whatever that was described in just issuing to push the que. Especially big between during peak hours, its between 10 and 4. You don't really have much time with the patient and just when I helped them as quickly as possible so they can go home so I can see I really sweet. We really get to like practice in that regard.*"

The same patient further elaborated: ---- "*Also, I think our role is systematic, you know, the thing with systems: do things a certain way all the time. You can't be creative about it or you just have to follow protocol. I think it could be limiting.*"

These findings are similar to the results obtained in an article by Rigby (2010). The researcher expressed the difficulties that community pharmacists face when they are expected to be in collaborative care with physicians. One of the main challenges was that direct contact between the pharmacist and the patient is often brief and viewed as adversarial.

4.7.3.5 Sub-theme 3.5

From the results of the study, the participants expressed their concern regarding the unwillingness of patients to listen to counselling that is offered by pharmacists. This was mentioned by a participant who stated:

"*Most patients firstly do not want to be counselled, they have this attitude that I have been taking medication for a long time, so I know my medication. So which means I don't get the chance to tell them about lifestyle modifications. So they have an attitude of not wanting to be counselled.*"

Another participant further said: …… "*I'm expecting in terms of feedback even from patients because that's where we usually pick up the challenges if they are any but they are those patients who actually just mentioned a challenge because they feel like okay then I'm not a doctor. He's just there to give medication and there are those who will just tell you that. You know, what I've been on this medication for a very long time. Even when you try to tell them those non-pharmacological interventions, they will tell you that "I've been this medication for a long time my child, don't worry". So it becomes a challenge*"

A study by Egbert et al. (2010) revealed the opposite of the results of this study. According to the researcher, patients perceived pharmacists as their primary source of information, and that they feel a pharmacist will fulfill their need to get more information and drug-related discussions. Another study by Carter et al. (2015) aimed to test the hypothesis that the perception of a patient on how a pharmacist listened to them would increase the chances of the patient using pharmacy services. The results of the study indicated that the willingness of the patient to use pharmacy services is directly influenced by their perception of how well the pharmacist actively listened to them during their last interview. The researchers even concluded that improving pharmacists' listening skills can actually improve the engagement between them and patients.

4.8 MERGING OF QUALITATIVE AND QUANTITATIVE:

As described earlier, there were two populations of interest in this study. The first population consisted of hypertensive patients on treatment attending the 4 clinics at Dikgale; namely Dikgale clinic, Seobi clinic, Sebayeng clinic and Makotopong clinic. The second population included pharmacists from Mankweng Hospital visiting the above-mentioned clinics at Dikgale area for dispensing of chronic medication for the patients. Mankweng hospital is a feeder for the Dikgale clinics, as part of The District Health System.

The two populations in this study interact on a monthly basis at the clinics, and thus would be rational to compare the outcome of both the quantitative and qualitative studies to assess influences. The relationship between the patients and the pharmacist is displayed in THEME 1 of the qualitative study and the knowledge about treatment and lifestyle modifications in the quantitative study.

The pharmacists in the qualitative study expressed the importance of giving patients correct and understandable instructions to hypertensive patients about their treatment. This is indicated by one participant who stated:

"…so just ask them if they do take their medication on time, and at what time they are taking them. If they are taking them in the morning at 8:00, make sure they take them in the morning at the same time every day and they don't skip a dose."

Pharmacists also indicated interest in maintaining good communication with patients and the importance of following up on the quality of life of patients. This was expressed with statements such as:

"So it's important to always do a follow-up on patients with hypertension to make sure that they're taking treatment and also to tell them that taking medication doesn't mean that they are being cured and it's just managing the disease condition."

The majority of the participants in the quantitative study were highly knowledgeable (48%) and 26% were knowledgeable about the treatment of hypertension. These participants understand the importance of adhering to medication instructions,

including that medication should be taken every day and doses should not be skipped. These results could be an indicator that pharmacists providing hypertensive medication to patients at Dikgale clinic are proactive when giving advice about treatment of hypertension. The patients displayed adequate knowledge in areas that the pharmacists indicated that they were responsible for.

The pharmacists also indicated that they are responsible for the provision of non-pharmacological counselling for hypertensive patients. These included lifestyle modifications that patients can practice as an adjunct to pharmacological treatment of hypertension. This is evidenced by participants stating:

"*Give the patient the information about hypertension like the things that I've mentioned before like the intake of salt, and smoking cigarettes and trying to exercise. If the patient takes those things into consideration some of them they get better. Like if they start exercising and use less salt and all those things then their health improves. But if they don't, most of them come back with their BPs still high so we have a challenge with that one. But if you give enough education to patients I think it helps a lot. Because most of them do tell us that if you didn't tell me about this I would have been dead by now because they know that now they are better because of the advice we give.*"

Another participant confidently said:

"*Lifestyle modifications, exercising and eating righ*t------- *By diet we mean eating the right quantities, reduce it. Basically, it's salt, reducing the salt intake but then we know that there are other things that have potassium that would be high like your bananas tell them to also reduce on that because it affects the potassium levels which later affects your hypertension.*"

Some participants admitted that they know the lifestyle modifications, but they did not know how these strategies directly affect blood pressure. One participant said:

"*Actually. We just want to, eh, like we were focusing more on diet whatever they are eating especially when they eat something with salt they have to limit the salt and*

then what else? I think I have forgotten some of the things but then we focus more on the salt because I don't know the mechanism of action how they salt you know, I mean, how can I put it? I don't know how the salt increases the high blood pressure or affect high blood pressure. Okay, but then we just tell them to limit it, you know less salt or maybe they think they can just stop salt at all."

The participants in the quantitative study, were highly knowledgeable (53.5%) about lifestyle modifications, with 28% being knowledgeable. They are aware of the benefits of salt reduction, cessation of smoking, limiting alcohol intake, consumption of fruit and vegetables and regular exercise. This could also be an indicator that the pharmacists do convey the necessary counselling regarding the lifestyle modifications. The knowledge that these patients have is good, although a study by Maimela et al. (2016) indicated the prevalence of the cardio-metabolic risk factors for hypertension to be high.

