A MODEL TO ENHANCE LIFESTYLE MODIFICATION FOR PATIENTS WITH HYPERTENSION IN LIMPOPO PROVINCE, SOUTH AFRICA

by

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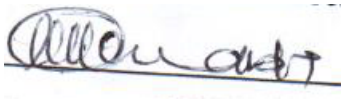
DECLARATION

I, Ndifelani Nemabaka, student number 1159315, hereby declare that the proposal titled ***"A MODEL TO ENHANCE LIFESTYLE MODIFICATION FOR PATIENTS WITH HYPERTENSION IN LIMPOPO PROVINCE SOUTH AFRICA"*** submitted by me, has not previously been submitted for a degree at this or other universities, and that it is my own work in design and execution and that all reference material contained therein has duly acknowledged.

Signature:  **Date:** 07.10.2022

DEDICATION

This work is dedicated to my family that is my husband Phanuel, my sons, Alive, Khano and Mukundi; and my daughter Peggy who have been there when I was busy with my studies. They have been my support throughout my studies. I have been able to hold on until I achieve this because of the courage I received from you all. I am where I am today because of you. I, therefore, share my success with you.

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ABSTRACT

Background: Lifestyle modification is fundamental in the management of hypertension. Although there is a wealth of literature in this regard, most patients are failing to comply with lifestyle modification guidelines.

Purpose: The purpose of the study was to develop a model to enhance lifestyle modification for patients with hypertension in Limpopo Province whose population is predominantly classified as the rural poor.

Methodology: An exploratory sequential mixed method was used. The study was descriptive, exploratory, and contextual. The study setting was Limpopo Province in Vhembe and Mopani Districts in Primary Health Care facilities. The study was done in phases. Phase 1 was comprised of phase 1a, which was qualitative strand where semi-structured interviews with clients diagnosed with hypertension. Purposive sampling was used to select participants. Tesch's 8 steps of data analysis were used to analyse the qualitative data. Phase1b entailed completion of questionnaires by 369 professional nurses experienced with caring for hypertensive clients, following a multi-stage random sampling technique. The Statistical Package for the Social Sciences version 26.0 was used to analyse the quantitative data. Development of the model was done following the six elements of practice orientated by Dickoff, James and Wiedenbach.

Results: In qualitative strand, five themes identified which were lifestyle of clients with hypertension, expression of benefits of lifestyle modification, expression of comlications of non-adherence to lifestyle modification, challenges related to adherence to lifestyle modification and suggestion related to enhancement of lifestyle modification to clients with lifestyle modification. Results of quantitative strand showed that 90.5% of nurses confirmed that clients with hypertension did not adhere to lifestyle modification, 42.2% of nurses gave health talk daily and 31.3% managed to do campaign per year on lifestyle modification of clients with hypertension.

Recommendation: The study recommended support from family, community and health care professionals through encouraging patient disclosure to family members, empowerment of community members and collaborative primary health care team-based approach on lifestyle modification of patients with hypertension

Keywords: blood pressure, enhance, hypertension, lifestyle modification, patient

LIST OF ACRONYMS AND ABBREVIATIONS

CVDs	Cardiovascular diseases
DoH	Department of Health
HBM	Health Belief Model
HCW	Health care Worker
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
PHC	Primary Health Care
SPSS	Statistical Package for the Social Sciences
TB	Tuberculosis
UVREC	University of Venda Research Ethics Committee
UVHDC	University of Venda Higher Degrees Committee
WHO	World Health Organisation

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CHAPTER 1

OVERVIEW OF THE STUDY

1.1 Introduction

This chapter outlines the background, rationale, statement of the problem, research questions, the aim and objectives of the study, research design and methodology, data collection and analysis. The key terms used in the study are also defined.

1.2 Background to the Study

The World Health Organization has set a target to reduce death due to non-communicable diseases by 25% by 2025, of which cardiovascular makes up a significant percentage (Salinas & Kones 2018:1). As hypertension is a risk factor for cardiovascular diseases, there is a need for effective management of hypertension. Management of hypertension starts with lifestyle modification if the client does not show any sign of target organ damage (Department of Health (DoH) 2019:113).

Healthy lifestyles include low intake of carbohydrates, salt, fats, alcohol, taking five portions of fruits or/and vegetables, moderate to vigorous physical activity and stopping smoking (DoH 2019:111; Hasan, Khan, Sutradhar, Hossain, et al 2021:2 WHO 2020:16). However, unhealthy lifestyles may lead to obesity, which is a risk factor for non-communicable chronic diseases like cardiovascular diseases, a healthy lifestyle (Buda 2017:1; Tibebu, Mengistu & Negesa 2017:323). In the European region, approximately 8 million deaths occur due to one of the non-communicable diseases (NCDs) such as hypertension.

Researchers believe that 12% of the deaths are associated with physical inactivity (Kumar 2017:1). In the United States of America, 66.7% do not adhere to lifestyle modification (Crittenden, Seibenhener & Hamilton 2017:238). Furthermore, there is a 22high level of risk of cardiovascular diseases. In another study, it was found that in Mexico 64, 5% of the people were overweight or obese (Alccalde-Rabanal, Orozco-Nunez, Espinosa-Henao & Arredondo-Lopez 2018:6). Korea had an unhealthy lifestyle but control of hypertension was found to be 84. 4% (Yang, Kang, Lee, Kim Sung, Lee, Oh, Kang & Lee 2017:38). This is an increased level, considering the increased unhealthy lifestyles, however, control may be due to dependency on pharmacological treatment.

In India, being overweight and obese is a challenge due to poor physical activity and improper diet hence the prevalence of hypertension was 69,4% high in males 42,1% as compared to females at 23.7% (Kandasamy, Rajagopal, Ramalingam & Krishnan 2018:1188). Furthermore, in a study about knowledge, attitude, and practice of lifestyle modification among hypertensive clients at Rajshashi medical college hospital it was found that 36% engaged in physical exercises (Biswa & Shanta 2021: 96). Moreover, physical exercises were done for 15-30 minutes, and only 1% engage in physical exercises for more than an hour. However, females may adopt a healthy lifestyle like a diet to manage their weight, to look good and they tend to be more likely to comply with antihypertensive treatment than men (Khalesi, Irwin, Sun 2017:460).

In Bangladesh, there is a high intake of salt and low intake of vegetables and fruits, hence increased obesity, and hypertension (Ahmed, Zaman, Chowdhury, Zissan et al 2017:122). In another study in Bangladesh, it was found that overall hypertension prevalence was 31.0% (Hasan, Khan Sutradhar, Hossain et al 2021:1). Furthermore, individuals from the urban area showed an increased prevalence of hypertension.

Africa was no exception, as most countries in Africa have poor lifestyle. In Egypt there was poor lifestyles, and prevalence of hypertension at 38.2% (Gabal, Abd Elaziz, Mostafa, Khallaf 2018:23). Niger Delta also had a high prevalence of hypertension and its poor control (Ezejimofor,Uthman, Cen, Ezejimofor et al 2018:1). However, the rural areas in Niger Delta had more prevalence than urban areas that is 51.3% in urban. Zimbabweans have shifted from a physically active life to sedentary life due to changes in the mode of work and transport meanwhile fruits intake is low (Chimberengwa & Naidoo 2019:8). Furthermore, 59% still consume salt. However, vegetable intake was found to be high that is most of them take vegetables 4 times per week.

In Botswana, hypertension prevalence was 30% (Tapela, Clifton, Tshisimongo, Gaborone et al 2020:30). Furthermore, only 9% of people with hypertension were controlled. In South Africa, clients in rural areas depended on primary health care nurses for the treatment and management of hypertension and few could access family physicians. However, lifestyle modification is still a challenge. It was found that 52% of participants have hypertension in the Eastern Cape and 57.9% were obese, 48.5% were not physically active (Monakali, Goon, Seekoe & Owalabi 2018:3). Furthermore, among those who were aware of their hypertension and on treatment, 38.1% had controlled hypertension. In Gauteng, poor lifestyle modification was also reported and some of the reasons for physical inactivity were physical symptoms after exercise (Magobe, Poggenpoel & Myburg 2017:6).

Hypertension incidence in PHC facilities in free state was at 34.9% (Massyn, Padarath, Peer & Day 2017:189). Furthermore, a study done in a district hospital in Kwazulu Natal showed that most health care workers did not follow a healthy diet (Kunene& Taukobong 2017:1). However, the incidence of hypertension in Kwazulu natal was the highest 49.5%, followed by Limpopo, Mpumalanga at 35.5% and 34.9 respectively (Massyn, Padarath, Peer & Day 2017:189). Another study in Mpumalanga Province

showed that 61.7% were aware of lifestyle modification (Umeh & Nkombua 2018:27). However, in the same study others believed that lifestyle modification involves diet only. Moreover, a cross-sectional study in Mkhondo municipality showed uncontrolled hypertension at 56.83% (Masilela, Pearce, Ongole, Adeniyi, et al 2020:1).

The study by Koma & Lebelo (2017:31) showed that there was a high prevalence of hypertension in Bapedi women in Sekhukhune District where 50% of participants took oils and fats. The African culture of using plain vegetables without fats is replaced by Western culture of using fats and oils. It was confirmed by Sharma, Mabhida, Amyers, Apalata et al (2020:1215) where fats and oils intake was high. However, smoking and drinking were very low at 0% and 2% respectively. In a study on regional and sex differences in the prevalence and awareness of hypertension, Dikgale health demographic and surveillance system site was among those with high prevalence (Go'mez-olive, Ali, Made, Kyobutungi et al 2017:71).

The lack of knowledge may lead to non-adherence to a healthy lifestyle. This was confirmed in a study by Anyiam (2018:15), where some clients were found to be unaware of what lifestyle modification to apply for the non-pharmacological management of hypertension. Furthermore, others did not comply due to failure to accept the diagnosis. Failure to apply lifestyle modification was also noted by Magobe, Poggenpoel & Myburg (2017:6) where clients reported non-adherence due to physical symptoms. Although the client may have the courage to exercise, if there is shortness of breath, this may cause him/her to avoid exercises the next time.

Some models may assist in behaviour change including the trans-theoretical model, Pender's model, and the health belief model. The trans-theoretical model is useful in health behaviour change since it is in stages which are pre-contemplation, contemplation, preparation, action, maintenance, relapse, and termination (Han,

Gabriel & Kohl 2017:5). However, it needs a longitudinal study to be able to have enough follow-up of the respondents for 6 months to 5 years. Hence trans-theoretical model can be used in the future to continue help in behaviour change of clients with hypertension.

Pender's Model focused on individual characteristics and experiences and behaviour-specific cognitions and effects to bring about behavioural outcomes. The model notes that everyone has unique characteristics and experiences that affect his/her actions. Pender's model was also used to develop a model to enhance lifestyle modification in America with clients who were admitted to the hospital (Holcomb 2017:24). Pender's Model may be good in the community; however, the model was used by nurses when assisting clients with hypertension to modify their lifestyle. Moreover, the model was developed in a developed country, hence, in developing countries, some trends may differ. Therefore, there was a need to develop a model to enhance lifestyle modification of clients with hypertension in rural areas.

South Africa had adopted the Integrated Chronic Disease Management Model, which had resulted in improved management of chronic diseases (Lebina, Alaba, Ringane, Hlongwane et al 2019:1). The model has individual-level intervention, where assisted self-supportive management is aimed at creating informed, encouraged, and adherent clients. However, due adherence was more focused on pharmacological treatment. Therefore, there was a need to emphasise the non-pharmacological management of chronic diseases, such as hypertension.

The Department of Health is doing its part in promoting healthy lifestyles by conducting campaigns. However, clients are not complying with that (Solomons, Kruger & Pouane 2017:70-78). Rather, there is also need to strengthen people-centered skills in the management of hypertension which can be implemented even in poor resources

settings (WHO 2020:2). The guidelines on healthy eating for nutrition educators were compiled for those who empower others on healthy eating (DoH 2016:73). The National guidelines on healthy meal provisioning in the workplace were developed to help employees to make healthy food choices (DoH 2016:5). However, healthy lifestyles were still a challenge, as previous studies have noted.

1.3 Theoretical Framework of the Study

The previous section dealt with the background of the study. This section dealt with the theoretical framework of the study. A theory is a "systemic abstraction of reality that serves some purpose" (Brink, van der Walt & van Rensburg 2019:21). The theory underpinning the study was the Health Belief Model (HBM) developed in 1950 by public health researcher (Conner & Norman 2015:32). The constructs of HBM include perceived susceptibility, perceived severity, perceived barriers, perceived benefits, health motivation and cues of action.

According to the Health Belief Model (HBM), demographic variables and psychological characteristics influence individual's motivation and perception about health. In a study by Puspita, Tamtomo & Indarto (2017:187), it was also shown that demographic variables affect motivation to healthy behaviours. Perceived susceptibility helps the client to be aware that a hypertensive client is susceptible to complications if the blood pressure is not controlled. Perceived severity is when a client believes that the complications of uncontrolled hypertension are severe, and this alerts the client on the need to modify his/her lifestyle. Perceived barriers show what a client believes to be barriers to lifestyle modification. Perceived benefits are what a client believes to be benefits of starting lifestyle modification. Health motivation is how a patient is motivated to manage the health. Cues of action mean the support that a client believes to be there to assist in lifestyle modification.

Health belief model was also used in a study to explain the patients' compliance to anti-hypertensive treatment in Tanzania and its constructs helps in treatment compliance predictions like perceived barriers, perceived severity and perceived benefits (Joho 2021:53). According to the HBM, demographic variables and psychological characteristics influence the motivation and perception about modification of lifestyle. Demographic variables such as class, gender, and age may influence a client's perception of lifestyle modification. Furthermore, psychological characteristics for example personality, peer pressure may affect the client's perceptions about lifestyle modification.

The researcher explored the constructs of HBM on how they manifest in clients with hypertension, as far as lifestyle modification is concerned. That is perceived benefits and threats to lifestyle modification, perceived susceptibility, and severity of complications due to non-adherence to lifestyle modification in hypertension. The present researcher developed a questionnaire for professional nurses, to determine what can be done to enhance the lifestyle modification of clients with hypertension, based on the clients' responses. Below is Figure 1. Is the diagram showing Health Belief Model as adopted from (Conner & Norman 2015:32).

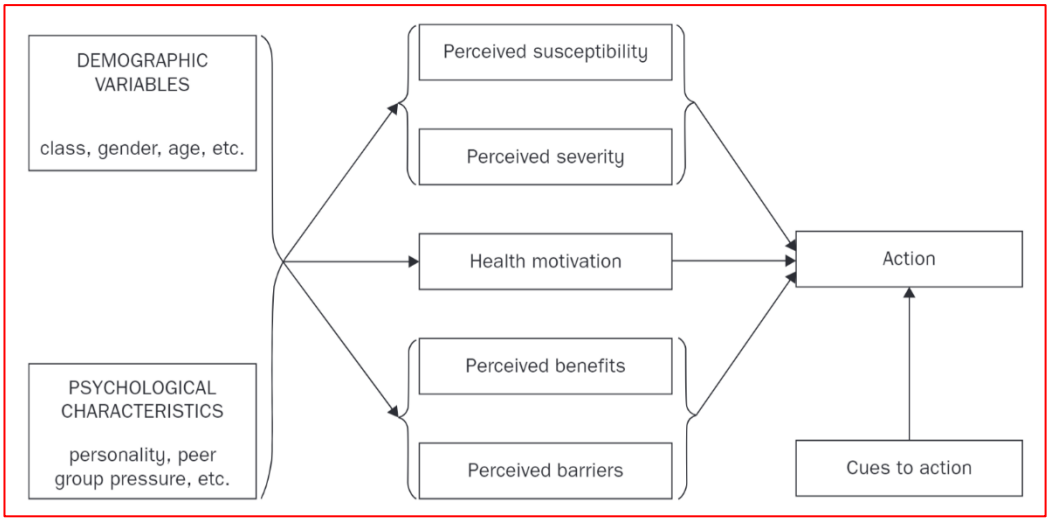

Figure 1.1: Health Belief Model as adopted from Conner & Norman (2015:32)

1.4 Problem Statement

Healthy lifestyles are at the core of management of hypertension. Most clients remain with uncontrolled hypertension due to poor adherence to lifestyle modification. Uncontrolled hypertension may lead to cardiovascular complications including death. According to 2017 District Health Barometer 2016/2017, in Vhembe district, hypertension incidence was 11.4% (Massyn, Peer, English, Padarath, Barron & Day 2017:558,574). Moreover, deaths due to hypertensive heart diseases in Vhembe district were 13,4. In Mopani district, hypertension incidence was 14.23 % and deaths due to hypertensive heart diseases were 11.3% (Massyn, Peer, English, Padarath, Barron & Day 2017:558,574). Whereas the treatment protocols include strict adherence to lifestyle modification, there has been neglect of compliance with recommended lifestyle modification. Emphasis has often been on treatment adherence and follow-up. Lifestyle modification is taken lightly although it is as important as treatments. Hence the present researcher was interested in developing a model to enhance lifestyle modification for clients with hypertension.

1.5 Significance of the Study

The findings of the study may assist policymakers to develop policies that promote the enhancement of lifestyle modification for patients with hypertension. The model may also assist nurses to assist clients to modify their lifestyles. The Department of Health may have reduced health care costs, due to the need for multiple drugs and management of complications of hypertension. Employers may have a reduced number of employees who go on sick leaves due to complications caused by uncontrolled hypertension. There may be also reduction in mortality due to complications of hypertension if the model is followed. Clients who develop stroke may also decrease because they will be adhering to lifestyle modification, hence controlled hypertension.

1.6 Purpose of the Study

The purpose of the study was to develop a model to enhance a lifestyle modification of clients with hypertension in Limpopo province, South Africa.

1.7 Objectives of the Study

The objectives were grouped/arranged according to phases.

- **Phase 1**

Phase 1 comprised of Phase 1a which was qualitative and Phase1b quantitative approach. Phase 2 was the development of a model. Phase 3 was the validation of a model.

The objectives of this study were:

- **Phase 1a: Qualitative Study**

- To describe the lifestyles of selected clients with hypertension in Limpopo Province, South Africa.

- To describe the beliefs about lifestyle modification among clients with hypertension in Limpopo Province South Africa.

- **Phase 1b: Quantitative Study**

  - To explain the role of health care workers in enhancing lifestyle modification of clients with hypertension in Limpopo Province, South Africa.

  - To determine what health care workers can do to enhance the lifestyle modification of clients with hypertension in Limpopo Province South.

- **Phase 2**

  - To develop a model to enhance lifestyle modification for clients with hypertension in Limpopo Province South Africa.

- **Phase 3**

  - To validate the model to enhance the lifestyle modification for clients with hypertension in Limpopo Province South Africa.

1.8 Research questions

- What are the benefits of lifestyle modification?

- What are the barriers to patients adhere to lifestyle modification?

- What are the effects of non-adherence to lifestyle modification by patients with hypertension?

- How can lifestyle modification of patients with hypertension be enhanced

1.9 Definition of Key Concepts

1.9.1 Belief

A strong feeling that something exists or is true (Horny 2020:124). In this study, belief meant acceptance that something is true.

1.9.2 Enhance

To make something more attractive or of greater quality (Horny 2020:124). In this study enhance meant to increase the desirability and value of lifestyle modification.

1.9.3 Health

Health is a state of complete physical, mental, social well-being and not merely the absence of disease or infirmity (Horny 2020:715). In the present study health meant condition where the individual is well physically, mentally, and socially.

1.9.4 Healthy Lifestyle

A way of living that puts a low risk of being seriously ill and dying early (WHO 2017:24). In the present study it meant a person is physically active; eating a diet with low salt, low in animal fats or oils; taking five portions of fruits/vegetables daily; if drinking alcohol, he/she drinks less than 7% of alcohol per day and non-drinkers do not smoke tobacco.

1.9.5 Hypertension

Hypertension is a condition related to blood pressure above 140/90 mmhg (Horny 2020:763). In the present study, hypertension meant an elevated blood pressure reading of above 140/90 mmHg on two occasions, more than two days apart.

1.9.6 Lifestyle Modification

Lifestyle modification means changing from an unhealthy lifestyle to a healthy one, for example, reducing salt intake and fats/oils and quitting smoking (Hadiza, Yakasai, Yau, Adamu, Mijinyawa 2017: 74). In the present study, lifestyle modification meant changing or adjusting a lifestyle of physical activity, a diet with low salt, low in animal fats or oils, rich in fruits and vegetables and standard drinking of alcohol and quitting smoking.

1.9.7 Model

A model is a depiction of reality (Brink, van der Walt & van Rensburg 2018:20). In the present study, a model meant schematic representation that shows the relationship among phenomena.

1.9.8 Client

A person who is under medical care or treatment (Horny 2020:268). In this study, clients meant any person who is under the care of a primary health care clinic or community health centre with hypertension.

1.10 Research Design and Methodology

In this study, the researcher used an exploratory sequential method design. The researcher used qualitative and quantitative approaches to have a better understanding of how lifestyle modification can be enhanced for clients with hypertension.

- **Phase 1a**

The researcher conducted individual interview to clients with hypertension to explore the lifestyles of clients with hypertension and to describe how lifestyle modification of

clients with hypertension can be enhanced.

- **Phase 1b**

The researcher collected quantitative data from primary health care nurses through a questionnaire. The researcher aimed to explain the knowledge of primary health care nurses on lifestyle modification of clients with hypertension. Furthermore, to explain how lifestyle modification of clients with hypertension can be enhanced.

- **Phase 2**

The Health belief Model was used as theoretical frame work of model development through the findings of the study. To classify the concepts of the model the researcher used six elements of practice theory by Dickoff, James and Wiedenbach (1968:422-423) which are agent, recipient, context, procedure, dynamics and outcomes.

- **Phase 3**

The researcher validated the model before implementation to determine if the model represented what it was intended to achieve. The researcher presented the model to supevisors, Operational managers, PhD and Masters Students to have reflective thinking if the model is usable.

1.11 Dissemination of the Study Findings

A copy of the results and recommendations will sent to the department of health Limpopo province. One copy will be sent to the library and district where the findings were presented. The findings will be submitted to peer-reviewed journals for publication and will be presented to organized conferences.

1.12 Layout of the Thesis Chapters

The chapters in this thesis are organised as shown in Table 1.1.

Table 1.1: Layout of the Thesis Chapters

Chapter 1	Overview of the study: This chapter covered the background and rationale of the study. A brief overview of the research questions and the objectives, research methods, design and definitions of concepts was provided.
Chapter 2	Literature review of the lifestyle modification and hypertension and factors affecting adherence discussed. The health belief model outlined and described.
Chapter 3	Research design and methods. This chapter outlined and discussed research design, selection of study setting and sample, the procedure for data collection and analysis, measures to ensure trustworthiness, reliability, and validity. conceptualisation, development of a model and ethical consideration described.
Chapter 4	The analysis, interpretation, and discussion of findings of Phase 1a (qualitative study) and Phase 1b (quantitative study) presented.
Chapter 5	Discussion of findings
Chapter 6	Model development
Chapter 7	This chapter focused on the evaluation, conclusion, limitations recommendations of the study.

1.13 Summary

This chapter outlined the overview of the study which included the introduction, background, theoretical framework, problem statement, significance of the study, purpose and objectives of the study, definition of key concepts, research design, research methodology and dissemination of the study findings. The following chapter will deal with the literature review and theoretical framework.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Chapter 1 outlined an overview of the study then background of the study discussed. The researcher outlined theoretical framework, problem statement, the significance of the study, purpose and objectives of the study, definition of key concepts, research design, research methodology and dissemination of the study findings. This chapter outlines the literature review on lifestyle modification of patients with hypertension from different countries.

The literature review is a presentation of what other researchers have written about the topic to place the study in the context of the general body of knowledge (Brink, van der Walt & van Rensburg 2018:57). The literature review was done to understand what other researchers have written about the lifestyle modification of clients with hypertension and how lifestyle modification can be enhanced.

2.2 Scope of the Literature Review

The researcher searched for articles published from 2017 to 2020 to have the most recent information. The researcher also searched for reports, policies, and guidelines from the Department of Health about hypertension and lifestyle modification to have a picture of the country's data about hypertension and the government's action about the healthy lifestyle of clients with hypertension.

2.3 Methodology and Strategy Used

The researcher used cumulative Index to Nursing and Allied Health Literature database for quality reviewed nursing literatures. This encourages the transparency of the study (Cooper, Booth, Varley-Campbell, Britten 2018:1). The researcher also searched for articles from Science Direct, Google Scholar and Sabinet since the topic has wider scope. The researcher searched from databases using the combinations of the following keywords blood pressure, enhance, hypertension, lifestyle modification, patients. The phrases used included lifestyle modification, lifestyle in hypertension, non-pharmacological management in hypertension, healthy lifestyle and hypertension, lifestyle modification enhancement. The citation searching was also used to compliment literature search. The researcher searched and found 03 government reports on hypertension. The researcher used 04 policies and guidelines about hypertension and its management in South Africa including a healthy lifestyle. About 201 articles were generated and 75 were selected which were relevant to the study where the researcher was able to have an insight on what is already known about lifestyle modification and hypertension.

2.4 Hypertension and Lifestyle Modification

Lifestyle modification forms the first-line management of hypertension (DoH 2019: 113). However, this is often not adhered to. Globally, lifestyle modification is still a challenge. In the United States of America, 66, 7% of hypertension clients failed to adhere to lifestyle modification (Crittenden, Seibenhener & Hamilton 2017:238). An unhealthy lifestyle was also found in Korea and Spain (Yang, Kang, Lee, Kim, et al (2017:38). In Korea, the control of hypertension was 84, 4% which may be due to dependence on pharmacological management of hypertension. In Canada, 50% of patients with hypertension do not adhere to lifestyle modification (Callgiuri, Austria & Pierce 2017:238).

Africa is no exception, there is poor lifestyle modification with poor vegetables and fruits intake and the use of fried and oily foods (Gabal, Abd Elaziz, Mostafa, Khallaf 2018:23). In sub-Saharan Africa, an unhealthy lifestyle is also a challenge and hypertension incidences are increasing. However, hypertension programmes that are not strengthened happened to miss clients that need care early like in Botswana (Tapela, Clifton, Tshisimongo, Gaborone et al 2020:30). In Botswana, some clients were received in care when they were in hypertension crisis.

Hypertension is becoming common in South Africa and lifestyle is the major challenge that affects hypertension control (Koma & Lebelo 2017:34). Physical inactivity, smoking, improper use of alcohol and an unhealthy diet are further challenges across provinces. Clients with hypertension are also failing to comply with a healthy lifestyle (Monakali, Goon, Seekoe & Owalabi 2018:3; Umeh & Nkombua 2018:27).

2.5 Healthy Lifestyle

A healthy lifestyle is a lifestyle that is good for one's health (Hornby 2020:716). The healthy lifestyles recommended include low intake of carbohydrates, salt, fats, alcohol, as well as taking five portions of fruits or/and vegetables, moderate to vigorous physical activity and stopping smoking and reduction of stress (Department of Health (DoH) 2019:111; Buda, Hanfore, Fite, Buda 2017:2). However, some clients have poor knowledge of a healthy lifestyle (Tibebu, Mengistu & Negesa 2017:323; Umeh & Nkombua 2018:27; Chimberengwa & Naidoo 2019: 2). Different studies confirm that a healthy lifestyle is significant in prevention of chronic diseases like diabetes and hypertension (Zhang, Pan, Chen Xia 2020: 21; Alkhatib, Tsang, Tiss, Bahorum, et al 2017: 1, Mutie, Giordano & Franks 2017:1).

2.5.1 Diet

The diet is essential for the management of hypertension because it helps in reducing

obesity and preventing excessive weight gain. The healthy diet recommended for client with hypertension includes a reduction of salt, carbohydrates, fats and oils (South Africa Guideline adult care 2018:76). An adult need to take minimal carbohydrates to help to reduce excess weight because carbohydrates are stored as fat, hence the increase in weight (Motadi, Veldsman, Mohlala & Mabapa 2017:7). Clients with hypertension should modify their diet to assist the control of hypertension and avoid complications (Margerison, Riddel, McNaughton & Nowson 2018:1). Fruits and vegetables are a good source of potassium and different antioxidants including carotenoids, vitamins A & E, phenolic compounds, flavonoids, dietary glutathione and endogenous metabolites (Ravimannan & Nisansala 2017:93). Furthermore, increased fruit and vegetable intake help to increase minerals, fibre, vitamins, and nitric oxide synthesis (DoH 2019:19). Potassium is good for heart functioning and antioxidants delay or prevent oxidative damage to body cells (Margerison, Riddell, McNaughton & Nowson 2020:1). Fruits and vegetables are essential to prevention of chronic diseases and their complications. Hence, clients with hypertension must be encouraged on increasing their intake of fruits and vegetables and have a positive belief in intake of fruits and vegetables.

2.5.2 Avoiding use of fats and oils

Consumption of fats and oils predisposes one to high levels of cholesterol and lipids in the blood, hence putting one at risk of cardiovascular disease and strokes (Shim, Heo & Kim 2020:2). Clients with hypertension should avoid fatty foods and use low-fat food and cut off animal fats (DoH 2019:111). However, saturated fats from animals are associated with a high risk of cardiovascular problems. Some oils are useful to our bodies like virgin olive oil which is rich in antioxidants and anti-inflammatory properties.

2.5.3 Reduction of Salt/Sodium Intake

High intake of sodium is associated with extracellular fluid volume, arterial pressure, and neuroendocrine systems (Bruno et al 2018:2). This means that a high intake of salt is not good for the conducting system of the heart. However, a reduced intake of salt helps in improving arterial dilatation (Chakraboty, Galla, Cheng & Mathew 2018:685). This was confirmed by a study in America which showed that a reduction in salt intake can reduce blood pressure (Jaraschek, Miller, Weaver & Appel 2017:2847). Blumenthal, Sherwood, Smith & Hinderlithe (2018:1598) also supported low salt intake as part of the management of hypertension. Some clients with hypertension used traditional herbs to lower blood pressure while avoid adding salt in their diet. It was revealed from the findings from the study in Zimbabwe where clients with hypertension used traditional medications and herbs to lower blood pressure (Chimberengwa & Naidoo 2019:8). This means that patients must have advice on other means to enhance flavors in food (Venmathi et al., 2017:143). The safe use of herbs should also be emphasised since there is a need to evaluate their efficacy, interaction, adverse effects, and toxicity (Chrysant & Chrysant 2017:1). This was confirmed by a study on the review of plants used in South African traditional medicine for the management and treatment of hypertension since some traditional herbs where not yet tested for safety (Balogun, Omotayo and Ashafa 2018:330).

2.5.4 Stopping Smoking

Cigarette smoke has nicotine and carbon monoxide, which cause structural and functional impairments such as increased vascular resistance and increased vasoconstriction (Bruno, Amaradio, Pricoco, Marino et al 2018:2). Furthermore, there is increased aggregation and adhesiveness of platelets in the body leading to increased risks of thrombosis. Hence, stopping smoking helps to reduce vasoconstriction and vascular resistance, this leads to hypertension. Furthermore, it

helps prevent thrombosis, which may lead to stroke. Shorock and Bakerly (2018:96) tabulated the multisystem effects of smoking including respiratory, cardiovascular (hypertension), hematological, immunity, bones, and cancer associations. A study in Kenya showed no relation between smoking and hypertension (Sohn 2018: 290). However, smoking cessation is recommended for everyone including clients with hypertension (Bruno et al 2018:4). In contrast, the study in Korea showed a null relationship between smoking and blood pressure (Sohn 2018:285).

2.5.5 Physical Activity

According to South Africa Adult Primary Care guideline, the following should be advised to patients with hypertension concerning physical exercises: client should aim at least 30 minutes of brisk exercise at least 5 days per week, increasing activities of daily living like gardening, housework, walking instead of taking transport using stairs instead of the lift, one can exercise with arms if unable to use legs (DoH 2019:111). Physical activity leads to a systemic adaptation of the arterial wall that reduces arterial stiffness hence decreasing peripheral resistance (Bruno et al 2018:3). An adult is supposed to have moderate to vigorous physical activity at least 150 minutes per week (Hoare, Stavreski, Jennings & Kingwell 2017:1). This helps in burning excess fat hence reducing excess weight. Furthermore, physical exercise has benefits on the cognitive functioning of clients with hypertension (Rego, Carbal, Costa & Fontes 2019:1).

Physical activity includes aerobics, muscle strength/resistance and neuromotor physical exercise (Piepolli & Villani 2017:103). Aerobics include brisk walking, jogging, cycling, and swimming. Muscle-strengthening/resistance targets major muscles and joints including working with the resistance band and heavy gardening. Neuromotor physical activity includes yoga and the use of a sports ball to challenge eye/motor coordination to improve motor skill coordination.

There are barriers to physical activities. Cascino, Maclaughlin, Richardson, Behbahani-Nejad et al (2019:2), in a study about barriers in physical activity in clients with pulmonary hypertension the following barriers were found among participants which include lack of discipline, knowledge, skills, equipment, time, good health and good weather. Moreover, lack of confidence can also be a barrier to physical activity (Hoare, Stacreski, Jennings, Kingwell 2017:1). However, through counselling and coaching, patients with hypertension might gain confidence to engage in physical activities (Magobe et al 2017:7).

2.5.6 Reduction of Alcohol Intake

Heavy drinking of alcohol harms the health of an individual, including cardiovascular functioning (Rehm & Roerecke 2017:535). Heavy drinking is described as taking more than 2 drinks per day for males and one drink per day for females (DoH 2019:111). A reduction of alcohol intake lowers blood pressure (Roerecke, Kaczorowski, Tobe, Gmel, et al 2017:108). This is because the muscles weakening through heavy drinking will then recover when alcohol intake is reduced (Rehm & Roerecke 2017:536). This was also confirmed by a study on consumption of alcohol and blood pressure in Brasil where it was found that consumption of alcohol beverages increase the odd of hypertension especially in heavy drinkers (Santa, Velasquez-Melendez, Moreira, Barreto et al 2018:1). Rehm & Roerecke (2017:535) highlighted the different negative effects of a high intake of alcohol which are described below.

