

**KNOWLEDGE OF THE HYPERTENSIVE
PERSON REGARDING PREVENTION
STRATEGIES FOR CORONARY
HEART DISEASE**

by

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Submitted in fulfilment of the requirements for the degree of

MASTER OF ARTS

in the subject Health Studies

UNIVERSITY OF SOUTH AFRICA

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March 2009

DECLARATION

I declare that **KNOWLEDGE OF THE HYPERTENSIVE PERSON REGARDING PREVENTION STRATEGIES FOR CORONARY HEART DISEASE** is my own work, and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work had not been submitted before for any other degree at any other institution.

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ABSTRACT

The aim of this study was to determine the knowledge of persons with hypertension in a selected geographical area regarding cardiovascular risk factors in order to make recommendations for patient education.

A quantitative, non-experimental, descriptive study was done in the form of a survey using a questionnaire as measuring instrument. The population was hypertensive patients from selected private medical practices in the western part of KwaZulu-Natal and the bordering eastern part of the Free State. Convenience sampling was used and 46 respondents participated in the study. Only 16 (35%) of the respondents achieved a percentage on or above the competency indicator of 50%.

Respondents performed worst in questions where definitions, for example hypertension, were assessed. Recommendations for a patient education document, nursing practice and further research were made.

Key concepts

Knowledge of persons with hypertension, hypertension, patient education, hypertensive patients.

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LIST OF ABBREVIATIONS

ACE-I	Angiotensin-Converting enzyme inhibitors
ARB	Angiotensin receptor blockers
BMI	Body Mass Index
BP	Blood pressure
CCB	Calcium channel blockers
CI	Class
Cm	Centimetre
CVD	Cardiovascular Disease
DASH	Dietary Approach to stop Hypertension
EDL	Essential Drugs List
Eg	Example
Fig	Figure
G	Gram
HDL	High-density lipoprotein
JNC	Joint National Committee
Kg	Kilogram
Kg/m ²	Kilogram per square meter
LDL	Low-density lipoprotein
Mg	Milligram
Mi	Millilitre
MI	Myocardial infarction
MmHg	Millimetre of mercury
Mmol/l	millimol per litre
P	Page
RAA	Renin Angiotensin Aldosterone
SA	South Africa
UK	United Kingdom
UNISA	University of South Africa
USA	United State of America

LIST OF ANNEXURES

Annexure A Information to respondents and informed consent

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CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Cardiovascular disease is a leading cause of morbidity and mortality worldwide (Marais 2003:7). Waeber and Brunner (2002:8) also confirmed that despite all the effort to diagnose and treat patients with high blood pressure, hypertension remains a leading cause of cardiovascular morbidity and mortality. In a study done by Kearney, Whelton and Reynolds (2005:217) hypertension was a distressingly common problem. It was found in 2000 that 26% of the adult population of the world had hypertension and by 2025 29% were projected to have this condition. It was also estimated that 972 million adults had hypertension in 2000, and it was predicted that by 2025 the number of adults with hypertension will increase to a total of 1, 56 billion.

In China hypertension has become a major health challenge. The cases of hypertension during the past 30 years has increased from 30 million in 1960, to 59 million in 1980 and 94 million in 1990. Annually a million residents die of hypertension related stroke and heart disease (Gu, He, Duan & Whelton 2001:9).

In South Africa hypertension is the dominant risk factor for stroke, coronary heart disease, heart failure and chronic kidney disease (Rayner, Blockman, Baines & Tinder 2007:280). Hypertension is one of a number of cardiovascular risk factors and therefore hypertension patients need to be identified and this risk factor needs to be treated.

Hypertension is ranked third as a cause of disability in later life years but at the same time it is also a risk factor for mortality in younger persons. According to Maduna (2006:252) the South African government has come to recognise hypertension as one of the five major conditions that must receive priority and has adopted new guidelines for the management of

hypertension. Emphasis on implementing lifestyle modification and active physical participation programmes, risk stratification and global cardiovascular risk reduction were proposed by the Hypertension Society of Southern Africa.

Hypertension is more than just an elevated or too high blood pressure. It is usually accompanied by other cardiovascular risk factors and blood pressure is only one component of the total risk. In 70 % of cases the overall risk for hypertension or myocardial infarction depends on these other cardiovascular risk factors (Raal 2007:40). A study done by INTERHEART showed that nine modifiable risk factors predict 90% of acute myocardial infarctions (Yusuf 2004:52-61).

There is a continuous association between an increased blood pressure and risk of cardiovascular disease, especially coronary heart disease. It is therefore very important to assess a patient's cardiovascular risk to risk-stratify the patient and in doing so to treat the patient holistically (Rayner et al 2007:280). Patients eventually end up in critical care unit with myocardial incidents. Yet, in many cases these patients were diagnosed and treated for hypertension for years. However, it seems as if these individuals were often not aware of the outcome that hypertension might eventually have and also not of the fact that they could have implemented actions to modify these risk factors.

1.2 BACKGROUND TO THE STUDY AND RESEARCH PROBLEM

Hypertension is called a silent disease because often symptoms are not recognised. Mabuza (2006:230) found in a study that in the adult population in Africa, one in five persons was hypertensive and in South Africa the figure was one in four, therefore even worse. It has been shown that people with an African descent, present with hypertension at the much earlier age of 35 years in countries like the USA, the Caribbean and the UK compared to the rest of the population. Seedat (2006:1993-338) said in Sub Saharan Africa there is evidence that hypertension and Coronary heart disease is increasing rapidly.

Edwards (2000:145) undertook two other surveys which indicated that only 20% of hypertensive people were aware of their diagnosis, 10% was on treatment and less than 1% was properly controlled. Of hypertensive South African black males only 20% was aware of their hypertension, 14% were on treatment and only 7% was controlled while 47% of females were aware, 29% on treatment and only 15% were controlled. Aggressive large and small scale interventions are necessary to control hypertension in South Africa.

In the South African Hypertension Guideline of 2006, it was mentioned that the major challenge for the community is the primary prevention of atherosclerotic disease by the control of hypertension in conjunction with other major risk factors such as cigarette smoking, dyslipidaemia and diabetes mellitus (Seedat 2006:338).