4.9 CONCLUSION

This chapter discussed the main findings of the study regarding the knowledge of hypertensive patients and the practice of pharmacists in the management of hypertension at Dikgale primary health clinics. The knowledge of hypertensive patients was determined via data analysis for quantitative data. The major themes and subthemes relating to the practice of pharmacists in the management of hypertension were achieved and confirmed by quotes from the transcription of the interview process. These themes and subthemes were also supported by the relevant literature.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter will discuss the conclusions, limitations, and strategies of the study and provide recommendations on the knowledge of hypertension and the practice of pharmacists in the management of hypertension

5.2 CONCLUSION OF THE STUDY FINDINGS

In conclusion, the findings are discussed by reflecting on the aim and objectives of the study, and the findings on the knowledge of hypertension and the practice of pharmacists in the management of hypertension at Dikgale primary health clinics.

5.2.1. Aim of the Study

The aim of the study is to assess the knowledge of hypertensive patients and also assess the practice of pharmacists in the management of hypertension at the Dikgale primary health clinics.

5.2.2. Objectives of the Study

The objectives of the study were:

- To determine the knowledge of hypertensive patients about hypertension at the Dikgale primary health clinics.

The researcher achieved this by administering pre-validated questionnaires to patients identified as hypertensive. The participants shared knowledge related to the management of hypertension, which includes knowledge related to definition of hypertension, treatment, influence of lifestyle modification and diet, and the complications of untreated hypertension. The study revealed that participants had good knowledge about hypertension. Although the overall knowledge about hypertension was found to be good, the results of the study by Maimela et al(2016)

indicated that the prevalence of cardio-metabolic risk factors for hypertension to be at high rates. These include smoking (14%), alcohol intake (16%), low fruit and vegetable diet (88%) and low physical activity (66.5%). Because of these results, it can be concluded that the hypertensive patients at Dikgale have good knowledge about hypertension, but they are not practicing what they are knowledgeable about.

- To determine the practice of pharmacists in the management of hypertension

The researcher achieved this objective through conducting semi-structured one-on-one interview sessions with pharmacists to determine the practice of pharmacists in the management of hypertension. The findings revealed that the participants had various practices in the management of hypertension.

5.3. LIMITATIONS OF THE STUDY

The study had limitations relating to the filling out of the questionnaires by patients. The majority of the patients were unable to fill out the questionnaires on their own, which prompted the researchers and colleagues to help fill out the questionnaire. This however did not affect the anonymity of the participants when filling out the questionnaire.

The study had limitations related to the interviewing process as leading questions were asked, which directed the participants on how to answer the questions. Also, the participation of the pharmacists was lower than the expected population of 20.

5.4. THE FINDINGS OF STUDY

5.4.1 The Knowledge of Hypertensive Patients

In section B, question 4 (Questionnaire for patients; Appendix 3) under knowledge of the definition of hypertension, the participants were asked if most times hypertension has symptoms. The majority of the participants (53%), agreed with the statement whilst 25% indicated that they don't know. The findings of the study also

revealed that only 36.5% of the participants were knowledgeable about the overall definition of hypertension.

On the knowledge about treatment of hypertension, the majority of the participants, 75.4 % indicated that high blood pressure cannot be treated without medication with 96% agreeing that blood pressure medication should be taken every day. Eighty-four percent (84%) of the participants disagreed that medication for increased blood pressure should be taken only when they feel ill.

Most of the participants, 72%, disagreed that one can stop taking blood pressure medication when the blood pressure is normal, with 18% agreeing and 10% indicating that they don't know whether medication can be stopped or not. Seventy-seven percent (77%), which is a total of 263 participants disagreed that high blood pressure is a result of aging, which means that they also disagree that the treatment of hypertension is not necessary.

The majority of the participants, 48%, were highly knowledgeable on the treatment of hypertension, with 26% being knowledgeable. About 9.4% of the participants were not knowledgeable, and 4.4% being highly not knowledgeable. Twelve percent (12%) of the participants were neutral.

On the knowledge about lifestyle modifications, A total number of 246 (71%) of the participants were able to identify the importance of lifestyle modifications in high blood pressure, as they disagreed that there is no need to change lifestyle if medication can control increased blood pressure. The majority of the patients, 94%, agreed that salt reduction can help in controlling high blood pressure, but only 85% disagreed individuals with increased blood pressure can eat salty foods as long as they are on treatment.

 Eighty-five percent disagreed that individuals with increased blood pressure can smoke at times, and 79% also disagreed that individuals with increased blood pressure can drink alcoholic beverages at times. The majority of the participants,

93%, agreed that regular exercise can help in controlling high blood pressure and 85% agreed that reducing stress can also help in reducing high blood pressure.

Almost all the participants, 341, agree that individuals with increased blood pressure must eat fruits and vegetables frequently, with only 1 participant not knowing. Ninety-four percent (94%) of the participants agreed that the best cooking method for individuals with increased blood pressure is boiling or grilling, but 88% disagreed that frying is the best method. Most of the participants, 53.5%, were highly knowledgeable about lifestyle modifications, with 28% being knowledgeable. Eleven percent (11%) were neutral and 1.2% were not knowledgeable.

5.4.2 The Practice of Pharmacists in the Management of Hypertension

The findings of the study revealed that the participants shared similar practices in the management of hypertension. The following themes emerged from the data analysis, using Tesch's inductive, descriptive coding technique of qualitative data analysis.

Theme 1 revealed that that there are common roles perceived by pharmacists during the management of hypertensive patients. Under this theme, six (6) sub-themes emerged. Inclusion of counselling role by pharmacists related to pharmacological profile of hypertensive drugs and provision of correct and understandable medication instructions to patients were identified as important roles of pharmacists. Monitoring of quality of life for patients on treatment, good communication with hypertensive patients is expected and provision of pharmacological and non-pharmacological management of hypertensive patients is also expected. The participants also viewed collaboration with other health professionals for the benefit of patients as an important role.

Theme 2 revealed had that the participants shared the same expectations during the provision of medications to hypertensive patients. The following five (5) sub-themes emerged under this theme: Consistency in taking the same treatment

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regimen is expected, adherence to health instructions by patients is expected, the importance of maintenance of normal blood pressure levels is expected, understanding medication and health related instructions is expected and transfer of information by patients to other patients is expected.