A high intake of alcohol causes toxin effects that weaken the heart muscles directly and increase blood pressure in a dose-response manner. Alcohol also harms vascular functioning associated with oxidative stress. A high intake of alcohol together with other risk factors such as smoking and malnutrition influences cardiovascular functioning, especially in poor individuals. Furthermore, a high intake of alcohol influences conducting systems leading to arrhythmias and clotting, which leads to thrombosis.

Hence clients with hypertension who take alcohol must be shown the dangers of high intake of alcohol, as compared to the benefits of alcohol reduction.

Chagas, Mazocco, Piccoli, Ardenghi et al (2017:1039) found that a moderate intake of alcohol lowers cardiovascular disease. However, this is not safe to recommend drinking to non-drinkers due to differences in genetic makeup. A study on the effect of alcohol dose on the development of hypertension in Asia and Western men showed that even low dose can lead to raised blood pressure particularly in Asian men (Jung, Shin Ihn, Jung et al 2020:906). Hence, clients with hypertension who never took alcohol, they must be advised to avoid alcohol as there may be effects even in a smaller dose. if an individual is also smoking, this has a negative impact on the heart (Jatoi, Al-Baker, Al-Muhanna, Al-Muhanna, Kyvelou, Sharif 2017:12). Furthermore, benefits that are claimed that alcohol could have might also be found from other lifestyle modifications, such as physical exercise and diet (Rehm & Roerecke 2017:537). Therefore, it is more safer for clients with hypertension to avoid alcohol intake.

2.5.7 Stress Reduction

Stress is a physical or emotional pressure that usually exists from different causes and can frustrate one to be angry or nervous and can increase to depression or lead to chronic diseases if not attended (Lin, Li, Shakeel, Samuel 2020:3330). This means that physical or emotional pressure that stays for a long time and is ignored might cause a rise in blood pressure. High stress is associated with hypertension development. This was found from the study about association between stress and hypertension among adults more than 30 years (Bhelkar, Desh Pande, Mankar & Hiwarker 2018: 430). It was also confirmed by a study about stress, adherence, and blood pressure control in the United States of America where it was found that there was a relationship between stress and systolic blood pressure (Kang, Dulin, Nadimpalli

& Risica 2018: 28).

However, most people stay with the stress and do not seek help. Hence, they end up having hypertension. Even though they have hypertension they do not seek help on stress management they are not identified by health care workers that they are not managing on their own and end up having uncontrolled severe hypertension (Lin, Li, Shakeel, Samuel 2020:3330). Some of unhealthy lifestyles are warning signs and symptoms of stress like overeating unhealthy diet, alcohol use, smoking and poor physical activity. This was found from the study depression, anxiety, and stress in Saudi Arabian dental students where these were some of the coping mechanisms (Basudan, Binanzan, Alhassan 2017:184). Multiple unhealthy lifestyles may be the effects of stress. Hence, patients with hypertension need comprehensive assessment to identify the root cause of hypertension and unhealthy lifestyles. Then, they can be assisted on how to attend to their stress fruitfully and advised on stress-relieving techniques.

2.6 Factors Affecting Adherence to Lifestyle Modification

There are several factors such as socio-demographic factors, cognitive and interpersonal, which affect adherence to lifestyle modification (Sharma & Argawal 2017:106-109).

2.6.1 Socio-Demographic Factors

Age, gender, socioeconomic status can also influence how individuals perceive lifestyle modification.

2.6.1.1 Age

Age influences adherence to lifestyle modification. The age greater than 65 years were 72% less likely to adhere to lifestyle modification than clients below 65 years (Buda et

al 2017:5). However, in contrast, clients with hypertension aged 61 and above showed good adherence to lifestyle modification (Obirikorang et al 2018:6). This was confirmed by a study in China by Leung, Chan, Sea & Woo (2017:922), where it was found that elderly people tend to adhere to diet modification, but younger people usually were non-adherent.

2.6.1.2 Gender

Most males do not adhere to measures to reduce weight, while female counterparts take measures to reduce their weight (Sharma & Argawal 2017:106-109). Since males are at risk of hypertension and non-adherence to lifestyle modification put them at high risk of complications like stroke and heart attack (Agyei-baffour, Tetteh, Quansah & Boateng 2018:938). Different studies confirmed that the male gender is a risk factor of non-adherence to lifestyle modification (Singh, Shakar & Singh 2017:1; Yang, Kang, Lee, Kim et al 2017:179; Kandasmy, Kameswaran, Sundaram & Kartickeyan 2018:340).

2.6.1.3 Socio-Economic Status

Most people move to urban areas where they take fast foods, with increased fats and salt; hence they are at risk of hypertension. Others have frequent parties over weekends and enjoy buffet food where there is a possibility of increased carbohydrates, fats, and heavy drinking (Bando et al 2018:4). A study about effects of socioeconomic status on physical health confirmed that socioeconomic status have an influence on lifestyle of an individual which in turn has effect on physical health of an individual (Wang & Geng 2018:5). Individuals with low socio-economic status tend to smoke and ignore regular physical activity and not increase vegetables and fruits. This was confirmed by a study on socio-economic inequalities in high blood pressure and additional risk factors for cardiovascular disease among older individuals in Columbia (Hessle, Rodriguez-Lesmes & Torres 2020:1-2). However, the findings also showed in

contrast that those of higher socio-economic status tend to take alcohol and being obese. This means that both higher and lower economic status have influence to physical health due to adoption of unhealthy lifestyles.

2.6.2 Cognitive Factors

2.6.2.1 Knowledge

When people are growing up, they adopted lifestyles which some are healthy lifestyle and some adopted unhealthy lifestyles that lead them to hypertension. When diagnosed with hypertension some of them are not aware of importance of healthy lifestyle and are non-adherent to lifestyle modification. In a study about lifestyle patterns in the Iranian population it was found that some clients do not modify their lifestyles due to a lack of knowledge that healthy lifestyle is part of management of hypertension (Akbarpour, Khalili, Zeraati, Mansournia et al 2018:1). This was in line with findings from a study in Ethiopia where it was found that participants with good knowledge showed healthy lifestyle (Kossahun, Asasahegan, Hagos, Ashenafi et al 2019:1). Knowledge is also important in prevention of the disease. When people know the complications of hypertension they become adherent to lifestyle modification. This was found from the study on factors associated with the level of knowledge about hypertension in primary care clients (Lugo-Mataa, Urich-Landetaa, Andrades-Pérez, León-Dugartea et al 2017:186). Different studies confirmed that knowledge is needed to enhance adherence to lifestyle modification (Biswa & Ashanta 2021:97; Bogale et al 2020:2; Osama, Ashour, El-Razek & Mostafa 2019:1). This means that pclents with hypertension need knowledge on lifestyle modification to enhance adherence

2.6.2.2 Beliefs

Beliefs may influence how one adhere to lifestyle modification (Mäntyselkä, Kautiainen & Miettola, 2019:1). Positive beliefs to lifestyle modification may influence adherence while negative beliefs to lifestyle modification may negative influence on adherence to lifestyle modification (Sharma & Argawal 2017:105). Some believe that lifestyle modification involves diet only (Umeh & Nkombua 2018:27). This means that they will not try to adhere to regular exercise since diet modification is believed to be the only lifestyle modification to be done by clients with hypertension. Therefore, beliefs of clients with hypertension should be considered and information given.

2.6.2.3 Perceptions

Perceptions is an idea, a belief or image you have as a result of how you see or understand something (Hornby 2020:1120). This means that way how clients with hypertension see or understand lifestyle modification may influence their lifestyle modification. Perception that lifestyle modification has benefit may influence one to adhere to lifestyle modification. Sharma and Argawal (2017:106) also showed that women tend to adhere to lifestyle modification because they consider their body shape as significant. However, Magobe et al (2017:6) revealed that women have no confidence in adhering to physical exercise due to perceived barriers like physical symptoms dizziness, lack of balance and cravings.

2.6.2.4 Motivation

People who are not health-motivated are not likely to adhere to lifestyle modification; not even adhere to medication and check-ups (Leung, Chan, Sea & Woo 2017:17). Some cliients need someone to motivate them to start lifestyle modification such as physical activity Umeh and Nkombua (2018:29) in a study about knowledge and practice of lifestyle modification, reported that some patients gave several reasons for non-adherence to exercise. Some said they have no exercise partners.

2.6.2.5 Support

Every individual with chronic diseases needs support to be able to adjust to the new life with a chronic disease (Piepoli &Villani 2017:102). Hence, lack of support is a challenge to adherence to lifestyle modification (Tibebu, Mengistu & Negesa 2017:323). Support is needed from family members, community members and health care workers. Good communication between the client and health care workers may show support to the patient.

2.7 Theoretical Framework

This section will deal with the theoretical framework that underpins lifestyle modification for patients with hypertension. The theoretical framework is a path or guide of the research study and serves as the foundation of the study (Adom, Hussein & Agyem 2018:438). Furthermore, a theoretical framework of the study gives the direction of the study's literature search scholarly discussion of findings. The theoretical framework of this study was Health Belief Model.

The health belief model is one of the health behaviors theories developed in the 1950s by social psychologists to enhance the effectiveness of health education and health promotion (Becker, Haenfer, Kasl, Kirscht, Maiman & Rosenstock 1977:30). This model has been applied to predict different health-related behaviors for example detection of asymptomatic diseases and receiving immunization. Recently it has been applied to different studies also coronavirus risk determinants and preventative measures (Costa 2020:1; Alsulaiman & Renter 2018:27. Health belief model constructs have their origin from the cognitive theories which propose that people's behaviour is due to the degree he/she values the results. The constructs of the health belief model are perceived severity, perceived susceptibility, perceived benefits, perceived barriers, health motivation and self-efficacy, and cues of action.

2.7.1 Perceived Susceptibility

Perceived susceptibility refers to an assessment of risk to health problems (Kim & Kim

2020:5). Clients with hypertension are at risk of developing complications like heart attack and stroke if not adhering to lifestyle modification (Addisu, Netsanet, Tesfamichael 2019:5). This is relevant to this study since client who has increased susceptibility to complications of hypertension will adhere to lifestyle modification. This was found in the study about facilitators and barriers to healthy eating in aged Chinese with hypertension (Zou 2019:4). However, client with hypertension and does not perceive himself/herself as susceptible to complications, may not adhere to lifestyle modification. This was found in the study about understanding nonadherence to treatment in hypertension (Ashoorkani, Majdzadeh, Gholami, Estekhar, Borzogi 2018:318). Furthermore, in the same study, some patients believed that complications of hypertension do not come soon, and there is a possibility that one can die before having complications.

Therefore, health care workers need to assess the perceived susceptibility of the clients with hypertension to be able to know how lifestyle modification of the patient with hypertension should be enhanced. This means that health care worker should assess patients' beliefs on the possibility of complications if one is having hypertension and do not adhere to lifestyle modification.

2.7.2 Perceived Severity

Perceived severity refers to the belief that complications of hypertension due to poor adherence to lifestyle modification are severe and may be life-threatening (Kim &Kim 2020:5). Different studies have shown that lifestyle modification influence the control of hypertension and its complications (Jaraschek, Miller, Weaver & Appel 2017:2847; Blumenthal, Sherwood, Smith & Hinderlithe (2018:1598; Chakraboty, Galla, Cheng & Mathew 2018:685).

Most clients are having hypertension, but they are not aware since they were not

checked (Banigbe, Itanyi, Ofili, Ogidi, Patel & Ezeanolue 2020:9). The model was applicable to this study since clients who were diagnosed to be having hypertension when they have consulted for a minor ailment or checked for blood pressure randomly during campaigns and found to be having hypertension might not be serious with lifestyle modification. Hence, they do not view hypertension as a serious condition that can lead to serious complications as found in (Ashoorkani, Majdzadeh, Gholami, Estekhar, Borzogi 2018:318).

The clients with hypertension who were diagnosed before they had complications might not adhere to lifestyle modification to control hypertension but depend on pharmacological treatments only for the management of hypertension as found in other studies (Obrikorang et al 2018:2; Alsaigh, Alanazi, Alkahtan, Alsinan et al. 2018:2152). However, those who were diagnosed with some complications have high perceived severity hence they tend to try to adhere to lifestyle modification (Sutipan & Intarakamhang 2017:1). Those who were diagnosed without any complications have low perceived severity. Moreover, they believe hypertension is not a dangerous disease and that health care workers are exaggerating it (Ashoorkani, Majdzadeh, Gholami, Estekhar, Borzogi 2018:318).

Hence, clients with hypertension may have adherence to lifestyle modification if their perceived severity has increased. If the patient with hypertension is assisted and his/her perceived severity is increased, adherence to lifestyle modification will be enhanced. However, this will need the efforts of health care workers as different studies had found (Obirikorang, Obirikorang, Acheampong & Anto 2018:11; Tam, Wong, & Chueng 2020:1; Bogale, Mishore, Tola, & Mekura et al 2020:6; Alsaigh et al 2018:2155).

2.7.3 Perceived Benefits

Perceived benefits refer to an individual's belief in value or importance of modification of lifestyle (Kim & Kim 2020:5). When an individual takes a healthy lifestyle as important of maintenance of quality life he/ she will adhere to modification. This was found from a study on an overview of factors associated with adherence to lifestyle modification programs for overweight management in adults (Leung, Chan, Sea & Woo 2017:17). This is relevant to this study since clients with hypertension will not modify their lifestyle after being diagnosed with hypertension if the perceived benefit is low. There are some of the reasons that patients with hypertension give as an excuse of not adhering to lifestyle modification which include lack of knowledge, socialization, lack of support, busy schedule, laziness, lack of resources (Tibebu, Mengistu & Negesa 2017:323; Buda, Hanfore, Fite, Buda 2017:6; Alefan, Huwari, Alshogran, Jarrah 2019:583; Pandey 2019:44; Magobe, Poggenpoel & Myburgh 2017:6; Sharma & Argawal 2017:107).

Unhealthy behavior practiced for a long time makes it difficult to adopt a new healthy lifestyle (Ashoorkani et al 2018:321). However, if one believe he/she will benefit from modifying the lifestyle, he/she may try to adhere to lifestyle modification. Hence, health care workers need to emphasise the benefits of lifestyle modification for patients with lifestyle modification during counselling. This was found from the study about factors affecting adherence to a healthy lifestyle Sharma & Argawal 2017:107). In the same study, it was found that a lack of information on the benefits of lifestyle modification contributed to poor adherence to lifestyle modification. Therefore, health care workers' enhancement of lifestyle modification can be through giving information about the benefits of lifestyle modification.

2.7.4 Perceived Barriers

Perceived barriers refer to obstacles that hinder behavior modification (Kim & Kim

2020:5). This is relavant to this study because if an individual has a certain issue that he/ she views as an obstacle to behaviour modification, he/she will not take an action to modify behaviour. Perceived barriers to adherence to the recommended diet include socialization, lack of taste, tempting desire to a restricted diet, eating out of home, poor knowledge and lack of family support (Ashoorkani et al 2018:321; Obbirikorang 2018:9; Shim, Heo & Kim 2020:10).

Furthermore, the emotional and psychological status of a client with hypertension might be a barrier to adherence to lifestyle modification. This was found from the study about perceived barriers to following dietary recommendations in hypertensive clients (Madhavi, Bagheri, Abadi & Namazi (2017:193). Clients with hypertension might have knowledge of need for physical exercise, but lack of energy, lack of interest, or lack of self-discipline might prevent adherence to physical exercise (Cascino, McLaughlin, Richardson Behbahani-Nejad, et al 2019:8). Furthermore, clients with hypertension might take physical exercise as rigorous exercise (Gebrezgi, Trepka & Kidane 2017:5). Therefore, when giving health talk and counselling of patients with hypertension the language used should be clear and simple to avoid misinterpretation (Gebrezgi, Trepka & Kidane 2017:5). Hence, to enhance adherence to lifestyle modification there is a need to explore perceived barriers of the cliient with hypertension.

2.7.5 Health Motivation

Health motivation refers to an individual need to stay healthy by adhering to heathy behaviors. Individual who is not health motivated might not tolerate modifying lifestyle to stay healthy, but if one is health motivated he/she might try by all means to reach the goal (Buda et al. 2017:6). Therefore, clients with hypertension need motivation to be able to adhere to lifestyle modification (Leung, Chan, Sea & Woo 2017:17). Health motivation is needed for one to stop smoking since it is addictive and is not easy to stop.

2.7.6 Self-Efficacy

Self-efficacy refers to the individual confidence or belief in the ability to perform healthy behavior (Kim & Kim 2020:6). That is, the individual believes that he/ she could succeed in healthy behavior. Hence, self-efficacy is a key component of lifestyle modification (Ghasem, Peyman, Tehrani, and Sany, 2018:2). This is applicable to this study since that client with hypertension who has increased self-efficacy has confidence and assurance that he/she will be able to modify his/her lifestyle. Hence, he/she has strong sense of motivation which will help him/ her to put an effort to adhere to lifestyle.

Factors that are associated with self-efficacy in hypertension were associated with low communication of patient-health care workers, obesity, and overweight (Khairy, Aslan, Samara, Mousa, Alkaiyat and Zyoud 2021:1). Hence, being obese, overweight, and having low communication with health care workers might cause patients with hypertension not to be adherent to lifestyle modification. Therefore, lifestyle modification for the client with hypertension might be enhanced when confidence is built.

2.7.7 Cues of Action

Cues of action refer to external or internal stimuli (Alsulaim & Rentner 2018:34) The external stimuli refer to those that influence one to take action, which is raising awareness through mass media, campaigning, phone messages and personal advice through reminders from health care workers, illness of family member. The internal stimuli include psychological cues including pains and the symptoms that clients have (Tan, Oka, Dambha-Miller & Tan 2021:2). Therefore, HBM shows that clients with hypertension and no symptoms of complications of hypertension are more likely to have poor adherence to lifestyle modification. Hence, awareness and health education/advice from health care workers are essential to enhance lifestyle

modification for clients with hypertension. Therefore, patients with hypertension might be encouraged to adhere to lifestyle modification when he/she has family members or friend with the condition.

2.8 Summary

This chapter dealt with the literature review including the scope of literature review, healthy lifestyle and factors affecting lifestyle modification. The theoretical framework of the study was also discussed. The following chapter will discuss the research method which outlined the research design, selection of study setting and sample, the procedure for data collection and analysis, measures to ensure trustworthiness, reliability and validity, concepts analysis, development of a model, evaluation of the model and ethical considerations.

CHAPTER 3

RESEARCH METHODS

3.1 Introduction

The previous chapter dealt with the literature review including the scope of literature review, healthy lifestyle and factors affecting lifestyle modification. The theoretical framework of the study was also discussed. This chapter outlined the research methodology and design, selection of study setting and sample, the procedure for data collection and analysis, measures to ensure trustworthiness, reliability and validity, concepts analysis, development of a model, evaluation of a model and ethical considerations.

3.2 The Aim of the Study

The study aimed to develop a model to enhance lifestyle modification for clients with hypertension. The objectives of the study were in three phases.

3.3 The Objectives of the Study

Objectives of the study were divided according to phases.

- **Phase 1a: Qualitative**

The objectives were to:

- Explore the lifestyle modification of clients with hypertension

- Describe the beliefs of clients with hypertension on lifestyle modification.

- **Phase 1b: Quantitative Study**

The objectives were developed after the results of the qualitative study. The objectives were:

- Explain the role of health care workers on enhancing lifestyle modification of clients with hypertension in Limpopo Province, South Africa.
- Determine how health care workers may enhance the lifestyle modification of clients with hypertension in Limpopo Province South Africa

- **Phase 2: Development of a Model to Enhance Lifestyle Modification**

The objectives were:

- Develop a model to enhance the lifestyle modification for clients with hypertension

- **Phase 3**

The objective was:

- To validate the model to enhance the lifestyle modification of clients with hypertension

3.4 Mixed Method Design

The researcher used mixed methods research approach. Mixed methods research is research where the researcher combines the qualitative and quantitative research techniques and approaches to a single study (Cresswell, 2014:217). In this study, the

mixed method was used to combine the qualitative and quantitative design in the same study to have comprehensive results. The researcher seeks to build a quantitative study from the results of a qualitative study (Bowen, Rose, Pilkington, 2017:11). Hence, the researcher had contextual and enriched findings from the qualitative study. This study was an exploratory sequential mixed method (Creswell, 2014:225).

3.5 Exploratory Sequential Mixed Method

Exploratory sequential mixed method design is a design that the researcher starts with qualitative data collection and analysis and then uses the results to build up the quantitative study (Cresswell 2014:225; Bowen, Rose, Pilkington, 2017:11)). The study was a sequential mixed method. The researcher started with qualitative study then quantitative study. In a qualitative study, narrative data was collected to have an in-depth description and to understand how lifestyle modification for patients with hypertension could be modified (Brink, van der Walt & van Rensburg, 2018:104). After data collection and analysis of the qualitative study, then, the researcher built the objectives of the quantitative study based on the findings of a qualitative study.

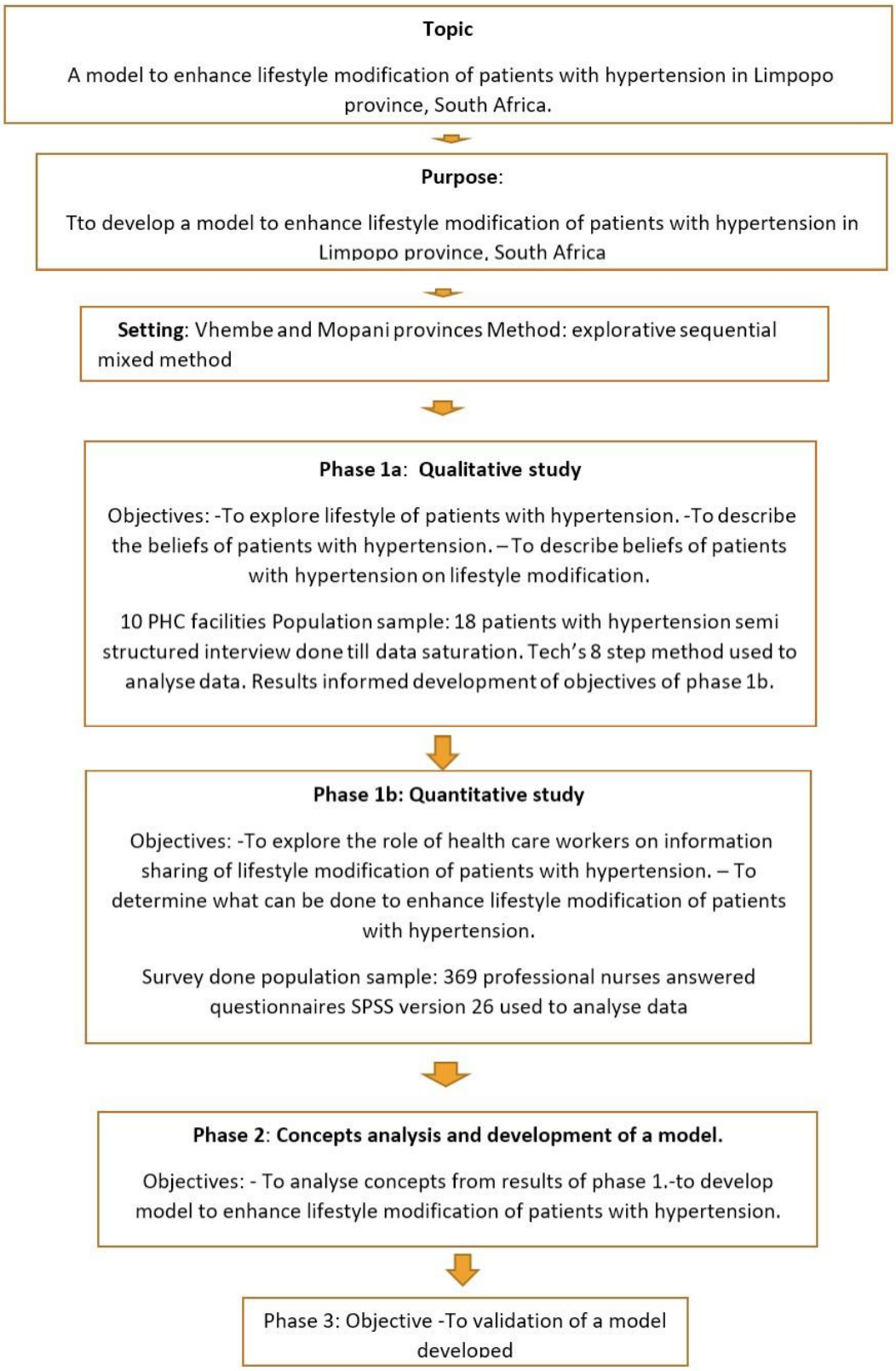

Figure: 3.1: Research map giving an overview of the study

3.6 Study Setting

The study was conducted at Primary Health Care (PHC) facilities in selected districts of Limpopo Province of South Africa and the districts that the researcher included were Mopani and Vhembe District. The researcher selected the two districts because most parts of these districts are rural areas and they share similar characteristics. Vhembe District is situated in the Northern part of South Africa sharing borders with Zimbabwe and Mozambique (Department of Cooperative Governance & Traditional Affairs 2020: 8). Mopani District is located in the North-Eastern part of the province (Department of Cooperative Governance & Traditional Affairs 2020: 8). In both districts, the staple food is pap, which can be eaten with any type of meat and/or vegetables (Motadi 2017:102). People from these districts are changing from their traditional lifestyles of being physically active to sedentary lifestyles since public transports are accessible to their villages. Vegetables and fruits are used minimally. Sports grounds that are there are mostly used for soccer games. Community halls are mostly used for civic gatherings. There are 8 health centres and 99 clinics in Mopani District. In Vhembe district there are 8 health centres and 117 clinics. In both districts, less than 30% of the patients have obtained matric education.

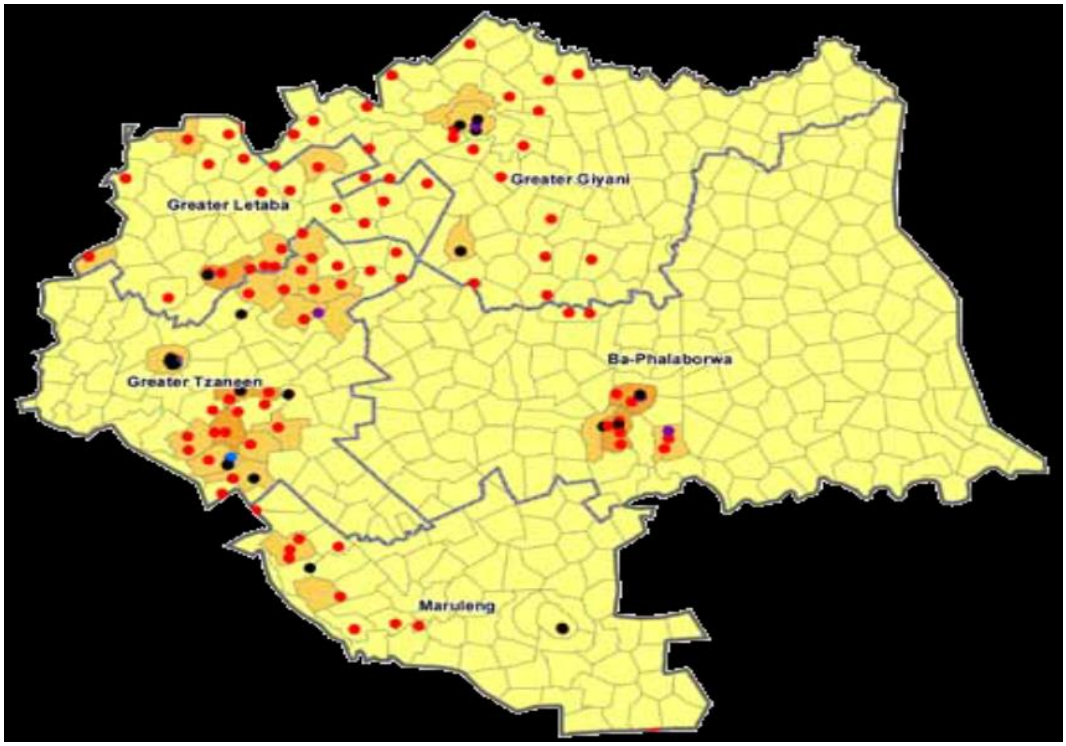

Figure 3.2: Mopani district health clinics (●). (Massyn, Padarath, Peer & Day 2017 in Health District Barometer 2016/2017)

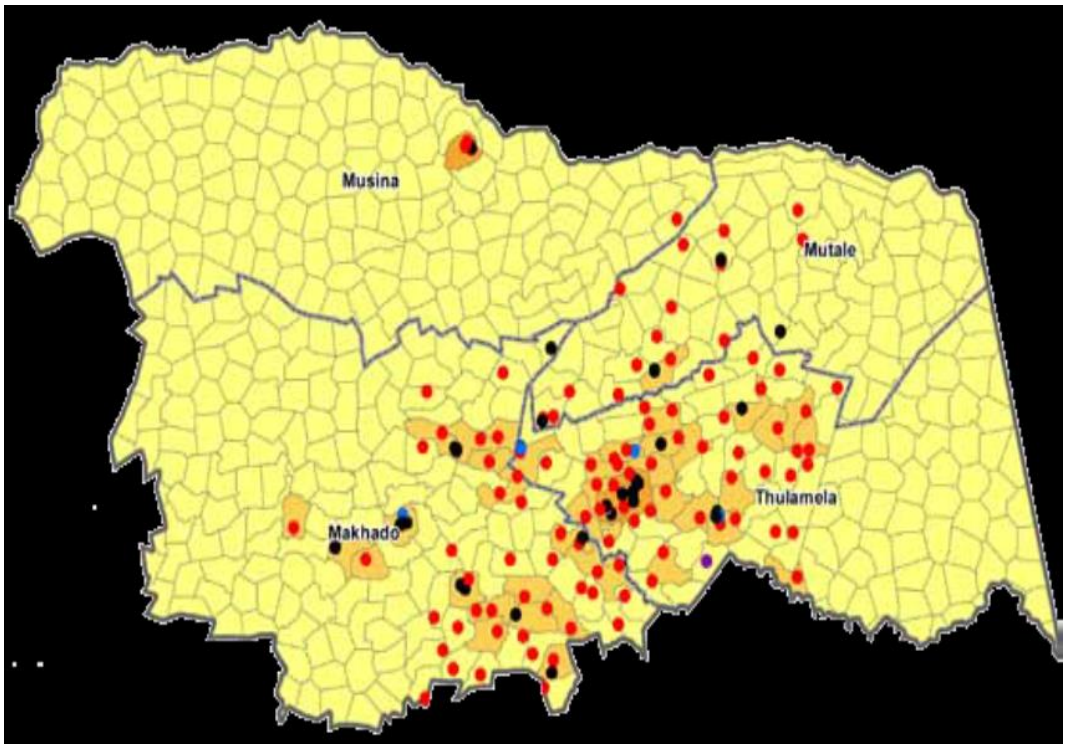

Figure 3.3: Vhembe district health clinics (●).(Massyn, Padarath, Peer & Day 2017 in Health

District Barometer 2016/2017)

3.7 Phase 1a: Qualitative Study

A qualitative study was used to investigate in-depth the beliefs of clients with hypertension on lifestyle modification through the collection of rich narrative data (Querios, Faria & Almeida 2017: 370; Kalu & Bwalya 2017: 44; Rahman 2017:102). Furthermore, little was known about the phenomenon and the researcher also wanted to get opinions and beliefs of patients themselves on how to enhance lifestyle modification of clients with hypertension (Kalu & Bwalya 2017: 44; Brink, van der Walt & van Rensburg 2018:104; Rahman 2017:103). The study was descriptive, exploratory, and contextual.

Table 3.1: Outline of the research process

Study Phase	Method	Objectives	Participants	Data Collection Method	Data Analysis
Phase 1	**Phase 1a** Qualitative Interviews (patients)	✸ Explore the lifestyle of patients with hypertension. ✸ Describe the beliefs about lifestyle modification of clients with hypertension.	18 males and females' clients with hypertension aged 25-60 years.	Semi-structured interview	Tesch's method
	Phase 1b Quantitative Questionnaires (professional nurses)	✸ To explain the role of health care workers on enhancing lifestyle modification ofcltients with hypertension in Limpopo Province, South Africa. ✸ To determine what health care workers can do to enhance lifestyle modification of clients with hypertension in Limpopo Province South Africa	369 professional nurses working in the PHC facilities in Vhembe and Mopani Districts	Self administered questionnaires	SPSS version 26
Phase 2	**Phase 2** Model Development Quantitative Methodology	✸ To develop a conceptual framework for the model from the results of Phase 1	Professional nurses	Criterion/merit checklist	Statistical analysis
Phase 3	**Phase III** of Validation the model 203	✸ Validate the developed model to enhance the lifestyle modification for clients with hypertension	Professional nurses		

3.7.1 Descriptive Design

The researcher allowed participants to describe how they think lifestyle modification can be enhanced for patients with hypertension. The researcher wrote down a description of the participants interviewed, as well as their reactions including nonverbal cues and the tone on the field notes when explaining responses of the participants.

3.7.2 Exploratory Design

The researcher allowed participants to explain what can be done to enhance lifestyle modification to patients with hypertension. Open-ended questions were used. The researcher used probing strategies to get deeper to unlock the data. Clarification was asked from participants, to give more details on the matter.

3.7.3 Contextual Design

The research was done in Limpopo Province and participants were from the same place where they live. The study took place at the locations where the participants collected their follow-up medications. The researcher used the clinics, to make participants more relaxed, as they were used to the environment.

3.7.4 Population and Sampling

3.7.4.1 Target Population

The target population was all male and female patients with hypertension who have been doing follow up for more than 6 months at the PHC facilities. The researcher explored their lifestyles and beliefs on lifestyle modification.

3.7.4.2 Sampling and Sampling Method

Non-probability sampling was used to select participants for the study, to achieve rich data (Moser & Krostjens 2018:9; Rahi 2017:3).

3.7.4.3 Sampling of Facilities

The researcher purposively selected sub-districts with a high incidence of hypertension to have enough data. In Mopani District, Greater Giyani was selected and in Vhembe district Makhado district was selected. 10 PHC facilities that is, 5 from each District were selected.