Rayner et al (2007:280) recommended that particular attention needs to be paid to the implementation of lifestyle changes, assessing target organ damage with basic investigations, risk stratification and global cardiovascular risk reduction. In hypertension, lifestyle plays a role and it can be prevented to an extent by strategies implemented at the individual level to combat this disease. Better awareness of the risk factors that cause coronary artery disease, especially hypertension can reduce the mortality and morbidity of coronary artery disease. The first line management of hypertension is lifestyle modification and the identification of risk factors, predisposing an individual to the development of hypertension.

Mbokazi (2006:232) found that there is an increase in the prevalence of lifestyle diseases such as hypertension, because urbanisation has led to changes in the lifestyle and habits of the South African population. There is also an increase in the consumption of alcohol and tobacco smoking, both of which are implicated in the cause and aggravation of hypertension.

As indicated above hypertension is increasing rapidly. However, hypertension cannot be treated in isolation and is an important predictor of future cardiovascular risk. Atherosclerosis as a result of hypertension remains the

major cause of death and premature disability in developed societies. It is estimated that by the year 2020 cardiovascular disease – notably atherosclerosis will become the leading global cause of total disease burden (Seedat 2006:338).

Hypertension patients need to be identified and prevention strategies including patient education for cardiovascular disease should be implemented. However, it is not clear what the level of knowledge of hypertensive persons is regarding Coronary heart disease prevention strategies in the South African context. The problem further is that lifestyle modification is only possible if the patients are knowledgeable on the disease. The problem is also that despite information that appears in the media from time to time, it is not clear what their level of knowledge is regarding lifestyle modifications.

A thorough literature review was done and no evidence of recent research was found that investigated Hypertensive persons' knowledge regarding Coronary heart disease prevention strategies in the South African context. The researcher decided to undertake this study because she is employed in a critical care environment and observed that hypertensive patients are at risk for the development of stroke, coronary heart disease, heart failure and chronic kidney disease. They often land in the critical care unit. These mentioned diseases are in fact those that can potentially be the cause of a patient that might need admission to a critical care unit. A multiple risk factor modification strategy or prevention strategy would therefore be necessary to make the people more aware of their risk.

1.3 AIM AND OBJECTIVES

The aim of this study is to determine the knowledge of persons with hypertension in a selected geographical area regarding cardiovascular risk factors in order to make recommendations for patient education.

The objectives of the study will be to

- Determine the knowledge of persons with hypertension, regarding cardiovascular disease and its risk factors using a measurement instrument in the form of a questionnaire.
- Make recommendations for patient education regarding hypertension and related risk factors.

1.4 DEFINITIONS OF KEY CONCEPTS

1.4.1 Blood Pressure

Blood pressure is the force that the circulating blood exerts on the wall of the arteries (Marieb 1999:727).

1.4.2 Hypertension

Persistently high arterial blood pressure leads to hypertension. Hypertension may have no known cause (essential or idiopathic hypertension) or be associated with other primary diseases (secondary hypertension). Hypertension is defined as a systolic blood pressure greater than 140mmHg and a diastolic pressure greater than 90mmHg (Vander, Sherman & Luciano 2001:446).

1.4.3 Atherosclerotic Cardiovascular Risk Factors

This term is used exchangeable with risk factors of coronary artery disease and it includes smoking, high blood pressure, high serum cholesterol levels, diabetes mellitus, obesity, physical inactivity, stress and anger. Risk factors occur in clusters and may feed one another, such as obesity leading to diabetes and high blood pressure (Urden, Stacey & Lough 2002:395).

1.4.4 Knowledge

Knowledge is defined as knowing what is known of a person, thing, fact or subject. It is a person's range of information and includes specific knowledge about a subject (Collins 2001:815).

1.4.5 Hypertensive Patient

In this study a hypertensive patient is any patient that was diagnosed by a general medical practitioner as suffering from hypertension and who is currently treated for the disease.

1.5 OVERVIEW OF THE RESEARCH DESIGN

1.5.1 Research Design

The research design is the set of logical steps taken by the researcher to answer research questions. It forms the blue print, pattern or recipe for the study and determines the methods used by the researcher to obtain subjects, collect data, analyse the data and interpret results (Mouton 2001:74).

The researcher adopted a quantitative, non-experimental descriptive design. Quantitative research is the precise measurement and quantification, involving a rigorous and controlled design (Polit, Beck & Hungler 2001:469). In this study the knowledge of hypertensive patient's will be quantified by using a questionnaire as measurement test. In descriptive research, the research can obtain complete and accurate information about the characteristics of a particular individual, event or group in actual situations.

1.5.2 Setting

The setting or context for this study is a selected geographical area namely selected private general practitioners' consulting rooms in the western part of KwaZulu-Natal and the bordering eastern part of the Free State.

1.5.3 Population and Sample

A population is the entire group of persons or objects that is of interest to the researcher or that meets the criteria the researcher is interested in studying (Polit et al 2001:234).

In this study the population will be all hypertensive patients in two rural towns in the western part of KwaZulu-Natal and the eastern Free State, who are patients of the selected private doctors of the study context.

A sample refers to the group of people that a researcher selects from a defined population and these are individuals about whom information will be collected (Polit et al 2001:234).

Convenience sampling will be used for this research. It is also referred to as accidental or availability sampling. Available and willing subjects will be included in the study until the desired sample size has been reached (Polit et al 2001:459).

The researcher will distribute questionnaires to the first 50 informed and willing hypertensive patients in the two towns of the study context of the private doctors' surgeries. Inclusion criteria will be described in chapter 3.

1.5.4 Validity, Reliability and Data Analysis

Validity and reliability are of vital importance for quantitative studies and will be explained in detail in Chapter 3.

Statistics will be used to analyse data. With the statistical methods the researcher aim to reduce, summarize, organize, manipulate, evaluate, interpret and communicate quantitative data. Polit et al (2001:460) define data analysis as "the systematic organisation and synthesis of research data". Tables and graphs will clarify data that will be presented.

1.6 ETHICAL ASPECTS

The researcher applied ethical principles that protect the participants in the research from harm or risk. Anonymity and confidentiality will be ensured throughout the study.