Theme 3 of the study revealed that there are several challenges that the participants experienced relating to the practice during the care of hypertensive patients. The sub-themes that emerged under this theme were indicative of several challenges the participants experienced at different levels in the provision of care of the patients. Lack of confidence in other professionals to provide care to hypertensive patients, generic substitution of hypertensive medication confusing patients, shortage of hypertensive medications at clinics, limited time for interaction with patients and unwillingness by patients to listen to counselling offered by pharmacists were stated as the main challenges which led to a lack of confidence in the performing of allocated tasks.

5.5 RECOMMENDATIONS OF THE STUDY

The following recommendations can help improve the knowledge of hypertensive patients and the practice of pharmacists in the management of hypertension, if applied effectively.

5.5.1 Knowledge of Hypertensive Patients

The results of the study indicate that the participants are not knowledgeable on the definition of hypertension. This could be because the definition of hypertension, including numerical value of normal and high blood pressure, is more clinical for the participants. More emphasis on educating the participants on the numerical values of high blood pressure should be a priority because it can lead to better understanding of when the blood pressure is high, low or normal.

Also, level of education had a bearing in all the aspects regarding the knowledge about hypertension, where level of education was directly proportional to the knowledge. Extensive education for the patients at the clinics is recommended,

especially patients that do not have formal schooling. This can be achieved by focus groups orchestrated by collaborative approach by health professionals, which has proven to be of benefit when providing care to hypertensive patients. The majority of the patients at Dikgale are pensioners, and would benefit from this intervention.

Additionally, the participants at Makotopong clinic had more knowledge on the treatment of hypertension as compared to other clinics. This can be used also as an advantage, as health professionals working at Makotopong clinic can share their strategies on educating patients about hypertension with the other clinics, thus aiming at the overall education of the patients regarding knowledge of hypertension.

The prevalence of cardio-metabolic risk factors for hypertension are at high rates despite the findings that the patients are knowledgeable about hypertension. It is thus a recommendation that further studies are conducted at the Dikgale area to determine the reasons why the patients are not practicing lifestyle modification communicated to them by health professionals. These patients are at risk of developing complications resulting from uncontrolled hypertension as these lifestyle modification form an integral part in the management of hypertension.

5.5.2 The Practice of Pharmacists in the Management of Hypertension

More attention should be focused on training pharmacists on how to provide comprehensive counselling to hypertensive patients. This training should contain the methods of delivering quality care for hypertensive patients in a time efficient manner, as some of the participants in the study indicated that they had limited time to interact with the patients. There should also be workshops for pharmacists on how to efficiently educate patients on overall hypertension management. These workshops should entail educating the pharmacists themselves so that they can convey appropriate information to the patients.

5.6 SUMMARY

In this chapter, the study findings were discussed as well as the limitations of the study. The study recommendations were discussed according to the findings of the study.

6. REFERENCES

Adebolu, FA. & Naidoo, M. 2014. Blood pressure control amongst patients living with hypertension presenting to an urban district hospital outpatient clinic in Kwa Zulu-Natal. *African Journal of Primary Health Care & Family Medicine*, 6(1):1-6.

Alberts, M. & Burger, S. 2002. Dikgale DSS, South Africa. *Population and health in developing countries*.

Alberts, M., Burger, S. & Tollman, SM. 1999. The Dikgale field site. *South African Medical Journal*, 89(8): 851-852.

Almas, A., Godil, SS., Lalani, S., Samani, ZA. & Khan, AH. 2012. Good knowledge about hypertension is linked to better control of hypertension; A multicentre cross sectional study in Karachi, Pakistan. *BMC Research Notes*, 5(579): 1-8.

Alsairafi, M., Alshamali, K. & Al-rashed, A. 2010. Effect of Physical Activity on Controlling Blood Pressure among Hypertensive Patients from Mishref Area of Kuwait. *European Journal of General Medicine*, *7*(4):377-384.

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

Aucott, L., Poobalan, A., Smith, W.C.S., Avenell, A., Jung, R. & Broom, J. 2005. Effects of weight loss in overweight/obese individuals and long-term hypertension outcomes: a systematic review. *Hypertension*, *45*(6):1035-1041.

Azhar, S., Hassali, MA., Ibrahim, MIM., Ahmad, M., Masood, I. & Shafie, A.A. 2009. The role of pharmacists in developing countries: the current scenario in Pakistan. *Human Resources for Health*, *7*(54):1-6.

Babbie, E. & Mouton, J. 2010. The practice of social research. 10th edition. Cape Town: Oxford University Press Southern Africa.

Batubenga, MM., Omole, OB. & Bondo, MC. 2015. Factors associated with blood pressure control among patients attending the outpatient clinic of a South African district hospital. *Tropical Doctor*, 45(4):225-230.

Bloch, MJ. 2016. Worldwide prevalence of hypertension exceeds 1.3 billion. *Journal of the American Society of Hypertension*, *10*(10):753-754.

Botma, Y., Greeff, M., Mulaudzi, FM. & Wright, SCD. 2010. Research in health sciences. 1st edition. Pearson Holdings South Africa

Brink, H., van der Walt, C. & van Rensburg G. 2012. Fundamentals of research methodology for healthcare professionals. 18th edition. Cape Town, Juta, South Africa.

Burns, N. & Grove, SK. 2005. The Practice of Nursing Research. 5th ed. Philadelphia: Saunders Company.

Burns, N. & Grove, SK. 2011. *Understanding nursing research. Building an evidenced-based practice*. 5th edition .St Louis: Elsevier/Sanders.

Cappuccio, FP., Kerry, SM., Micah, FB., Plange-Rhule, J. & Eastwood, JB. 2006. A community programme to reduce salt intake and blood pressure in Ghana. *BMC Public Health*, 6(13):1-11.

Carvajal, MJ., Popovici, I. & Hardigan, PC. 2018. Gender differences in the measurement of pharmacists' job satisfaction. *Human Resources for Health*, *16*(33): 1-8.

Chisholm-Burns, MA., Lee JK., Spivey, CA., Slack, M., Herrier RN., Hall-Lipsy, E., Zivin, JG., Abraham, I., Palmer, J., Martin, JR. & Kramer, SS. 2010. US pharmacists' effect as team members on patient care: systematic review and meta-analyses. *Medical Care*, 48(10):923-933.