3.7.4.4 Sampling of Participants

A purposive sampling technique was used, to select patients with hypertension, to be part of the study. The researcher liaised with the clinical nurse practitioners at each facility, who helped in the identification of patients who met the criteria for the study. The researcher explained the purpose of the study to the clients who came for follow-up in the facility. The researcher recruited 40 participants, that is, 20 participants from each district. The researcher interviewed participants until data saturation was reached. After 18 clients were interviewed, data saturation was attained. The researcher started the interviews in Mopani district followed by Vhembe district. In Mopani district data saturation reached after 10 participants were interviewed. In Vhembe district data saturation reached after 8 participants were interviewed. The males who were found by the time of the study who met inclusion criteria and agreed to be part of that study were 7 and females were 11

3.7.4.5 Inclusion Criteria

The eligible patients were males and females with hypertension doing follow-ups at selected facilities. Clients aged 25 years to 60 years of age were included in the study.

Unhealthy lifestyle can increase chance of hypertension diagnose at an early age and become uncontrolled as age advances

3.7.4.6 Exclusion Criteria

Pregnant clients were not part of the study, as some of the lifestyles are temporary, because of pregnancy like cravings for sweets or beer due to hormonal imbalances.

3.7.4.7. Data Collection

Data collection is a way in which the researcher approaches answering research question (Brink et al 2018:133). Data collection was done after obtaining permission to conduct the study from the district offices of Mopani and Vhembe. The researcher requested permission to conduct research from the operational managers of the selected PHC facilities. The researcher requested to use one cubicle in the facility for interviewing the participants. An explanation of the study and purpose were done to the patients. It was made clear that the participants were not going to receive any payments, but only knowledge on lifestyle modification in hypertension.

Participants who agreed to participate in the study were given a consent form to sign. Each consent form was having an information sheet that the participant was allowed to read before they sign the consent form. The researcher read the information sheet for the participants who cannot read before signing the consent form see attachment Annexure C. The researcher asked permission to use a voice recorder during the interview to avoid missing important data. Three participants who said they were just not comfortable that their voices were recorded were excluded from the study since it was going to be difficult to write every word that they said which would result in missing important data. Participants who agreed on the use of a voice recorder were allowed to sign the consent form. Patients with hypertension were interviewed using an

interview guide. The researcher conducted interviews with each participant. The researcher took note of the observations made during the interview and their interpretations. Field notes helped the researcher to recall what happened during the discussion such as keywords, verbal tone, gesture, facial expression, sighing and participants' responses. Data collection and interpretation were done concurrently to avoid missing some important data if data was collected and stored until finishing data collection process.

The following communication techniques were used to encourage participants to talk:
Listening- The researcher paid attention to information that the participant was narrating and used listening skills throughout the interview and responding appropriately to the meaning conveyed by the message

Probing- The researcher explored the meaning of vaque comments that could have multiple meanings by encouraging the participant to elaborate.

Paraphrasing- The researcher repeat what the participant has said in a more concise manner in order to show to the participant that the researcher was listening and understood what participant was describing.

Clarification- This was done throughout the interview to clarify information that was not clear initially in order to have clear information from the participant.

Summarising- the researcher summarised what the participant has said in order to be sure that what the researcher heard was correct.

Minimal verbal response- The researcher used minimal verbal response by saying "yes", "mm", while nodding head to allow smooth flowing of information and

encouraging participant to talk while relaxed.

3.7.5 Measurement Instrument

The researcher used the interview guide for data collection (Krostjens & Moser 2018:9; Querios, Faria & Almeida 2017:378). For data collection tool, see Annexure K in page 214. The researcher had a one-on-one interview with the participants, collecting data using open-ended questions. The researcher had a predetermined set of questions logically arranged, starting with the less sensitive to more sensitive questions. An interview guide helped the researcher not to miss any data that need to be collected. Although the interview needs much time, the researcher agreed with the participants on the possible time length of the interview which will be 45-60 minutes.

3.7.6 Data Analysis

Data analysis is a process of bringing order structure and meaning to the mass data collection and a way to consolidate relationships among the categories of data (Brink et al 2018:164). The researcher used Tesch's inductive, descriptive open coding eight steps of data analysis (Creswell, 2014:198).

- **Step 1 – Reading through the data**

The researcher got a sense of the whole by reading all the verbatim transcripts carefully. This gave ideas about the data segments and how they look like/mean. The meaning that emerged during reading were written down and all ideas as they come to mind. The researcher carefully and repeatedly read the transcripts of all the participants and understood them.

An uninterrupted period of time to digest and thought about the data in totality was

created. The researcher engaged in data analysis and wrote notes and impressions as they come to mind.

- **Step 2 – Reduction of the collected**

The researcher scaled down the data collected to codes based on the existence or frequency of concepts used in the verbatim transcriptions. The researcher then listed all topics that emerged during the scaling down. The researcher grouped similar topics, and those that did not have association were clustered separately. Notes were written on the margins and the researcher started recording thoughts about the data on the margins of the paper where the verbatim transcripts appeared.

- **Step 3 – Asking questions about the meaning of the collected data**

The researcher read through the transcriptions again and analyse them. This time the researcher asked herself questions about the transcriptions of the interview, based on the codes (mental picture codes when reading through) which existed from the frequency of the concepts. The questions were “Which words describe it?” “What is this about?” and “What is the underlying meaning?”

- **Step 4 – Abbreviation of topics to codes**

The researcher started to abbreviate the topics that have emerged as codes. These codes need to be written next to the appropriate segments of the transcription. Differentiation of the codes by including all meaningful instances of a specific code’s data were done. All these codes were written on the margins of the paper against the data they represent with a different pen colour as to the one in Step 3.

- **Step 5 – Development of themes and sub-themes**

The researcher developed themes and sub-themes from coded data and the associated texts and reduced the total list by grouping topics that relate to one another to create meaning for the themes and sub-themes.

- **Step 6 – Compare the codes, topics, and themes for duplication**

The researcher in this step reworks from the beginning to check the work for duplication and to refined codes, topics, and themes where necessary. Using the list of all codes the researcher checked for duplication. The researcher grouped similar codes and recoded others that were necessary so that they fit in the description.

- **Step 7 – Initial grouping of all themes and sub-themes**

The data belonging to each theme were assembled in one column and preliminary analysis was performed, which was followed by the meeting between the researcher and co-coder to reach a consensus on themes and sub-themes that each one has come up with independently.

3.7.6 Measures to Ensure Trustworthiness

Measures to ensure trustworthiness in qualitative research help the researcher in preventing errors through the establishment of rigour without sacrificing relevance (Lincoln and Guba 1985:216). Krostjens & Moser (2018: 121) showed that measures to ensure trustworthiness answer the question “Can the findings be trusted?” This question was used by researcher to establish credibility, transferability, dependability,

conformability, and authenticity.

3.7.6.1 Credibility

This was to establish confidence in the truth of the findings and interpretation of data as it is lived and perceived by participants (Kalu & Bwalya 2017:50; Moser & Krostjen 2018:121). The researcher has done the following to ensure credibility:

- **Prolonged engagement:** The researcher spent time with the participants collecting data. An in-depth interview was conducted to get rich information. The researcher also established a rapport to get sensitive issues.

- **Member checking:** Follow-up interviews were done to validate data; and by providing feedback to participants to check if the information collected was well captured.

- **Field notes:** The researcher took descriptive notes of direct verbatim, non-verbal cues and noting important or supporting information such as mannerism, emotions, and voice tone. A voice recoder was used to record the conversation with the participants. Methodologic notes included how the strategy was effective or the new approach used. Theoretical notes included how the researcher makes sense of the whole interview. Personal notes included researcher's feelings during the interview (Kalu & Bwalya 2017:50; Krostjen & Moser 2018: 121)).

- **Peer debriefing:** Different meetings were done with peers and supervisors with experience in qualitative research, discussing research process.

- **Triangulation:** Different methods of research were used. This study used a mixed method research method that is, qualitative and quantitative study.

3.7.6.2 Transferability

This was achieved by properly describing the context of the study and background information of the participants (Kalu & Bwalya 2017:50; Krostjen & Moser 2018: 121). The researcher ensured that there is an accurate description of methodology and sampling.

3.7.6.3 Dependability

The inquiry auditor, generally peer, followed the process and procedure used by the researcher, and to determine if they are acceptable (Kalu & Bwalya 2017:50; Moser & Krostjen 2018: 121). The study was presented to the research committee of the School of Health at the University of Venda, who evaluated and corrected, where necessary.

3.7.6.4 Confirmability

Guarantees that the findings, conclusion, and recommendations are supported by data which means that there is an internal agreement between the investigator's interpretations and the actual evidence (Kalu & Bwalya 2017:50; Krostjen & Moser 2018: 121). The findings and activities of the study were documented, to show how conclusions were reached.

3.7.6.5 Authenticity

The researcher used participants' information to which the findings are solely for the participants, condition of the research and not of biases, motivation, and perspectives. Hence, signifying that the research procedure and results were free from bias. Raw data were recorded using a voice recorder. The researcher used bracketing of ideas to consider every viable perspective (Brink et al 2017:105). The researcher put aside preconceived ideas on lifestyle modification of patients with hypertension.

3.8 Phase 1b: Quantitative Study

The quantitative study classifies features of what is studied and quantifies data to present statistical findings (Rahman 2017:105; Rahi 2017:2). A quantitative study was used because the researcher wanted to have statistical data from professional nurses on what can be done to enhance lifestyle modification to patients with hypertension. The findings from the qualitative study informed the formulation of questions that were asked in quantitative questionnaires. Statistical data showed how many consider what can be done to enhance lifestyle modification for patients with hypertension**.**

3.8.1 Study Population

The population of the study was professional nurses rendering primary health care services in the selected districts. Professional nurses have contact with patients with hypertension on diagnosis and when doing follow up. Hence, they had information about patients with hypertension and the extent of non-adherence to lifestyle modification.

3.8.2 Sampling and Sampling Method

Multistage sampling was used. Stage 1: Two districts have been selected namely, Mopani and Vhembe Districts. Stage 2: One sub-district with the highest hypertension incidence was selected from each district. According to the District Health Barometer 2016/2017, Greater Giyani was having highest hypertension prevalence in Mopani. Makhado sub-district was the highest in Vhembe district. According to the District Health Information personal system, Vhembe District has 2828 filled posts of professional nurse and Mopani District is having 1885 filled posts of professional nurses. The total population is 1885+2828=4713 professional nurses.

Table 3.2: Sample frame

District	Total number of professional nurses filled posts
Mopani District	1885
Vhembe District	2828
Total	**4713**

- Slovin's formula was used to determine the sample size. Below is the calculations:

  $n=N/1+ N(e)^2$

  n=sample size of adjusted population and N= total population size which is 4713

  e=accepted level of error set at 0.05

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

  $n=4713/ 1+ 4713(0.05)^2$

  n=4713/ 1+4713(0.0025)

  n=4713/ 12.7825

  n=369 professional nurses were recruited and given questionnaires to respond.

3.8.3 Inclusion Criteria

Eligible nurses were professional nurses aged 25 to 60 years, registered with the South African nursing council as most nurses fall in this category. Participants were professional nurses working in the PHC facilities as the model will be implemented in the PHC facilities.

3.8.4 Measurement Instrument

The instrument used was a self-administered questionnaire. The researcher developed a questionnaire for the respondents to answer, based on the results of the qualitative results. The questionnaire had 21 items. The researcher collected quantitative data from a large group of professional nurses, using the same standard

format (Brink et al 2018:139; Rahi 2017:2). A questionnaire helped the respondents to have a sense of anonymity, hence, participants could answer questions honestly. The respondents had time to think carefully about each question before answering. Sometimes some respondents might not return the questionnaires hence the researcher allowed the respondents to answer the questionnaires during lunchtime and submit them before the end of the day.

3.8.5 Pre-Test

Pre-test in research refers to investigate for possible flaws in the instrument which is accomplished by including few individuals who will meet the inclusion criteria (Brink et al 2018:161). It is when the survey questions and are tested on members of target population to evaluate the reliability and validity of the survey instrument. The pre-test was done in five PHC facilities in Thulamela municipality to check any shortcomings of the questionnaire. Thirty-nine (39) professional nurses were given questionnaires to complete questionnaires. The researcher was able to find out if there were any shortcomings such as ambiguous instructions, wording, and length of the questionnaire. Data from the pre-test study was not included in the main study.

3.8.6 Reliability

Reliability is the consistency of the measuring instrument to yield the same results when used in the same condition on different occasions (Bacon-Shone 2017:53). Two or more questions were used to measure each aspect. Construct were measured at the exact level as far as possible. The instrument was checked for stability using test-retest method (Bacon-Shone 2017:54). The instrument was given to professional nurses working in PHC facilities on two occasions within a short space of time and examined similarities of their responses (Brink et al 2018:156). The internal consistency of the measurement instrument was estimated using the split-half method.

The items on the measurement instrument were divided into two halves, then compared results.

3.8.7 Validity

The researcher ensured content and concurrent validity (Brink, van Der Walt & van Rensburg 2018:153-154). Content validity was ensured by doing a comprehensive literature review of hypertension, lifestyle modification and health belief model to incorporate all aspects under study. Concepts were clearly defined to prevent vague statements. The researcher developed operational definitions for the study and measurements were done in accordance with these definitions.

After the instrument was completed, it was presented to the statistician to evaluate the instrument. The instrument was presented to supervisors and colleagues who are experts in lifestyle modification and hypertension for evaluation if it is measuring what it was supposed to measure.

3.8.8 Plan for Data Collection

The researcher had one research assistant, to assist during the collection of quantitative data. The research assistant was knowledgeable about research and was trained in this study and questionnaire for one day. The researcher used a self-administered questionnaire, which was a series of questions to be answered by the respondents (Rahi 2017:5). The researcher liaised with the operational manager of each facility. The purpose and objective of the study was explained to the professional nurses and an appointment was made with them. The researcher gave the respondents the self-administered questionnaires to complete during lunchtime. An information sheet was attached to each questionnaire. Furthermore, the respondents were allowed to sign a consent form before completing the questionnaire. The

questionnaires were collected the same day from each facility. The questions were about what can be done to enhance the lifestyle modification of patients with hypertension. The questionnaires were in English, as all professional nurses can read and write English.

3.8.9 Data Management and Analysis

The data collected was analysed using descriptive statistics where data was described and summarised (Brink et al 2018:167. The statistic made data organised and be visually represented in graphs and diagrams, to have meaning in enhancing lifestyle modification in patients with hypertension. The software that was used for data analysis was a Statistical Package for Social Science (SPSS) version 26.0. The researcher worked with the statistician when analysing data.

3.9 Phase 2

Phase 2 comprised model development. The results of phase 1a and 1b and health belief model informed the development of model to enhance lifestyle modification of clients with hypertension. The researcher used the framework of practice theory of Dickoff, James and Wiedenbach (Dickoff, James & Wiedenbach 1968:415). The six elements of practice theory are agent, recipient, context, dynamics, procedure and terminus.

- Agent: an agent is a person or any other thing that contributes to the realization of the goal. In the present study the agent will be nurses.
- Recipients: these are persons who receive action from the agent that contributes to a certain goal. In the present study recipients will be patients with hypertension.
- Context: the context is viewed in the matrix of activity. In this study the activity will occur in the community, family, and Primary health Facilities where clients do their follow up visits.

- Dynamics: these are power sources of the activity that can be chemical, physical, biological and psychological for a person or thing to function as an agent. The patients form the framework in realizing the goal.
- Procedure: refers to how the activity takes place.
- Terminus: this is the endpoint. In the present study the terminus will be adherence to lifestyle modification by patients with hypertension.

3.10 Phase 3 Model validation

The developed model was evaluated using checklist to ascertain its effectiveness during implementation process (Chin & Kramer 2012:205). The model was evaluated on its clarity, simplicity, generalizability, accessibility and importance. The researcher presented the model to PHC managers, PhD students, Masters students, and promoters. The researcher explained the existing gap on enhancement of lifestyle modification of patients with hypertension. Checklist used to evaluate the model.

3.11 Ethical Considerations

Rahman (2017:107) defines ethics as a system of moral values that is concerned with the degree to which research procedures adhere to professional, legal, and social obligations to the study participants. It is about protecting the rights of human subjects, balancing the benefits and the risk in the study. The researcher explained the research study to the participants. Participants gave informed consent that they were willing to participate in the study.

3.11.1 Permission to Conduct the Study

The present study was presented to the School of Health Sciences for approval, followed by approval by the University Higher Degree committee of University Venda. Permission and ethical clearance certificate were sought from the Research Ethics

Committee of the University of Venda and the Limpopo Department of Health for permission to do the study see annexures A and B. Permission was obtained from Mopani and Vhembe District to conduct the study at selected facilities see annexures and C and D. Furthermore, the researcher received permission from the operational managers of each selected facility verbally**.**

3.11.2 Voluntary Participation and Respect for Human Rights

Voluntary participation means that the participants must be allowed to participate in the study willingly and no one should be forced to be part of the study if he/she is not willing to do so (Brink, van der Walt & van Rensburg 2017). Hence participants' human rights should be respected at all times. This means that the participants must not be treated like objects, they are human beings who have the rights to be respected. In this study, all participants were informed that participation in the study is voluntary, and no one is forced and that they were free to choose to participate or not. As the result, the researcher explained the research study to the participants and participants gave informed consent that they were willing to participate in the study.

3.11.3 Confidentiality and Anonymity

This means that the information collected from the participant will be nameless and will not be able to be linked to the identity of the participant (Brink, van der Walt & van Rensburg 2017:30). In this study, the participants were assigned codes or pseudo names for them to remain anonymous so that no link between the individual identities of the participants and the research data can be made

3.11.4 Freedom from Harm (Protection from Exploitation)

This means that the researcher must protect the participants from harm either physically, psychologically, emotionally, spiritually, economically, socially, and legally (Brink, van der Walt & van Rensburg 2017: 31). The researcher made sure that the participants were protected from psychological harm by spending enough time with each other. A debriefing was done to inform the participants about the research and to neutralize any resultant negative feelings. There was no victimization of the participants who refused to participate.

3.11.5 Informed Consent: (Right to Full Disclosure)

This means that the researcher should give the participants necessary information about the study so that the participant will give consent to participate with relevant information. The participants were given information about the nature, purpose, and benefits of the study, as well as possible discomfort which may be encountered by the individuals, see annexure D. Consent forms were given to those who could read and for those who could not read, the form was read to them and if the participant was willing to participate, he/she was allowed to sign the consent form.

3.12 Dissemination of the Study Findings

The study findings will be published in accredited journals and also be presented in local and international research conferences. A copy of the results and recommendations of the study will be provided and presented to the Limpopo Department of Health. Electronic version of the study will be submitted to the University of Venda library. Copy of the study will be submitted to districts where the study was conducted, and findings will be presented.

3.13 Summary

This chapter discussed the research method of the study which has outlined research design, selection of study setting and sample, the procedure for data collection and analysis, measures to ensure trustworthiness, reliability and validity, concepts analysis, development of a model, evaluation of the model, ethical considerations, and dissemination of the findings. The following chapter will outline the analysis, interpretation, and discussion of the findings of phase 1a (qualitative study) and phase 1b (quantitative study).

CHAPTER 4

DATA PRESENTATION AND ANALYSIS (PHASES 1A AND 1B)

4.1 Introduction

The previous chapter dealt with research design, selection of study setting and sample, data collection procedure and analysis, measures to ensure trustworthiness, reliability and validity, concepts analysis, development of a model, evaluation of a model and ethical consideration. In this chapter, findings from the phase 1a (qualitative study) will be presented and direct quotations were represented by “HP” where “HP” stands for hypertensive person. Number was allocated to be able to distinguish the interview recording and its transcription and phase 1b will be presented. In both results, literature control was done.

4.2 Phase 1a (Qualitative Study)

In the qualitative study semi-structured interviews was done with 18 clients with hypertension attending follow-up in PHC facilities. Data was collected from 18 participants; 11 participants were females and 7 were males. The results were presented in themes and sub-themes that emerged during analysis.

The objectives of qualitative interviews with hypertensive clients were to:

- Explore the lifestyles of selected clients with hypertension in Limpopo Province, South Africa.

- Describe the Knowledge, attitudes and beliefs about lifestyle modification among clients with hypertension in Limpopo Province South Africa.

The semi-structured interviews dealt with the following questions:

- How is your lifestyle since you were diagnosed with hypertension?
- How do you think clients with hypertension can benefit from lifestyle modification?
- What do you think can be the barriers to clients adherence to lifestyle modification?
- How can non-adherence to lifestyle modification affect clients with hypertension?
- How do you think lifestyle modification can be enhanced?

4.3 Presentation of Themes and Sub-Themes

The identified themes and subthemes are presented in Table 4.1. And they were substantiated by appropriate quotations from raw data.

Table 4.1: Themes and sub-themes

Themes	Sub-Themes
4.3.1 Lifestyle of clients living with hypertension	4.3.1.1 Increased fruit and vegetable intake 4.3.1.2 Avoid adding salt to food 4.3.1.3 Avoid fats and oils 4.3.1.4 Increase water intake 4.3.1.5 Physical exercise 4.3.1.6 Stopping smoking 4.3.1.7 Reduction of alcohol intake 4.3.1.8 Stress management 4.3.1.9 Adherence to treatment and follow-up visit at PHC facility
4.3.2 Expression of benefits of adhering to lifestyle modification **4.3.3 Expression of complications related to non-adherence to lifestyle modification**	4.3.2.1. Reduction of weight .and belly fats, controlled hypertension 4.3.2.2. Prevention of complication 4.3.2.3. Limiting increased hypotensive drugs 4.3.3.4. Stroke 4.3.3.5. Heart attack obesity 4.3.3.6. Metabolic conditions (diabetes mellitus) 4.3.3.7. Joint or skeletal problems and cancer 4.3.3.8. Beliefs and myths
4.3.4 Challenges related to adherence to lifestyle modification by clients with hypertension	4.3.4.1.Sharing same food 4.3.4.2.Lack of taste 4.3.4.3.Tempting desire 4.3.4.4.Eating out of home 4.3.4.5.Lack of knowledge 4.3.4.6.Lack of family support 4.3.4.7.Lack of motivation 4.3.4.8.Lack of resources 4.3.4.9.Busy schedule

4.3.5	**Suggestions related to enhancing adherence to lifestyle modification of clients with hypertension.**	4.3.5.1.Continuous sharing of information about lifestyle modification by health care workers and client adhering to lifestyle modification 4.3.5.2.Involvement of family members, traditional healers, pastors when health care workers share information about lifestyle modification 4.3.5.3.Teaching lifestyle modification in civic meetings, schools, community clubs, churches, funerals. 4.3.5.6.Suggestion of having playgrounds, pamphlets, trained person responsible for lifestyle modification in the facility and in the community to assist clients with hypertension.

4.3.1 Theme 1: Lifestyle of Clients Living with Hypertension

Participants were asked to explain their lifestyle since they were diagnosed with hypertension. Lifestyle modifications used by patients with hypertension was characterised by different issues as explained by the participants. The participants expressed awareness of ingredients of lifestyle recommended for hypertensive clients to include diet-nutrition, physical exercises, stopping smoking, reduction of alcohol intake, stress management as factors for lifestyle modification. Some mentioned about treatment adherence and follow-up as one of the lifestyle modifications for clients with hypertension

4.3.1.1 Sub-Theme 1.1: Increase Fruit and Vegetable Intake

The findings showed that participants took fruits and vegetables however, they did not mind about how many portions per day. The fact that they sometimes take vegetables and fruits was enough to them. They took vegetables or fruits when they were available and did not include them in their grocery budget.

- **HP 5 confirmed this by saying:**

  "I use vegetables when available at home. Otherwise, I can manage to take vegetables 2 times per week not daily. I often use vegetables when my mother-in-law is around. She is the one who used to go to the field to pick up some of the vegetables from the field or else she may buy. It is rare to find me taking vegetables if she is not around"

- **HP 12 said:**

  "I do not have money to spend on vegetables or fruits, but, I spend money on meat and other items. My children do not like vegetables hence if I cook vegetables and not meat it will be for me alone and they will be complaining in a way that will disturb me. They even do not eat for the whole day. Hence, I buy that will cater to the whole

family. When there are vegetables or fruits in my yard/garden I do take them. But not that I can spend money on vegetables and fruits as such".

Participants knew that they were supposed to take vegetables instead of meat, but they were unable to adhere because they like meat more than vegetables. The following quote from the participant verify these findings

- **HP 10 said:**

  "I take vegetables but mostly I used chicken and fish in my meal. I cannot take vegetables for more than 2 meals. There must be a piece of meat on the side if I am taking vegetables, alone it is not my favorite, I like meat a lot. It is not easy to use vegetables without meat. I feel like I am punishing myself. I take fruits when I have found them.

- **HP 8 supported and said:**

  "Meat and porridge is my favourite that is why I am unable to increase my intake of vegetables. I eat vegetables but I am not satisfied like when I have taken meat. I do not mind which type of meat but as long as is meat I am fine. Mmm…. as you know meat is meat it is not like vegetables".

- **HP7 said:**

  "I do not worry about buying fruits because it is not so important to me like vegetables. I can eat fruit when I have found it. In fact, I favour mangoes and avocadoes which are seasonal fruits. I have planted some at home. I eat fruits when it is a season for mangoes and avocadoes".

However, the study also revealed that only a few have modified their lifestyles concerning diet. Below are quotes that confirmed that:

- **HP 14 said:**

  "When I was diagnosed with hypertension, I ate a lot of junk foods at home and from restaurants. I was working and I was enjoying my life. The time I was aware that I had hypertension it was a blow. I did not want to change but the blood pressure was uncontrolled, it was going up even though I was taking pills. I told myself that it is time to change or else I will lose my life due to food and I have to change. I eat my fruits raw. And I prepare my vegetables without oils or salt. I choose mayonnaise with low fats and mix. It is tasty. Now my blood pressure is controlled".

- **HP 18 said:**

  "Change is very difficult, and it needs somebody ready for that. I was not interested in vegetables in my meal. I used wors, chicken, beef, deep-fried fish, and tin stuff. I only ate vegetables as a salad on Sundays. Because now I have hypertension, I am trying to stop all this nonsense.

  "I use vegetables most of the time. I do not mind about meat that these children are cooking every day. I enjoy my pap with vegetables. I feel ok with it. In fact, these chicken portions from retailers are full of fats and they are not healthy".

4.3.1.2 Avoid Adding Salt to Food

Participants showed that they are aware that salt should be avoided but were not adhering to that. Sometimes participants avoid salts in their food but still add salt at times. The following two quotes from the participants evidenced that in this manner.

- **HP 1 said:**

  "I do not add every time salt to my food. I was told salt is not good if one is having hypertension, and I am afraid to add too much salt because my blood pressure will rise. It is now going down bit by bit

since I stopped salt. I think if I have started it by the time I was diagnosed I would be able to stop salt and I was going to be taking one tablet per day."

- **HP 6 said:**

  "I am very careful with salt. In fact, I have told them to separate my food and do not add salt but instead to add a stock cube to enhance flavor. Sometimes I use soup or aromat, at least there will be a little bit of flavor rather than just plain."

Furthermore, participants used a traditional herb called 'nngu' which is cooked with vegetables to enhance taste while avoiding salt and sometimes boiled and its juice was taken to lower blood pressure and blood sugar.

- **HP 6 said:**

  "I decided to use more of traditional herbs 'nngu' when preparing vegetables. It has helped me a lot".

- **HP 4 said:**

  "I use nngu and sometimes I boil it and drink its juice. People say it controls blood pressure and blood sugar".

4.3.1.3 Avoid Fats and Oils

In this study some participants carelessly ate animal fats and fried foods. These are discussed as follows in the two quotes expressed by the participants:

- **HP 17 said:**

  "I enjoy chicken wings, not those other parts. I understand they have a skin that has fats but wings are my chicken's delicious parts. I enjoy them and I cannot do away with them. They are delicious and when

I say I have enjoyed chicken I mean that the wings were there. I am unable to take boiled chicken portions they have a smell that I cannot stand. I want my chicken to be fried, is then that I can enjoy it. No, boiled chicken I am sorry".

- **HP 13 said:**

"I do not have any restrictions, I eat everything. I do not punish myself with food. How can I remove skin from chicken?

- **HP 16 said:**

"My greatest temptation is chips. I tried to avoid them but that smell is so charming I cannot hold myself when passing a restaurant. They are cheap and I can afford them".

4.3.1.4 Increase Water Intake

Participants in this study expressed their regular intake of water intake daily.

- **HP 1 said:**

"I always have a water bottle with me when I am out of home. I do not want my body to be dry because I feel it is not good for blood pressure. Per day I can finish these two bottles (showing 1,5l water bottle)".

- **HP13 said:**

"I am used to taking water frequently since I was told that water is needed for our bodies and it is healthy to take water. I cannot eat without a glass of water and when I have a headache I first sit down and drink a good amount of water before I can treat it with Panado. Most of the time it goes off on its own before I use Panado. That is why I believe that water is a medicine that people usually ignore".

- **HP 9 said:**

"Also, water is very useful. I take more than 2 liters per day. When I am exercising is then that I take even 3 liters because I will be sweating".

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4.3.1.5 Physical Exercise

Some participants mentioned physical activities like brisk walking and jogging and house chores.

- **HP 9 said:**

  "I walk from here up there to chief's kraal two times a week. I do not mind going there alone because there is nobody who understands that physical exercise are important. But besides going on a walk I can still have exercised at home. Because outside people will take me as mad, I do exercise inside my house, lifting my hands, my legs and whatever (trying to show how she lift hands and legs. Otherwise, I do that alone since none at home understand this. I can see that this is working for me".

- Another participant explained that they do physical exercise through doing house chores daily.

  "I do some washing on my own I do not depend on the assistant of domestic worker at home. When I wake up every day, I clean the yard".

- **HP 5 said:**

  "I do some house chores. I do not wait for children to do everything for me. That is how I exercise."

- **HP 14 said:**

"…You know I clean my room using my legs. I wake up early in the morning, I throw the rug on the floor and stand on top of it and I go 1,2,3,4,5 (showing with his feet going left and right on the floor). Then is a double job I am cleaning, and I am exercising".

- **HP 17, a member of an exercise team with friends said:**

"I do not exercise alone; I am lazy and do not feel motivated alone. I have joined a group for exercise. We are a group of men who jog every Saturday and Sunday. Some weekends I feel lazy, and I do not go but they will be phoning until I join them. After work, I do some house chores or just walking".

4.3.1.6 Sub-Theme 1.3: Stopping Smoking

In this study, some participants revealed that they were smoker but now have stopped smoking after being diagnosed with hypertension. Another participant was on the process to stop smoking by reducing cigarettes per day. Though it was not easy now they are adhering. These were evidenced by the following direct quotes:

- **HP 18 said:**

"In fact, I used to smoke a cigarette when I was having stress during the day at work. "I was told that smoking was not good for my health, and I stopped smoking and I removed cigarettes from my car. I do not want cigarette smoke next to me. During the first weeks, I was struggling to cope when I was having work stress and my boss advised me to keep myself busy and have sweets and chewing gums. Now I am ok I no longer crave to smoke, and I no longer feel good around someone who is smoking. My blood pressure is going down".

Participants smoked as a way to relieve stress and did not value the need to stop smoking before being diagnosed with hypertension. However, when having evidence

that smoking has some complications due to the development of hypertension, participant acknowledged importance to stop smoking. Furthermore, smoking was not taken as a risk factor for hypertension. This was revealed by the following quotes below.

- **HP 16 supported and said:**

  "I no longer smoke. I used to smoke until I was diagnosed with hypertension. I stopped smoking and had no problem. I no longer think of smoking again. Smoking was wasting my money, but I did not realize it until I stopped. Though I heard that smoking was bad for my health I did not take it seriously until the day I was diagnosed with hypertension. I did not think I could have hypertension because I am always laughing with people not angry. I thought hypertension is for those who are easily angered. Now I am aware that if I continue to smoke, I might die soon".

- **HP 13 supported:**

  "I did not stop smoking because I take hypertension as a disease for the rich people. I was surprised when I was told my blood pressure was high. I was shocked and I continued smoking. When I went for a check-up my blood pressure was swinging up. It was then that I started to take it seriously that I have to stop smoking. I tried to stop smoking but it was not easy. I managed to stop because I did not have any other way except to stop or else, I will kill myself".

4.3.1.7 Reduction of Alcohol Intake

Participants who took alcohol revealed that they took it for leisure, during social gatherings and during happy days and trips which was confirmed by the quotes from participants.

- **HP 17 said:**

"I was a heavy drinker, especially during weekends until I found that I have hypertension. I reduced my drinking and only take alcohol during parties and social gatherings. My blood pressure is going down".

- **HP 16 said:**

"I am still taking alcohol, but I am not a heavy drinker. I take alcohol for leisure, and it does not control me. I can spend some months without taking alcohol and still be fine. I do not want my blood pressure to go up the way it was before. I was so scared the time I found out that my blood pressure was so high".

- **HP 14 said:**

"I use alcohol during happy days and when I am on community club trips during the end of the year. Even there I use only 1 or two. It does not control me. I do not want to drink until I am unable to take charge of my life".

4.3.1.8 Stress Management

Participants expressed how stress affected blood pressure. This is confirmed by quotes from participants.

- **HP 3 said:**

"I was diagnosed with hypertension when I collapsed when I was told about the passing on of my brother who was a breadwinner…..(she looked down and took a deep breath). He was shot and passed on at the scene. I woke up when I was in the hospital. I was told that I will be admitted for a while since my blood pressure was too high. When I was discharged it was still not going down. My pastor and his wife used to come to my place to counsel me until I was better because I was still worried about my brother who was shot dead and who was supporting me financially. Every time I came here to the

clinic, I was referred to a lay counsellor who counselled me….

HP 4 said:

"My blood pressure came because of a family problem my husband who was cheating, and I found out. He was no longer coming home, and I was so frustrated. I started to have chest pains and I came to the clinic where I was diagnosed with hypertension. I am now taking treatment because of that unfaithful husband. I attended trauma counseling in our hospital until I have improved….Every time I felt stressed up, I phone my pastor who will pray with me (locking fingers together) and encourage me with different verses. I write each verse he gave me, and I meditate on it day and night".