The following considerations will be addressed in the study by the researcher to protect human rights:

1.6.1 Informed Consent

The researcher will provide understandable information in their own language and on their level of understanding regarding participating in the research. It will be in written form and all participants are free of choice to participate and they don't have to feel obliged to do so.

1.6.2 Maintaining Privacy

The researcher will ensure anonymity using numbers or codes and report data for the entire group only.

1.6.3 Risk/Benefit Assessment

The researcher will protect the participants from any harm and secure the well being of all participants. Participants will benefit from the research because they can gain from the recommendations of this study.

The layout of the study will be as follows:

Chapter 1: Orientation to the study

Chapter 2: Literature review

Chapter 3: Research methodology and design

Chapter 4: Data analysis

Chapter 5: Conclusions, recommendations and limitations

In the next chapter a thorough review of the literature on hypertension is presented.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

When conducting the literature review, much information was found about hypertension itself. However, about the level of knowledge of hypertensive persons regarding prevention strategies for coronary heart disease, especially from a South African perspective literature could not be found by this researcher.

Babbie and Mouton (2004:566) define a literature review as follows: "it serves a bibliographical function for readers, giving an overview of the previous research on a given topic". The review of the literature should focus mainly on studies and other literature that have direct relevance to the present one.

Hypertension awareness, treatment and control are essential aspects in the prevention of coronary heart disease. Prevention and treatment of hypertension and target organ disease remains essential public health challenges that needs to be addressed. It is therefore important to identify and treat high blood pressure and at the same time to improve the knowledge of hypertensive persons in order to reduce the risk of cardiovascular disease and associated morbidity and mortality.

2.2 ELEMENTS OF THE NORMAL PHYSIOLOGY OF BLOOD PRESSURE AND PATHOPHYSIOLOGICAL DEVIATIONS

Smeltzer and Bare (2004:299) describe systemic arterial blood pressure as follows 'it is the pressure exerted on the walls of the arteries during ventricular systole and diastole, and is affected by factors such as cardiac output, distension of the arteries and the volume, velocity of flow and viscosity of blood".

The normal physiology and deviations from the normal physiology is described in this section.

2.2.1 Blood pressure defined

Blood pressure may be defined as the force or pressure which the blood exerts on the walls of the blood vessels in which it is contained and it is expressed in millimetres of Mercury (mmHg). Blood pressure in the arteries is higher than in the veins due to some delay in movement of blood through the arteriolar and capillary system. The arterial walls are continuously subjected to stretch and are therefore always full (Marieb, 1999:727).

Blood pressure is the driving force that keeps blood moving and can be calculated as a function of cardiac output and peripheral resistance (Marieb 1999:727).

Arterial blood pressure then is the result of the discharge of blood from the left ventricle into the already full aorta. Peripheral resistance should be overcome, so arterial pressure must be high enough for blood flow through capillary beds in order to be maintained. Systolic blood pressure is produced when the left ventricle contracts and pushes blood into the aorta: it is thus the measurement during ventricular systole. In an adult the normal value is about 120 mmHg. Diastolic blood pressure occurs as the heart is resting following the ejection of blood and is in complete cardiac diastole. In an adult the normal value is about 80mmHg (Martini 2001:705).

2.2.2 Factors involved in the maintenance of a normal blood pressure and deviations

Factors that are involved in the maintenance of a normal blood pressure and deviations from the normal will now be discussed. It is important to take note that these factors are interrelated.

2.2.2.1 Cardiac Output

Cardiac output is the volume of blood ejected from each ventricle per minute. Therefore the determinants of cardiac output are stroke volume and heart

rate. The diastolic and systolic pressure rises with an increase in minute volume. If cardiac output increases the blood flow through the capillary beds increases, but if cardiac output declines capillary blood flow is reduced (Martini 2001:701).

2.2.2.2 Blood Volume

To maintain blood pressure there must be a sufficient and normal amount of circulating blood in the vessels. An increased circulating volume will lead to an increased blood pressure as opposed to a hypovolemic patient who will have a low blood pressure (Martini 2001:702).

2.2.2.3 Peripheral Arteriolar Resistance

Martini (2001:703) explains that movement of blood is opposed by the resistance of the cardiovascular system. The greater the resistance the slower the blood flow. For circulation to occur, the pressure gradient of the blood which is pumped from the heart must be great enough to overcome the resistance of the entire cardiovascular system including the peripheral capillaries. An increase in blood pressure can result from an increase in the activity of the vasomotor centre which then results in constriction of the arterioles. A fall of blood pressure on the other hand can result from a decrease in vasomotor activity with resulting vasodilatation. Changes in the blood flow through organs can be regulated according to their needs. Dilatation and constriction of arterioles then occurs selectively in different organs of the body.

The following play a role in peripheral resistance:

- Vascular resistance:

Vascular resistance is the result of the friction between blood and the vessel walls. It is an important factor and it depends on the length and diameter of the vessel (Martini 2001:703).

- Viscosity:

Viscosity can be explained in terms of the “stickiness” of a fluid. Liquids such as water have a low viscosity. Blood contains formed elements like blood cells and plasma proteins (Marieb 1999:728). The viscosity of blood is five times that of water and under normal conditions it remains stable. Blood viscosity and peripheral resistance as a result can be changed by disorders like anemia and polycythemia (Martini 2001:703).

- Turbulence:

Turbulence increases the resistance and slows down the flow of blood. Turbulence results from exposure to irregular surfaces and swirling movement of blood at high flow rates. Atherosclerotic plaque is an example of a factor that creates an abnormal turbulence and results in restricted blood flow (Martini 2001:703).

2.2.2.4 Elasticity of the Artery Walls

In the walls of the large blood vessels there is an amount of elastic tissue in the arterial walls. The function of this elasticity is when blood is ejecting into an already full aorta from the left ventricle it distends and then recoils pushing the blood onwards. Through out the arterial system this distension and recoil occurs. The diastolic pressure is maintained by the elastic recoil of the arteries during cardiac diastole (Martini 2001:705).