Creswell, JW. 2003. *Research design: Qualitative, quantitative and mixed approaches.* 2nd Edition. SAGE Publication, Thousand oaks.

Creswell, JW. 2014. *Research design: Qualitative, quantitative and mixed methods approach.* SAGE Publication, California.

De Vos, AS., Strydom, H., Fouché, CB. & Delport, CLS. 2012. *Research at grassroots: For the social sciences and human service professions.* Van Schaik Publishers, Pretoria, South Africa.

Di Palo, KE. & Kish, T. 2018. The role of the pharmacist in hypertension management. *Current Opinion in Cardiology*, *33*(4):382-387.

El-hay, SAA. & El Mezayen, SE. 2015. Knowledge and Perceptions Related to Hypertension, Lifestyle Behavior Modifications and Challenges That Facing Hypertensive Patients. *Journal of Nursing and Health Science,* 4(6):15-26.

Erkoc, SB., Isikli, B., Metintas, S. & Kalyoncu, C. 2012. Hypertension knowledge level scale (HK-LS): A study on development, validity and reliability. *International Journal of Environmental Research and Public Health*, 9(3):1018-1029.

Fogari, R., Zoppi, A., Corradi, L., Preti, P., Mugellini, A., Lazzari, P. & Derosa, G. 2010. Effect of body weight loss and normalization on blood pressure in overweight non-obese patients with stage 1 hypertension. *Hypertension Research*, *33*(3):236-242.

Frisoli, TM., Schmieder, RE., Grodzicki, T & Messerli, FH. 2012. Salt and hypertension: Is salt dietary reduction worth the effort?. *The American Journal of Medicine*,125(5):433-439.

Galdas, PM., Cheater, F. & Marshall, P. 2005. Men and health help-seeking behaviour: literature review. *Journal of Advanced Nursing*, *49*(6):616-623.

Garg, R. 2016. Methodology for research. *Indian Journal of Anaesthesia*, 60(9):640-645.

George, PP., Molina, JA., Cheah, J., Chan, SC. & Lim, BP. 2010. The evolving role of the community pharmacist in chronic disease management-a literature review. *ANNALS Academy of Medicine Singapore*, *39*(11):861-867.

Golafshani, N. 2003. Understanding reliability and validity in qualitative research. *The qualitative report*, *8*(4):597-606.

Gómez-Olivé, FX., Ali, SA., Made, F., Kyobutungi, C., Nonterah, E., Micklesfield,L., Alberts, M., Boua, R., Hazelhurst, S., Debpuur, C. & Mashinya, F. 2017. Regional and sex differences in the prevalence and awareness of hypertension: an H3Africa AWI-Gen study across 6 sites in sub-Saharan Africa. *Global Heart*, *12*(2):81-90.

Gray, A., Riddin, J. & Jugathpal, J. 2016. Health care and pharmacy practice in South Africa. *The Canadian Journal of Hospital Pharmacy*, *69*(1):36-41.

Grove, SK., Gray, JR., & Burns, N. 2015. *Understanding nursing research. Building an evidenced-based practice.* 6th ed. St Louis: Elsevier/San.

Gudmundsdottir, H., Høieggen, A., Stenehjem A., Waldum, B. & Os, I. 2012. Hypertension in women: latest findings and clinical implications. *Therapeutic Advances in Chronic Disease*, *3*(3):137-146.

Han, HR., Chan K., Song, H., Nguyen, T., Lee, JE. & Kim, MT. 2011. Development and Evaluation of a Hypertension Knowledge Test for Korean Hypertensive Patients. *Journal of Clinical Hypertension*, 13(10):750–757.

He, FJ., Li J. & MacGregor, GA. 2013. Effect of longer term modest salt reduction on blood pressure: Cochrane systematic review and meta-analysis of randomised trials. *The British Medical Journal*, 346:1-15. doi: 10.1136/bmj.f1325.

Hacihasanoğlu, R. & Gözüm, S. 2011. The effect of patient education and home monitoring on medication compliance, hypertension management, healthy lifestyle behaviours and BMI in a primary health care setting. *Journal of Clinical Nursing*, 20(5-6):692-705.

Håkonsen, H. & Toverud, EL. 2011. Special challenges for drug adherence following generic substitution in Pakistani immigrants living in Norway. *European Journal of Clinical Pharmacology*, 67(2):193-201.

Houston, M., 2012. *What your doctor may not tell you about Heart Disease. Grand Central Life & Style*.

Janzen, D., Fitzpatrick, K., Jensen, K. & Suveges, L. 2013. Women in pharmacy: A preliminary study of the attitudes and beliefs of pharmacy students. *Canadian Pharmacists Journal*, 146(2):109-116.

Jimmy, B. & Jose, J. 2011. Patient medication adherence: measures in daily practice. *Oman Medical Journal*, *26*(3):155-9.

Johnston, A., Stafylas, P. & Stergiou, GS. 2010. Effectiveness, safety and cost of drug substitution in hypertension. *British Journal of Clinical Pharmacology*, *70*(3):320-334.

Joubert, G. & Ehrlich, R. 2012. *Epidemiology: A research manual for South Africa*. 2nd Edition. Oxford University Press, South Africa.

Khothatso, T., Moshoeshoe, T., Saroni, Z. & Ross, A. 2015. Knowledge of hypertensive patients about treatment in the Seboche hospital, 2013. *South African Family Practice*, 58(S1):27-28.

Lamberts, EJ., Bouvy, ML. & van Hulten, RP. 2010. The role of the community pharmacist in fulfilling information needs of patients starting oral antidiabetics. *Research in Social and Administrative Pharmacy*, *6*(4):354-364.

Lindholm, L.H., 2002. The problem of uncontrolled hypertension. *Journal of human hypertension*, *16*(S3):3-9.

Lloyd-Sherlock, P., Beard, J., Minicuci, N., Ebrahim, S. & Chatterji, S. 2014. Hypertension among older adults in low-and middle-income countries: prevalence, awareness and control. *International Journal of Epidemiology*, *43*(1):116-128.