- **HP 16 supported and said:**

  "I was in debt, and I did not tell anyone. I respected my wife who send me to the social worker. My blood pressure was uncontrolled, and she asked me if I was having any problem bothering me and told her that I do not work and have a financial problem. A social worker counselled me. Now my blood pressure is ok (showing thumbs up).

4.3.1.9 Adherence to Treatment and Follow-Up Visit at PHC Facility

In this study, participants expressed adherence to treatment as lifestyle modification that they have adopted even though they have a challenge with other lifestyle modification. This was confirmed by the direct quotes from participants below.

- **HP 13 said:**

  "But, I make sure I take my pills every day to control my blood pressure".

- **HP 6 said:**

"Even though I have a challenge with my behaviors which are not healthy, but I do not have a problem with my treatments because all of them are taken daily. It makes me not miss a day without taking treatment. I take my treatment after each breakfast"

- **HP 9 supported and said:**

"As you can see, I was here to collect my treatment. I do not skip my dates because I do not want to run short of treatments. High blood pressure is serious it does not need one who skips treatment because it will not be controlled. Some measures may be difficult but taking treatment is easy".

- **HP 2 said:**

"I came to collect my treatment parcel. The last date I was at work, and I sent my wife to collect my parcel. We are not allowed to skip the date. If I am committed by the date I was given like when I am busy with family issues, I have to send relatives to collect because I will run short of treatments that I do not want. I do not want blood pressure to go up because sometimes I may eat food with salt, but treatment must be taken regularly".

4.3.2 Theme 2: Expression of benefits of adhering to lifestyle modification

Participants verbalised benefits of adhering to lifestyle modification even though some were unable to adhere to that. Some participants had experienced some of those benefits. The benefits mentioned included reduction of weight and belly fats, controlled hypertension, prevention of complication, limiting increased drugs to reduce blood pressure (hypotensive drugs).

4.3.2.1 Reduction of Weight and Belly Fat

Some participants knew that adherence to lifestyle modification results in reduction of

weight and belly fats from their own experience. Participants' direct quotes confirmed this.

- **HP 14 said:**

  "My stomach was big (trying to show estimated diameter with his hands) and weight of my stomach only was plus or minus 25kg to 30kg. After cutting all these things my stomach is flat (looking at his stomach showing how flat it is). I feel light and my weight is reduced".

- **HP 18 said:**

  "I was unable to walk fast or walk for a distance without shortness of breath which led me to rest now and then. This happened until I consulted at the clinic where I was checked and told that my blood pressure was very high and I need to reduce my weight. I was weighing 120,8 kg by then. I was too fat. I was initiated on hypertensive drugs. I am one person who hated taking pills but the situation forced me to comply there was nothing that could help me. I then realised that my weight is going to kill me. I started to stop eating meat, oils and fats and started exercising. It was then that I felt relieved from shortness of breath".

- **HP 17** expressed benefits experienced by adhering to lifestyle modification and said:

  "By that time when I was serious with a healthy diet I maintained my good image and feeling light. By the time I was faithful to the diet and exercise is the time when I was very strict and did not want to mess up with my health. I do not know what makes me return to that meat and fats".

4.3.2.1.1 Controlled Hypertension

In this study, participants knew that adherence to lifestyle modification lead to controlled hypertension. This was confirmed by the direct quotes from participants.

- **HP 18 said:**

  "I was advised by a nurse that I must stop smoking and reduce alcohol intake for my blood pressure to be controlled. This is true. It is only that people do not adhere to what they were told".

- **HP 4 expressed the evidence of adhering to lifestyle modification and said:**

  ""Since I started to follow a healthy lifestyle I was advised by nurses, my blood pressure is being controlled, I feel light and with energy and my feet are no longer painful, my size of skirts are reasonable, not like before when I was wearing size 40 and 42".

- **HP 15 supported this by saying:**

  "Since I started doing an exercise I can see that my blood pressure is going down (pointing down with her right hand and smiling). I am telling you, people must try and see the results".

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4.3.2.1.2 Prevention of Complications

In this study, participants expressed a belief that non-adherence to lifestyle modification might cause complications of hypertension.

- **HP 15 said:**

  "As patients with hypertension, we have to follow a healthy lifestyle because there is a possibility that one can have a stroke and heart attack if the blood pressure is not controlled. That is why I no longer take chips even though I sometimes crave for them, I do not want to kill myself."

- **HP 14 said:**

"Since I started following a healthy lifestyle I was advised by nurses, my blood pressure is being controlled, I feel light and with energy and my feet are no longer painful… I was told that other group that we must follow the advice we are given from the clinic because it works".

- **HP 4 supported by saying:**

"This terrible headache is the one that forced me to comply to low fats and low salt diet otherwise. I was so stubborn. But now I do not have that headache if I am faithfull, but if not faithful, it comes back. I am not ashamed to tell others because I know that. No one can rob me I know it".

4.3.2.1.3 Limiting Increased Hypotensive Drugs

Participants showed knowledge on limiting increased hypotensive drugs if one adheres to lifestyle modification.

- **One participant said:**

"My blood pressure was not coming down and I was advised to adhere to a healthy lifestyle especially diet. I was still adding salt, fats, and oils to my diet. I was started on treatment and my blood pressure was not responding. The nurse showed me that the treatments are going to be increased until blood pressure comes to the desired limit hence I can end up taking a lot of treatment. I then decided to adhere to stop salt fats and oils. My blood pressure started to come down. I am still taking one pill only".

- **This was confirmed by participant (HP 1) who said:**

"It is now going down since I stopped salt. I think if I have started it the time I was diagnosed I was going to be taking one tablet per day."

- **HP 18 said:**

"I am now taking three pills because I refused to live a healthy lifestyle when I was diagnosed that my blood pressure was going up. By then it was at a level that I was told to control it using diet, exercise and stopping alcohol. I did not listen. My blood pressure was too high and I was started with treatment and was increased until they were three because of stubbornness".

4.3.2.2 Sub-Theme 2.2: Non-Adherence to Lifestyle Modification

Participants showed knowledge of some complications that develop due to poor adherence to lifestyle and uncontrolled blood pressure. Most participants were aware of stroke, heart attack, obesity, and metabolic condition as some of the complications of poor adherence to lifestyle. However, few mentioned diabetes mellitus and cancer.

4.3.2.2.1 Stroke

The participants in this study expressed their knowledge about complications that might be caused by non-adherence to lifestyle modification.

- **HP 14 said:**

  "I don't think fats, oils and salt are benefiting. They will make you fat and blood pressure will be uncontrolled you will start to have severe headaches and dizziness hence, you will have a stroke, which is bad. I do not want to be in that situation."

- **HP 4 confirmed by saying:**

  "I know that if one does not adhere to a lifestyle that we are taught there is a possibility that one can have a stroke and will be physically disabled for life. It is better to adhere to avoid this".

- **HP 8 said:**

  "Complications of uncontrolled blood pressure are prevented by

adhering to lifestyle modification and taking pills as one was told by nurses. You will feel dizziness and body weakness then it will be a stroke. That is why when I experienced dizziness I immediately assumed that may be blood pressure is high. I am afraid of stroke".

4.3.2.2.2 Heart Attack

Participants showed heart attack as one of the complications of hypertension and poor adherence to lifestyle modification. This was confirmed by direct quotes from participants.

- **HP 17 said:**

  "My heartbeat made me uncomfortable. I started to suspect that I may have a heart attack that is why I went to a clinic for consultation. I found that my blood pressure was very high but I was taking treatment correctly. I started to realise that I can have a heart attack if I do not adhere to lifestyle modifications."

- **HP 14 supported by saying:**

  "Unhealthy lifestyle and hypertension may lead to a heart attack. When sometimes I feel my heart beating like it is outside the chest, I fear that it may complicate to heart attack and this is serious".

- **HP 1 said:**

  "Hypertension may lead to a heart attack if not controlled. It is only that changing diet and doing exercise is not easy but I need to try bit by bit because I sometimes have this pounding heart"

4.3.2.2.3 Obesity

In this study, participants expressed obesity as one of the effects of non-adherence to lifestyle modification.

- **HP 14 said:**

  "I was very fat with a big stomach. I ate too much junk food. At home, I used porridge and meat, especially beef. My stomach was big (trying to show estimated diameter with his hands) and weight of my stomach only was plus or minus 25 to 30 kg".

- **HP 16 supported by saying:**

  "I started doing exercise and I used to go to the playground and run around the ground 10-11 times with these boys I work with 3 times a week. Though I am still fat, I am better than before I was too fat. If was not exercising, I think I was going to be very much obese".

- **HP 17 supported by saying:**

  "When I was still a heavy drinker we use to have braai every week and I was too fat. No wonder this hypertension. It was too much. We ate meat and drink beer until late".

4.3.2.2.4 Metabolic Conditions (Diabetes Mellitus)

The participants in this study showed this as evidenced by the direct quote below.

- **HP 15 said that after developing diabetes:**

  "I used to ignore to adhere to a healthy lifestyle. Then will feel headache which is not stopping, dizziness and dry mouth. At first, I ignored that because I thought I have treatments for blood pressure, things will be ok. It became worse and when I came to the clinic my blood pressure was too high and I was checked and found my blood sugar going up now. I understand that if not adhering to correct

lifestyle one can develop diabetes".

- **HP 6 who developed diabetes after being diagnosed with hypertension said:**

  "I am now taking pills for sugar and blood pressure. I should have started with healthy behavior the time I was diagnosed with hypertension. Now instead of high blood pressure, I have diabetes (shaking her head.)".

- **HP 5 expressed her fears of diabetes:**

  "I was told that I will have diabetes if I do not follow the correct diet and exercise that is why I no longer take fizz drinks. I am afraid of diabetes because my mother is having diabetes maybe I have inherited the gene and I can have it if I am not careful".

4.3.2.2.5 Joints or Skeletal Problems and Cancer

In this study, participants showed that unhealthy behaviour might result in cancer development and joint pains. This was confirmed by direct quotes below.

- **HP 9 said:**

  "I am now afraid of taking these fats because they have to lead me to where I am today. Since I started avoiding salt and fats my blood pressure is controlled. I have heard that if I do not follow the correct diet, I am also at risk to have joint problems and cancer".

- **HP 2 expressed damage that overweight does to the bones:**

  "The more one is obese there is a possibility of developing joints problems because he/she will be heavy for the bone or joints to carry. My father is now using crutches, he is overweight and always complains of painful joints and bones".

- **Another participant (HP 14) expressed junk food as poison:**

> *"Most of the junk food that we eat are full of poisons that can cause cancer. They are damaging us. Especially this meat that stays for a long time in refrigerators. Who knows when they were packaged? These are poisons that we are taking into our bodies. Can't you see that children are having joint problems very early? It was not like this when we were still taking vegetables. Now we think we are rich and we afford to buy what we want that is why we die early because of cancer and stroke".*

HP 13 said:

> *"We are just killing ourselves because of unhealthy behaviors. I have hypertension now, then I will have all these cancer and joints problems because I did not take care of myself. Unhealthy behaviors are very damaging".*

4.3.2.3 Sub-Theme 2.4: Beliefs and Myths

There were different belief and myths that participants have concerning hypertension, its cause and its management Some participants believed that hypertension is not be found in people who are always laughing and not easily, but they did not consider other unhealthy lifestyles like diet and physical exercise.

- **HP 16 said:**

> *"Though I heard that smoking was bad for my health I did not take it seriously until the day I was diagnosed with hypertension. I did not think I could have hypertension because I am always laughing with people not angry. I thought hypertension is for those who are easily angered. Now I am aware that if I continue to smoke I might die soon".*

- **HP1 said:**

"There are hypertensions that are witchcraft issues. Though you exercise and stop taking meat and fats, it remains high. This are those that will lead you to stroke unless you consult your traditional healer

- **HP 5 said**

"They have helped me because I was not taking treatment because my pastor have prayed for me and said I am delivered. I must have faith that I am healed and I did not care what I ate because pastor told me that I was healed".

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- **HP 1** showed that she was not engaging in physical exercise because she feared that if she started to exercise and things happen that she stop she is going to be too fat:

"I do not exercise because if something happen that I stop I am going to be too fat." Hence there is a need for people to know about exercises and its health benefits."

There were people who believe that exercise is done in the playground only.

- **HP13 said:**

"We cannot exercise because we are far away from the playground if we were having a playground next to our dwellings it was going to be better". This means that patients with hypertension should be taught on different exercises that can be done indoors."

4.3.3 Theme 3: Challenges Related to Adherence to Lifestyle Modification by clients with Hypertension

Challenges that were expressed and hindering adherence to lifestyle modification by participants in this study were on diet and exercise. Participants in this study managed

to adhere to the reduction of alcohol intake and stopping smoking. However, participants have challenges to adhere to diet and doing physical exercises because of sharing same food with others, lack of taste of food without salt, tempting desire of unhealthy food, eating out of home, lack of knowledge, lack of family support, laziness, lack of motivation, lack of resources and busy schedule.

4.3.3.1 Sub-Theme 3.1: Sharing Same Food

Most participants showed that they shared the same food and this gave a challenge because they have to eat a restricted diet.

- **HP 18 said:**

  "We are used to eating the same food together as a family. Family members must know high blood pressure because you find that as a husband staying with my wife you will find that she prepares food with salts and fats not knowing she is killing me. Sometimes she does not understand when I say she will have to prepare separate food for me."

- **HP 14supported by saying:**

  "I am used to eating the same food with the family. It is difficult for me to prepare a double menu.

- **HP 12 said:**

  "We share the same food but if other family members want to use salt and add that day without separating mine hence I am forced to eat that food with salt and I have no other option. I do not want to give them a lot of work".

- **HP 8 supported and said:**

  "Dinner time is the time we eat together as a family hence we share same food".

Participants also have a challenge of sharing the same food, even at work.

- **HP 15 said:**

  "At work, we contribute money to buy food that we eat together. Restaurants foods are full of fats and salt".

- **HP 10 said:**

  "During family or community gatherings I do not have an option, I have to take what is there because it is difficult to be selective in front of other people".

4.3.3.1.1 Lack of Taste

Some participants who were used to taking food with salt expressed that food without salt has no taste this was a challenge on adherence to lifestyle modification. This is confirmed by direct quotes from the participants where they expressed that food without salt is tasteless and that is causing them not to adhere to the recommended diet.

- **HP 15 said:**

  "To be honest food without salts like vegetables and meat is tasteless. I cannot eat and enjoy it. I know that I have to avoid adding salt but it has no taste. Can you imagine taking a chicken portion or vegetable without salt? And even taking vegetable alone without a piece of meat next to it, I do not feel ok".

- **HP 13 said:**

"I try to take food without adding salt but I cannot enjoy it because it is not tastier. Salt makes vegetables or meat tastier. We are used to adding salt and it is difficult not to add salt. We are addicted to salt but it is killing us in return, hypertension is not controlled and nurses are adding treatments after another to try to help us to control the blood pressure".

- **HP 5 supported this:**

"Salt enhances the taste of meat and vegetables that is why we add salt even though nurses said it is not good for hypertension".

4.3.3.1.2 Tempting Desire

A tempting desire was a challenge when one is changing from an unhealthy diet to a healthy diet. This was shown by the direct quotes from the participants in this study. Some participants were tempted when seeing others and some were tempted alone at home.

- **HP 17 said:**

"I am still trying but sometimes I am tempted and I add. When my wife is not near I steal and add salt but if she finds out she will be complaining. But I cannot hold myself. Sometimes my wife used to hide salt where I could not find it but I buy mine and hide it that I will add when she is not around. However, I am killing myself not my wife but it is just that".

- **HP 13 said:**

You know, if I do not see junk food for a while I do not take a restricted diet and drink beer, but seeing that cold bottle of beer and wors/meat I cannot hold myself. I end up saying I will take just a small amount. One sip and piece of meat calls to another, from there I say never mind (clutching and throwing out right hand) it is only for today.

I will not repeat tomorrow. But until now I am still struggling.

- **HP 6 said:**

  "My greatest temptation is chips. I tried to avoid them but that smell is so charming I cannot hold myself when passing a restaurant. They are cheap and I can afford them".

- **HP 1 supported by saying:**

  "Junk food like chips are so tempting to eat. One must be firm enough to say no to the temptation".

4.3.3.1.3 Eating Out of Home

In this study, participants showed a desire of eating a restricted diet as a challenge when eating out of the home setting like at workplaces, parties/social gatherings, and restaurants.

- **One participant said:**

  "When I am in (well-known restaurant) I filled up with all these junks. When I was diagnosed, then I said to myself 'N' you are killing yourself. I decided to stop eating from restaurants. When you are still doing it, you think 'ek eet lekker.' But we are killing ourselves".

- **HP 10 said:**

  "During parties and social gatherings there is nothing you can do. I eat whatever is the offer because when I refuse they may think I am rude".

- **HP 15 supported by saying:**

  "At work, we contribute money to buy food that we eat together. Restaurants' foods are full of fats and salt. I have also a problem

when I am in social gatherings and parties".

- **HP 1 said:**

"When I am at home I can try to use vegetables and avoid salt and oils in my food. But, when I am doing shopping during month-end I cannot come back home without eating bugger or Kentucky Fried chicken. I mean it is not every day it is just when I am eating away from home. Sometimes I do not mind what is on my plate when I am in social gatherings or parties because people may say I qm rude when I do not eat while others are eating".

4.3.3.1.4 Lack of Knowledge.

Clients with hypertension might not adhere to lifestyle modification because they do not know what they might do and to avoid when having hypertension (Anyians 2018:15). Participants showed to have poor knowledge of types of oils needed in the body and oils which are bad for health.

- **HP 10 said:**

"We need to be taught about the type of oils to use when one is having hypertension because we do not know which type to use, and we end up using the wrong ones and our blood pressures go up. "

- **HP 5 said:**

"Since food without salt or oils is tasteless, I do not know what I can use to replace salt or oils. I think if there were certain spices that that can stand for oils and salt, which can help".

- **HP 6 said:**

"I have heard that there are oils that patients with hypertension can use but I have not yet bought it, I do not even know its name but I think if I ask from a store they can show me. I think it will be too

expensive".

4.3.3.1.5 Lack of Family Support

Some of the participants in this study expressed a lack of support from their families.

This was confirmed by the direct quotes from participants

- **HP 11 said:**

  "When I invite my wife to a clinic, she used to say she is working. I think if she comes with me to the clinic she will understand when I say I am not supposed to take oils and fats because she does not know my diet. She doesn't want to cook she wants us to eat takeaway always". This means that participants take family's preference as a priority."

- **HP 1 said:**

  "My children do not like vegetables hence if I cook vegetables and not meat it will be for me alone and they will be complaining in a way that will disturb me. They even do not eat for the whole day".

- **HP 16 said:**

  "My wife does not know the importance of exercise and is not interested in exercise. When I am doing exercises at home I am taken as a fool hence, it discourages me to continue. That is why I depend on the weekends when I am at home and not engaged where I will be with others outside the home. She does not come to the clinic maybe she will learn that physical exercise is important. She always says she is busy".

- **HP 8** supported that lack of family support affects adherence to physical exercise:

  "Exercise at home is not easy if there is no one who is supporting. It is the same as in diet if family members are not supporting you it is

difficult".

This means that family members who did not know lifestyle to be adopted by clients with hypertension gave participants a challenge to adhere to lifestyle modification. However, other participants did not disclose their hypertension diagnosis and management to family members. This was supported by participants' direct quotes.

- **One participant said:**

  "I have not yet told my wife that I am on the treatment of blood pressure. And I cannot invite her to come with me for follow up. I cannot blame her when she is cooking for me restricted diet".

- **Another participant said:**

  "My daughter-in-law is not aware that I have hypertension and she just cooks whatever she likes. She is the one who gives me problem".

4.3.3.1.6 Laziness

Participants in this study showed laziness as the prime cause of non-adherence to exercise. HP16 said:

"Sometimes, during weekends, I am too lazy to go for physical exercise with my group. I sometimes feel just tired that I will not go for exercise. There are times when I will force myself to go and join them and I felt strong along the way. But, most of the time I feel so lazy that I just ignore the call or just shut down my phone."

- **HP 18 said:**

  "Most of the time there are no challenges it is only that I am lazy It is just laziness and feeling not having the energy to go. There are times

that I say there is nothing that can stop me from exercising, and I use a skipping rope until I fell sweating. Or just going out walking. If I sweat at least it is something". This means that participants had no energy to engage in physical exercises.

- **HP 7 supported by saying:**

  "Mmm… Exercises Ah…eh. I am just too lazy to exercise I do not want to lie. I feel that I do not have energy and I am to exercise. But I think I must exercise because it is healthy. At least if one exercises and sweats it is a good thing".

4.3.3.1.7 Lack of Motivation

In this study, some participants expressed that they were not motivated for lifestyle motivation, especially physical exercise. Lack of motivation was confirmed by direct quotes from participants.

- **HP 2 said:**

  "Motivation is needed in this. Exercise is painful, I did it once and did not return. I do not have a partner that I go with here most of them are on the other side of the village".

- **HP 14 supported by saying:**

  "Nothing motivates me to do exercise. I am staying alone and no one is doing exercise and I cannot exercise alone. Walking along the road without anywhere to go looks like I am mad". This means that participants need the company of others to be motivated to engage in physical exercise."

- **HP 10 supported this and said:**

  "Exercising alone is not motivating. You feel like you are being punished and I do not want that. If there was an organized group for

exercise where we have date and time to exercise, I think it can be better".

4.3.3.1.8 Lack of Resources

Most participants in this study showed playground absence of trained person who will in turn train clients in the facilities and in the communities as a challenge to adhere to exercises. This was confirmed by direct quotes from participants.

- **HP 10 said:**

  "I do not engage in physical exercise because there is no playground next to our residing area and the one which is used is far and it discourages to go before you spend sometimes before reaching there. When you come back tired it takes some time to reach home, hence I do not prefer to go there. I was once called by other members of the elderly soccer team and I tried to measure the distance and it discourage me. If it was next to our area it was better I was going to be encouraged to join them."

- **HP 7 said:**

  "There is no playground next to our clinic that we can exercise while monitored by health care workers and showed different exercises. It is far from the clinic and health care workers cannot come to help us there because he/she is supposed to come back for work after helping us".

- **HP 9 said:**

  "If there was a space where they can make us exercise around the clinic and outside it will help. When we come inside the clinic hall they also make us do other exercises. It can be good. But, there is no space and it is difficult to teach us different exercises".

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4.3.3.1.9 Busy Schedule

In this study, participants showed that they were busy and have no time to exercise. This was shown by participants' direct quotes.

- **HP 10 said:**

  "I do not exercise because I am busy at work and I do not have time to exercise. The whole week I am at work and weekend is my time to do home chores".

- **HP 6 supported this by saying:**

  "There is no one to remain with my small babies when I go for exercise. I am always busy with them, I do not have time to exercise because of that".

- **HP 8 said:**

  "The whole day, I am busy in my spaza shop so I do not have time to go for exercise. There are others who have a walk in the morning but I will be busy preparing to go to my spaza shop".

4.3.4 Theme 4: Suggestions Related to Enhancing Lifestyle Modification of clients with Hypertension

Participants expressed their suggestion on how lifestyle modification of clients with hypertension could be enhanced. Participants suggested that there must be continuous sharing of information about lifestyle modification by health care workers and client who showed good adherence to lifestyle modification; involvement of family members, friends, traditional healers, pastors when health care workers share information about lifestyle modification; educating of lifestyle modification in civic

meetings, schools, community clubs, churches, funerals and suggestion of having playground for clients with hypertension, pamphlets, trained person responsible for lifestyle modification in the facility and in the community to assist clients with hypertension.

4.3.4.1 Sub-Theme 4.1: Continuous Sharing of information about lifestyle modification

In this study, participants expressed suggestions that there must be continuous information sharing by health care workers on lifestyle modification of clients with hypertension. The direct quotes from the participants confirmed this.

- **HP 5 said:**

  "I think most of us are having little knowledge on healthy lifestyle, I think we need more knowledge and we can be encouraged to adhere. Some of us are using traditional medicines together with these treatments and will end up with damaged livers and kidneys".

- **HP 4 said:**

  "Even though we are twenty and we are taught, not all of us will grab it today but at least five will hold on to the information and change the next time maybe the others will grab the information taught on and on like that we will learn.

- **HP 7 said:**

  "We need information every time we come to the clinic because some of us do not have full information on lifestyle needed when we have hypertension. Some of us do not have a family member with hypertension that can advise us what to do. We end up listening to advice that contradict what nurses want us to do. I think nurses must teach us the correct thing."

- **HP 3 said:**

  "We lack information that is why we are not following the correct lifestyles. It is not easy to change but continuous information that is shared by the nurse will help us. Anything that you hear continuously becomes part of you. Whether it is good or bad it is the same. I think it is better if we hear the correct thing every time we come to the clinic.

4.3.4.1.1 Involvement of family members, traditional healers, pastors, when health care workers share information about lifestyle modification of clients with hypertension

In this study, participants expressed their suggestion that patients' support systems like family members, friends, community members and religious leaders like pastors and traditional healers may help to enhance lifestyle modification of clients with hypertension if they are having necessary knowledge.

- **HP 5 said:**

  "Family members are important when it comes to lifestyle modification. If family members are aware that I am using treatment of hypertension and I am not supposed to add salt/oils in my food, they will be aware of how I am supposed to live. They will be aware that they must not add salt /fats to my food friends, pastors and traditional healers are also a problem if they are not having knowledge on hypertension and lifestyle that is needed".

- **HP 1 supported and said:**

  "Family members must have knowledge about high blood pressure and lifestyle because you may find that an old person staying with grandchildren and not knowing what is to be done and will be given food with salt and fats. I think besides the family member there is a need for traditional healers to know because they influence our grannies, others are influenced by their pastors, I think they must

know the importance of a healthy lifestyle. all in all the whole community members must know about hypertension and healthy lifestyle because even though they are healthy today, tomorrow they may be ill hence we all need this information to support us and to be ready for future".

- **HP 14 said:**

"The family members are supposed to support a person with hypertension on exercises and preparation of relevant diet in order to enhance adherence. The family member must come to the clinic so that they may hear what nurses are teaching us because there is a problem when you tell them how you are supposed to live. I think even these pastors, traditional healers can help if they are taught because most of us believe on one of them and we take their advice because they help us in our problems".

4.3.4.1.2. Teaching about lifestyle modification in civic meetings, schools, community clubs, churches, funerals.

Education programmes were suggested to be in different levels like at home by homes, clinics, civic meetings, churches, schools, and media. At this level, different people can be reached that may have an impact on the support of clients with hypertension like family members and friends

HP 1 suggested:

"People must be taught in civic meetings, in schools and at home for it to be in the mind of all about hypertension and lifestyle modification. Even when one does not have hypertension, the day he/she will be diagnosed will be aware of the lifestyle to adopt".

- **HP 5 suggested:**

"Even at school learners can be taught to know what is expected

when their parents have hypertension. Health care workers can also go to our community clubs, churches, funerals and civic meetings".

- **HP 4 supported lifestyle programmes at different levels by saying:**

"I think there must be a time when health care workers go to different places like schools, homes, civic meetings, funerals, and media to tell people about hypertension and lifestyle modification."

- **Another participant supported and said:**

"Everyone must know about a healthy lifestyle. Nowadays people are eating junk food, they do not select. Everyone will have hypertension if they continue with an unhealthy lifestyle. Hence, information must be taken to every place like churches, funerals, schools, club meetings and media because some people do not come to clinics. Campaigns are very good because most people can be reached."

4.3.4.1.3 Suggestion of having playgrounds, pamphlets, trained person responsible for lifestyle modification in the facility and in the community to assist clients with hypertension.

In this study, a participant expressed the need for a person who is trained on lifestyle modification and place where lifestyle modification of patients with hypertension could be enhanced. This was confirmed by the direct quotes from the participant below**.** The participant expressed their concern about the shortage of places to exercise in the community and the clinic.

- **HP 10 said:**

"There must be a playground for patients with hypertension in each village so that when people with hypertension are told to exercise they will be told to go there at which day and time. There must be machines at the clinic that we can use and nurses can teach us

different exercises at each visit. They can also give us pamphlets that we can refer to at home."

- **HP 9 supported and said:**

"I think if we were having a person who is trained on lifestyle modification who can teach us how to change our lifestyles every visit there we will be able to comply with a healthy lifestyle. Posters and brochures everywhere at the clinic and community can also attract people to check what is there. The other thing I think is if we have a place where we can train as people with hypertension it can help."

- **HP 7 said:**

"My suggestion is that we must have somebody who is trained on how to change to a healthy lifestyle as people with hypertension. I think he/she can teach us every time we gather here. Or if we have community health workers who can help us in our playground for people with chronic diseases where we meet and have some exercises."

- **HP 13 said:**

"I think there must be people who work in the community who are trained about lifestyle modification of patients with hypertension. And they can concentrate on teaching us different exercises and how to prepare a healthy diet since some of us feel that the healthy diet that we prepare is tasteless. They can teach us better ways to make food tasteful without salt or oils. The use of pamphlets in our community can work because we can read what we are supposed to do and our family members without hypertension can read also. Nurses are giving us counselling but most of the time they are busy and not there for us".

4.4 Presentation of Data and Analysis of Findings of Phase 1b (Quantitative Survey)

The previous section focused on the data presentation and analysis phase 1a (qualitative study). The study was an exploratory sequential mixed method. Hence, the objectives of phase 1b (qualitative study) were developed after the results of phase 1a.

The objectives were:

- To explain what health care workers are doing about enhancing lifestyle modification of clients with hypertension in Limpopo Province, South Africa.
- To determine how health care workers may enhance the lifestyle modification of clients with hypertension in Limpopo Province South Africa.

The researcher conducted quantitative research study where self-administered questionnaires were used to collect data from the professional nurses working in PHC facilities of Mopani and Vhembe Districts. The respondents were male and female professional nurses aged 25-60 years registered with the South African Nursing Council (SANC) and working in the PHC facilities for one year and above. The researcher distributed 369 questionnaires. The researcher checked each questionnaire for completeness and accuracy. Only one questionnaire was incomplete and inaccurate and was spoiled. Hence, 368 questionnaires were completed and analysed.

Tables, graph pies were also used to describe and summarise the survey data. The results were presented according to the research questions and objectives that were formulated by the researcher.

4.4.4 Descriptive Statistics for Demographic Information Variables

4.4.4.1 Gender

The majority (n = 313) 85.05% respondents were females whilst the remaining 14.95% (n = 55) were males. Thus, nearly 9 in every 10 respondents who participated in the survey were females whilst the remaining 1 in every 10 respondents were males. Hence, it is not amazing that the majority of respondents were females since nursing was taken as a female profession. Below is the pie chart showing distribution of respondents by gender

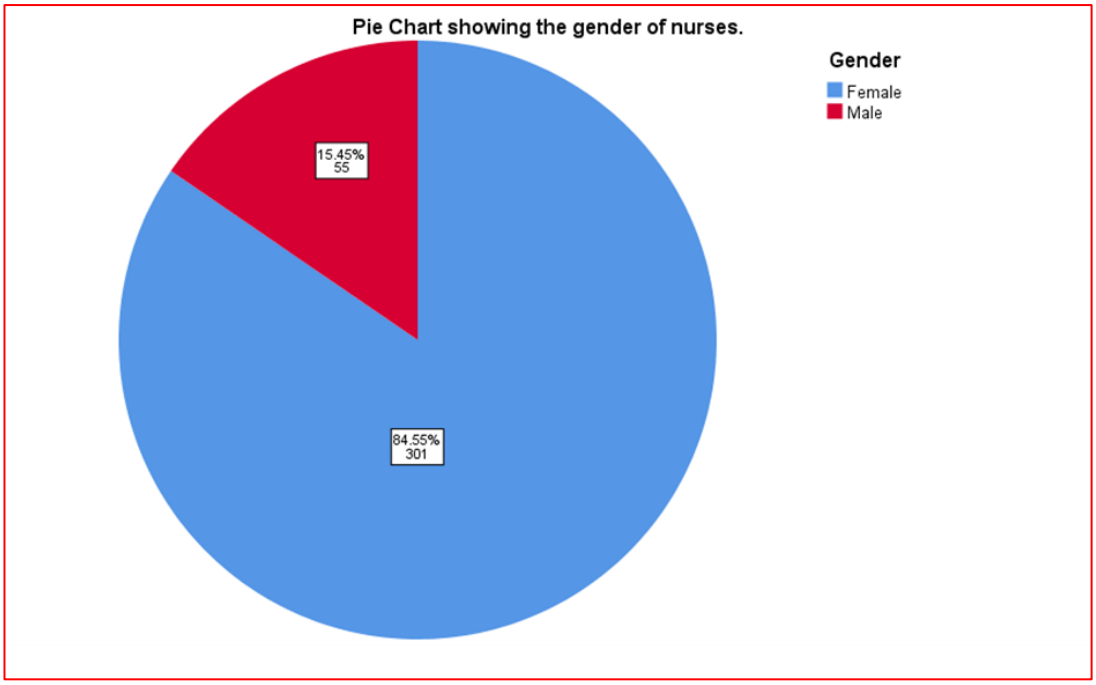


Figure 4.1: Distribution of respondents by gender

4.4.4.2 Age

Half 51.09% (n=368) of the total respondents were within the 45 - 50 years age group, 27.45% within 30 - 45 years, 14.40% (n=368) were between 51 - 60 years whilst 7.07% were aged between 25 - 29 years old. Hence, nearly 5 in every 10 respondents were aged between 30 - 45 years old, 3 in every 10 were aged between 45 - 50 years old whilst nearly 2 in every 10 were aged between 51 - 60 years old. The age group with most respondents was 45-50 years and was almost half of the total respondents who participated in the survey followed by ages from 30-44. This implies that most of the professional nurses working in the PHC facilities in Mopani and Vhembe districts have ages from 30-50 years of age which is the mature group and know the dangers of poor adherence to lifestyle modification.