A loss of elasticity – in other words an increase in rigidity will result in an increased pressure in these vessels. This can be the result of atherosclerotic plaque formation or aging. Aging results in stiffing of arteries (loss of elasticity) and they can not buffer the pulse wave generated during a systolic cardiac contraction. Elastic recoil diminishes. This leads to a relative increase in systolic pressure, normal diastolic pressure and therefore an increase in pulse pressure. This is what is seen in isolated systolic hypertension (Ker 2000:64).

Fragmentation of the elastic lamellae, increased collagen and calcium content and dilation of arteries is the result of progressive degeneration of the arterial media and then arterial stiffness eventually results. These changes can lead to the development of vascular disease such as atherosclerosis (Ker 2000:66). As the tension in the arterial wall increases due to elevated arterial pressure, damage occurs to the vessel wall, including medionecrosis, atherosclerosis and development of aneurysms that can rupture and hemorrhages. A more forceful pulsatile flow develops because of the chronic increase in arterial pressure which causes endothelial wall damage. These areas of the endothelial lining that are damaged result in an enhanced cell replication. Atherosclerosis is directly related to the rate and number of cell replications.

Urden et al (2002:395) describes coronary heart disease as follows “it is an insidious, progressive disease that results in coronary arterial narrowing or complete occlusion. Coronary heart disease is caused by atherosclerosis, the thickening and the hardening of the inside walls of the arteries.”

2.2.2.5 Venous Return

An important aspect that cardiac output is depended on is the amount of blood returned to the heart through the superior and inferior venae cavae.

Venous return is determined by the amount of blood arriving at the right atrium each minute; in other words venous pressure. The blood must flow through the arterial system before returning to the heart. Venous pressures are usually low. As the blood moves through the venous system, the veins offer less and less resistance and therefore pressure declines slowly. The velocity of blood flow increases as the blood continues to flow to the heart because the veins then become then larger and the resistance drops. The heart must overcome gravity for venous blood to return as it ascends within the inferior vena cava (Martini 2001:710).

Two factors are involved in assisting low venous pressure namely muscular compression and the respiratory pump.

Muscular compression assists because blood is pushed towards the heart by the contractions of skeletal muscles near a vein. Blood is then flowing in one direction because of the valves in small and medium-sized veins. In normal standing and walking venous return is assisted by the contraction and relaxation of muscles that accompany normal movements (Martini 2001:710).

The respiratory pump also assists because when a person inhales the pressures in the pleural cavities decline as the thoracic cavity expands, and air is pulled into the lungs. At the same time the inferior vena cava and right atrium pull blood from the lower body and abdominal cavity. The vessels from the superior vena cava have the assistance of gravity.

During exhale time the internal pressures rise and force the air out of the lungs and push venous blood into the right atrium (Martini 2001:711).

2.3 HYPERTENSION AND CLASSIFICATION OF HYPERTENSION

2.3.1 Introduction

Internationally for persons 18 years and older, a hypertensive person is regarded as a person with multiple blood pressure readings of 140/90mmHg or higher (Boucher & Malinder 1999:519).

According to the Standard Treatment Guidelines and Essential Drugs List for South Africa (National Department of Health 2003:20), which are used in primary health care clinics, levels of hypertension in adults are classified as follows:

TABLE 2.1: LEVELS OF HYPERTENSION IN ADULTS

Level of hypertension	Systolic mmHg	Diastolic mmHg
Mild	140-159	90-99
Moderate	160-179	100-109
Severe	180 or more	110 or more

Hypertension classification can also be based on cause and severity. Classification of hypertension according to cause is termed primary and secondary hypertension, and classification of hypertension according to severity is numerically based on systolic and diastolic pressure like the values reflected above in table 2.1.

2.3.2 Primary (essential) hypertension

Primary hypertension has an unknown cause and accounts for 90% - 95% of all hypertension cases. Usually these patients do not have many signs or symptoms. Headaches sometimes occur – but more so with very high pressures and are localized in the occipital region. According to Woods, Froelicher & Halpenny (1995:754) there are several theories to explain primary hypertension. Five are discussed here namely neural hypothesis, peripheral autoregulatory, renin-angiotensin-aldosterone, defective vaso-depressor mechanisms and defects in membrane permeability theories. These theories are briefly summarized below.

2.3.2.1 Neural hypothesis

If there is an increase in systemic vasoconstriction and myocardial reactivity there is an increase in adrenergic neural activity (Woods et al 1995:754).

2.3.2.2 Peripheral Autoregulatory Theory

If there is a defect in sodium excretion (natriuresis) at normal arterial pressures it leads to auto regulation at higher pressure, for what is necessary for resumption of normal sodium and water secretion (Woods et al 1995:754). Hypertension results from impairment in renal sodium excretory ability when confronted with a sodium load this defect results in sodium and

water retention, and blood volume expansion which increases cardiac output and consequently, arterial pressure. The resulting tissue hyperperfusion leads to an autoregulatory vasoconstriction resulting in a sustained increase in peripheral vascular resistance (Woods et al 1995:754).

2.3.2.3 *Renin-Angiotensin-Aldosterone (RAA) hypothesis*

Increased activity of the renin-angiotensin-aldosterone system, results in expansion of extracellular fluid volume including the intravascular component and systemic vascular resistance as well (Woods et al 1995:754).

2.3.2.4 *Defective vasopressor mechanisms hypothesis*

According to Woods et al (1995:754) the concentration of vasodilation substances such as renal prostaglandins is decreased.

2.3.2.5 *Defects in membrane permeability theory*

In this case interference with the cellular sodium transport caused by the natriuretic hormone exists because of a defect in reabsorption of sodium from the renal tubules. Transport of calcium out of the vascular smooth muscle cell is prevented by the increased intracellular sodium concentration. Systemic resistance and blood pressure then rise because of the increased muscle contractility that is caused by the increased calcium concentration (Woods et al 1995:754).

2.3.3 *Secondary hypertension*

Patients with secondary hypertension have a distinct cause and accounts for 5% - 10% of all hypertension persons. Patients with secondary hypertension are best treated by controlling or removing the underlying disease or pathology, although they still may require antihypertensive drugs.