Lobiondo-Wood, G. and Haber, J. 2010. Nursing research: Methods and critical appraisal for evidenced based practice. 7th edition. St Louis, Missourri: Elsevie

Magadza, C., Radloff, SE. & Srinivas, SC. 2009. The effect of an educational intervention on patients knowledge about hypertension, beliefs about medicines and adherence. *Research in Social and Administrative Pharmacy*, 5(4):363–375.

Maimela, E., Alberts, M., Modjadji, SE., Choma, SS., Dikotope, SA., Ntuli, TS. & Van Geertruyden, JP. 2016. The prevalence and determinants of chronic non-communicable disease risk factors amongst adults in the Dikgale health demographic and surveillance system (HDSS) site, Limpopo Province of South Africa. *PLoS One*, *11*(2):1-18.

Marquez, P.V. & Farrington, J.L. 2013. The challenge of non-communicable diseases and road traffic injuries in sub-Saharan Africa: an overview. [Online]. Available at: https://ncdalliance.org/sites/default/files/The%20Challenge%20of%20Non-Communicable%20Diseases%20and%20Road%20Traffic%20Injuries%20in%20Sub-Saharan%20Africa%20-%20AN%20OVERVIEW.pdf [Accessed on: 10/07/18].

Malangu, N. 2014. The future of community pharmacy practice in South Africa in the light of the proposed new qualification for pharmacists: implications and challenges. *Global Journal of Health Science*, *6*(6):226-233.

McFadden, CB., Brensinger, CM., Berlin, JA. & Townsend RR. 2005. Systematic review of the effect of daily alcohol intake on blood pressure. *American Journal of Hypertension*. *18(2)*:276-286.

Merriam-Webster. 2017. "Knowledge". [Online]. Available at: https://www.merriam webster.com. [Accessed on: 10/06/17].

Mondzinger, N.M., 2012. *The knowledge of young adults on hypertension* (Doctoral dissertation, Stellenbosch).

Mossialos, E., Courti, E., Naci, H., Benrimoj S., Bouvy, M., Farris, K., Noyce, P. & Sketris, I. 2015. From "retailers" to health care providers: transforming the role of community pharmacists in chronic disease management. *Health Policy, 119*(5):628-639.

Mpinda, J., Tumbo, J., Govender I. & Mills, B. 2014. The knowledge and beliefs of hypertensive patients attending Katleho District Hospital in Free State province, South Africa, about their illness. *South African Family Practice*, 56(4):1-6.

Nkosi, PH., Horwood, CM., Vermaak, K., Cosser, C. & Haskins, JL. 2009. The role of doctors in provision of support for primary health care clinics in KwaZulu-Natal, South Africa. *South African Family Practice*, 51(5):408-412.

Nojilana, B., Bradshaw, D., Pillay-van Wyk, V., Msemburi, W., Somdyala, N., Joubert, JD., Groenewald, P., Laubscher, R. & Dorrington, RE. 2016. Persistent burden from non-communicable diseases in South Africa needs strong action. *South African Medical Journal*, 106(5):436-437.

Nteta, TP., Mokgatle-Nthabu, M. & Oguntibeju, OO. 2010. Utilization of the primary health care services in the Tshwane Region of Gauteng Province, South Africa. *PloS one, 5*(11):1-9.

Olowe, OA. & Ross, AJ. 2017. Knowledge, adherence and control among patients with hypertension attending a peri-urban primary health care clinic, KwaZulu-Natal. *African Journal of Primary Health Care & Family Medicine*, 9(1):1-5.

Olsen, C. & St George, DMM. 2004. Cross-sectional study design and data analysis. [Online]. Available at: http://yes-competition.org/media.collegeboard.com/digitalServices/pdf/yes/4297_MODULE_05.pdf [Accessed on: 10/06/17].

Pannucci, CJ. & Wilkins, EG. 2008. Identifying and avoiding bias in research. *Plastic and Reconstructive Surgery*, 126(2):619-625.

Phelan, C. & Wren, J. 2006. Exploring reliability in academic assessment. [Online]. Available at: https://www.uni.edu/chfasoa/reliabilityandvalidity.htm [Accessed on: 10/06/17].

Polit, DF. & Beck, CT. 2008. *Nursing research: Generating and assessing evidence for nursing practice.* 1st edition. Wolters Kluwer Health. Lippincott Williams & Wilkins.

Porter, RS. & Kaplan, JL. 2011. *The Merck manual of diagnosis and therapy.*18th edition. Whitehouse Station, N.J., Merck Sharp & Dohme Corp.

Ragot, S., Sosner, P., Bouche, G., Guillemain, J. & Herpin, D. 2005. Appraisal of the knowledge of hypertensive patients and assessment of the role of the pharmacists in the management of hypertension: results of a regional survey. *Journal of Human Hypertension*, 19(7):577–84.

Ramanath, KV., Balaji, DBSS., Nagakishore, CH., Kumar, SM. & Bhanuprakash, M. 2012. A study on impact of clinical pharmacist interventions on medication adherence and quality of life in rural hypertensive patients. *Journal of Young Pharmacists*, *4*(2):95-100.

Rampamba, E.M., Meyer, JC., Helberg, E. & Godman, B. 2017. Knowledge of hypertension and its management among hypertensive patients on chronic medicines at primary health care public sector facilities in South Africa; findings and implications. *Expert Review of Cardiovascular Therapy*, 15(8):639-647.

Richards, N.C., Gouda, HN., Durham, J., Rampatige, R., Rodney, A. & Whittaker, M. 2016. Disability, noncommunicable disease and health information. *Bulletin of the World Health Organization*, 94(3):230-232. doi: http://dx.doi.org/10.2471/BLT.15.156869.

Roach, KE., 2001. A clinician's guide to specification and sampling. *Journal of Orthopaedic & Sports Physical Therapy*, *31*(12):753-58.

Roerecke, M., Kaczorowski, J., Tobe, SW., Gmel, G., Hasan, OS. & Rehm, J. 2017. The effect of a reduction in alcohol consumption on blood pressure: a systematic review and meta-analysis. *The Lancet Public Health*, *2*(2):108-120.