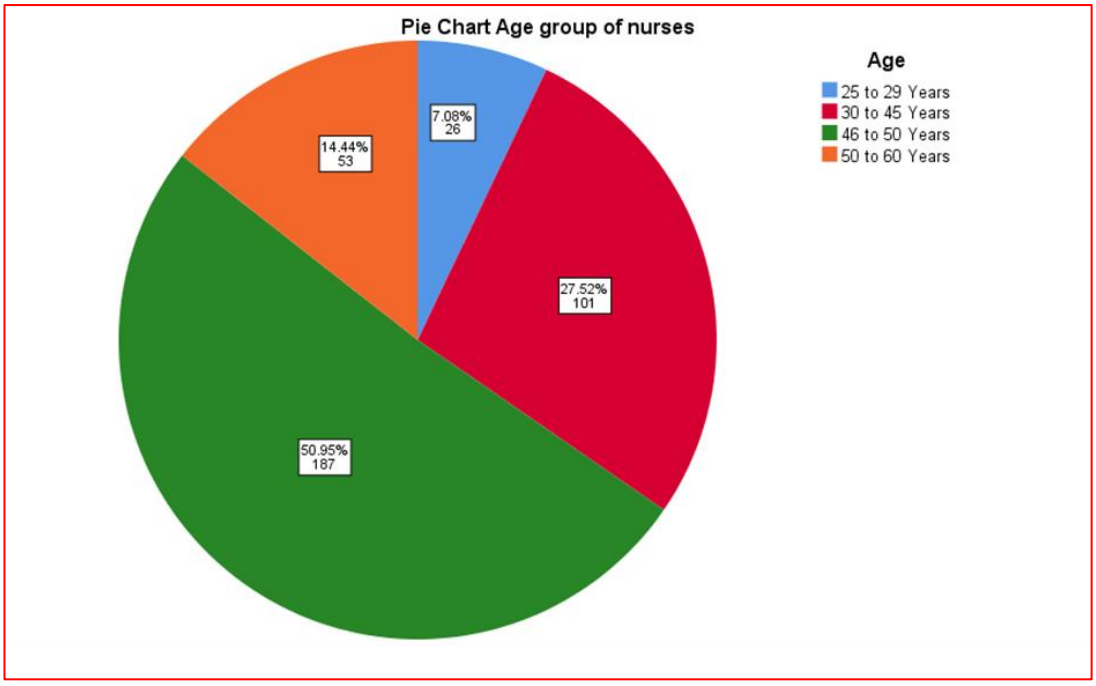


Figure 4.2: Distribution of respondents by age group

4.4.4.3 Years of Working as a Professional Nurse

The majority of respondents 74.73%,(n=68) reported that they had 11 - 30 years of working as professional nurses, followed by 16.3%,(n=368) who had 6 - 10 years, then 6.25% had more than 30 years and the remaining 2.72%, (n=368) had 1 - 5 years working experience as professional nurses. Thus, nearly 7 in every 10 respondents had 11 - 30 years of working experience as professional nurses, 2 in every 10 respondents had 6 - 10 years of working experience, whilst the remaining 1 in every 10 had more than 30 years. This implies that the majority of respondents had experience working as professional nurses and had attended different clients with hypertension. below is a pie chart showing distribution of respondants by years working as a professional nurse.

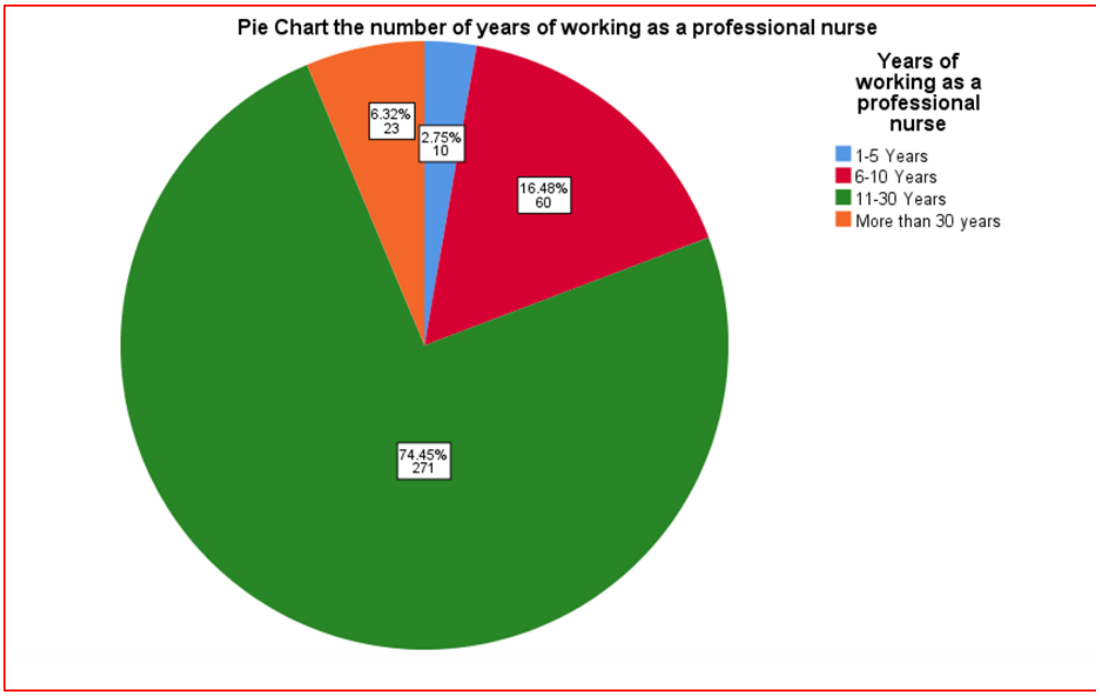


Figure 4.3: Distribution of respondents by years of working as professional nurses

4.4.4.4 Number of Hypertension clients Seen Per Day

The researcher sort to find out the workload of clients with hypertension in different PHC facilities because not only clients with hypertension were seen in the PHC facilities but also other categories of clients are seen daily. In this study, respondents who attended to less than 10 clients with hypertension per day were 13 and that was 3.63%, (n=368). The respondents who saw 10-30 clients with hypertension per were 319 and that was 66.68%. The respondents who saw more than 30 clients with hypertension per day were 36 and that was 9.78%. This revealed that most nurses in the PHC saw between 10-30 clients with hypertension per day. Hence, approximately 97%, (n=68) of professional nurses in PHC facilities in Mopani and Vhembe districts attend to 10-30 clients with hypertension per day. This means that daily there were

clients with hypertension who visited PHC facilities. Below is distributionof respondents by number of clients with hypertension.

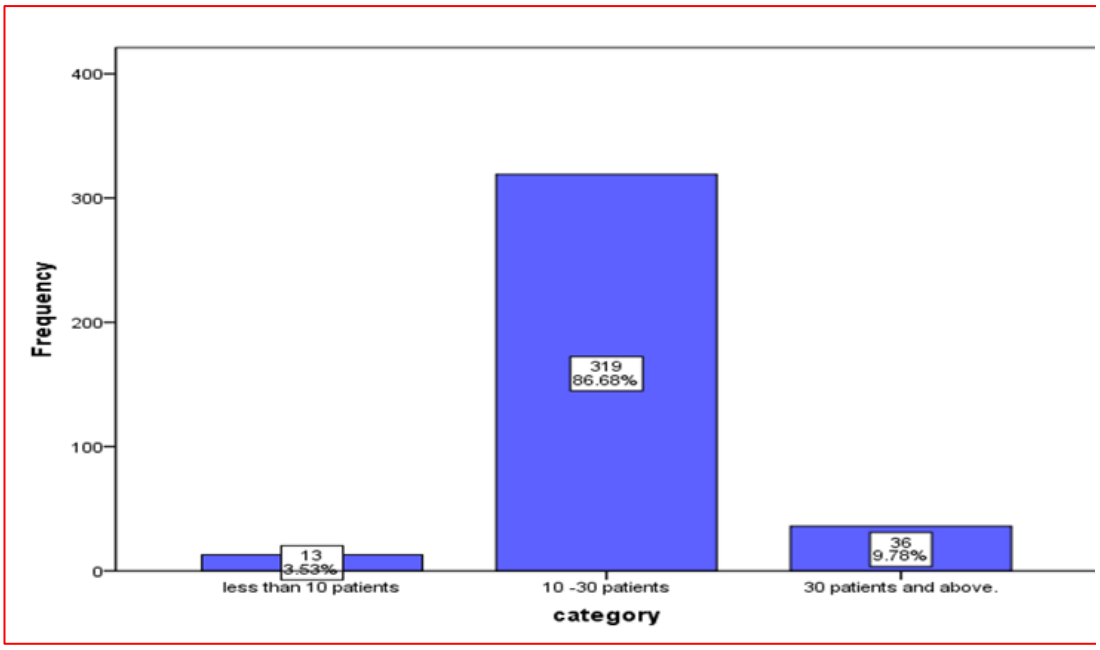


Figure 4.4: Distribution of respondents by number of clients with hypertension seen per day

4.4.4.5 Experience Regarding clients' Adherence to Lifestyle Modification

The researcher requested respondents to complete questions on experience of nurses on client's adherence. Below are findings on whether nurses have noted the non-adherence to lifestyle modification of clients with hypertension. According to the experience of professional nurses regarding clients' adherence to lifestyle modification, 90.49% (n=333) respondents that clients with hypertension were not adhering to lifestyle modification. Only 9.51% (n=35) of respondents showed that clients with hypertension were adhering to lifestyle medication. Therefore, approximately 9 in every 10 respondents believed that clients with hypertension were not adhering to lifestyle modification. This implies that most of the clients coming to

PHC facilities in Mopani and Vhembe districts showed non-adherence to lifestyle modification. Below is distribution of respondents by experience of nurses on client's adherence to lifestyle modification.

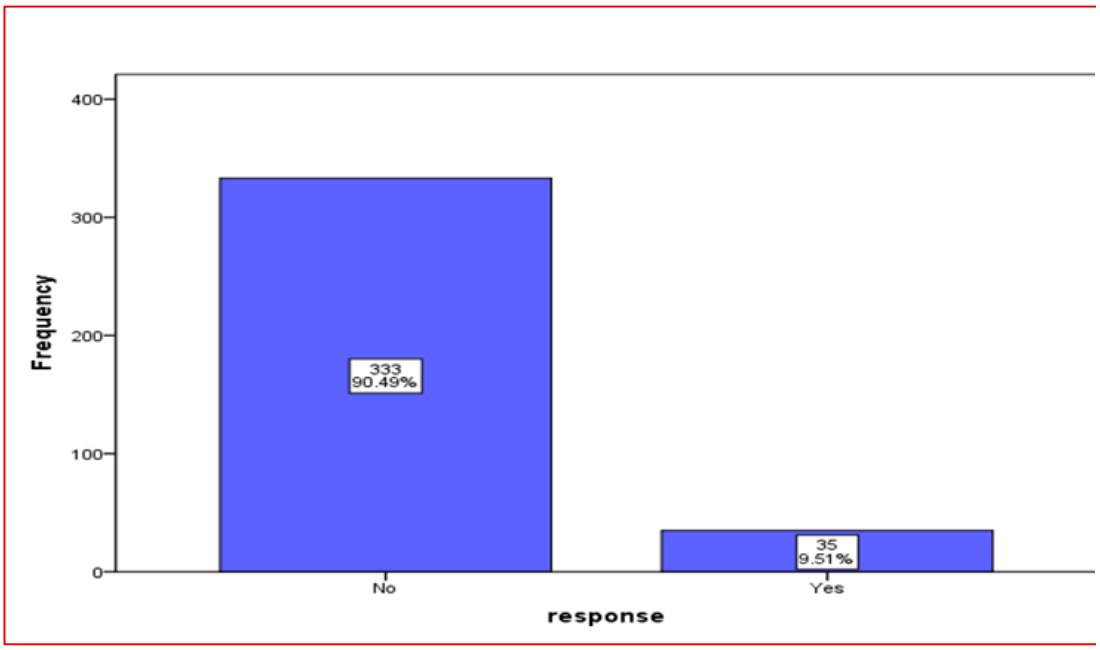


Figure 4.6: Distribution of respondents by experience of nurses on client's adherence to lifestyle modification

4.4.5 Roles of Health Care Workers Regarding Enhancement of Lifestyle Modification

Methods to enhance lifestyle modification of clients with hypertension and their frequencies were explained.

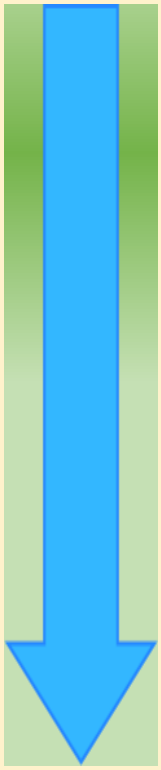
4.4.5.1 Methods to Enhance Lifestyle Modification of Clients with Hypertension

The researcher wanted to methods that were used to enhance lifestyle modification of clients with hypertension. The table below present results summarising the distribution of responses per each method employed by respondents to enhance lifestyle

modifications with hypertensive clients in health facilities. Health talks was used by 99.2% (n=365) of respondents followed by clients' adherence clubs with 29.1% (n=106), then campaigns with 18.8% (n=70)), then home visits with 18.2% (n=66) and posters with 8,2% (n=29). This were the top five methods used by respondents for enhancing lifestyle modifications of clients with hypertension. Furthermore, support groups were used by 5.7% (n=22), then school visit by 5.2% (n=18), civic meetings by 2.4% (n=7), brochures/flyers by 2.2% (n=7), community clubs by 19.% (n=7), funerals by 1,6 (n=7), and media (radio) by 1.6 (n=6).

Table 4.3: Methods to enhance lifestyle modification

Method	No	Yes	Most Frequent
Health talks	0.8%	99.2%	
Clients' adherence clubs	70.9%	29.1%	
Campaigns	81.3%	18.8%	
Home visits	81.8%	18.2%	

Posters	91.8%	8.2%	
Support groups	94.3%	5.7%	
School visits	94.8%	5.2%	
Civic meetings	97.6%	2.4%	
Brochures/fliers	97.8%	2.2%	
Community clubs	98.1%	1.9%	
Funerals	98.4%	1.6%	
Media (radio)	98.4%	1.6%	
Cell phones	98.4%	1.6%	
Church gathering	98.9%	1.1%	**Less Frequent**

4.4.5.2 Frequency of Methods to Enhance Lifestyle Modification

The respondents were asked to show how often they used methods to enhance lifestyle modification of clients with hypertension given the following options were when the opportunity arise daily, weekly, monthly, bimonthly, quarterly, twice a year, yearly and rarely. The findings showed that health talks were used daily for most of the respondents that are, 42.2% weekly 31.9% when an opportunity arises 25.1%, and monthly 0.8%. Health talks were mostly done daily and weekly. Respondents who used posters to enhance lifestyle modification of patients with hypertension daily were 42.9%, 37.1% used posters weekly when an opportunity arises 11.4%, monthly 5,7% and yearly 2.9%. Posters were mostly used daily and weekly.

Similarly, brochures/flyers were mostly used weekly and daily that is 56.8% of respondents used them weekly, 29.7% used them daily, 8,1% when opportunity

aroused and 2.7% used them both monthly and bimonthly. However, a support group was mostly used monthly by 37.9%, then 31.0% used quarterly, 24.1% monthly, and 6,9% twice a year. Most respondents that are 42,9% attended civic meetings to enhance lifestyle modification mostly quarterly, 32,1% twice a year, 14,3% when opportunity aroused, and 3,6% attended civic meetings monthly and bi-monthly to enhance lifestyle modification. Rarely, 3,6% of respondents used civic meetings to enhance lifestyle modification of clients with hypertension.

Most of the respondents that are 42,9% enhance lifestyle modification of patients with hypertension in church gatherings twice a year, 28,6% when opportunity aroused, 14,3% quarterly, 4,8% bi-monthly and yearly then 3,6% rarely used church gathering. However, 45,8% of respondents attended a funeral gathering to enhance lifestyle modification of clients with hypertension when the opportunity aroused, 33,3% attended twice a year, 12,5% quarterly then 4,2% attended both monthly and yearly with an aim to enhance lifestyle modification of clients with hypertension. School visits were done by 27,6% twice a year to enhance lifestyle modification of clients with hypertension, 24,2% rarely did school visits, 20,7% yearly, 13,8% quarterly, 6,9% monthly and 3,4% bimonthly and when opportunity aroused. Hence school visits were rarely used to enhance lifestyle modification.

However, most respondents that are 44,0% did home visits monthly, 34,7% did home visits weekly, 14,7% when opportunity aroused, 4,0% bi-monthly and 2,7% daily. Most respondents that are 48,7% used clients' adherence to enhance lifestyle modification bi-monthly, 44,5% monthly, 3,4% weekly, 1,7% quarterly and 0,8% shared both yearly and twice a year. Furthermore, community clubs were used by 28,6% of respondents to enhance lifestyle modification of clients with hypertension quarterly, 25,0% used community clubs bi-monthly, 17,9% twice a year, 14,3% when opportunity aroused,

10,7% yearly and 3,6%monthly. However, 25,0% of respondents rarely did campaigns to enhance lifestyle modification of clients with hypertension, but 31,3% did campaigns yearly, 17,2% twice a year, 14,1% quarterly, 6,3% monthly, 4,7% bimonthly then 1,6% did campaigns daily.

Half of the respondents, that is 50% used media (radio) to enhance lifestyle modification of clients with hypertension, 28,6% used media daily, 7,1% of respondents used media monthly, yearly then 7,1% rarely used media to enhance lifestyle modification. Most respondents that are 51,7% used cell phones daily to enhance lifestyle modification, 34,5% of respondents used cell phones weekly, 3,4% used cell phones monthly but, 10,3% rarely used cell phones to enhance lifestyle modification of clients with hypertension. This means that more than half of the respondents contacted their clients with hypertension daily through cell phones encouraging them on lifestyle modification.

The survey respondents used health talks, posters, and cell phones to enhance lifestyle modification on a daily basis, brochures/flyers, and media (radio) were mostly used on weekly basis, support groups on a bimonthly basis, civic meetings on a quarterly basis, church gatherings were used on bi-annual (twice in a year) basis, funerals were used when an opportunity arises. Home visits, clients' adherence clubs and community clubs were used on a monthly, bi-monthly, and quarterly basis respectively. School visits were rarely done. This implies that school visits are a challenge. This finding showed that respondents were enhancing lifestyle modification using different methods however clients with hypertension reported that they need health care workers to give information on lifestyle modification each visit.

Table 4.4: Distribution of methods to enhance lifestyle modification by their usage frequency

Method	When opportunity arises	Daily	Weekly	Monthly	Bi-monthly	Quarterly	Twice a year	Yearly	Rarely
Health Talks	25.1%	**42.2 %**	31.9%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Posters	11.4%	**42.9 %**	37.1%	5.7%	0.0%	0.0%	0.0%	2.9%	0.0%
Brochures flyers	8.1%	29.7 %	**56.8%**	2.7%	2.7%	0.0%	0.0%	0.0%	0.0%
Support groups	0.0%	0.0%	0.0%	24.1%	**37.9%**	31.0%	6.9%	0.0%	0.0%
Civic meetings	14.3%	0.0%	0.0%	3.6%	3.6%	**42.9%**	32.1 %	0.0%	3.6%
Church gathering	28.6%	0.0%	0.0%	0.0%	4.8%	14.3%	**42.9 %**	4.8%	4.8%
Funerals	**45.8%**	0.0%	0.0%	4.2%	0.0%	12.5%	33.3 %	4.2%	0.0%
School visits	3.4%	0.0%	0.0%	6.9%	3.4%	13.8%	27.6 %	20.7%	**24.1%**
Home visits	14.7%	2.7%	34.7%	**44.0%**	4.0%	0.0%	0.0%	0.0%	0.0%
Clients'adherence clubs	0.0%	0.0%	3.4%	44.5%	**48.7%**	1.7%	0.8%	0.8%	0.0%
Community Clubs	14.3%	0.0%	0.0%	3.6%	25.0%	**28.6%**	17.9 %	10.7%	0.0%
Campaigns	0.0%	1.6%	0.0%	6.3%	4.7%	14.1%	17.2 %	**31.3%**	25.0%
Media (radio)	0.0%	28.6 %	**50.0%**	7.1%	0.0%	0.0%	0.0%	7.1%	7.1%
Cell phones	0.0%	**51.7 %**	34.5%	3.4%	0.0%	0.0%	0.0%	0.0%	10.3%

4.4.6 Professionals Who Enhance Lifestyle Modification of clients with Hypertension

Researcher wanted to find out if all member of the PHC team were enhancing lifestyle modification to clients with hypertension since clients were mentioning nurse as the one that they received information from. The study revealed that approximately 100%

(n = 366) reported that nurses enhanced lifestyle modification for clients with hypertension. Followed by 27% (n = 101) who revealed that community health workers were enhancing lifestyle modification for patients with hypertension then 20% (n =72), dietician 13% (n = 48), doctors 12% (n=44,) Lay counsellors and lastly by 9% (n=33) who reported that trained person enhanced lifestyle modification of clients with hypertension.

Table 4.5: Distribution of respondents by professional responsible for enhancing lifestyle modification

Profession	No		Yes	
Nurse	2	0.5%	366	99.5%
Community health worker	267	72.6%	101	27.4%
Dietician	296	80.4%	72	19.6%
Doctor	320	87.0%	48	13.0%
Lay counsellor	324	88.0%	44	12.0%

4.4.7 Challenges Associated with the Involvement of Family Members When Enhancing Lifestyle Modification of Clients with Hypertension

The respondents were also asked about the challenges that were associated with the involvement of family members when enhancing lifestyle modification of clients with hypertension. Majority of respondents 56.8% (n = 208) reported that the challenges were associated with lack of knowledge, followed by 48.9% (n=179) who perceived busy schedules then 27.9% (n=102) who revealed clients not disclosing about hypertension, and lastly 17.5% (n=64) who revealed that there were no challenges associated with involvement of family members when enhancing lifestyle modification.

These findings imply that there are challenges associated with family members'

involvement in enhancing lifestyle modification of clients with hypertension despite the willingness of nurses to include them when enhancing lifestyle modification of family members with hypertension. It showed that most of the family members of clients with hypertension were not having knowledge of the need for being there to support clients with hypertension.

Furthermore, family members were having a challenge in including patients' support in their busy schedules. However, there were clients with hypertension who did not disclose to families that they were having hypertension for reason that need further exploration. Therefore, family members were not involved. Hence, family support remained a barrier for adherence to lifestyle modification of clients with hypertension (Zou 2019:8). However, family members who were supporting the clients with hypertension when coming to the PHC facility sometimes come and go without receiving information on lifestyle modification of clients with hypertension. This was because nurses rarely gave the information on lifestyle modification as reported by clients during the qualitative study.

Table 4.6: Challenges associated with family members' involvement when enhancing lifestyle modification of Clients with hypertension

Challenge	**No**		**Yes**	
	F	**%**	**F**	**%**
Lack of knowledge	158	43..2%	208	56.8%
Busy schedule	187	51.1%	179	48.9%
Cltient not disclosing about hypertension	264	72.1%	102	27.9%
None	302	82.5%	64	17.5%

4.4.8 What Health Care Workers Can Do to Enhance Lifestyle Modification of Clients with Hypertension?

The researcher wanted to find out what nurses believe could be done for effective enhancement of lifestyle modification of clients with hypertension. Frequency of method used for improved effectiveness of enhancing lifestyle modification. The respondents were further asked about how frequent the methods of enhancing lifestyle modification should be for improved effectiveness given the following options: when opportunity aroused, daily, weekly, monthly, bimonthly, quarterly, twice in a year and yearly. The majority of respondents, that is 55.5% recommended that the health talks should be given daily, weekly 30,9% when the opportunity arises 12.8 % and monthly 0.8%.

The majority of respondents, that is 63.2% believed that posters should be used daily in order for them to be more effective, followed by weekly 29.5% and when an opportunity arises 4.5%, then monthly 1.4%. The brochures/flyers were recommended to be used daily in order to be more effective by 57.5%, then weekly 29.5%, when an opportunity arises 6.6%. However, 3.2% recommended brochures/flyers to be used bi-monthly, then monthly 2,3%), quarterly 0.3% and both twice a year and yearly were recommended by 0.6%. Support groups were recommended to be used by majority bimonthly 40.5%, then monthly 27.9%, quarterly 19.0%, twice a year 7.4% daily 3.4%, weekly 1.8% and yearly 0.2%. The findings showed that support groups to be effective in enhancing lifestyle modification of patients with hypertension should be used monthly/ bimonthly/quarterly.

The majority of respondents, 469% recommended that visits to civic meetings to enhance lifestyle modification of patients with hypertension should be done quarterly, followed by twice a year 188%, bimonthly 175%, monthly 75%, when an opportunity

arises 6.9% then yearly 1.9%. The visit to church gatherings was recommended by the majority that is 36.8% to be done quarterly, followed by twice a year 31,5%, then when an opportunity arises 11.1%, monthly 9.4%, yearly 6.5%. However, no respondent reported that they did visit church gatherings weekly and monthly, but it was recommended to be effective by 2,3% when enhancing lifestyle modification.

The majority of respondents, 35.4%, recommended enhancing lifestyle modification of patients with hypertension in funerals when the opportunity arises, followed by quarterly 28.0%, then twice a year 23.2%, both bi-monthly and yearly were recommended by 3.8% and weekly by 2.2%. School visits were rarely used to enhance lifestyle modification of patients with hypertension. However, it was recommended by majority 4.,0% to be used yearly to enhance lifestyle modification effectively, followed by twice a year 31.0%, then quarterly 12.3%, monthly 7.8%, bimonthly 3,9%, when an opportunity arises 3.3% and both daily and weekly were recommended by 0,3%. More than half of respondents, that is 59.7% recommended that home visits should be done monthly to be effective, followed by when an opportunity arises 17.6%, then weekly 12.7%, bimonthly 4.0%, twice in a year 2.0%, quarterly 1.4%, and yearly 0.9%.

Majority of respondents, that is 71.8% recommended patients adherence club to be used to enhance lifestyle modification of patients with hypertension bimonthly, followed by monthly 17.9%, then quarterly 7.1%, twice a year 2.1%, weekly 0.6% and 0,3% of the respondents recommended yearly or when an opportunity arises.

The respondents, that is 45.4% recommended community clubs to be used to enhance lifestyle modification quarterly, twice a year 19.8%, bimonthly 14.9%, when an opportunity arises 8.5%, yearly 5.5%, monthly 4.9% and weekly 0.9%. However, for campaigns to be effective, majority of the respondents that is 46.0% recommended

that they should be done twice a year, followed by yearly 36,5%, quarterly 13.6%, bimonthly 2.4%, and monthly 1.5%. Furthermore, media(radio) was recommended to be used to enhance lifestyle modification of patients with hypertension weekly by the majority of respondents 50.7%, followed by daily 42.0%, then quarterly 3.7%, twice a year 0.8 %, then yearly 0.3%. The use of radios was preferred to be used weekly since in rural areas radios are mostly used.

The use of cell phone was recommended by the majority, 72.1% to be used daily, then weekly 27.3%, and 0.3% of respondents recommended quarterly and yearly. The use of cell phones was the most preferred on a daily basis.

Table 4.7: Distribution of responses on frequency recommended for effective use of methods

to enhance lifestyle modification of clients with hypertension

Method	When opportunity arises	Daily	Weekly	Monthly	Bimonthly	Quarterly	Twice in a year	Yearly
Health talks	12.8%	**55.5%**	30.9%	0.8%	0.0%	0.0%	0.0%	0.0%
Posters	4.5%	**63.2%**	29.5%	1.4%	0.0%	0.3%	0.6%	0.6%
Brochures /fliers	6.6%	**57.5%**	29.0%	2.3%	3.2%	0.3%	0.6%	0.6%
Support groups	0.0%	3.1%	1.8%	27.9%	**40.5%**	19.0%	7.4%	0.3%
Civic meeting	6.9%	0.0%	0.6%	7.5%	17.5%	**46.9%**	18.8%	1.9%
Church gathering	11.1%	0.0%	2.3%	2.3%	9.4%	**36.8%**	31.6%	6.5%
Funerals	**35.4%**	0.0%	2.2%	3.5%	3.8%	28.0%	23.2%	3.8%
School visits	3.3%	0.3%	0.3%	7.8%	3.9%	12.3%	31.0%	**41.0%**
Home visits	17.6%	1.7%	12.7%	**59.7%**	4.0%	1.4%	2.0%	0.9%
Clients' adherence club	0.3%	0.0%	0.6%	17.9%	**71.8%**	7.1%	2.1%	0.3%
Community clubs	8.5%	0.0%	0.9%	4.9%	14.9%	**45.4%**	19.8%	5.5%
Campaigns	0.0%	0.0%	0.0%	1.5%	2.4%	13.6%	**46.0%**	36.5%
Media (radio)	0.0%	42.0%	**50.7%**	2.5%	0.0%	3.7%	0.8%	0.3%
Cell phones	0.0%	**72.1%**	27.3%	0.0%	0.0%	0.3%	0.0%	0.3%

4.4.9 Recommendations Regarding Enhancement of Lifestyle Modification

Nearly all respondents 99.5% (n=363) recommended that community health care teams should be included in enhancing lifestyle modification of clients with hypertension, 99.2% (n=362) suggested the marketing lifestyle modification to the community members in different gatherings like funerals, church gatherings, civic meetings and imbizos and 95.6% (n=349) recommended encouraging clients with hypertension to be ambassadors of lifestyle modification of clients with hypertension when enhancing lifestyle modification of patients with hypertension.

5 Table 5.1: Distribution of respondents by recommendations

Recommendation	No		Yes	
	f	%	f	%
To include community health care team on information sharing regarding lifestyle modification of clients with hypertension.	2	0.5%	363	99.5%
To market lifestyle modification to the community members in different gatherings like funerals, church gatherings, civic meetings and imbizos	3	0.8%	362	99.2%
To encourage patients with hypertension to be ambassadors of lifestyle modification of clients with hypertension.	16	4.4%	349	95.6%

5.3 Conclusion

This chapter dealt with the presentation of data and analysis of phase1a (qualitative study) and phase 1b quantitative study). In qualitative study themes and sub-themes were presented and analysed. In phase 1a the participants showed knowledge on benefits of lifestyle modification though they were not adhering to it with some of the challenges that they came across were described. In phase 1b statistical data was presented in tables, pies and graphs and analysed. Respondents confirmed that participants were not adhering to lifestyle modification though they were given information on lifestyle modification. Hence, recent strategies should target outreaches and increase the frequency of method used.

CHAPTER 5

DISCUSSION OF FINDINGS

5.1 Introduction

The previous chapters presented findings of phase 1a and phase 1b. This chapter will deal with a discussion of findings and literature control. The findings of the study will be discussed focusing on the lifestyle of clients with hypertension, support of patients with hypertension on lifestyle, challenges related to adherence to lifestyle modification, information sharing, health care workers responsible for enhancing lifestyle modification of clients with hypertension, methods and their frequencies to enhance lifestyle modification of clients with hypertension

5.2 Lifestyle of clients with hypertension

Nearly all participants were aware of some of the lifestyle to be adopted when one is having hypertension like diet, physical activity, stopping smoking, reduction of alcohol, and stress management. Furthermore, others also mentioned treatment adherence and follow-up at PHC facility as a lifestyle to be adopted when one is having hypertension. Participants showed that they were given information on lifestyle modification to be adopted by the time they were diagnosed with hypertension. Most participants showed poor adherence to lifestyle modification. Most participants were still taking chicken skin, fried chips, and added salt/oils/fats in their diet, poor physical activity. Few participants used vegetables. Some participants used fruits when they have found them and do not take fruits daily.

This was also confirmed by nurses who showed that most clients with hypertension were not adhering to lifestyle modification. This concurs with other studies which found that lifestyle modification was still a challenge to most clients with hypertension (Buda et al 2017:4; Bogale et al 2020:1; Kandasamy et al 2018:337). The participants were having a struggle with adherence to physical exercise and different excuses were given like laziness, busy schedule, lack of motivation, lack of resources and lack of knowledge of different exercises. Those who were adhering to lifestyle modification had serious complications when they were diagnosed with hypertension (Ashoorkani et al 2018:318). Hence, clients with hypertension and have perceived severity, adhered to lifestyle modification to avoid complications (Sutipan & Intarakamang 2017:1). However, those with perceived severity were few.

Most clients with hypertension were not adhering to lifestyle modification and most of them were diagnosed when they have consulted for minor ailments (Tan, Oka, Dambha-Miller & Tan 2021:2). Hence, it was found by Ashoorkani et al (2018:318) that clients with hypertension and had no complication on diagnosing of hypertension tended to think that health care workers were just exaggerating the condition and end up not adhering. Hence, clients randomly diagnosed with hypertension without complications might need intensive counselling on lifestyle modification to increase perceived severity, perceived benefits, perceived susceptibility, and self-efficacy.

Non-adherence to lifestyle modification was also found in studies in other countries where clients with hypertension were not adhering to a healthy diet and physical exercises (Buda et al 2017:1; Chimberengwa & Naidoo 2019:8). In South Africa, studies showed the same trends where clients with hypertension were not adhering to lifestyle modification. It was found that most of them were not physically active and were still adding oils and salt in diet (Monakali, Goon, Seekoe & Owalabi 2018:3;

Magobe Poggenpoel & Myburg 2017:6). However, in this study excessive use of alcohol and smoking were not a challenge. Most clients were not smokers. In contrary, in a study about active smoking among people with diabetes or hypertension, it was found that smoking was high in Africa (Noubiap, Nansseu, Endomba, Ngouo et al 2019: 1). However, clients who were smokers have received advice on stopping smoking when diagnosed with hypertension. Most of them were diagnosed with hypertension after having complications that forced them to consult in the PHC facilities. Some participants have stopped smoking while some were still reducing daily cigarettes and they showed a willingness to stop smoking. This showed that clients with hypertension and have complications when diagnosed tend to adhere to lifestyle modifications to avoid annoying symptoms (Ashoorkani et al 2018:319).

According to HBM, one of the constructs of the model is cues of action which refers to external and internal stimuli. Complications are internal stimuli, and they remind clients with hypertension to adhere to lifestyle modification due to uncomfortable symptoms (Tan, Oka, Dambha-Miller & Tan 2021:2). A study on an investigation of factors influencing self-care behaviors in young and middle-aged adults with hypertension based on the health belief model showed hypertension-related complications as one of the predictors of self-care behaviors (Ma 2017:136).