A few identifiable causes of secondary hypertension are as follows:

2.3.3.1 *Oral contraceptives*

The estrogen and progestogen in oral contraceptives increase blood pressure in women. Blood pressure raises with increased amounts of each

hormone and the severity also increases with time. In contraceptive users, hypertension is caused by stimulation of the rennin-angiotensin-aldosterone mechanism which creates volume expansion. Enhanced blood clot formation, increased coronary artery vascular tone and increased fibroblast deposition are the structural and functional changes associated with contraceptive users (Boucher & Malinder 1999:525).

2.3.3.2 Renal parenchymal disease

A person with renal parenchymal disease that results in hypertension is usually patients with chronic glomerulonephritis. If untreated it leads to renal damage and inappropriately stimulates the renin-angiotensin mechanisms. Infections can also alter renal function (Boucher & Malinder 1999:526).

2.3.3.3 Reno vascular disease

Reno vascular disease is the result of stenosis caused by atherosclerosis of the renal arteries. Over-activity of the renin-angiotensin mechanism leads to a decrease in renal flow resulting in high blood pressure (Boucher & Malinder 1999: 526). For some people on high blood pressure medication- such as ACE inhibitors the problem may be discovered if side effects such as kidney failure or other severe kidney problems appear. As a result of high blood pressure the condition causes some of the following complications: congestive heart failure, heart attack and stroke (Boucher & Malinder 1999:526).

2.3.3.4 Primary aldosteronism

Because of an overproduction of aldosterone that is caused by an adenoma on the adrenal gland it leads to Primary aldosteronism. This overproduction creates an excess salt and water is refrained which is the mechanism behind hypertension in this case. Increased circulating aldosterone causes renal retention of sodium and water, so blood volume and arterial pressure increase. Plasma renin levels are generally decreased as the body attempts to suppress the renin-angiotensin system; there is also hypokalemia associated with the high levels of aldosterone (Boucher & Malinder 1999:526).

2.3.3.5 Coarctation of the Thoracic Aorta

Coarctation, or narrowing of the aorta (typically just distal to the left subclavian artery), is a congenital defect that obstructs aortic outflow leading to elevated pressures proximal to the coarctation. This constriction of the Thoracic Aorta reduces the lumen of the aorta and results in an elevated arterial pressure in the upper extremities. In the lower extremities the opposite happens where pressures are very low or absent. In hypertension it leads to vasoconstriction and an increase in fluid volume as well as alterations in renal function (Boucher & Malinder 1999:526).

There are a few more identifiable causes of hypertension like sleep apnea, drug-induced or related causes, chronic kidney disease, chronic steroid therapy and Cushing's syndrome, pheochromocytoma and thyroid or parathyroid disease.

2.3.4 Risk factors for hypertension

Certain risk factors appear to increase the likelihood of a person to become hypertensive. These include:

- Family history of hypertension
- Race (more common in blacks)
- Gender
- Diabetes mellitus
- Stress
- Obesity
- High dietary intake of saturated fats or sodium
- Tobacco use
- Hormonal contraceptives
- Sedentary lifestyle
- Aging (Mabuza 2006:238)

2.3.5 Signs and symptoms of hypertension

Signs and symptoms of hypertension may include the following:

- Blood pressure readings of more than 140/90mmHg, on two or more readings, taken at two or more visits.
- Throbbing occipital headaches upon waking
- Drowsiness
- Confusion
- Vision problems
- Nausea (Mhlongo 2006:244)

Other clinical effects only appear until complications develop as a result of vascular changes in target organs. These include:

- Left ventricular hypertrophy
- Angina
- Myocardial infarction
- Heart failure
- Stroke
- Transient ischemic attack
- Nephropathy
- Peripheral arterial disease
- Retinopathy (Smeltzer & Bare 2004:303)

2.4 IMPACT THAT HYPERTENSION HAS ON CORONARY HEART DISEASE AND STROKE

It is recognized now that blood pressure is a very important predictor of future cardiovascular risk. Ker (2000:62) explains that in the past hypertension was classified according to diastolic pressure only because of the risk associated with it; despite that systolic pressure was a predictor of future cardiovascular risk.

In 1993 the JNC (Joint National Committee in the USA) recognized the importance of systolic blood pressure and made it equal in importance to diastolic blood pressure (Ker 2000:62).

Ker (2000:62) further explains that usually until the eight decade of life systolic pressure is rising in contrast with diastolic pressure that rises only until the middle age. This could explain why, with advancing in age the pulse pressure and the prevalence of isolated systolic hypertension rises. Franklin (2002:4) confirms that according to the Framingham Heart Study, diastolic blood pressure was the strongest predictor below the age of 50, for coronary heart disease and that all three pressures were comparable predictors between 50 - 59 years. From the age 60 years and onwards pulse pressure (the difference between the systolic and diastolic blood pressure) was the best predictor and diastolic pressure was negatively related to coronary heart disease (Urden et al 2000:259).

Ker (2000:62) also confirms that in the elderly, systolic hypertension is a very important modifiable cardiovascular risk factor. In systolic hypertension the systolic blood pressure is usually more than 140 mmHg and the diastolic less than 90 mmHg. In people older than 60 years, in 15% of people isolated systolic hypertension occurs and increases your risk for stroke and cardiovascular disease. People with isolated systolic hypertension benefit from drug treatment and lifestyle modifications.

The Framingham Heart Study confirms that hypertension causes heart failure (Lindsay & Gaw 2004). The damage caused by hypertension can be classified as either coronary artery disease or left ventricular hypertrophy. Hypertension patients are more likely to develop angina and myocardial infarction than normotensive persons. Kaplan (2005:1441) explains that the lack of adequate microcirculation can be related to angina and that in hypertensive persons myocardial infarction is more common. There is a continuous association between increasing blood pressure and the risk of cardiovascular disease, especially coronary heart disease. Vander et al (2001:446) also confirms that the presence of hypertension enhances the

development of atherosclerosis and heart attacks, kidney damage, and rupture of a cerebral blood vessel, which causes localized brain damage in other words a stroke.

Urden et al (2000:395) describes coronary heart disease as follows: “it is an insidious, progressive disease that results in coronary arterial narrowing or complete occlusion. Coronary heart disease is caused by atherosclerosis, the thickening and the hardening of the inside walls of the arteries”.