Saleem, F., Hassali, MA., Shafie, AA., Ul Haq, N., Farooqui, M., Aljadhay, H. & Ahmad FUD. 2015. Pharmacist intervention in improving hypertension related knowledge, treatment medication adherence and health related quality of life: a non-clinical randomized controlled trial. *Health Expectations: An International Journal of Public Participation in Health Care and Health Policy*, *18*(5):1270-1281.

Samal, D., Greisenegger, S., Auff, E., Lang, W. & Lalouschek, W., 2007. The relation between knowledge about hypertension and education in hospitalized patients with stroke in Vienna. *Journal of the American Heart Association*, 38(4):1304-1308.

Samal, D., Greisenegger, S., Auff E., Lang W. & Lalouschek, W. 2007. The relation between knowledge about hypertension and education in hospitalized patients with stroke in Vienna. *Journal of the American Heart Association,* 38(4):1304-1308.

Schmidt, NA., & Brown, JM. 2015. Evidence-based practice for nurses: appraisal and application of research.4th Edition. Jones and Bartlett Learning.

Shayesteh, H., Mirzaei, A., Sayehmiri, K., Qorbani, M. & Mansourian, M. 2016. Effect of Education Intervention on Lifestyle of Patients with Hypertension among the Rural Population of Lorestan Province. *Journal of Lifestyle Medicine*, 6(2):58-63.

Shenton, AK. 2004. Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2):63-75.

Shrestha, M., Maharjan, R., Prajapati, A., Ghimire, S., Shrestha, N. & Banstola, A. 2015. Assessment of knowledge and practice of community pharmacy personnel on diabetes mellitus management in Kathmandu district: a cross sectional descriptive study. *Journal of Diabetes & Metabolic Disorders*, 14(71):1-6.

South Africa. 1974. Pharmacy Act, no.53, 1974, *(as amended)*. Pretoria: Government Printer.

Takami, T. & Saito, Y. 2011. Effects of smoking cessation on central blood pressure and arterial stiffness. *Vascular Health and Risk Management*, 7:633-638.

Trochim, WM. 2006. Qualitative measures. *Research Measures Knowledge Base*, 361:2-16.

Tsuyuki, RT. & Paradis, G. 2015. Evidence for pharmacist care in the management of hypertension. *Canadian Pharmacists Journal,* 148(1):13-16.

Turlova, E. & Feng ZP. 2013. Dietary salt intake and stroke. *Acta Pharmacologica Sinica*, 34(1):8-9.

Van de Vijver, S., Akinyi, H., Oti, S., Olajide, A., Agyemang, C., Aboderin, I. & Kyobutungi, C. 2014. Status report on hypertension in Africa-Consultative review for the 6th Session of the African Union Conference of Ministers of Health on NCD's. *Pan African Medical Journal*, *16*(1)1-38. doi: 10.11604/pamj.2013.16.38.3100.

Wang, L., Manson, JE., Gaziano, JM., Buring, JE. & Sesso, HD. 2012. Fruit and vegetable intake and the risk of hypertension in middle-aged and older women. *American Journal of Hypertension*, 25(2):180-189.

Weber, MA., Schiffrin, EL., White, WB., Mann S., Lindholm, LH., Kenerson, JG., Flack, JM., Carter, BL., Materson, BJ., Ram, CVS., Cohen, DL., Cadet, JC., JeanCharles, RR., Taler, S., Kountz D., Townsend, RR., Chalmers J., Ramirez, AJ., Bakris, GL., Wang J., Schutte, AE., Bisognano, JD., Touyz, RM., Sica, D. & Harrap, SB. 2014. Clinical Practice Guidelines for the Management of Hypertension in the Community. *Journal of Clinical Hypertension*, 16:14-26.

Wen, H., & Wang, L. 2017. Reducing effect of aerobic exercise on blood pressure of essential hypertensive patients: A meta-analysis. *Medicine*, 96(11):1-6.

Williams, H. 2015. Hypertension: Pathophysiology and diagnosis. *Clinical Pharmacist*, 7(1):11-14.

WHO see World Health Organization

World Health Organization. 2010. Global status report on non-communicable diseases. Description of the global burden of NCDs, their risk factors and determinants. Chapter 3: Monitoring NCDs and their risk factors: a framework for

surveillance. [Online]. Available at: http://www.whqlibdoc.who.int/publications/2011.9789241502283_eng.pdf. [Accessed on: 12/06/17].

World Health Organization. A global brief on hypertension. Silent killer, global public health crisis. WHO 2013; Geneva, Switzerland. [Online]. Available at: http://apps.who.int/bitstream/10665/790591/1/WHO_DCO_WHD_2013.2_eng.pdf [Accessed on: 10/06/2017].

World Health Organization, 2014. *Global status report on noncommunicable diseases 2014* (No. WHO/NMH/NVI/15.1). World Health Organization.

Young, M. 2016. Private vs. public healthcare in South Africa. [Online]. Available at: https://scholarworks.wmich.edu/cgi/viewcontent.cgi?article=3752&context=honors _theses [Accessed on: 10/06/2017].

Youssef, RM., Moubarak, II. & Kamel, MI. 2005. Factors affecting the quality of life of hypertensive patients. *EMHJ - Eastern Mediterranean Health Journal,* 11(1-2): 109-118.

Zheng, M. 2015. Conceptualization of cross-sectional mixed methods studies in health science: a methodological review. *International Journal of Quantitative and Qualitative Research Methods*, 3(2):66-87.

APPENDIX 1: CONSENT FORM

PROJECT TITLE:

Knowledge of hypertensive patients and the practice of pharmacists in the management of hypertension at the Dikgale primary health clinics, Limpopo Province.
SUPERVISOR: Mr M.S Poka

I, …………………………………………………………….. hereby voluntarily consent to participate in the above-mentioned project. I have been invited to participate in the study. I have had the opportunity to ask additional questions and have been answered satisfactorily. I have been given enough time to decide about participation. I understand that:

1. The study deals with the investigation of the prevalence of diabetes complications and management.

2. The Turfloop Research Ethics Committee has approved that individuals may be approached to participate in the study.

3. The research project, i.e. the extent, aims and methods of the research, have been explained to me. Any questions that I may have regarding the research, or related matters, will be answered by the researcher/s.

4. Participation in this research is voluntary and I can withdraw my participation at any stage. I have been assured that the information obtained from me will remain anonymous and confidential and to be solely used for the purpose of this research.