In this study, the gender which most likely showed adherence to lifestyle modification was females. Most females were adhering to a diet and did not smoke nor engaged in excessive use of alcohol. Furthermore, female participants showed that they socialize with friends when trying to cope with stress or go to church for prayer in a way to cope with stress. This was confirmed by respondents in this study whereby almost 98,1% of respondents believed that females were most likely to adhere to lifestyle modification than males.

The same found in China females were reported as the gender that mostly adheres to lifestyle modifications (Pan, Wu, Wang, Lei et al 2019:3). The HBM showed that demographic variables and psychological characteristics have an influence on the belief of an individual. That is, clients with hypertension may be influenced to adhere or not to adhere because of being male or female. This was in line with the findings of one study which showed that there was a relationship between gender and lifestyle modification (Hattori, Komo & Munakata 2017:2253).. However, a study conducted in China showed no significant relationship between gender and lifestyle modification (Ma 2018:139).

5.3 Support of clients with Hypertension on Lifestyle Modification

In this study support is beneficial in improving adherence to lifestyle modification. Few participants showed support that they received to be able to adhere to lifestyle modification. That is support from family members, friends, health care workers, community members, religious leaders. One participant showed support from her children and spouse, and another showed support from friends. Health care workers should influence support through awareness and training (Gebrezgi, Trepka, Kidane 2017:1). Respondents showed that they included mostly family members than friends and were less likely to include community members and religious leaders that are pastors and traditional healers when enhancing lifestyle modification.

Furthermore, friends were also considered when enhancing lifestyle modification of patients with hypertension. This was in line with the study by Wang, Zhuang & Shao (2020:7) which showed that some adults considered friends to share information concerning one's health. The community members, pastors, and traditional healers were less considered, that is 37,3%, 30,8%, and 30,5% respectively. However, on average, nurses showed that family members, pastors, friends, traditional healers, and

community members were equally worthy involved when enhancing lifestyle modification of clients with hypertension in the future (Pressila, Haryanto, Asturi 2020:26; Leung et al 2017:20). Hence, they will be empowered with relevant knowledge and can support patients with hypertension to adhere to lifestyle modification. It was revealed in the qualitative study that traditional healers and pastors have influence on adherence to lifestyle modification. This means that if they are involved in enhancement of lifestyle modification of clients with hypertension, they might be of good influence toward lifestyle modification. However, respondents believed that for the effectiveness of enhancing lifestyle modification the whole clients' support system must be included when enhancing lifestyle modification of clients with hypertension. This was confirmed by other studies as vital on enhancing lifestyle modification (Maslakpak, Rezaei & Parizad 2018:1; Magobe, Poggenpoel & Myburgh 2017:6; Ashoorkani 2018:321). Hence, clients with hypertension should be encouraged to engage the support system that will assist them with lifestyle modification.

5.3.1 Support Ecosystem

Ecosystem is a community or group of living organism that live in an interaction with each other in a specific environment (Merriam Webster 2020). Support system is a network of people who provide an individual with practical or emotional support (Merriam Webster 2020). Hence support eco-system is a network of people who provide an individual with support in an interaction with each other. The findings of this study, there is a need of interaction of family, health care workers, work environment and social network and client with hypertension at a centre of care to adapt and cope with lifestyle modification (Gasiorowski & Rudiwcz 2017:40).

The clients with hypertension interact with this network of people frequently hence they

have influence on patients' adherence to lifestyle modification. Support of clients with hypertension matters and depend on the development of strong and maintenance of regular, strong, and positive support from all network (Brandt et al 2018:6). However, in the qualitative study there was inadequate support and clients were not adhering even though they were given information on lifestyle modification by nurses. Some reported failure to adhere when they were with friends at work, at home and in social gatherings where they took the restricted diet. However, few which showed to have received support were having progress in adherence to lifestyle modification.

- **Family**

Family members have an important role in enhancing lifestyle modification of clients with hypertension. This was in line with findings from the study about barriers and facilitators of hypertension management in Asmara (Gebrezgi, Trepka & Kidane 2017:6). Other studies also supported that family support is important in enhancing lifestyle modification of clients with hypertension (Maytassari & Sartika 2020:152; Pressila, Haryanto, Asturi 2020:26; Leung et al 2017:20).

However, nurses showed that family member involvement in enhancing lifestyle modification had challenges which were lack of knowledge by 56% of respondents, busy schedule by 48, 9% and client not disclosing about hypertension by 27%. Hence, there is a need to encourage clients with hypertension to disclose to a family member that is trusted to can give positive support on a day-to-day basis (Brandt et al 2018:1). Some family members had poor knowledge of hypertension and lifestyle modification.

Hence, there is a need to give information on hypertension and lifestyle modification to clients and family members to increase family support (Osama, Ashour, El-Razek & Mostafa 2019:6). Some family members had the challenge of a busy schedule which

prevented them to be involved in enhancing lifestyle modification of clients with hypertension. Busy home schedule or employed person may have no time to be involved when enhancing lifestyle modification of family member with hypertension (Magobe, poggenpoel & Mybugh 2017:6). However, if one is willing and motivated time can be squeezed to fit involvement to lifestyle modification of clients with hypertension. There must be interaction of health care workers with families of clients with hypertension. Family members should be part of enhancement of lifestyle modification of clients with hypertension since diagnose in order to be able to know how they can support the family. Family is the key to adherence to lifestyle modification (Chacko & Jeemon 2020:16) Spouse of clients with hypertension is one of the pillar of support in lifestyle modification hence spouse should be engaged in enhancement of lifestyle modification of patients with hypertension (Magobe, Poggenpoel & Mybugh 2017:6). Chidren and other members of household should be involved in enhancement of lifestyle modification of client with hypertension.

- **Work environment**

Clients with hypertension are also part of work environment (Damtie, Bereket, Bitew & Kerisew 2021:5). In some work places employees spent most of the time sited without exercising which is a risk of development of hypertension (Hoare, Stavreski, Jennings & Kingwell 2017:1). As a result lifestyle modification should be enhanced in workplaces. In this study there was participant who was unable to mange to adhere to physical exercise after work. Hence there must be lifestyle modification enhancement even in work place where employees support each other (Asadzandi, Eskandar, KhademAl-hosayni & Ebadi 2018*:7*). Recently there are work places that have teams for training like Thulamela municipality which conduct sports activities to promote physical wellness of employees (Malange 2019:38)`. Therefore, enhancement of

lifestyle modification should be emphasised in different work places.

In qualitative study there was one participant who was unable to adhere to healthy diet because the friend he shared food with eat junk food and did not disclose his diet preference. This means that disclosure also assist in adherence of lifestyle modification since others would be aware of diagnose and how they could support *(*Asadzandi, Eskandar, KhademAl-hosayni & Ebadi 2018:7*;* Ashoorkhani, Majdzadeh, Gholami, Hassan et al 2018:318).

- **Primary Health Care facility**

PHC facility is one of the environment where lifestyle modification should be enhanced since the findings of the study revealed that clients with hypertension were adhering to follow up visit to the facilities. They were not adhering to lifestyle modification however, they honour their follow up visit date. One of the participants did not want to skip follow up dates and treatment intake however still not adhering to lifestyle modification. Adherence to treatment was honoured more than adherence to lifestyle modification which showed that clients with hypertension depended on treatments than lifestyle modification for control of hypertension. This was also found in Ghana where most of clients with hypertension adhered to follow-up visits (Obrikorang, Obrikorang, Acheampong, Anto et al 2018:5). As a result, PHC facilities should have programme on enhancing lifestyle modification of clients with hypertension.

- **Nurse**

In the PHC facilities nurses were having the responsibility of enhancing lifestyle modification. However, clients with hypertension rarely receive information on lifestyle modification during follow up sessions. This might mean that nurses were

concentrating on issuing of treatments and overlooked lifestyle modification enhancement. Some clients with hypertension were also not serious about lifestyle modification. However, according to WHO Technical Package for Cardiovascular Disease Management in PHC, there is a need for evaluating lifestyle modification of each one with hypertension on each visit and to do individual counselling. (WHO 2018: The above Technical package was meant for all members of PHC multidisciplinary team including nurses, doctors, dietician, and trainers of community health care workers.

This means that community health care workers should be trained on the risk factors and counselling approaches, adapting to local customs and context (WHO 2018:8). However, clients reported that nurses were unable to attend to lifestyle enhancement during follow up visit. Furthermore, most PHC facilities has put enhancement of lifestyle modification as the responsibility of a nurse.

However, other health care workers were not taken as much responsible for enhancement of lifestyle modification. Hence, trainers of community health care workers should train them on enhancing lifestyle modification. Furthermore, there should be collaboration between PHC facility's health care team to enhance lifestyle modification of clients with hypertension. Community health worker has been effective in other programmes like HIV/AIDS and Tuberculosis (Jobson, Naidoo, Matlakala, Marincowitz 2020:284).

- **Allied team**

Dietician and physiotherapist should participate in sessions for enhancement of lifestyle modification since diet and exercise is important in lifestyle modification of clients with hypertension. Lee, Kim, Shim, Hong et al showed that diet and exercise

was effective for control of blood pressure (Lee, Kim, Shim, Hong kong et al 2018:637). However, few PHC facilities have allied team in the facility but depend on the visiting ones. Dietician should assist on counselling clients with hypertension on diet modification. It was found from qualitative study that some clients were not adhering to lifestyle modification as the expressed that diet without salt or oils had no taste. Hence, they could be taught on how to prepare food without salt and oils to be tastier in a cultural sensitive way. Zou (2019:10 confirmed that health care workers should assist in diet modification through health education sensitive to culture of clients. Physiotherapist should assist on physical exercise. The dietician and physiotherapist must interact with clients with hypertension, family and other members of PHC facility enhancing lifestyle modification of clients with hypertension.

- **Doctor**

Client with hypertension is referred to the doctor if the blood pressure is not control on stage 6 of treatment or when there are signs of organ damage (DoH 2019:116). Clients with hypertension who adhere to lifestyle modification have more chance of staying in the lower steps of treatment management or use no treatment at all (Mahmood et al 2019:437. For clients referred to doctor, lifestyle modification should also be emphasised as important part of management (Ashhorkhani et al 2018:320).

- **Social network**

According to (Dictionary Merriam Webster, 2020) social network is the creation and maintenance of personal and business relationship especially on line. The use of social network might assist on enhancement of lifestyle modification of patients with hypertension where lifestyle modification is enhanced on-line. clients can be connected to professionals and peers who can assist on challenges that client with

hypertension come across (Correira, Lachat, Lagger, Chappuis 2019:3; Maytasari & Sartika 2020: 151). Hence interconnection of all PHC team members is needed to enhance lifestyle modification of patients with hypertension.

5.4 Challenges Related to Adherence to Lifestyle Modification

Challenges related to lifestyle modification include challenges expressed by clients and those described by nurses.

5.4.1 Patient

Participants reported challenges that hindered them to modify their diet and exercise. Some participants were used to eating the same food with their family members and some family members do not understand that patients with hypertension should avoid salt and fats. Sharing same food was also found at work and during family and community gathering. Participants were socialised in a way that to be selective in front of other people as far as diet is concern is not good, one has to accept whatever is served and that family members should eat same food. Hence, participants' socialisation was a barrier to adherence to lifestyle modification (Barolia, Petrucka, Higginbottom, Khan, et al 2019:7; Buda et al 2017:6). Some barriers that hindered clients with hypertension to adhere to lifestyle modification identified were lack of taste (Shim, Heo & Kim 2020:10). However, tempting desire to restricted diet was a challenge even though the client with hypertension wanted to adhere (Chidambaram, Venmathi, Kaylan, Felix, Govindarajan 2019:144). Furthermore, some patients had a problem when eating out of home (Sharma & Agrawal 2017:108). There was also the challenge of poor knowledge of healthy oils made clients with hypertension use oils that are not good for healthy eating (Alefan, Huwari, Alshogran & Jarrah 2017: 577). Some showed that they were unable to adhere to diet because they were not having support from their family members (Brandt et al 2018:1).

Other challenges on adherence to physical exercise which were identified in this study included laziness, lack of motivation, lack of resources, lack of knowledge of different exercises and busy schedule. These challenges were also found from different studies (Leung, Chan, Sea & Woo 2017:17; Buda et al. 2017:6; Alefan, Huwari, Alshogran, Jarrah 2019:583; Pandey 2019:44; Magobe, Poggenpoel & Myburgh 2017:6; Mukonka, Mukona, Zvinavashe, Stray-Perdesen et al. 2016:18; Sharma & Argawal 2017:107).

The participants suggested a lifestyle modification program at different levels. However, due to human resource shortage nurses confirmed that they concentrated on health education in the facilities and lifestyle modification in different levels was less likely to be done for example school visits. Therefore, shortage of staff affected service delivery of enhancing lifestyle modification of clients with hypertension (Limbani 2017 96). Hence, there is a need for a dedicated person responsible for enhancing lifestyle modification

5.4.2 Nurses

Participants suggested that health care workers have continuous information sharing, involvement of clients' support systems during information sharing on lifestyle modification and lifestyle modification programs in different levels. However, nurses confirmed that there were challenges that they encountered regarding enhancing lifestyle modification in different facilities due to lack of pamphlets/flyers/posters that will draw attention on lifestyle modification, lack of trained person on lifestyle modification of clients with hypertension. These led to a limitation in sharing of information and use of different methods to enhance lifestyle modification. Nurses end up using the same method repeatedly with no fruitful results which had a negative impact on adherence of clients to lifestyle modification as different studies indicated

(Shim, Heo & Kim 2020: 9; Liu, Ford, Hu, Zelman et al 2017:1; Hadisa, Yakasai, Yau, Adamu et al 2017:78).

The promotional materials like pamphlets/flyers/posters enhance lifestyle modification because patients can also see what was taught. Hence, the lack of pamphlets/fliers/posters became a barrier to enhancing lifestyle modification of clients with hypertension. This was found in the study about barriers to and facilitators of hypertension management in Asamara, it was found that health promotion materials can assist in advocating lifestyle modification of clients with hypertension (Gebrezgi et al 2017:6).

Therefore, posters and pamphlets can give a concrete and important direction of what is to be done and not to be done (Bardach & Schoenenberg 2019:5). Nurses suggested encouraging patients with hypertension to be ambassadors of lifestyle modification of patients with hypertension as a way that might enhance lifestyle modification of clients with hypertension. This means that patients would be taught by someone with hypertension and has experienced the challenges that they had and how he/she overcome that. Hence, they would be on the same level and know how to assist each other.

5.4.3 Benefits Related to Lifestyle Modification Patients with Hypertension

Participants believe that there were benefits of adhering to lifestyle modification. The benefits mentioned were reduction of weight and belly fats, controlled hypertension, prevention of complications, good image and limiting increased hypotensive drugs.

- **Reduction of weight belly fats**

Ideal adult body weight is measured by calculating body mass index (BMI) with the

formula of body weight divided by height in meters squared which the healthy BMI in South Africa is <25kg/m^2 (DoH 2020:111). Furthermore, one must aim at waist circumference <80cm for women and <94cm for males. In this study, participants know about reduction of weight and belly fat when one adhered to lifestyle modification. The findings of this study revealed that patients with hypertension knew that loss of weight and a good image are benefits of adherence to lifestyle modification. This confirmed the findings of a study that showed that physical exercise reduces obesity (Purba, Santosa & Siregar 2019:3467). This means that when clients with hypertension adhere to lifestyle modification, they could see the measurable results that encourage them to continue. Hence, clients with hypertension should be assessed regularly for blood pressure, and weight when enhancing lifestyle modification in order to see the progress (Bruno et al 2018:3). Therefore, reduction of weight and belly fats will increase perceived benefits to clients with hypertension and must be included in the information given to clients with hypertension when enhancing lifestyle modification to increase perceived benefits (Metwaly, Soliman, Abdelmohsen, Kandeel et al 2019:2892).

- **Prevention of complication**

These findings revealed that clients with hypertension believe that some of the symptoms that they experience are due to unhealthy lifestyles like a diet. This means that clients with hypertension have experiences that make them ready to modify their lifestyles. This confirmed the findings of the study in a rural area in Southern Denmark where it was revealed that experiences triggered to initiate engagement in lifestyle modification (Brandt et al 2018:4). The experiences of pclents with hypertension increase their perceived severity and cues of action. Hence, clients with hypertension would be encouraged to modify their lifestyle when having some experiences that trigger readiness to engage in lifestyle modification. This concurs with a study in Ghana where it was revealed that a higher level of perceived severity is one of the predictors

of adherence to lifestyle modification (Obirikorang et al. 2018:8). The findings of this study also revealed that patients with an experience that triggers their readiness for action might be useful in advising other clients with hypertension on lifestyle modification because they will be telling lived experiences. This confirmed the finding of a study on extension wellness ambassadors where volunteers positively influenced others on healthy lifestyle (Wasbburn, Traywick, Copeland & Vincent 2017:5).

- **Limiting hypotensive drugs**

The management of hypertension is done in a stepwise manner where lifestyle modification is the first step followed by antidiuretic as the first drug to be initiated if there are no contraindications (DoH 2019:116). Drugs can be increased step by step until the blood pressure is controlled.

The nurses confirmed that these benefits should be taught to clients with hypertension to enhance lifestyle modification. The following studies confirmed these findings (Purba, Santosa & Siregar 2019:3467; Bruno et al 2018:1; Unger, Borghi, Charchar, Khan, Poulter, et al 2020:987; Bando, Fujiwara, Imamura, Takeuchi 2018: 1). Few clients who had episodes of adhering to lifestyle modification in this study had experienced some of these benefits. Two participants reported that they had reduced belly fat through exercises and diet.

Furthermore, nurses who were part of the study also believed that patients with hypertension must be given information about the benefits of adhering to lifestyle modification. According to the health belief model, if one has perceived benefits, he/she tend to follow the healthy behavior. Hence, there is a need to emphasise the benefits of adherence to lifestyle modification during counselling of patients with hypertension.

5.4.4 Non-Adherence to Lifestyle Modification of Patients with Hypertension

The participants' beliefs on complications related to poor adherence to lifestyle modification were stroke, heart attack, obesity, metabolic conditions (diabetes mellitus) joint and skeletal problems and cancer.

- **stroke**

This revealed that clients with hypertension were aware that stroke is a complication of hypertension and non-adherence lifestyle modification. This concurs with findings from a study by Osama, Ashour, EL-Razek, Mostafa (2019:5). Furthermore, clients with hypertension headaches and dizziness as signs that the blood pressure is high and one may have a stroke (Abate, Bayu, Mariam 2019:5). That is, some clients may not take treatment in the absence of signs that they perceive as not dangerous (Kleinsinger 2018:1). Hence, when enhancing lifestyle modification of clients with hypertension, stroke as complication should be discussed and emphasise continuation with pharmacological and non-pharmacological management of hypertension even if there are no symptoms (Abate, Bayu, Mariam 2019:6).

- **Heart attack**

An unhealthy lifestyle weakens vasodilation, increases circulating volume and alters cardiovascular reactivity (Rehm & Roerecke 2017:53). This study revealed that participants believe that heart attack is a complication of hypertension and lifestyle modification and its warning sign is palpitations. This concurs with the findings from a study in Zimbabwe where respondents associate palpitation with high blood pressure (Chimberengwa & Naidoo 2019:8). Hence, when enhancing lifestyle modification of patients with hypertension clients should be screened for cardiovascular risk and told their status to show the importance of lifestyle modification (DoH 2019:110).

- **obesity**

There is a relationship between obesity and an unhealthy lifestyle (Purba, Santosa & Siregar 2019:3466). The results of this study revealed that clients with hypertension knew that non-adherence to lifestyle modification is associated with obesity. This concurs with the findings from an evidence-based review study on lifestyle and hypertension which revealed that unhealthy lifestyles are associated with obesity which has an effect on hypertension control (Bruno et al 2018:4). This is in line with the findings of a study in Medan about the relationship of physical activity and obesity with the incidence of hypertension in adults 26-45 years (Purba et al 2019:3664). It is evident that weight loss is beneficial to hypertension and helps prevent other complications of hypertension (Fantin, Giani, Zoico, Rossi et al 2019:1). This means that adherence to lifestyle modification has evident results. Hence, when enhancing lifestyle modification, it should be emphasised to monitor weight and BMI to motivate adherence to lifestyle modification (Sebire, Toumpakari, Turner & Cooper 2018:5).

- **Metabolic condition**

The findings of this study revealed that clients with hypertension believe that non-adherence to lifestyle modification might lead to metabolic conditions like diabetes mellitus. This means that it is important that clients with hypertension adhere to lifestyle modification. This concurs with findings from a study about healthy lifestyle and life expectancy free of cancer, cardiovascular diseases and type 2 diabetes which showed that adherence to a healthy lifestyle at midlife is associated with longer life expectancy free of major chronic diseases (Li, Schoufour, Wang, Dhana et al 2019:5). Different studies confirm that a healthy lifestyle is significant prevention of chronic diseases like diabetes (Zhang, Pan, Chen Xia 2020: 21; Alkhatib, Tsang, Tiss, Bahorum, et al 2017:1; Mutie, Giordano & Franks 2017:1). Hence, it is important that clients be assessed for diabetes when enhancing lifestyle modification to know their status and

to encourage adherence to lifestyle modification.

- **Joint and skeletal**

Joints/skeletal problems are the main causes of disability in middle age and older people (Law et al 2019:2). However, this can be limited through lifestyle modification. The findings of this study revealed that clients with hypertension knew that an unhealthy lifestyle is also the risk of cancer and joint problems. This confirms advice on the Adult Primary Care Guideline of South Africa DoH (2019:115) which shows that antihypertensive treatment is not enough there is still a need for lifestyle modification to prevent other chronic illnesses. This concurs with the findings of the study in Iran on healthy lifestyle behaviors and the control of hypertension among adult hypertensive clients. Hence, there is a need to emphasise lifestyle modification as one of the management of hypertension.

Nurses who were part of the study confirmed that patients with hypertension must be counselled on the complications of poor adherence to lifestyle modification. That is, 99% agreed that stroke heart attack, metabolic conditions like diabetes must be included when counselling clients on complications of non-adherence to lifestyle modification of clients with hypertension.

Therefore, patients with hypertension will have knowledge on complications of non-adherence to lifestyle modification hence perceived severity and perceived susceptibility will be increased. Patients with hypertension who were diagnosed with some complications have high perceived severity and perceived susceptibility hence they tend to try to adhere to lifestyle modification (Sutipan & Intarakamang 2017:1). Hence, clents with hypertension must-have information on complications of poor adherence to lifestyle modification.

- **Beliefs and myths**

This means that there were clients who were not adhering to lifestyle modification because they believe that hypertension is for people who are easily stressed. This means that there are patients who consider psychological predisposing causes of stress and ignore the biological predisposing causes of hypertension. However, individual who has stress might have both psychological and biological changes which could place the individual at risk of illness (Bhelkar, Deshpande, Mankar & Hiwarkar 2018:432). Higher stress is associated with high systolic blood pressure and a high rate of uncontrolled blood pressure (Kang, Dulin, Nadimpali & Risica 208:128). Hence there is a need for people to be made aware of relationship of hypertension and stress management including the other unhealthy lifestyle that lead to hypertension which are smoking, alcohol intake, diet high in fats and salt, obesity and overweight.

There were clients with hypertension who believed that prayer can heal them and traditional healers can help without adhering to lifestyle modification. This confirms findings from the study in China which revealed that clients with hypertension still consult their pastors and traditional healers for advice and other management of hypertension (Zou 2018:9). Some of them end up stopping treatment and hope that prayer is working instead of drugs for hypertension. However, there is a risk of not adhering to lifestyle modification and depend on the pastor's prayers to work it all. There were also clients who believed that hypertension is caused by witchcraft. clients with hypertension and who believed that hypertension was caused by witchcraft did not adhere to lifestyle modification and hypertension management (Chimberengwa & Naidoo 2019:6). Hence, pastors and traditional healers should have knowledge on hypertension and lifestyle modification in order to encourage adherence to lifestyle modification to clients with hypertension. This means that pastors and traditional healers who are aware of hypertension and lifestyle modification will be able to advice

clients with hypertension appropriately. Campaigns and other outreaches should include them in order to have more information on lifestyle modification. Some participants believe that if one was having hypertension he should be having other signs that show that the blood pressure was high like headache. In this study there were participants who were diagnosed with hypertension when consulting for other problems not related to hypertension

5.5 Information Sharing on Lifestyle Modification of Clients with Hypertension

In this study, participants revealed that they received information about lifestyle modification the day they were diagnosed with hypertension. Information given included diet, physical exercises, stopping smoking, reduction of alcohol and stress management mainly on diagnosis. Almost all respondents confirmed and showed that they gave information on lifestyle modification of patients with hypertension. Buda et al (2017:1) confirmed and revealed that patients with hypertension needed advice and counselling on lifestyle modification to enhance adherence. Different studies showed the importance of counselling of clients on lifestyle modification of clients with hypertension (Gebrezgi et al 2017:1; Giena, Thongpat, Nitirat 2018:201, Ashoorkani et al 2018:314).

However, participants in this study had limited information and were unsure of some aspects like the type of healthy oils that can be used and types of exercises that attend to the core muscles. Hence, concrete information was needed (Bardach & Schoenenberg 2019:5). Furthermore, clients with hypertension might be still shocked on the day they were diagnosed with hypertension and most information given might not be grabbed well. Hence, the patient needed regular informational support from health care workers (Ashorkani et al 2018:320). However, during follow up participants

showed that they rarely have information on lifestyle modification and nurses concentrated on blood pressure monitoring and issuing of medication. Those who received information during follow-up were clients whose blood pressure was still uncontrolled. There was only one participant whose blood pressure was uncontrolled because she had not yet accepted the sudden passing on of her brother who was a breadwinner. Participant had stress and blood pressure remained high. This confirmed findings from (Agrawal & Sharma 2017:105). The same participant received regular counselling by a lay counsellor every time she came for follow-up until her blood pressure was controlled.

There was no continuous information sharing by health care workers on lifestyle modification to clients with hypertension who came for follow up treatment. The client's attention focused on medication and blood pressure readings and lifestyle modification taken lightly. This was also found from the study on understanding adherence to treatment in hypertension where it was found that health care workers just check blood pressure and give treatment without taking time explaining the mechanism of hypertension and factors that affect it like lifestyle (Ashoorkani et al 2018:320).

When health care workers did not effectively communicate with patients about lifestyle modification, clients might think what they were doing was right while they were not adhering to lifestyle modification. This was confirmed by a study in America on the role of primary care providers in encouraging older clients to change their lifestyle behaviors (Bardach & Schoenberg 2018:6). Furthermore, in the same study respondents assume that the health care provider was looking after their health and if there was an issue with lifestyle behaviour the health care provider would advise for a change. A recent study was done inside the PHC facilities and the same respondents who were not adhering to lifestyle modification honoured their appointment dates.

Information sharing might assist in improving the health beliefs of patients with hypertension thus enhancing lifestyle modification (Ma 2018:136). Hence, follow-up days might be some opportunities for enhancing lifestyle modification of clients with hypertension by providing health education covering all aspects related to lifestyle modification.

5.6 Health Care Worker Responsible for Enhancing Lifestyle Modification of Clients with Hypertension

In this study, respondents' source of information on lifestyle modification was health care workers mainly nurses than doctors, dieticians, community health care workers and lay counsellors. This was confirmed by nurses who showed that the nurse was the professional responsible for enhancing lifestyle modification in the PHC facilities. This might be because nurses were responsible for screening people for hypertension in the PHC facilities and doctors came on scheduled dates once a week or in two weeks. Most PHC facilities were not having dieticians in the facility but depended on scheduled visits once a month.

The lay counsellor was always busy with HIV/AIDS counselling as was their job description. Community health care workers were mentioned by clients who were on ARVS or very sick on diagnose with hypertension (Jobson et al 2019:281). Only 9.0% of nurses revealed that lifestyle modification of clients with hypertension was the responsibility of a trained person. However, clients were having a challenge that they were not counselled on lifestyle modification regularly on follow-up visits and nurses concentrated on issuing of treatment and increasing dosages if blood pressure is not controlled. Most patients depended on nurses for counselling on lifestyle modification however it was not usually done during follow up. This means that there was no chance of assistance if client is having challenge or concern on adherence to lifestyle

modification. Hence, a trained dedicated person might be there for continuous counselling because this will be the routine daily unlike nurses with complexity of work. This was supported by a study in Brazil about the complexity of the work of nurses where it was found that lack of human resources in primary health care settings affected the execution of essential duties (Ferreira et al 2018:706).

Trained dedicated person will concentrate on lifestyle modification only without attending to different services in the PHC facilities. Since the number of clients with hypertension in PHC facilities is increasing daily, there is a need for a trained person who will be responsible only for counselling on lifestyle modification of clients with hypertension. In the study by Neupane, MacLan, Mishra, Olsen, et al (2018:66) it was found that a trained person has a great impact on the management of clients with hypertension. This was also confirmed by the study on the delivery of health coaching in primary care (Djuric, Segar, Arizondo, Mann, et al 2017:369).

However, 97,8% of nurses confirmed that shortage of staff was a challenge in the two districts in Vhembe and Mopani where sometimes a professional nurse might be attending to clients alone. This was in line with the finding in Mpumalanga (Limbani 2017:96). Nonetheless, a trained person who will be empowered with the necessary knowledge was needed since it might be cost-effective. A study from the University of Michigan revealed that a trained person or health coach was acknowledged and was cost-effective (Djuric et al 2017:369). Respondents recommended the inclusion of a community health care team on information sharing regarding lifestyle modification of clients with hypertension. The community health care team is in contact with clients in the community and is effective in leading lifestyle modification in the community (Neupane et al 2018:66).

Finally, it was recommended that clients with hypertension be ambassadors of lifestyle modification. Hence, clients who will be involved as ambassadors will be encouraged to adhere to lifestyle modification while encouraging other patients to adhere. This was revealed in the study about an extension of wellness ambassadors (Washburn, Trawick, Copeland & Vincent 2017:1). Hence, the patient who will be an ambassador will increase his/her health motivation and self-efficacy. Meanwhile, others will be encouraged by seeing a client with hypertension fully engaged in lifestyle modification. Hence, cues of action of lifestyle modification of clients with hypertension and others may be triggered and lifestyle modification might be enhanced.

5.7 Methods Used to Enhance Lifestyle Modification of clients with Hypertension

Participants reported that they were given health talks on lifestyle modification the day they were diagnosed with hypertension. During follow up they were given health talks by nurses or counselling by lay counsellors if the blood pressure was not controlled. Most of the respondents confirmed that they gave health talks to clients with hypertension. Furthermore, the top 5 methods which were mostly used by majority of respondents to enhance lifestyle modification were health talks, clients' adherence clubs, campaigns, home visits and posters. Health talks and posters were used by most respondents daily. A study about barriers to and facilitators of hypertension management in Asmara showed that good communication of health care workers was important in promoting lifestyle modification (Gebrezgi et al 2017:6).

Nurses were failing to do outreaches like school visits, campaigns, support groups and home visits due to challenges like shortage of staff as noted above and confirmed in (Limbani 2017:96). Nevertheless, nurses showed that for enhancement of lifestyle modification all methods possible were to be used to increase self-efficacy, motivation,

and perceived benefits (Obirikorang et al 2018:1). Furthermore, nurses recommended that lifestyle modification of clients with hypertension is marketed to the community members in different gatherings like funerals, church gatherings, civic meetings and imbizos to reach many people (Firestone, Rowe, Modi, Sievers 2017:111).

5.8 Frequency of Methods of Sharing Information on Lifestyle Modification of clients with Hypertension

The participants showed that the message about lifestyle modification should be frequently shared like during follow up visits. This was in line with the study about practicing health promotion in primary care (Pati et al 2017:288). However, annually, different methods should be used to be able to include the whole community. If they did not get the message from the PHC facility, they might receive the message where other methods will be used like in funerals, homes, community clubs, civic meetings, imbizos and media.

Enhancement of lifestyle modification could be incorporated into Integrated School Health program which could be helpful to teachers, the community, and learners. This was confirmed by the whole school, whole community and whole child model by Centers for Diseases Control and prevention (Videto 2019:6). If a learners is taught on lifestyle modification this massage is useful to them and the family concern. Patients reported that the children who cook were still adding salt and oils in food of clients with hypertension However, a study in the City of Tshwane found that there was non-compliance in the application of Integrated School Health program (Rasesemola 2019:6).

Another method which nurses thought it can be effective was the use of cell phones on enhancing lifestyle modification of patients with hypertension on daily basis. It was found to be effective from the study about a mobile phone-based health coaching

intervention for weight loss and blood pressure reduction in a national prayer population in the United States of America (Mao, Chen, Magana, & Barajas et al 2017:8). However, for the patients without mobile phones family members' phones can be used. The use of radios was preferred to be used weekly since in rural areas radios are mostly used. Moreover, the use of cellphones and radios might be useful in the case where social gatherings will be limited like recently in the case of Covid -19 prevention measures.

5.9 Summary

This chapter dealt with the discussion of findings of qualitative and quantitative study. Findings of this study showed that enhancement of lifestyle modification which was done need improvement to ensure effectiveness. There is a need for a trained person who will be responsible for enhancing lifestyle modification of clients with hypertension using a variety of methods to share information on lifestyle modification. Furthermore, there is a need for inclusion of patients' support system like family, friends, community, and religious leaders when enhancing lifestyle modification of clients with hypertension. When this is implemented, there will be a dedicated service on lifestyle modification of clients with hypertension in the PHC facilities where every client will be referred for enhancement of lifestyle modification.

CHAPTER 6

MODEL DEVELOPMENT

6.1 Introduction

The previous chapter focused on the discussion of findings of phase 1a and phase 1b of the study. This chapter dealt with phase 2 of the study.

6.2. Theoretical framework of the model

The theoretical framework is the path or assumptions that guide the research and become the key part of the design (Adom et al 2018:438). The theoretical framework of development of model to enhance lifestyle modification of clients with hypertension is the Health Belief Model which was guiding the study throughout. Each client with hypertension is unique and is expected to modify lifestyle as such as perceptions and beliefs differ. Therefore, each individual is unique and will adopts lifestyle modification influenced by perceptions and the belief towards lifestyle modification (Anuar, Shah, Gafor, Mahmood et al 2020:202). Therefore, how client with hypertension adhere to lifestyle modification depend on the perception of lifestyle modification perceived benefits, perceived barriers, health motivation, perceived severity and cues of action (Kim &Kim 2020:5), To classify the concept of the model the researcher used six elements of practice theory agents, recipient, context, procedure, dynamics and outcomes (Dickoff et al (1968:422-423) showed the related questions which are:

Who or what perform the activity?