According to Burgess, Sulzer and Doubell (2006:200) atherosclerosis is one of the most prevalent causes of death and disability throughout the world. Atherosclerosis begins in childhood and is a process that starts early in life, progressing silently and slowly and only manifested clinically in the middle age. Risk factors like a lifelong burden of dyslipidaemic trait, obesity and hypertension is risk factors since childhood that persist into adulthood and has a major impact on the silent phase of this disease. Both morbidity and mortality can be reduced by lifestyle changes and primary risk factor modification.

According to Urden et al (2000:679) the greatest risk factor for ischemic stroke, is hypertension. Ischemic stroke results because of an occlusion of a blood vessel and low cerebral blood flow exists. This occlusion can be thrombotic or embolic. Thrombotic strokes results at the bifurcations or curves of the vessel, because of accumulation of atherosclerotic plaque in the vessel lumen. Usually at the bifurcation of the carotid artery, origins of the middle and anterior cerebral arteries, and the origins of the vertebral arteries. An embolic stroke results in a loss of blood supply because of an embolus that occurs from the heart or lower circulation which travels distally and lodges in a small vessel.

According to Lindsay and Gaw (2004:88) the contents of the following table shows the effect of non-pharmacological intervention on blood pressure and cardiovascular risk.

TABLE 2.2: NON-PHARMACOLOGICAL INTERVENTION ON BLOOD PRESSURE AND CARDIOVASCULAR RISK

NON-DRUG THERAPY	EFFECT ON RISK	EFFECT ON BP
Normalizing glucose	Reduces risk	No effect
Normalizing cholesterol	Reduces risk	No effect
Stopping smoking	Reduces risk	No effect
Losing weight	Unknown	Lowers BP*
Decreasing alcohol intake	Unknown	Lowers BP **
Decreasing salt intake	Unknown	Lowers BP ***
Increasing exercise	Reduces risk	Lowers BP

* Weight reduction of 1kg can reduce blood pressure by 2mmHg

** Reducing alcohol consumption to within the recommended units/week

*** Reducing salt to 5g/day has less pronounced effect in mild hypertension and therefore remains controversial. Patients should be advised not to add salt at the table and avoid very salty foods.

2.5 CARDIOVASCULAR RISK FACTORS AND COMPLICATIONS RELATED TO HYPERTENSION

Risk factors for atherosclerotic heart disease and diabetes mellitus are often associated with hypertension. According to Smeltzer and Bare (2004:855) high blood pressure can be divided in three ways namely:

- As a sign: blood pressure is used to monitor a person's total clinical status
- Risk factor: the rate in which atherosclerotic plaque is forming in arterial walls is at stake here.
- As a disease: high blood pressure can lead to death from cardiac, cerebral, renal and peripheral vascular disease.

2.5.1 Complications of hypertension

The following complications are associated with hypertension and patients may present with it before a diagnosis of hypertension has even been made:

2.5.1.1 Hypertensive crisis

Patients may present for the first time with a hypertensive crisis and it can be an emergency or urgency. An emergency is severe elevation of blood pressure (>180/110mmHg) and evidence of impending target organ damage. These patients may present with the following complications: hypertensive encephalopathy, intracerebral haemorrhage, myocardial infarction, acute left ventricular failure with pulmonary oedema, unstable angina pectoris, dissecting aneurysm or eclampsia. Patients should be treated in an intensive care unit with parenteral administration of an appropriate agent.

Urgency is severe elevation of blood pressure without progressive target organ dysfunction. Patients may present with severe headache, shortness of breath, epistaxis or severe anxiety. Patients must be treated in hospital for several hours of observation and be treated with two oral agents for example an ACE inhibitor and a beta-blocker (Mbokazi 2006:233).

2.5.1.2 Cerebrovascular events

Cerebrovascular events, namely stroke, may be fatal or non-fatal and patients with undiagnosed hypertension may present with it for the first time before hypertension was diagnosed. Usually the following symptoms are an indication of a stroke: severe sudden onset of headache, nausea and vomiting and loss of consciousness. According to Mbokazi (2006:233) as blood pressure levels increases hemorrhagic and ischemic stroke increases proportionally.

2.5.1.3 Dementia and cognitive impairment

Patients with hypertension can develop dementia or cognitive impairment. Poor blood supply to the brain tissue and cognitive decline are the result of narrowing and sclerosis of the small penetrating arteries in the sub cortical regions of the brain. Dementia and cognitive impairment may result from previous stroke and it can be prevented by effective antihypertensive therapy (Mbokazi 2006:233).

2.5.1.4 Chronic kidney disease

Hypertensive patients may complain of weakness, fatigue, headaches and a metallic taste in mouth, hiccups, anorexia, nausea, vomiting, pruritis and nocturia. All these symptoms may be the result of chronic or even end-stage renal disease. A decline in glomerular filtration rate can be a sign of reduced kidney excretory function (Mbokazi 2006:233).

Besides the complications mentioned above, there are also cardiovascular risk factors and these are associated with further cardiovascular events like coronary heart disease.

2.5.2 Risk factors for hypertension

2.5.2.1 High blood pressure

According to Mabuza (2006:230-231) a hypertensive patient's prognosis depends not on the blood pressure alone but also on the sum of risk factors. That is why it is very important to control and identify risk factors for proper blood pressure management. The most modifiable risk factor is hypertension. If you know what your risks are you can make lifestyle changes to help prevent high blood pressure or delay its onset. And that means you can avoid or delay serious complications that high blood pressure can cause- such as stroke, heart attack, dementia and blindness. Hypertension is a risk factor for stroke, myocardial infarction, cardiac and renal failure; but when the blood pressure is reduced there is reduction in the risk as well (40% for stroke, 8% for myocardial infarction, and 10% for cardiovascular mortality) that is why hypertension needs to be understood not only as a disease but also as a risk factor for other diseases (Mabuza 2006:239).

2.5.2.2 Dyslipidaemia

Blood cholesterol values are extremely important. The following values are associated with a high risk for coronary heart disease: total serum cholesterol above 6.5mmol/l, or LDL above 4mmol/l or HDL less than 1mmol/l for men and less than 1.2mmol/l for women. It is been found that

weight reduction and increased exercise will elevate HDL-cholesterol (Mabuza 2006:239).