SIGNATURE OF PARTICIPANT……………………………….

SIGNATURE OF WITNESS……………………………………..

SIGNATURE OF INVESTIGATOR ……………………………….

Signed at_____ this _____ day of _____ 20_

APPENDIX 2: INTERVIEW GUIDE (Pharmacists)

PROJECT TITLE: Knowledge of hypertensive patients and the role of pharmacists in the management of hypertension at the Dikgale public health clinics, Limpopo Province.

(Please do not write your name on this questionnaire)

SECTION A - BIOGRAPHICAL DATA

Read each item and mark with an **X** in the applicable block.

1. **What is your Gender?**	
Male	
Female	

2. **What is your Age Group?**	
Below 20	
Between 20 – 30	
Between 31 – 40	
Between 41 – 50	
Between 51 – 60	
Above 60	

3. **Your Race Group?**	
White	
Black	
Asian	
Coloured	

4. **Years of experience**	
Less than 1 year	
1 to 3 years	

3 to 5 years	
More than 5 years	

QUESTIONS FOR AN INTERVIEW

- Could you kindly describe how is it for you to provide assistance to hypertensive patients on treatment.

Probing questions:

- Could you kindly describe what you understand by the help you should provide to hypertensive patients on treatment as a pharmacist?
- What are the self-management strategies you can advise the hypertensive patients on treatment to employ in order to maintain quality of life as a pharmacist?
- Can you kindly describe the role of pharmacists in managing hypertension?
- What are your expectations from you as a pharmacist to assist in maintaining quality of life for hypertensive patients?

APPENDIX 3: QUESTIONNAIRE (PATIENT) (ENGLISH VERSION)

(Please do not write your name on this questionnaire)

SECTION A - BIOGRAPHICAL DATA

Read each item and mark with an **X** in the applicable block.

1. **What is your Gender?**	
Male	
Female	

2. **What is your Age Group?**	
Below 20	
Between 20 – 30	
Between 31 – 40	
Between 41 – 50	
Between 51 – 60	
Above 60	

3. **Your Race Group?**	
White	
Black	
Asian	
Coloured	

4. Your Level of Qualification?	
Tertiary Education (Diploma or Degree)	
Secondary School (Grade 8-12 {Standard 6 -10})	
Primary School (Grade 1-7 {Sub A to Sub B, Standard 1 - 5})	
No Schooling	

SECTION B- KNOWLEDGE ON HYPERTENSION:

Read the following questions and indicate whether you agree or disagree or indicate as Don't Know with an **X** in the applicable block.

Q. No	Question	Agree	Disagree	Don't know
I. DEFINITION				
1	The normal blood pressure reading should be below 120/80mmHg			
2	The blood pressure is high when it is at or above 140/90mmHg			
3	High blood pressure is a life-long disease.			
4	Most times, people with high blood pressure have symptoms			
5	High blood pressure is a man's problem			

II. TREATMENT

6	High blood pressure can be treated without the use of medication.			
7	Medication for increased blood			

	pressure must be taken every day.			
8	Individuals with increased blood pressure must take their medication only when they feel ill.			
9	You can stop taking medication when the blood pressure is normal.			
10	Increased blood pressure is the result of aging, so treatment is unnecessary.			

III. LIFESTYLE MODIFICATIONS AND DIET

11	If individuals with increased blood pressure change their lifestyles, there is no need for treatment.			
12	If the medication for increased blood pressure can control blood pressure, there is no need to change lifestyles.			
13	Reducing salt intake can help in controlling high blood pressure.			

14	Individuals with increased blood pressure can eat salty foods as long as they take their drugs regularly.			
15	Individuals with increased blood pressure can drink alcoholic beverages.			
16	Individuals with increased blood pressure can smoke at times.			
17	Regular physical exercise can help in controlling high blood pressure.			
18	Reducing stress can help in controlling high blood pressure.			
19	Individuals with increased blood pressure must eat fruits and vegetables frequently.			
20	For individuals with increased blood pressure, the best cooking method is frying.			
21	For individuals with increased blood pressure, the best cooking method is boiling or grilling.			
22	The best type of meat for individuals with increased blood pressure is white meat.			
23	The best type of meat for individuals with increased blood pressure is red meat.			
IV. COMPLICATIONS				

24	Increased blood pressure can cause premature death if left untreated.			
25	Increased blood pressure can cause heart diseases, such as heart attack, if left untreated.			
26	Increased blood pressure can cause strokes, if left untreated.			
27	Increased blood pressure can cause kidney failure, if left untreated.			
28	Increased blood pressure can cause visual disturbances, if left untreated.			

APPENDIX 4: QUESTIONNAIRE (PATIENTS) SEPEDI VERSION

Semamaretšwa sa 4: POTŠOLOŠIŠO (MOLWETŠI)

(Hle o se ngwale leina la gago mo letlakaleng le)

KAROLO YA A - PAYOKERAFI

Bala dipotšišo mme o swaye ka X lepokising la maleba.

1. **Bong bja gago ke bofe?**	
Monna	
Mosadi	

2. **Mengwaga ke ye me kae?**	
Tlase ga 20	
Magareg ga 20 – 30	
Magareng ga 31 – 40	
Magareng ga 41 – 50	
Magareng ga 51 – 60	
Go feta 60	

3. **Mohlobo wa gago?**	
Mošweu	
Mothomoso	
Mo-Ašia	
Wa-Mmala	

4. **Bogomo bja dithuto?**	
Thuto ya godimo (Kgerata goba Tipholoma)	
Sekolo se se phagamego (Kereiti 8-12 {Mphato 6 -10})	
Phoraemare (Kereiti 1-7 { A -Sub B, Mphato wa 1 - 5})	
Ga ke a tsena sekolo	

KAROLO YA B- TSEBO KA KGATELELO YA MADI:

Bala dipotšišo tše di latelago mme o laetše ge o dumela le ge o sa dumele goba o laetše ka Ga ke tsebe ka X polokong ya maleba.