Who or what is the recipient of the activity?

In what context is the activity performed?

What is the guiding procedure, technique, or protocol of the activity?

What is the energy source for the activity whether, material, physical, biological, mechanical or psychological?

6.2.1 Agents

An agent is a person or any other thing that contributes to the realization of the goal (Dickoff et al 1968:425.

In this study the agent comprised of the health care workers and professionals in PHC facilities who will assist in changing their perception to lifestyle modification and increase adherence. Health care workers will include dieticians, nurses, doctors, lay counselors, and community health care workers. This is the team of health care workers who are involved in screening, diagnosis, management and counselling showing the healthy lifestyle of clients with hypertension and encouraging their follow-ups. Health care workers have knowledge and skills of managing clients with hypertension and interacting through proper referral systems from one professional to another.

PHC nurses are the first contact of patients with hypertension in the PHC facilities in Mopani and Limpopo province. PHC nurses start by screening and diagnose of the patient with hypertension. Furthermore, PHC nurses are also responsible for follow-up care of clients with hypertension and can monitor the stability of the clients and evaluate if adhering to lifestyle modification or not. However, if a client is stable and

blood pressure is less than 140/90 mmHg for three consecutive months, the PHC nurse refers the client to an adherence club to be under the supervision of community health care workers.

PHC Operational managers with other managers of the multidisciplinary team involved in the care of clients with hypertension will be responsible for the facilitation and implementation of the model to enhance the lifestyle of these clients. The team will also evaluate the model if it is bringing anticipated modification of lifestyle of clients with hypertension.

6.2.1.1 Recipients

These are persons who receive action from the agent that contributes to a certain goal (Dickoff et al 1968:427). Recipients are people who receive activities from an agent. In this model, the recipients are the clients with hypertension. In this study patients with hypertension together with their families, friends, pastors and traditional leaders and the community will be receiving activities from the health care workers that are nurses, doctors, trained persons, lay counsellors, dieticians, and community health care workers. The goal is that clients with hypertension should be able to modify and adhere to a healthy lifestyle. This can be achieved through information sharing and counselling

6.2.1.2 Context

The context where the model will be implemented will be the community context, family context and PHC facility context.

- **Community Context**

Socio-cultural beliefs that community has, might influence how a clients with hypertension modify their lifestyle. The community where the client with hypertension

stays has some rules imposed on people that live there. In African rural communities, during community or family gathering, people share the same food and if one refuses some food, he/she is taken as a rude person. Hence members of the community who are having hypertension forced themselves to eat the restricted diet to avoid being rude. This interferes with the lifestyle modification of clients with hypertension. Hence, the community environment should be created in a way that community members with hypertension are catered for during community gatherings like funerals, church gatherings, and community clubs.

- **Family Context**

Client with hypertension belongs to the family context. Members of the family have an influence on the lifestyle modification of clients with hypertension. Most families believed in eating the same food together. However, this has an impact when a client with hypertension been restricted from taking some of the foods. Family members have the role to play in supporting clients with hypertension to modify their lifestyles. However, from the analysed data some family members were not supportive of their family members with hypertension due to a lack of knowledge and information on lifestyle modification of clients.

- **Health Context**

Health context involves diagnosis, health education, home visit, and staff. When a person is diagnosed with hypertension, he/she is counselled about a healthy lifestyle. According to qualitative data, it was found that there was poor continuous information sharing on lifestyle modification during follow-up. This leads to clients with hypertension having a lack of information on lifestyle modification. Some of the questions that they have did not have somebody to answer since nurses were too busy and could not attend to them.

6.2.1.3 Dynamics

These are powerful sources of the activity that can be barriers or enhancers of the realisation of the model. The researcher identified and described dynamics related to enhancement of lifestyle modification. The dynamics include competency, advocacy, dedication, collaboration, knowledge, motivation, confidence and support.

6.2.1.4 Procedure

The procedure is a way of doing things in a correct and orderly manner (Oxford 2020:1202). Procedure refers to how the activity takes place and gives a detail that enables the activity to be carried out and outlines the agent, recipient and situation for the procedure (Dickoff et al 1968:415).

The implementation of the model will be in the community where information sharing will be done through civic meetings, church gatherings, funerals, community clubs, campaigns, media (radio) and school visits. In the family, information sharing will be done through home visits. Lastly, information sharing in PHC facility will be done through health talk, cell phones, support groups, patients' adherence clubs and individual or group counselling. The following people will be included during information sharing; family members, friends, pastors, traditional healers and the community members.

Health care workers will receive training on counselling skills about lifestyle modification of clients with hypertension. After, training health care workers will have gain knowledge and skills to counsel and share information about lifestyle modification of clients with hypertension. . Nurses will be responsible of screening and counselling of clients on healthy lifestyle according to healthy lifestyle counselling as outlined by WHO document on Healthy Lifestyle Counselling (WHO 2018:1-28). Then the client

will be referred to appropriate health care worker depending on the need identified. Clients will receive individual or group counselling or therapy sessions accordingly. When knowledge and skills implemented the clients with hypertension will have knowledge about lifestyle modification which increase perceive benefits, perceived susceptibility and decrease perceived

6.2.1.5 Terminus

This is the endpoint, activities and accomplishment of the desired outcome of the activities. In this study, the terminus is when the clients with hypertension engage in lifestyle modification with support from family members, friends, pastors, traditional healers and the community. Clients with hypertension will display knowledge of lifestyle modification, willingness to change, and physical and health benefits, perceived benefit, perceived severity, perceived susceptibility, health motivation, and self-efficacy.

6.3. Model development

Relational statements

Relationship statements were constructed from the identified and defined concepts to show the interaction between the concepts (Chinn & Kramer 2011:180). The central concept of the model is lifestyle modification enhancement as derived from the topic of the study.

- **Lifestyle**

Lifestyle is a compound word formed by life and style. Merriam Webster‘s definition of life is the ability to function and grow that distinguishes animals and plants from rocks

and synthetic objects; an aspect of someone's life or type or manner of existence (Dictionary Meriam Webster 2020). Style according to Oxford Advanced Learner's Dictionary (2020:1527) means "particular way in which something is done". Life and style in combination (lifestyle) means "the way people live at a particular time and place". Lifestyle means a person's way of life (Oxford advanced learners dictionary 2012:355).

Lifestyle was once analysed by Veal who came up with a definition of lifestyle and showed lifestyle as a distinctive pattern of personal and social behaviour characteristics of an individual or a group (Veal 1993:247). This analysis of lifestyle was done concerning leisure. This study, was done in relation to health. Lifestyle in this study means the way how people live which influences their health positively or negatively. The lifestyle of clients with hypertension can influence their hypertension positively or negatively. Smoking, the way how they use alcohol, fats oils vegetables, and fruits can influence their hypertension positively or negatively. Hence, clients with hypertension should have this knowledge and be supported in the process of change.

- **Modification**

The Oxford Advanced Learner's Dictionary (2020:984) defines modification as "an act or process of changing something slightly especially in order to improve it or make it more acceptable". Modification is a noun that comes from a verb modify which means to change something in small ways, to make something less severe or harsh. Modification is an act or process of changing something to improve it or make it more acceptable. It involves a process of changing something in a small way to make something less severe or harsh. Synonyms are alteration, adjustment, conversion, adaptation, change, correction, variation, and transformation.

According to Dictionary Merriam Webster, English (2021) modification is “an act, process or results of making different, to make less extreme”.

There is a need for a change, adjustment, change, and transformation of lifestyle of clients with hypertension to improve their health and blood pressure (Obirikorang et al 2018:2). This is to prevent complications of uncontrolled pressure while improving the general well-being of a patient with hypertension. Clients with hypertension need to change and correct unhealthy lifestyles and adjust to a healthy lifestyle to manage well their hypertension. Hence, there is a need to involve their support system in their care like family, friends, religious leaders, community, and trained person who will assist them to adapt to healthy lifestyles.

- **Enhancement**

Enhancement is used most of the time without clear meaning. According to Dictionary Meriam Webster’s Advanced Learner’s dictionary (2021) enhancement comes from the verb “*enhance*” which means to heighten, to increase, or to improve in value, quality, desirability, or attractiveness.

The Oxford Advanced Learner’s Dictionary (2020:502) showed that enhancement originates from the verb “***enhance”*** which is defined as to increase or further improve the good quality, value, and status of somebody or something. Lifestyle modification of patients with hypertension needs to be increased in its value to make it desirable or attractive in a way that clients with hypertension might be willing to modify their lifestyles

Enhancement of Lifestyle modification was defined as a dynamic interaction process where professional nurses is dedicated and competent to guide, motivate and

advocate for support of patients with hypertension. Enhancement of lifestyle modification of patient with hypertension is achieved when patients with hypertension is motivated, committed, have knowledge and confidence to take charge in making slight change on lifestyle modification.

- **Relationship Statement**

  - Enhancement of lifestyle modification in PHC facilities need professional nurse who is dedicated and competent and who understands challenges of clients with hypertension on lifestyle modification in order to be able to increase their motivation.

  - Health care worker should be competent in scientific knowledge of lifestyle modification to be able to guide clients with hypertension to be committed to lifestyle modification and have confidence that they can make change that is needed.

  - Clients with hypertension have trust on health care worker to advocate for the support from their family members, friends, traditional healers and pastors and community on lifestyle modification ofclients with hypertension.

  - Benefits of enhancement of lifestyle modification include knowledge of lifestyle modification, willingness to change, and physical and health benefits to clients with hypertension

  - For enhancement of lifestyle modification in PHC there must be collaboration of health care workers in different specialties through referrals, support from mangers of PHC services.

6.3 Description of the Model

Description of model of enhancement of lifestyle modification of clients with hypertension was done in terms of the purpose, structural description nature and assumptions by Chinn and Kramer (Chinn & Kramer 2011:180).

6.3.1 Purpose of the Model

The purpose of the model is to be used as framework of reference to enhance lifestyle modification of clients with hypertension which will guide health care workers in the PHC facilities and assist chronic diseases on guidelines for operationalisation of the model.

6.3.2 Structure of the Model

The structure of a model to enhance lifestyle modification of clients with hypertension include the agent (health care workers) to facilitate lifestyle modification, the recipients (clients with hypertension the support system, dynamics (drivers of enhancement of lifestyle modification) the context to support the model, the procedure and the terminal.

6.3.3 The Nature of the Model

Model is a symbolic depiction of reality that gives a schematic representation of relationships between concepts and uses symbols and diagrams to represent phenomenon (Brink et al 2018:20). The model to enhance lifestyle modification of clients with hypertension is represented by rectangular shape showing the context where the model will be implemented. Colours were meant to identify different contexts of the study and have no special meaning. Inside the rectangular shapes there are different boxes that denote the agent, recipient, dynamics, procedures, and terminus the dynamics in the middle since they are the power source of the agent and the recipient and if they are there they encourage the implementation of the measures to

enhance lifestyle modification of clients with hypertension. The arrows show the relationships among the different components of the model.

6.4 Assumptions of the Model

6.4.1 Assumptions Related to Context

Lifestyle modification of patients with hypertension occurs in three contexts that is PHC facilities where clients do follow up of hypertension treatments, in the community where clients live and in the families of the clients. The outer part represents the community where enhancement of lifestyle modification will occur, the middle part represents the families of clients with hypertension where enhancement of lifestyle modification will occur and the inner frame which is the PHC facility where clients with hypertension do follow up visits.

6.4.2 Assumptions Related to the Agent and Recipients

- The agent is who will perform the activities. In this model to enhance lifestyle modification of clients with hypertension the agent refers to nurses, community health care workers, lay counsellor, doctors, dietician, psychologist and trained person.

- The recipient of a model to enhance lifestyle modification of clients with hypertension refers to patients with hypertension, their family members, friends, community members, pastors and traditional healers.

- The structure of a model to enhance lifestyle modification of patients with hypertension should be such that the context community, family and PHC facility setting should facilitate and support lifestyle modification.

- The nurse should orientate the patients diagnosed with hypertension on

the guidelines about lifestyle modification, and the team that is involved. The clients with hypertension should engage in necessary individual or group counselling.

6.4.3 Assumptions Related to Procedure

The procedure is a way of doing things in a correct and orderly manner (Oxford 2020:1202). It is a way that activities should be performed. This includes devices to be used and proper steps to be followed for the activities to be done correctly. The procedure gives a detail that enables the activity to be carried out and outlines the agent, recipient, and situation for the procedure (Dickoff et al 1968:415). The procedure in this model refers to all activities that are done to reach the purpose of a model to enhance lifestyles modification of clients with hypertension. In this model the activities include individual or group counselling, civic meetings, church gatherings, funerals, community clubs, campaigns, media(radio), school visits, home visits, health talk, cell phones, support groups and patients' adherence clubs. The following people will be included during information sharing; family members, friends, pastors, traditional healers and the community members.

For the implementation of the model there must be dedicated health care workers who are trained to be competent on lifestyle modification of clients with hypertension and acquired knowledge and be confident on advocacy, motivation, support of clients with hypertension and collaboration with other health care workers. The health care workers should share information on lifestyle modification of clients with hypertension with in different levels that are:

in the facility, community and at homes of clients. When clients with hypertension are engaged in the process as recipients of the model they should be empowered to be ambassadors of lifestyle modification, that is, they should also have the dynamics of the model and as a results be able to be agents of the model. Then the model will continue without the issue of shortage of staff as it was one of the findings of the study.

6.4.4 Assumption Related to Dynamics

Dynamics are the motivating factors for success and the inner power to do activities that can be chemical, biological, or physiological for an agent (Kamanye, et al 2016:122). The agent for the model to enhance lifestyle modification of patients with hypertension need competency on skills to enhance lifestyle modification in order to be able to give guidance to clients on lifestyle to gain confidence to modify lifestyle. Some health care professionals only acquired basic knowledge on the management of hypertension concerning their profession. The agent needs to be dedicated to advocate for clients' support on lifestyle modification. The findings of this study revealed that adequate enhancement of lifestyle modification of clients with hypertension was not done, lack of family support, lack of knowledge, inadequate involvement of clients' support system, lack of motivation and confidence. Hence, the model had to be developed to address such challenges to enhance lifestyle modification of patients with hypertension.

- **Competency**

According to Oxford Advanced Learners Dictionary (2020:300) competency is the

ability to do something well. The word competency was described as having a focus on a person's behaviour (Wong 2020:98). Competency described the attributes of a person for his/her superior work performance which is transferable from one person to the other and assessed in terms of behaviours and attitude (Wong 2020:98). However, according to the Nursing Act, 2005 (Act No, 33 of 2005), as amended, competency means specific knowledge, skills, judgement, and personal attributes required for a health care professional to practice safely and ethically in a designated role and setting. Professional nurses in PHC should have knowledge and skills about counselling of clients with hypertension on lifestyle modification.

- **Advocacy**

The word advocacy means public support that somebody gives to an idea, a course of action, or belief (Oxford Advanced Learners Dictionary (2020:24). Furthermore, according to the Nursing Act, 2005 (Act No, 33 of 2005), advocacy is the provision of support, referral, liaison, representation, and protection of the interests of individuals or families who may or may not be aware of the need for or unable to coordinate or arrange health care for themselves. The professional nurses should be able to support clients with hypertension on lifestyle modification, refer and liaison with other health care providers on modification of lifestyle modification.

- **Dedication**

Dedication is an act of setting apart for a special purpose (Meriam-Webster 2022) The findings of the study showed that for enhancement of lifestyle modification there must be a dedicated person who is responsible for lifestyle modification of clients with hypertension. There must be a nurse who is dedicated to give information and encourage clients with hypertension to modify lifestyle.

- **Collaboration**

Collaboration is working with another person or a group to produce something (Oxford English Dictionary 2020:283). Health care workers should collaborate with each other to enhance lifestyle modification of clients with hypertension. This could be through referral of clients from one professional to another to enhance lifestyle modification of clients with hypertension.

- **Knowledge**

Knowledge is understanding, skills acquired to do something (Oxford Advanced Learner Dictionary 2020:825). Knowledge is one of the factors that influence adherence to lifestyle modification (Lugo-Mata, Urich–Landeta, Andrades-Perez, Leon-Dugarte 2018:184). The findings of the study showed lack of knowledge as one of the challenges to lifestyle modification adherence. Clients should have knowledge about lifestyle modification to be able to know what is allowed and not allowed to be done.

- **Motivation**

Motivation is the feeling of need to do something, especially that which requires hard work and effort (Oxford Advanced Learner Dictionary 2020:994). It is an enthusiasm to do something. Findings of the study showed lack of motivation as one of the challenges to adherence to lifestyle modification. Clients with hypertension should be motivated on lifestyle modification of patients with hypertension to have passion for it (Buda 2017:6).

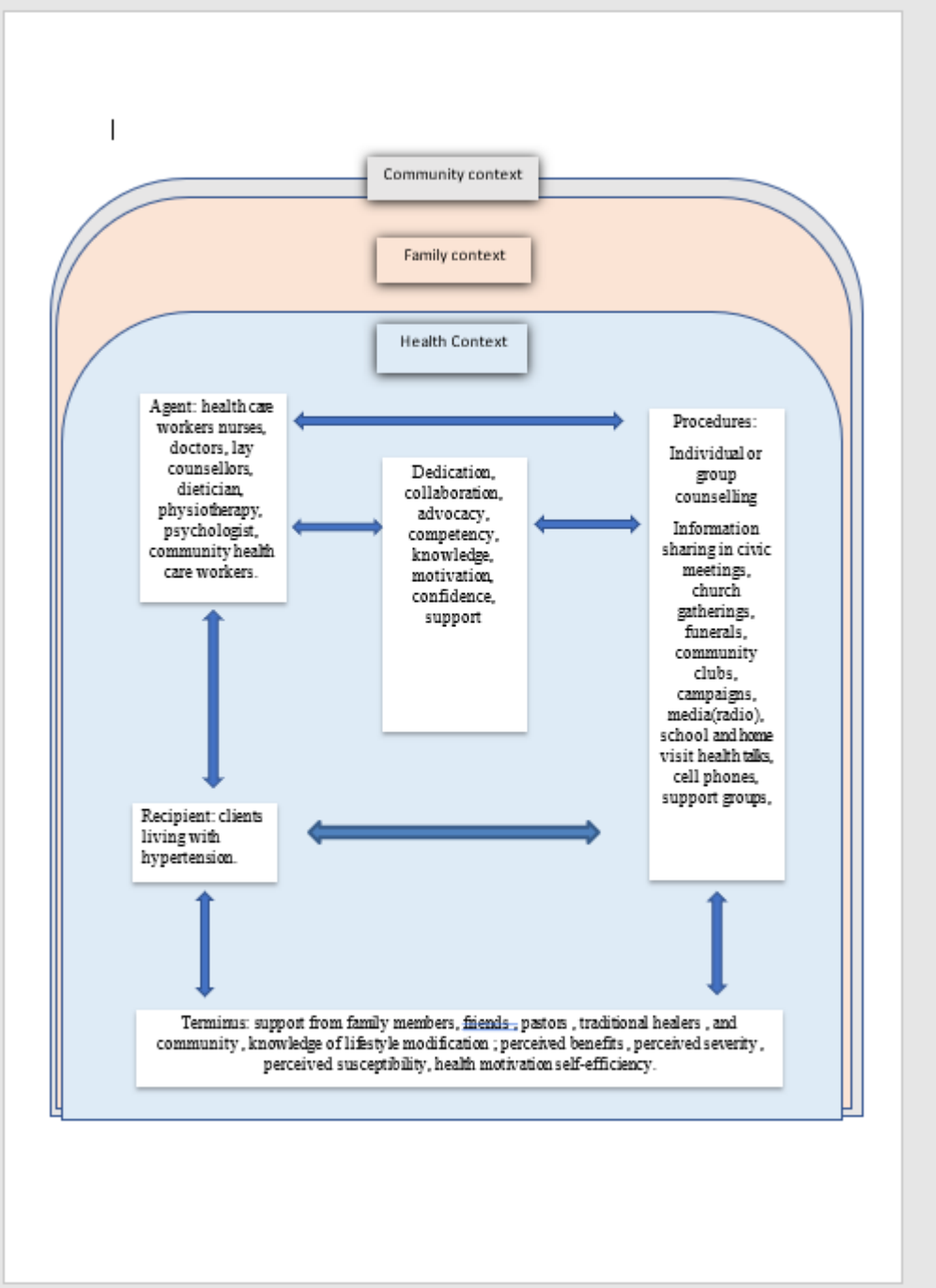
- **Self efficacy**

Self-efficacy is a belief or confidence in one's own ability to do things and be successful (Oxford Advanced Learner Dictionary 2020:311). The clients with hypertension lack

confidence to change their lifestyles. Clients with hypertension s' confidence should be encouraged that they will be able to modify their lifestyle Through information sharing self-efficacy can be improved (Khiry et al 2021:1). This makes the client with hypertension to be able to have desired results. Hence self-efficacy is increased.

- **Support**

Support is to give or be ready to give help to somebody when they need it (Oxford English Dictionary 2020:1542). Clients need support from the family members, community, pastors, traditional healers and health care workers for enhancing lifestyle modification of clients with hypertension. Findings revealed that there was lack of support from family members. When support is lacking, clients with hypertension find it difficult to adhere to lifestyle modification (Ashoorkani 2018:321). Lack of support is one of barriers to adherence to lifestyle modification in this study (Zou 2019:3).



6.5 Evaluation of the Model

Evaluation of theory enables the researcher to find out if it is clear and understandable to the population intended to apply it (Sousa 2014:215). The model was not evaluated in the PHC facility where it is going to be implemented but critical reflection was done to check the suitability of the model using critical reflection questions by Chinn and

Kramer (2012:196-194) which are:

- How simple is the model?
- How general is the model?
- How clear is the model?
- How accessible is the model?
- How important is the model?

The meaning of the model was reviewed by promoter and co-promoters of the study. The researcher presented the model to the promoters and co-promoters, operational managers of PHC facilities, PhD and Masters Students. Validation of the model was done according to Chinn & Kramer's criteria (Chinn & Kramer 2011:196).

Participants gave evidence that the model was clear and understandable as it relates to the concepts. The purpose, definition, of the concepts and relationships were consistent with the stated assumption (Chinn & Kramer 1999:103).

6.5.1 Simplicity

According to Chinn & Kramer (1999:105), simplicity means that the elements within each descriptive category, preferably the concepts and their interrelationships are minimal. The participants who reviewed the model acknowledge that the model was simple and straight forward. Major and related concepts used to describe the phases of the study.

6.5.2 Generalization of the Model

Generalization of the model imposes that the model scope and purpose can be relevant to other fields. The model to enhance lifestyle modification of clients with hypertension can be generalised to other fields of nursing. The study was done in the PHC facilities but the professional in hospital settings can understand the model and its applicability. The health care professional became competent and be able to share information with patients with hypertension to be able to modify their lifestyle. The context is the community, family, and health care facility that clients with hypertension do follow up visits.

6.5.3 Accessibility

The model would be accessible to PHC facilities through workshops that the researcher would conduct wherein the participants and the managers would be included in the facilities where data was collected. The model could also be accessible in the research seminars, presentations at national and international seminars.

6.5.4 Importance of the Model

The proposed model is important as it serves as a standard to guide the health care professionals on how to enhance lifestyle modification of clients with hypertension. Currently, there is no model to enhance lifestyle modification of clents with hypertension in Limpopo province. The clients with hypertension lacked knowledge and support hence not adhering to lifestyle modification. The model will assist the health care professionals to empower clients with hypertension and people who will support them on lifestyle modification.

6.6 Guidelines on How to Implement the Model

The last step in model development is the application of the model which involves the

description of guidelines on how to implement the model. The guidelines presented pertaining to the context. The guidelines were derived from the data analysis and conceptualization of the context where lifestyle modification enhancement was to be implemented.

- The family
- Community
- Health care professionals

6.6.1 Guidelines Pertaining to Family

- Clients with hypertension should be counselled on lifestyle modification of clients with hypertension diagnosis to family members
- Need for openness and transparency in the family when discussing lifestyle modification.
- Family members to know about complications of non-adherence to lifestyle modification
- The family members to be aware of the benefits of lifestyle modification.
- Clients should be encouraged to invite their family members for counselling
- Family members should be given knowledge on lifestyle modification
- Family members should be encouraged to accompany the patient with hypertension for follow up
- Family members should be involved in lifestyle modification outreach

programs

- Health care workers should do a home visit to evaluate how lifestyle modification is managed
- Family members should seek information from different sources on lifestyle modification of clients with hypertension.
- A health care professional should advocate for clients on issues pertaining to lifestyle modification
- Client and family members should be assisted to describe the benefits of modifying lifestyle.

6.6.2 Guidelines Pertaining to Community

- Encourage interactive participation by all community members on lifestyle modification.
- Different activities like soccer should be encouraged since sports are recognised as significant in encouraging physical activity.
- Provision of more resources and new indicators for the provision of lifestyle modification enhancement services to the communities.
- Outreaches to be conducted like campaigns and workshops to be conducted in the community with the help of a local PHC facility.
- Communication with the community using print, electronic, telephone, broadcast, and media.
- Environmental restructuring and modelling of the community roads.

- Continuous health education programs including training and feedback in the community.

- Collaboration with the community leaders on issues pertaining to lifestyle modification.

6.6.3 Guidelines for Health Care Professionals

- Collaboration with the traditional healers, pastors, peers and PHC facilities as the resource centres in the provision of information on lifestyle modification.

- Attendance of workshops and seminars on hypertension management and lifestyle modification to acquire knowledge and skills on current information to share with patients with hypertension.

- Health care professionals to refer patients with hypertension to other services for relevant management.

- Health care professionals to follow relevant guidelines policies on the management of hypertension in the PHC services.

- The health care professional to enhance lifestyle modification of clients with hypertension.

- Health care professionals to share information on lifestyle modification with patients with hypertension on follow-up visit.

- A home visit should be done to monitor and encourage clents with hypertension from their family backgrounds.

- Health care professionals should assist patients with hypertension to

develop skills on how to modify their lifestyles.

- The health care professionals to give patients with hypertension information on the benefits of lifestyle modification and complications of non-adherence to lifestyle modification.
- There must be good communication with the patients with hypertension, families, and community.
- Collaborative team-based approach involving nurses, dieticians, doctors, community health care workers, physiotherapists, and lay counsellor.

6.7 Summary

This chapter discussed about development and validation of a model to enhance lifestyle modification of clients with hypertension. The following chapter will focus on the conclusion, limitations and recommendation of the study.

CHAPTER 7

EVALUATION, CONCLUSION, LIMITATIONS AND RECOMMENDATION OF THE STUDY

7.1 Introduction

The previous chapters dealt with literature review, research design, methodology, data analysis, interpretation, and discussion of the findings of phase 1a (qualitative study) and phase 1b (quantitative study). A model to enhance lifestyle modification of clients with hypertension was developed. This chapter presented the conclusions based on the results of the study and recommendations to lifestyle modification enhancement in Vhembe and Mopani districts in Limpopo province of South Africa. Limitations and the concluding remarks were laid down in this chapter.

The study emanated from the evidence that patients with hypertension were not adhering to lifestyle modification. It was revealed from literature and study results that there is a need to enhance lifestyle modification of clients with hypertension. This includes the need for early diagnosis of hypertension, acceptance of diagnosis and need for lifestyle modification through counselling and family support, empowerment of clients with hypertension with knowledge and skills on lifestyle modification. Furthermore, to increase commitment to modify lifestyle by clients with hypertension manifested through health motivation and change of health beliefs.

7.2 The Objectives of the Study

- **Objective 1 was to explore the lifestyles of patients with hypertension in Limpopo Province, South Africa.**

This objective was met by having semi-structured interview asking questions regarding lifestyle of clients with hypertension. The findings showed non-adherence to lifestyle modification by patients with hypertension and inadequate support from family members, friends and health care workers. The clients also suggested to be given information during follow up and in different settings. Furthermore, they suggested to have person trained who will attend to them and availability of educational materials

- **Objective 2 was to describe the beliefs about lifestyle modification among clients with hypertension in Limpopo Province, South Africa.**

This objective was met by asking questions related to beliefs of the clients regarding lifestyle modification. Clients revealed their beliefs on benefits of lifestyle modification and complications due to non-adherence to lifestyle modification. Though, some clients were not adhering to lifestyle modification, they were aware that there are complications of non-adherence to lifestyle modification however, there are benefits if one adhere to lifestyle modification

- **Objective 3 was to explain the role of health care workers in enhancing lifestyle modification of clients with hypertension in Limpopo Province, South Africa.**

The findings of Phase 1b confirmed that patients with hypertension were not adhering to lifestyle modification. Different methods to enhance lifestyle modification of clients with hypertension with their possible effective frequencies in PHC facilities were

determined. The choice of methods and frequency of methods to enhance lifestyle modification was associated with nurses' age, years of experience and workload of the facility. Nurse's experience on adherence of clients to lifestyle modification was also associated with the choice of method to enhance lifestyle modification.

- **Objective 4 was to determine what health care workers can do to enhance the lifestyle modification of clients with hypertension in Limpopo Province, South Africa.**

Nurses also agreed on increasing frequency of methods to enhance lifestyle modification in different level. It was suggested that there should be a person trained to enhance lifestyle modification. Encouragement of clients to be ambassadors of lifestyle modification was agreed by most of nurses to be another strategy to enhance lifestyle modification.

In PHC facilities lifestyle modification enhancement was mainly a responsibility of nurses who were short-staffed and have complex duties which make them fail to attend to lifestyle modification of clients with hypertension. Hence clients with hypertension lacked knowledge and support on lifestyle modification.

- **Objective 5 was to develop a model to enhance lifestyle modification for pclents with hypertension.**

  The model to enhance lifestyle modification of clients with hypertension was developed and it was reviewed and found usable by health care workers working with clients with hypertension.

7.3 Research Approach and Design

The research study adopted a exploratory sequential mixed method design to investigate how lifestyle modification of patients with hypertension could be enhanced. The qualitative data was collected and analysed. The results of the qualitative study were used to build the objectives of the quantitate study. The data from the quantitative study confirmed the results of the qualitative study.

7.4 Limitations

The study was limited to Limpopo province in Vhembe and Mopani districts PHC facilities. Doctors, dieticians, and physiotherapists were not included due to time and financial constraints since they come to PHC facilities on appointment dates and appointments schedules were not followed as usual due to Covid 19 preventative measures.

7.5 Recommendations

Recommendations were made based on the results of the study and were grouped in terms of practice, management and future researches.

7.5,1 Practice

The findings of this study revealed that patients with hypertension have inadequate knowledge of lifestyle modification. They showed inadequate knowledge of diet and physical exercise. The following recommendations were made:

- Health care workers should work with the families to ensure appropriate information is given on lifestyle modification of clients with hypertension
- Clients with hypertension should be counselled on lifestyle modification

since diagnosis and on follow-up.

- To encourage clients to be ambassadors of lifestyle modification
- To include community health care team on sharing information-sharing regarding lifestyle modification.
- To market lifestyle modification to community members in different gatherings like funerals, civic meetings, and imbizos.
- The following frequencies are recommended for effective information sharing: Health education, posters, brochures should be done daily; media (radio) weekly
- Home visit monthly; patients' adherence clubs and support groups bimonthly; civic meeting, church gatherings, and community clubs quarterly; community clubs; campaigns twice a year; school visit yearly; funerals when opportunities arise.
- A trained person is recommended for PHC facilities as a responsible person for lifestyle modification of clients with hypertension.
- The health care worker to include information on benefits of lifestyle modification when enhancing lifestyle modification
- The health care worker to include complications of non-adherence to lifestyle modification when enhancing lifestyle modification of clients with hypertension.

The study revealed a lack of support which led to challenges on diet and physical exercises including socialisation, eating out of home setting, laziness, non-disclosure

of hypertension diagnoses and busy schedule.

The following recommendations are done:

- Involvement of patients' support system that is family members, friends, pastors, traditional healers, and community should be done when sharing information and lifestyle modification to empower them on lifestyle modification and how they can support clients.
- There must be lifestyle modification on different levels.
- There should be support groups on lifestyle modification initiated in each PHC facility
- Clients with hypertension should be supported with messages on their mobile phones.
- Clients should be encouraged to invite their family members to come with them for follow-up.
- Pastors, friends, traditional healers should be invited to attend outreaches to gain knowledge on lifestyle modification and how they can support clients with hypertension.

7.5.2 Management

The findings of the study revealed that there is no one to encourage clients on lifestyle modification during follow-up. Hence clients with hypertension had none to ask questions when they have challenges on lifestyle modification. The following recommendations were made:

- All nurses in PHC should be trained on the enhancement of lifestyle to assist clients during follow-up.
- There should be a person who is trained and responsible for lifestyle modification enhancement.
- Community health care workers should be trained on lifestyle modification of clients with hypertension.
- Clients with hypertension should be trained on skills to encourage others on lifestyle modification.
- Visiting allied heealth teams should emphasise lifestyle modification when attending to a client with hypertension.

7.5.3 Future Research

- Further research on lifestyle modification enhancement should be done in the workplaces since clients with hypertension also have challenges when they are at work.
- More research should be done to evaluate the established methods effectiveness.

7.6 Conclusion

The study focused on the development of a model to enhance lifestyle modification of clients with hypertension in Limpopo, South Africa. A model was developed using the six elements of Dickoff and James. The findings of the study contributed to the body of knowledge since currently there was no model on lifestyle modification of patients with hypertension in Limpopo province, South Africa. The objectives of the study were

discussed and evaluated if they were met. The researcher included the limitation of the study. Recommendations that could benefit the patients were outlined.