2.5.2.3 Diabetes mellitus

Diabetes mellitus are often associated with obesity, dyslipidaemia, hypertension and hyperuricaemia and are one of the modifiable risk factors related to coronary vascular diseases. Diabetic patients are predisposed to atherosclerotic disease. Mabuza (2006:239) states that “there is strong evidence that in patients with insulin resistance, vascular abnormalities such as hypertension and atherosclerosis precede the onset of type 2 diabetes mellitus so that by the time diabetes is diagnosed, hypertension is already present”.

2.5.2.4 Obesity

In some studies it is been found that obesity in men is an independent risk factor for coronary artery disease. The metabolic syndrome is associated with obese people. The criteria for the metabolic syndrome are: obesity, high triglyceride levels, low HDL levels, high blood pressure and high fasting plasma glucose levels. One in 5 overweight men and one in 20 normal-weight men suffer from the metabolic syndrome, compared to three of every 5 obese men (Mabuza 2006:239). Kaplan (2005:1442) also confirms that there is a strong correlation between obesity and hypertension, especially in young adults and children. Obesity also creates an increase in blood volume resulting in an increase in cardiac output. Obesity may lead to hypertension and cardiovascular disease by activating the rennin-angiotensin-aldosterone system by increasing sympathetic activity by promoting insulin resistance and leptin resistance, by increasing procoagulatory activity and by endothelial dysfunction. Increased renal sodium reabsorption, causing a shift to the right of the pressure natriuresis relationship and resulting in volume expansion (Kaplan 2005:1442).

2.5.3 Cigarette smoking

According to Mabuza (2006:239) the risk of CVD is in smokers proportional to the number of cigarettes smoked and how deeply the smoker inhales. The

risk is also greater in women than in men. If you are a pipe or cigar smoker your risk falls between those of non-smokers and cigarette smokers. Reduced HDL cholesterol is one of the results of cigarette smoking.

2.6 MANAGEMENT OF HYPERTENSION

Hypertension could be managed in two ways, namely by means of lifestyle modification or by using pharmacological agents. Treatment should always start with lifestyle modification, but should continue even when medication becomes necessary.

2.6.1 Lifestyle modification

2.6.1.1 Weight management

There is a strong association between obesity, hypertension and the risk of vascular diseases. Overweight means that you eat more than your body needs for your level of activity. A waist circumference of more than 102cm for men and more than 88cm for women suggests a risk of coronary heart disease. In a study done by Rayner et al (2007:283), about hypertensive patients, 45,3% of all patients were obese with a BMI of more than 30kg/m. The waist circumference of these patients, were above the recommended levels of 102cm and 88cm, respectively in 41,9% of men and 85,1% of women. Weight loss must be introduced by gradually introducing permanent changes in the daily diet in order to achieve and maintain ideal weight with a BMI between 18 to 24,9kg/m². It was also indicated in this study that only 56% of patients reported that they have been counselled on improving their blood pressure and reducing cardiovascular risk through following a healthy diet.

2.6.1.2 Healthy diet

A healthy lifestyle remains the cornerstone of the management of hypertensive for all levels of blood pressure (Seedat 2006:343). A healthy diet links to weight management and will include the following:

A diet low in fat (animal fat) and low fat dairy products, high fibre wholegrain foods, fish rather than meat, limited use of sugar and sugar containing foods and limited sodium intake.

Reduced sodium intake will help to reduce blood pressure. According to Ker (2006:181) a reduced salt intake not only reduces blood pressure but also improve the efficacy of ACE-inhibitors, angiotensin receptor blockers and beta blockers. It is important to inform patients about high sodium foods (potato chips, hot dogs) and to recommend low sodium foods (dried fruit, unsalted nuts). Sodium intake must be limited to less than 2400mg per day (approximately half a teaspoon). Teach patients to remove the salt cellar from the table and gradually reduce added salt in food preparation. Inform patients that food may taste bland initially but encourage the use of lemon juice, herbs and spices as alternative seasoning (Seedat 2006:343).

The Dietary approach to stop Hypertension has confirmed the effectiveness of increasing the consumption of vegetables and fruit.

2.6.1.3 Exercise

Increased physical activity is part of essential lifestyle modification. This includes at least thirty minutes of moderate aerobic exercise preferably on everyday of the week. Increased exercise can lower blood pressure and is equally important in reducing weight. Moderate exercise [walking three to five kilometres per day] can reduce the mortality and morbidity due to cardiovascular disease according to evidence of epidemiological surveys (Morgan 2001:33). Regular aerobic exercise can lower blood pressure for up to 16 hours after one hour of aerobic exercises (Ker 2006:180).

2.6.1.4 Alcohol

There is an association between alcohol intake and blood pressure according to some community surveys (Morgan 2001:32). People who drink one to two standard drinks daily may have a better prognosis than non-drinkers although it is claimed that blood pressure rises by 1mmHg for each standard drink. The problem lies with heavy drinkers (those who drink six to

eight or more drinks per day) who have an elevated blood pressure resistant to antihypertensive medication. By reducing or stopping these patients' alcohol intake is the only way to reduce their blood pressure effectively. Alcohol intake must be limited to two standard drinks per day for men and one standard drink per day for women and small men. A standard drink would be 25ml spirits, 125ml wine, 340ml beer, 60ml sherry and 25ml liquor. Keeping alcohol intake within safe limits will help reduce blood pressure and the risk of vascular (and other) diseases, also keep the weight down.

2.6.1.5 Smoking

The use of tobacco products should be stopped because of the harmful cardiovascular effects. Smoking has little direct effect on blood pressure but in the long term there is a strong association between atherosclerosis due to smoking and cardiovascular incidents due to the interference with endothelial function (Morgan 2001:33).

2.6.2 Pharmacological hypertension management

Sometimes lifestyle modification and risk stratification is not enough to treat hypertension and medication is needed. According to the South African Hypertension Society Guidelines (Seedat 2006:338) hypertensive patients with low risk factors are first treated with life style modifications for 6 - 12 months. If the blood pressure remains high it should then be treated with drug therapy. Patients with moderate risk factors will be treated with medication after 3 - 6 months of lifestyle modification.