Nom.	Potšišo	Dumela	Gana	Ga ke tsebe
I. TLHALOSO				
1	Bogomo bja palo ya kgatelelo ya madi bja tlwaelo e swanetše go ba 120/80mmHg			
2	Kgatelelo ya madi e godimo ge e le go/goba godimo ga 140/90mmHg			
3	Kgatelelo ya madi ke bolwetši bja bophelo kamoka.			
4	Gantši, batho ba go ba le kgatelelo ya madi ban a le dika			
5	Kgatelelo ya madi ke bothata bja banna			
II. KALAFO				
6	Kgatelelo ya madi e ka alafiwa ntle le dihlare.			
7	Dihlare tSa kgatelelo ya madi ye e oketšegilego di swanetše go nwewa letšatši le lengwe le le lengwe..			
8	Batho ba kgatelelo ya madi ye e oketšegilego ba swanetše go nwa dihlare fela ge ba ekwa bolwetši			
9	O ka tlogela dihlare ge kgatelelo ya madi e kaonafetše.			
10	Kgatelelo ya madi ye e oketšegilego ke seka sa botšofadi, ka fao kalafo ga e bohlokwa.			

11	Ge batho ba kgatelelo ya madi ba ka fetoša mekgwa ya bona ya bophelo, ga go bohlokwa go nwa dihlare.			
12	Ge e ba dihlare tša kgatelelo ya madi ye e oketšegilego di ka laola kgatelelo, ga go bohlokwa go fetoša mokgwa wa lephelo.			
13	Go fokotša letswai go ka fokotša kgatelelo ya madi.			
14	Bath bo kgatelelo ya godimo ya madi ba ka ja dijo tša letswai ka gore ba nwa dihlare ka mehla.			
15	Batho ba kgatelelo ya godimo ya madi ba ka nwa ditagi.			
16	Batho ba kgatelelo ya godimo ya madi baka b aka no kgoga nako ye nngwe.			
17	Go itšhidulla go ka thuša go laola kgatelelo ya madi ya godimo.			
18	Go fokotša seterese go ka thuša go laola kgatelelo ya madi ya godimo.			
19	Batho ba kgatelelo ya godimo ya madi ba ka ja dienywa le merogo ka mehla.			
20	Go batho ba kgatelelo ya godimo ya madi mokgwa wo mokaone wa go apea ke go gadika			

21	Go batho ba kgatelelo ya godimo ya madi, mokgwa wo mokaone wa go apea ke go bediša goba go kirila.			
22	Mohuta o mokaone wa nama go batho ba kgatelelo ya madi ya			
	godimo ke nama ye tšhweu.			
23	Mohuta o mokaone wa nama go batho ba kgatelelo ya madi ya godimo ke nama ye hubedu.			
IV. DIHLAKAHLAKANO				
24	Kgatelelo ya madi ya godimo e ka hlola mahu a go tla ka pela ge e ka se alafiwa.			
25	Kgatelelo ya madi ya godimo e ka hlola bolwetši bja pelo bjalo ka go šwahlelwa ke pelo, ge e sa alafiwe.			
26	Kgatelelo ya madi ya godimo e ka hlola seterouko, ge e sa alafiwe.			
27	Kgatelelo ya madi ya godimo e ka hlola bolwetši bja diphio, ge e sa alafiwe.			
28	Kgatelelo ya madi ya godimo e ka hlola go se bone gabotse, ge e sa alafiwe.			

APPENDIX 5: ETHICS CLEARANCE CERTIFICATE

TURFLOOP RESEARCH ETHICS COMMITTEE CLEARANCE CERTIFICATE

MEETING: 02 November 2017

PROJECT NUMBER: TREC/376/2017: PG

PROJECT:

Title:	Knowledge of hypertensive patients and the practice of pharmacists in the management of hypertension at the Dikgale Primary Health Clinics, Limpopo Province
Researcher:	MM Setshekgamollo
Supervisor:	Mr MS Poka
Co-Supervisor:	Prof PH Demana
	Prof J Fraeyman
	Mr TL Manyama
School:	School of Health Care Sciences
Degree:	Masters in Pharmacy

PROF TAB MASHEGO
CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE

The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: REC-0310111-031

Note:
i) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
ii) The budget for the research will be considered separately from the protocol.
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

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APPENDIX 6: APPROVAL FROM THE DEPARTMENT OF HEALTH

Enquiries: Stander SS (015 293 6650)   Ref:4/2/2

Setshekgamollo MM
University of Limpopo
Turfloop Campus
Sovenga
0727

Greetings,

RE: Knowledge of hypertensive patients and the practice of pharmacists in the management of hypertension at the Dikgale Primary Health Clinics, Limpopo Province

The above matter refers.

1. Permission to conduct the above mentioned study is hereby granted.

2. Kindly be informed that:-

   - Research must be loaded on the NHRD site (http://nhrd.hst.org.za) by the researcher.

   - Further arrangement should be made with the targeted institutions, after consultation with the District Executive Manager.

   - In the course of your study there should be no action that disrupts the services.

   - After completion of the study, it is mandatory that the findings should be submitted to the Department to serve as a resource.

   - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.

   - The above approval is valid for a 3 year period.

   - If the proposal has been amended, a new approval should be sought from the Department of Health.

   - Kindly note, that the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated.

_____   08/02/2018
Head of Department   Date

APPENDIX 7: APPROVAL FROM MANKWENG HOSPITAL

DEPARTMENT OF HEALTH

MANKWENG HOSPITAL

Ref: S5/3/1/2

Enq: Makola M.M

From: HR Utilization and Capacity Development

Date: 26 February 2018

TO: MM Setshekgamollo
University of Limpopo
Turfloop Campus

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT MANKWENG HOSPITAL

1. The above matter has reference.

2. This is to confirm that **MM Setshekgamollo** has been granted permission to conduct research on" **Knowledge of hypertensive patient and the practica of pharmacists in the management of hypertension at Mankweng Hospital"**

3. She will be conducting research as from 01 March 2018 to 30 May 2018.

4. Attached please find her application letter, approval from Provincial Office, Turfloop Research Ethics Committee Clearance Certificate, Research Proposal and Questionnaire.

Thanking you in advance

....
Chief Executive Officer

2018/02/26
Date

DEPARTMENT OF HEALTH
Mankweng Hospital

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Tel. 015 286 1000

LIMPOPO PROVINCE