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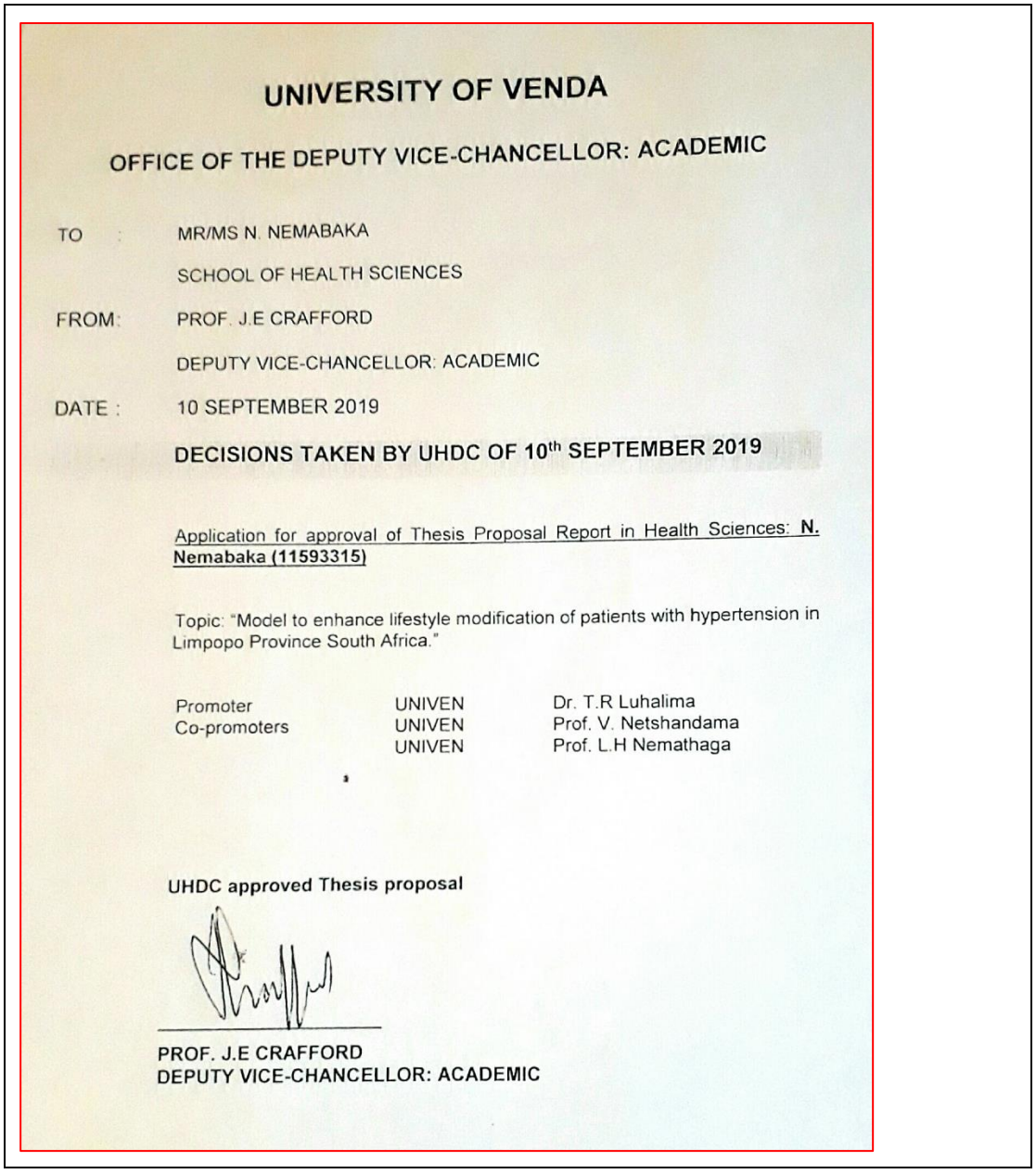
ANNEXURE A

APPROVAL FROM UNIVERSITY OF VENDA HIGHER DEGREES COMMITTEE (UVHDC)



UNIVERSITY OF VENDA

OFFICE OF THE DEPUTY VICE-CHANCELLOR: ACADEMIC

TO : MR/MS N. NEMABAKA

SCHOOL OF HEALTH SCIENCES

FROM: PROF. J.E CRAFFORD

DEPUTY VICE-CHANCELLOR: ACADEMIC

DATE : 10 SEPTEMBER 2019

DECISIONS TAKEN BY UHDC OF 10th SEPTEMBER 2019

Application for approval of Thesis Proposal Report in Health Sciences: **N. Nemabaka (11593315)**

Topic: "Model to enhance lifestyle modification of patients with hypertension in Limpopo Province South Africa."

Promoter	UNIVEN	Dr. T.R Luhalima
Co-promoters	UNIVEN	Prof. V. Netshandama
	UNIVEN	Prof. L.H Nemathaga

UHDC approved Thesis proposal

PROF. J.E CRAFFORD
DEPUTY VICE-CHANCELLOR: ACADEMIC

ANNEXURE B

UNIVERSITY OF VENDA RESEARCH ETHICS COMMITTEE (UVREC) CLEARENCE CERTIFICATE

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Mrs N Nemabaka

Student No:
11593315

PROJECT TITLE: **Model to enhance lifestyle modification of patients with hypertension in Limpopo Province, South Africa.**

PROJECT NO: **SHS/19/PDC/41/2410**

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr TR Luhalima	University of Venda	Promoter
Prof VO Netshandama	University of Venda	Co - Promoter
Prof LH Nemathaga	University of Venda	Co - Promoter
Mrs N Nemabaka	University of Venda	Investigator – Student

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: November 2019
Decision by Ethical Clearance Committee Granted
Signature of Chairperson of the Committee: .....
Name of the Chairperson of the Committee: Senior Prof. G.E. Ekosse

UNIVERSITY OF VENDA
DIRECTOR
RESEARCH AND INNOVATION
2019 -11- 04
Private Bag X5050,
Thohoyandou 0950

University of Venda
PRIVATE BAG X5050, THOHOYANDOU, 0950λ LIMPOPO PROVINCEλ SOUTH AFRICA
TELEPHONE (015) 962 8504/8313 FAX (015) 962 9060
"A quality driven financially sustainable, rural-based Comprehensive University"

ANNEXURE C

LETTER TO LIMPOPO PROVINCE DEPARTMENT OF HEALTH REQUESTING PERMISSION TO CONDUCT THE STUDY

P.O. Box 80
Tshakhuma
0951
01. 05. 2019
Department of Health
Limpopo Province
Polokwane

Sir

I, Ndifelani Nemabaka, am Doctorate student at the University of Venda, student number 11593315. I am applying to do research as part of my studies.

The research topic**: A model to enhance lifestyle modification to patients with Hypertension in Limpopo Province in South Africa.**

The purpose of the study is to explore and describe how and what can be done to enhance lifestyle modification of patients with Hypertension.

The study will be conducted in Mopani and Vhembe districts. The results of the study may help policy makers to design strategies that will enhance lifestyle modification to patients with diseases of lifestyle. Furthermore, health care workers will have information on what can be done to enhance lifestyle modification to patients with Hypertension.

Hoping my application will be considered.

Regards

Researcher: N. Nemabaka

ANNEXURE D

PERMISSION FROM LIMPOPO PROVINCE DEPARTMENT OF HEALTH TO CONDUCT THE STUDY

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

Department of Health

Ref : LP – 2019-11- 015
Enquires : Ms PF Mahlokwane
Tel : 015-293 6028
Email : Kurhula.Hlomane@dhsd.limpopo.gov.za

Mrs N Nemabaka

PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES

Your Study Topic as indicated below;

Model to enhance lifestyle modification of patients with hypertension in Limpopo Province South Africa.

1. Permission to conduct research study as per your research proposal is hereby Granted.
2. Kindly note the following:
   a. Present this letter of permission to the institution supervisor/s a week before the study is conducted.
   b. In the course of your study, there should be no action that disrupts the routine services, or incur any cost on the Department.
   c. After completion of study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
   d. The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
   e. The approval is only valid for a 1-year period.
   f. If the proposal has been amended, a new approval should be sought from the Department of Health
   g. Kindly note that, the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated

Head of Department

10/02/2020
Date

Private Bag X9302 Polokwane
Fidel Castro Ruz House, 18 College Street. Polokwane 0700. Tel: 015 293 6000/12. Fax: 015 293 6211.
Website: http/www.limpopo.gov.za

The heartland of Southern Africa – Development is about people!

ANNEXURE E

LETTER TO LIMPOPO PROVINCE DEPARTMENT OF HEALTH REQUESTING PERMISSION TO CONDUCT THE STUDY IN MOPANI DISTRICT PHC FACILITIES

P.O. Box 80
Tshakhuma
0951
01. 02. 2020
District Executive Manager
Mopani District
Giyani

Sir/Madam

RE: APPLICATION FOR PERMISSION TO CONDUCT RESEARCH

I, Ndifelani Nemabaka, am Doctorate student at the University of Venda, student number 11593315. I am applying to do research as part of my studies.

The research topic: **A model to enhance lifestyle modification of patients with Hypertension in Limpopo Province in South Africa**.

The purpose of the study is to explore and describe how and what can be done to enhance lifestyle modification to patients with Hypertension.

The results of the study may help policy makers to design strategies that will enhance lifestyle modification to patients with diseases of lifestyle. Furthermore, health care workers will have information on what can be done to enhance lifestyle modification to patients with Hypertension.

Permission has already been granted by the Limpopo Province Department of Health.

Hoping my application will be considered.

Regards

N. Nemabaka

ANNEXURE F

PERMISSION FROM LIMPOPO PROVINCE DEPARTMENT OF HEALTH MOPANI DISTRICT TO CONDUCT THE STUDY

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH
MOPANI DISTRICT

Student number : 11593315
Enquiries : S Chuma
Tel Direct : 015 811 6661

To: **Ms. Ndifelani Nemabaka**
P.O Box 80
Tshakhuma
0951

RE: PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES: YOURSELF

1. We acknowledge receipt of your request received on the 26 February 2020.
2. It is with pleasure to inform you that permission has been granted for you conduct research in Primary Health Care facilities of Greater Giyani Sub-District between **March and October 2020.**
3. You are advised to furnish the Operational Managers of the respective facilities with this letter and the letter from the Provincial office for the purposes of access and assistance.
4. You will also expected to observe and comply with all ethical standards and acts governing the public service to keep the integrity of the health facility and the department.
5. Wishing success in your career.

S. Chuma
.....
ACTING DIRECTOR: CORPORATE SERVICES

2020/03/03
.....
DATE

ANNEXURE G

LETTER TO LIMPOPO PROVINCE DEPARTMENT OF HEALTH REQUESTING PERMISSION TO CONDUCT THE STUDY IN VHEMBE DISTRICT PHC FACILITIES

P.O. Box 80
Tshakhuma
0951
01. 02. 2020
District Executive Manager
Vhembe district
P/Bag x5009

Sir

RE: APPLICATION FOR PERMISSION TO CONDUCT THE RESEARCH

I, Ndifelani Nemabaka, am Doctorate student at the University of Venda, student number 11593315. I am applying to do research as part of my studies.

The research topic: **A model to enhance lifestyle modification to patients with Hypertension in Limpopo Province in South Africa.**

The purpose of the study is to explore and describe how and what can be done to enhance lifestyle modification to patients with Hypertension.

The results of the study may help policy makers to design strategies that will enhance lifestyle modification to patients with diseases of lifestyle. Furthermore, health care workers will have information on what can be done to enhance lifestyle modification to patients with Hypertension.

Permission has already been granted by the Limpopo Province Department of Health.

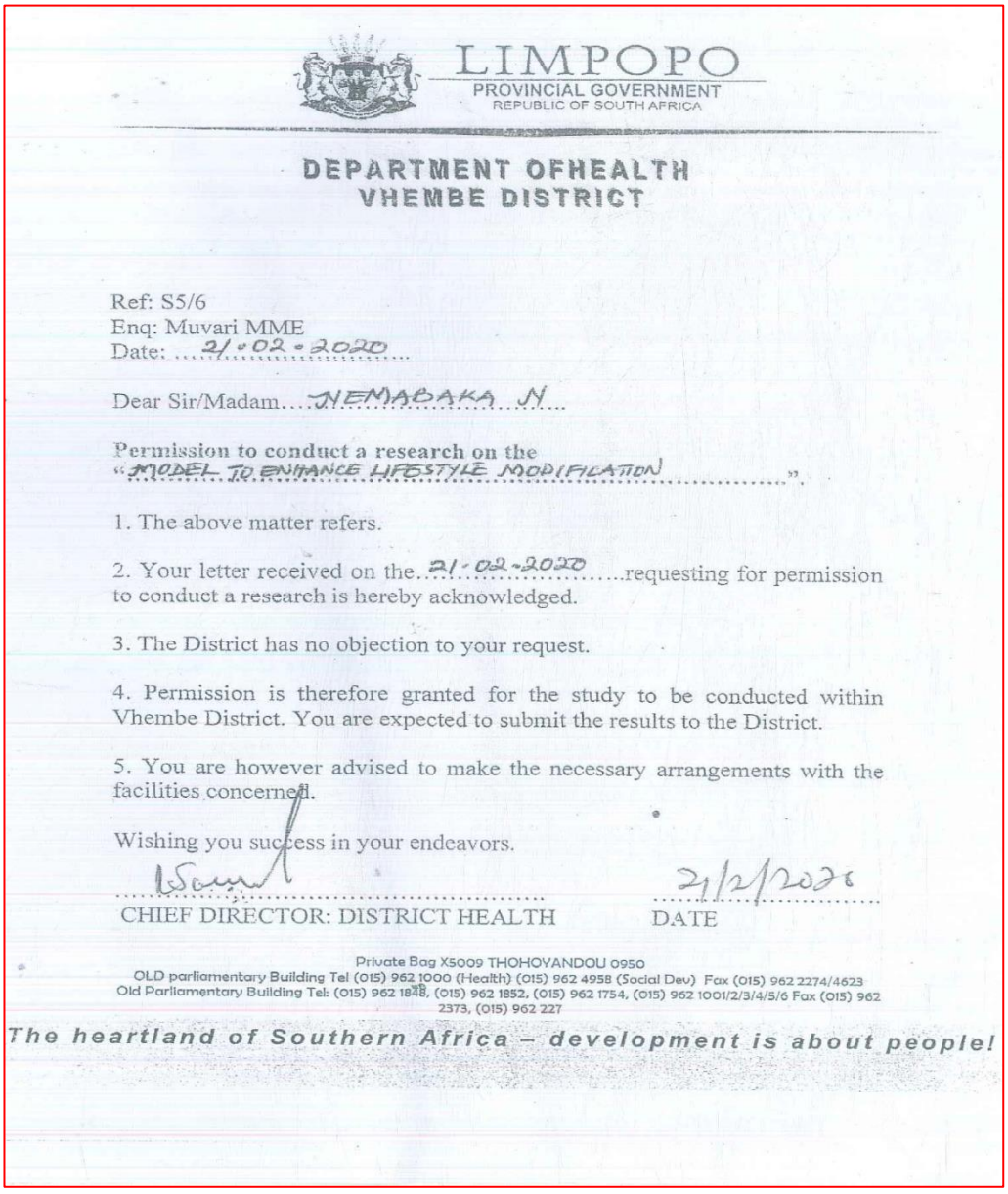
Hoping my application will be considered.

Regards

N. Nemabaka

ANNEXURE H

PERMISSION FROM LIMPOPO PROVINCE DEPARTMENT OF HEALTH VHEMBE DISTRICT TO CONDUCT THE STUDY



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OFHEALTH
VHEMBE DISTRICT

Ref: S5/6
Enq: Muvari MME
Date: 21-02-2020

Dear Sir/Madam... NEMABAKA N

Permission to conduct a research on the
"MODEL TO ENHANCE LIFESTYLE MODIFICATION".

1. The above matter refers.

2. Your letter received on the 21-02-2020 requesting for permission to conduct a research is hereby acknowledged.

3. The District has no objection to your request.

4. Permission is therefore granted for the study to be conducted within Vhembe District. You are expected to submit the results to the District.

5. You are however advised to make the necessary arrangements with the facilities concerned.

Wishing you success in your endeavors.

CHIEF DIRECTOR: DISTRICT HEALTH — DATE 21/2/2020

Private Bag X5009 THOHOYANDOU 0950
OLD parliamentary Building Tel (015) 962 1000 (Health) (015) 962 4958 (Social Dev) Fax (015) 962 2274/4623
Old Parliamentary Building Tel: (015) 962 1848, (015) 962 1852, (015) 962 1754, (015) 962 1001/2/3/4/5/6 Fax (015) 962 2373, (015) 962 227

The heartland of Southern Africa – development is about people!

ANNEXURE I

INFORMATION SHEET

Title of research: **A model to enhance lifestyle modification to patients with hypertension in Limpopo province South Africa.**

Principal researcher: N. Nemabaka **Qualifications:** MCur

Supervisor: Dr T.R. Luhalima

Brief introduction and purpose of the study

Hypertension is rising in South Africa and patients are failing to comply with healthy lifestyle modification. The purpose of the research is to find out what can be done to enhance healthy lifestyle to patients with hypertension.

Outline of the procedures

Venue: Makhado PHC facility

Inclusion criteria: Male/female aged 30-60 years

Questionnaire will be used

As a participant you are expected to spend 40-45 minutes to completing this questionnaire.

Risk or discomfort expected from participant

There are questions that require your personal lifestyle.

Benefits of the research

The participant will gain knowledge on lifestyle modification. Remuneration: Participants will not be remunerated in any form. This is a voluntary participation.

Cost of the study

Participants will not be expected to pay any cost to participate in the study.

Remuneration for any injury

No remuneration as there is no risk of injury during the study.

Person to be contacted in the event of any problem or queries:

Supervisor: Dr T.R. Luhalima **Cell Number:** 072 482 3404

The University Research Ethics Committee Secretariat on 015 962 9058.

Complaints can be reported to the Director: Research and Innovation, Prof G.E. Ekosse on 015 962 8313

Or Georges Ivo. ekosse@univen.ac.za

ANNEXURE J

INFORMED CONSENT FORM

I hereby confirm that I have been informed by the researcher, …….., about the nature, conduct, benefits, and risks of this study – Research Ethics Clearance Number……

- I have also received, read, and understood the above written information regarding the study
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials, and diagnosis, will be anonymously processed into study report
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerized system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Names of Participant: ……..

Date: …… **Time:** ……

Signature: ……

I……..herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Full Names of Researcher: ……

Date: …… **Time:** ……

Signature: ……

Full Names of Witness: ……..

Date: …… **Time:** ……

Signature: ……

I …… have been asked to participate in research study to be conducted by Nemabaka N Student number 11593315

The title of the research is: **A model to enhance lifestyle modification of patients in Limpopo province of South Africa.**

The aim of the study was explained to me and the rights to participate/terminate my participation was also explained to me.

I understand that the benefit from participating in this study may help the researchers and managers to plan for patients with chronic diseases of lifestyle

I was assured of confidentiality of information that I will provide, and research code will be used to identify my response from those of other patients and no information will be linked to my personal details

I understand that my refusal to participate will involve no penalty or loss of rights to which I am entitled to. I may withdraw from the study at any time without fear of any threat

The study is one of the requirements the degree Doctor in Nursing at the University of Venda.

Signature of Participant: ……

Signature of Researcher: ……

ANNEXURE K

INTERVIEW GUIDE

1. How do you think patients with hypertension can benefit from lifestyle modification?
2. What do you think can be the barriers to patients adhere to lifestyle modification?
3. How can non-adherence to lifestyle modification affect patients with hypertension?
4. How can patients with hypertension be supported on lifestyle modification?
5. How do you think lifestyle modification could be enhanced?

ANNEXURE L

QUESTIONNAIRE FOR PROFESSIONAL NURSES IN SELECTED PHC FACILITIES

Instructions:

- Answer all questions
- Tick on space provided or fill in the gaps

Respondent's Code number: ……

Date of completion of questionnaire: ……

SECTION A: DEMOGRAPHIC INFORMATION

1.1. Gender

1. Male	2. Female

1.2. Age

25.29 years	30-45 years	46-50 years	51-60 years

1.3. Years of working as a professional nurse

1-5 years	6-10 years	11-30 years	More than 30

1.4. How many patients with hypertension do you see per day?

<10 patients	10-30 patients	30 patients and above

SECTION B. The next set of questions is to check your experience regarding patients' adherence to lifestyle modification:

1.5. In your own experience, do you think patients with hypertension are adhering to lifestyle modification?

Yes	No

1.6. Which age group is most likely to adhere to lifestyle modification?

20-30 years	31-40 years	41-50 years	51-60 years	60 years and above

1.7. Which gender is most likely to adhere to lifestyle modification?

Male	Female

SECTION C: Explanation on the role of nurses on enhancing lifestyle modification of patients with hypertension.

The following set of questions is to check information-sharing regarding lifestyle modification.

1.8. How do you share information about lifestyle modification of patients with hypertension in your facility (Tick all that apply)?

Checklist of sharing information method	
Method	
1. Health talks	
2. Posters	
3. Brochures/fliers	
4. Support groups	
5. Civic meetings	
6. Church gatherings	
7. Funerals	

8. School visits	
9. Home visits	
10. Patients' adherence clubs	
11. Community clubs	
12. Campaigns	
13. Media (Radio)	
14. Cell phone	
15. Other (please specify)	

1.9. How often is the information about lifestyle modification of patients with hypertension shared? Please tick in the appropriate box.

	When opportunity arises	Daily	Weekly	Monthly	Bimonthly	Quarterly	Twice in a year	Yearly	Rarely
1. Health talks									
2. Posters									
3. Brochures/fliers									
4. Support groups									
5. Civic meetings									
6. Church gatherings									
7. Funerals									
8. School visits									
9. Home visits									
10. Patients' adherence clubs									
11. Community clubs									
12. Campaigns									
13. Media (Radio)									

14. Cell phone									
15. Other									

1.10. Which information about lifestyle modification of patients with hypertension shared?

Type of information shared	Tick all that apply
a. Healthy diet	
b. Stopping smoking	
c. Reduction of alcohol	
d. Physical exercise	
e. Weight reduction	
f. Stress management	

1.11. Who is responsible for information sharing about lifestyle modification?

Professionals responsible for information sharing	Tick all that apply
a. Nurse	
b. Community health worker	
c. Lay counsellor	
d. Dietician	
e. Doctor	
e. Trained person	

The following set of questions is regarding people who support patients with hypertension

1.12. Who are involved when sharing information about lifestyle modification of patients with hypertension?

People involved during information sharing	Tick all that apply
a. Friends	
b. Family members	
c. Community members	
d. Pastors	

e. Traditional healers	

1.13. What are the challenges associated with the involvement of family members when sharing information about lifestyle modification of patients with hypertension?

Challenges associated with family involvement	Tick all that apply
a. Busy schedule	
b. Lack of knowledge	
c. Patient not disclosing about hypertension	
d. None	

SECTION D: Determine what health care workers can do to enhance the lifestyle modification of patients with hypertension in Limpopo Province South Africa

The following set of questions is to check information-sharing strategies**.**

1.14. How often should the following be used to improve effectiveness of information sharing on lifestyle modification of patients with hypertension?

	When opportunity arises	Daily	Weekly	Monthly	Bimonthly	Quarterly	Bi-annually	Yearly
1. Health talk								
2. Posters								
3. Brochures/fliers								
4. Support groups								
5. Civic meetings								
6. Church gatherings								
7. Funerals								
8. School visits								
9. Home visits								
10. Patients' adherence clubs								

11. Community clubs								
12. Campaigns								
13. Media (Radio)								
14. Cell phone								
15. Other								

1.15. Who may be the most effective person to share information on lifestyle modification of patients with hypertension?

Person responsible for information sharing	**Tick all that apply**
a. Nurse	
b. Community health worker	
c. Lay counsellor	
d. Dietician	
e. Doctor	
f. Trained person	

1.16. Who must be included when sharing information about lifestyle modification of patients with hypertension?

People involved during information sharing	**Tick all that apply**
a. Friends	
b. Family members	
c. Community members	
d. Pastors	
e. Traditional healers	

1.17. Which information about lifestyle modification must be shared with patients with hypertension?

Type of information	Tick all that apply
a. Healthy diet	
b. Stopping smoking	
c. Reduction of alcohol	

d. Physical exercise	
e. Weight reduction	
f. Stress management	

1.18. When counselling patients with hypertension on lifestyle modification, which information should also be included?

Benefits of adhering to healthy lifestyle	**Tick all that apply**
a. Good image	
b. Controlled hypertension	
c. Prevention of complications	
d. Limiting increase of hypotensive drugs	
e. Reduction of weight	

1.19. When counselling patients with hypertension on lifestyle modification, which information should also be included?

Complications of non-adherence to healthy lifestyle	**Tick all that apply**
a. Stroke	
b. Heart attack	
c. metabolic conditions like diabetes	
d. Obesity	
e. Cancer	
f. Joints and skeletal problems	

1.20. Which challenges regarding information sharing are encountered in your facility?

Challenges regarding information sharing	**Tick all that apply**
a. Lack of dedicated person	
b. Shortage of staff	
c. Lack of pamphlets/fliers/posters	
d. Other (please specify)	

1.21. Which among the following do you think can be done to encourage information sharing on lifestyle modification of patients with hypertension?

Code	Recommendation	Tick all that apply
A	To encourage patients with hypertension to be ambassadors of lifestyle modification of patients with hypertension.	
B	To include community health care team on information sharing regarding lifestyle modification of patients with hypertension.	
C	To market lifestyle modification to the community members in different gatherings like funerals, church gatherings, civic meetings and imbizos.	
D	Other	

If other in Q1.21, please specify:

……

……

……

……

……

ANNEXURE M

INTERVIEW TRANSCRIPT

Researcher: Good afternoon

Participant: *Good afternoon*

Researcher: How are you?

Participant: *I am fine and how are you?*

Researcher: I am fine. As I have said earlier, I would like us to start discussing about lifestyle of person with hypertension. I want you to tell me lifestyle that you have been told by the time you were diagnose with hypertension.

Participant: *I have been told that I must not take salt, I must not eat sour porridge, when cooking stew do not use ordinary cooking oils but I must use olive oil just a bit, I must not take fat meat especially red meat and in chicken I must take out the skin. It was said that I must exercise and must take more than 2 liters of water per day. I always have water bottle with me when I am out of home. I do not want my body to be dry because I feel it is no good for me. Per day I can finish these two bottles (showing a 1 litre plastic bottle). Lastly, I was told to come every time to collect treatments and check my blood pressure.*

Researcher: Mm, how are you managing the lifestyle you were told.

Participant: *At first it was difficult, especially when it comes to diet. Food without salt is tasteless. But it came a time that I tried, and I succeed but still was not so good until I decided to use more of traditional vegetable 'nngu', taking even its juice.*

Researcher: Mm.

Participant: *I decided to use more of traditional herbs 'nngu' when preparing vegetables. It has helped me a lot. I add it to my vegetables and even to meat while cooking it gives flavor while avoid adding salt. Since I started using it my blood pressure is always down".*

Researcher: mm

Participant: *if I am following healthy diet and taking my treatment which is only one pill daily, I am now living well. I no longer have headache and dizziness as before. I do not skip my follow update.*

Researcher: What about exercise?

Participant: *I exercise by moving from here up via graveyard and come back (pointing chief's kraal). I can go there and come back on foot. I usually do that alone if my husband is busy.*

Researcher: Mm

Participant: *I walk from here up there to chief's kraal two times a week. But besides going on walk I can still have exercises at home. Because outside people will take me as mad person I do exercise inside my house, lifting my hands, my legs and whatever (trying to show how she lift hands and legs).*

Researcher: How was your experience on adhering to lifestyle modification?

Participant: *Yes, there are benefits because if you do not follow correct diet and exercise, you become fat and tummy may become big. But if you are doing exercise your tummy flattens. And you become presentable in a way that you can walk without feeling anything. Since I started to follow healthy lifestyle that I was advised by nurses, my blood pressure is being controlled, I feel light and with energy, my size of skirts are reasonable not like before when I was wearing size 40 and 42. I was having painful knees that I was struggling to bend on my knees.*

Researcher: mm

Participant: *My blood pressure is now controlled. I am using only one tablet per day for my blood pressure. I no longer have that headache. As patients with hypertension, we must follow healthy lifestyle because there is a possibility that one can have stroke and heart attack if the blood pressure is not controlled. That is why I no longer take chips even though I sometimes crave for them, I do not want to kill myself.*

Researcher: May you please tell me about challenges that you came across when you started to adhere to lifestyle modification?

Participant: *There is a challenge when I am in social gatherings I just eat and tell myself that I will stick to healthy diet at home because people will think that I am rude. Sometimes I am tempted to go to restaurant I am unable to hold myself from this tempting flavours, eish I cannot resist. But I can take months without going to restaurant if my friends did not invite me.*

Researcher: What about challenges on exercise?

Participant: *Sometimes I am too busy to can have exercises or I am just lazy. If there was a playground near our households, I think we were going to encourage each other to exercise as patients with hypertension. But if you are alone, the day you are lazy no one motivates you.*

Researcher: How can patients with hypertension be supported to adhere to lifestyle modification?

Participant: *We need help from health care workers. The day we come for follow up they must give us time that we exercise at the clinic supervised. Because others come by cars not walking. If they make us exercise around the clinic and outside, it will help. When we come inside the clinic, they also make us do other exercises. It can be good.*

Researcher: Does that mean that it is necessary to do exercise where patients collect their treatments?

Participant: *Yes, when we are together as patients with hypertension, we can*

motivate each other that exercise is important.

Researcher: I understand.

Participant: *I think the government can help by making sure there are soccer clubs of people with hypertension like that of the old ages and young ones and sports that we can do. I think if there can be machines to exercise, we can come to clinic for exercise in different days. Exercises have great benefits. I no longer have headache, dizziness. And my body even feels good and when I wake up, I feel strong.*

Researcher: How can you encourage someone to adhere to healthy lifestyle?

Participant: *I can encourage him/her that if he/she will stop salt and oils he/she will see the benefits.*

Researcher: Ok, how can people with hypertension be encouraged to adhere to this lifestyle?

Participant: *(Looking upward)*

Researcher: How can they be assisted? Others are unable to start, and others say they started and stopped.

Participant: *I think may be when we go to the clinic I mean may be there is one who is having hypertension and have started with lifestyle modification he/she can tell us how he/she feels since initiation of healthy lifestyle. he/she can share with us how he/she managed some of the challenges.*

Researcher: Mm

Participant: *Telling others how he/she is feeling after stopped salt and fats. He/she must be one with hypertension. Because if he/she is having hypertension he/she will be telling us the truth of challenges that he/she did experienced like us.*

Researcher: Mm. so you want somebody who experienced hypertension.

Participant: *Yes, may be if he/she is told a time before clinic visit to come prepared, he/she will have time to share with others what he/she has done to make blood pressure to decrease and stick to healthy lifestyle.*

Researcher: Ok, this means that people need knowledge every time.

Participant: *Yes, if we are given information about lifestyle modification every time, things will go well.*

Researcher: Mm

Participant: *But if it is the information that I am told by a person who is just my nurse and not suffering from hypertension, it is not the same as the information that I am told by a person who has hypertension.*

Researcher: Ok

Participant: *One with hypertension is talking what he/she knows. Mm, yes but the one who is talking without experience will be just talking but the one in it will be talking what he/she knows from experience. He/she is living this life.*

Researcher: Ok let's talk about support you received since you were diagnosed with hypertension and told to start healthy lifestyle.

Participant: *Yes, my family members supported me a lot because even when I am not around and is time to cook, I am also considered that I do not take salt and fats. They separate my food then; they add salt or fats as they want it.*

Researcher: Does this means that at home they are supporting what you are supposed to eat?

Participant: *Yes, and sometimes when my husband is free, we take walk together to the chief's kraal and come back.*

Researcher: Do you have some inputs on how people with hypertension can be supported to modify their lifestyle?

Participant: *Yes, as a mothers in the families, there are times we have problems, you must tell yourself that you are throwing them away. Mm, because problems is something serious and they are different and can make your blood pressure to be too high.*

Researcher: Does this means social problems can make the blood pressure to remain high?

Participant: *Yes, it can make the BP to be high.*

Researcher: How can people with hypertension supported in order to can pass over that problem?

Participant: *I think if I am going to the clinic, I can check who can help me and I tell him or her as my nurse. That I have this kind of problem. If I have tried different people and they are failing to help me, or I can tell my pastor that I have this kind of problem. Yes, he/she will help me by prayers also. If you make it yours alone BP will go up or you can have stroke or heart attack unnecessarily. By just being too lazy to talk that there is this because if we are living, we must talk. We do not accept that which is good, but we accept also that which is not good.*

Researcher: So, you are saying that if one is having problem one must talk that it must be out of him/her that he/she can find some that can help him/her.

Participant: *Yes, others can help. There are people who can help. Yes, that can help us. And we must be next to them. Social workers are there, and nurses are there. Pastors are there, doctors are there and if I tell, them they will help me. Even in church there are those you can see that they are grown up. If you have problem you can tell them to help. They will help you.*

Researcher: Mm, ok I understand.

Participant: *If one change there will be no problem, and everything will be in order if following what one is told to do. And even the patient must accept the illness because it is not going out tomorrow it is forever.*

Researcher: Mm, what can you tell someone who is not adhering to lifestyle modification.

Participant: *I can tell her that if you want to live longer follow what you have been told. Diet with salt or fats are tastier but mind your health.*

Researcher: Ok that is important. Are you still having other thing to say?

Participant: *Only this that if one is having problem must be encouraged to talk to someone and not bottle in the problem.*

Researcher: Ok, thank you. Have a good day

Participant: *Thanks, is a pleasure and honor to be chosen and included to say amongst others.*

Researcher: Ok

ANNEXURE N

CONFIRMATION BY LANGUAGE EDITOR

CONFIRMATION BY LANGUAGE EDITOR

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14 March 2022

To Whom It May Concern

This serves to confirm that I have edited the language, spelling, grammar and style of the **Doctor of Nursing** thesis by **Ndifelani Nemabaka**, titled: "**A Model to Enhance Lifestyle Modification for Patients with Hypertension in Limpopo Province, South Africa**" The manuscript was also professionally typeset by me.

Sincerely Yours

Cert. Freelance Journalism, Dip. Creative Writing, MSc (Medicine), PhD