2.6.2.1 The routine management for hypertension is:

- Low-dose hydrochlorothiazide or thiazide-like diuretic
- Angiotensin-converting enzyme (ACE) inhibitors, Calcium channel blockers, long- acting dihydropyridines or non-dihydropyridines
- Direct vasodilators: hydralazine, minoxidil; Centrally acting drugs: methyl dopa, moxonidine; Alpha blocker: doxazosin; Beta-blockers; Aldosterone antagonist (Veriava 2007:18-21).

If the patient is intolerant to ACE-inhibitors it can be replaced by an angiotensin receptor blocker. Some patients may need a beta blocker like patients with angina, post myocardial infarction and heart failure. Patients with isolated systolic hypertension and angina can use a calcium antagonist (Veriava 2007:18-21).

2.6.2.2 Explanation of drugs used in the treatment of hypertension

DIURETICS: it increases urinary excretion of sodium *and* water and it decreases cardiac output with no change in the total peripheral resistance (chlorothiazide, furosemide, amiloride):

- Thiazide Diuretics (chlorothiazide, hydrochlorothiazide): decrease of intravascular fluid volume, renal blood flow and cardiac output. It results in a depletion of extracellular fluid, negative sodium balance, mild hypokalemia and directly affects vascular smooth muscle.

Advantages: these are effective during long term administration, has mild side effects and enhance other antihypertensive medication.

Contra-indications: are as follows: gout, severely impaired kidney function and history of hyponatremia.

- Loop Diuretics (bumetanide, furosemide): it leads to volume depletion and blocks reabsorption of sodium, chloride and water in kidney.

Advantages: the action time is rapid and potent and is useful when thiazides fail or patient needs rapid diuresis.

Contra-indications: same as thiazides (Smeltzer & Bare 2004:860).

- Potassium-Sparing Diuretics (amiloride, triamterene) acts on distal tubule independently of aldosterone

Advantages: Triamterene causes retention of potassium

Contra-indications: renal disease, azotemia, severe hepatic and hyperkalemia (Smeltzer & Bare 2004:860).

BETA-ADRENERGIC RECEPTOR BLOCKERS (atenolol, propranolol): These drugs block the sympathetic nervous system, especially to the heart and slow the heart rate and reduce blood pressure and therefore these drugs reduce cardiac output (Smeltzer & Bare 2004:862).

Advantages: reduces pulse rate in patients with tachycardia and blood pressure elevation, indicated for patients who also have stable angina pectoris or have had a myocardial infarction.

Contra-indications: bronchial asthma, allergic rhinitis, right ventricular failure from pulmonary hypertension, congestive heart failure, depression, diabetes, heart block, heart rate under 60 (Smeltzer & Bare 2004:862).

CALCIUM CHANNEL BLOCKERS (CCB) (bilacor XR, cardizem SR): total peripheral resistance is lowered by these drugs by the reducing of calcium into the vascular smooth muscles cells causing them to contract less strongly. Reduce cardiac after load.

Advantages: inhibits coronary artery spasm not controlled by beta-blockers or nitrates.

Contra-indications: sick sinus syndrome, AV-block, hypotension, heart failure (Smeltzer & Bare 2004:863).

ANGIOTENSIN-CONVERTING ENZYME (ACE) INHIBITORS (captopril, enalapril, quinapril, lisinopril): in the final formation of angiotensin II, a vasoconstrictor is mediated by an enzyme called angiotensin-converting enzyme. Total peripheral resistance is lowered by drugs that lowered this enzyme and reduce the concentration of angiotensin II in plasma and causes arteriolar vasodilation (Vander et al 2001:447).

Advantages: fewer cardiovascular side effects and can be used with thiazide diuretics and digitalis. Hypotension can be reversed by fluid replacement.

Contra-indications: renal impairment, pregnancy.

ANGIOTENSIN II ANTAGONISTS (Cozaar, Diovan, Micardis): block the effects of angiotensin II at the receptor and reduce peripheral resistance.

Advantages: minimal side effects.

Contra-indications: pregnancy, renovascular disease (Smeltzer & Bare 2004:863).

According to the Veriava (2007:20) the following drugs must be used if there are any compelling indications:

TABLE 2.3: DRUGS USED WITH COMPELLING INDICATIONS

COMPELLING INDICATIONS	DRUG CLASS
Angina	Beta-blocker or CCB
Prior myocardial infarct	Beta-blocker and ACE-1. Verapamil if beta-blockers contraindicated.
Heart failure	ACE-1 and certain beta-blockers and aldosterone antagonist. Loop diuretics for volume overload.
Left ventricular hypertrophy	ARB or ACE-1
Stroke: secondary prevention	ACE-1 plus diuretic or ARB
Diabetes type 1 or 2 with or without microalbuminuria or proteinuria	ACE-1 or ARB—usually in combination with a diuretic.
Chronic kidney disease	ACE-1 or ARB—usually in combination with a diuretic.
Isolated systolic hypertension	Low-dose thiazide or thiazide-like diuretic or long-acting CCB.

2.7 KNOWLEDGE NEEDED BY HYPERTENSIVE PATIENTS IN THE PREVENTION AND TREATMENT OF HYPERTENSION

2.7.1 Patient education

Patient education is essential because patients want information and because recovery appears to be accelerated in patients who are well informed. The aim is to improve quality and quantity of life by identifying and modifying risk factors and optimize medical treatment, in order to achieve this goals patients need to be educated about their condition.

The following is important:

- Discuss the importance of regular medical examinations and stress the importance of compliance.
- Smoking - explain that nicotine causes vasoconstriction and an increase in the heart rate, blood pressure and the force of contraction of the heart and therefore increased workload and oxygen demand.
- Stress - advise patients to avoid upsetting situations and an accumulation of stress factors by spacing activities, setting aside time for relaxation and be prepared for boredom, depression and weakness which may be experienced.
- Diet - explain that salt restriction prevents accumulation of fluid and the resulting increased cardiac work load. If dietary changes are necessary the help of a dietician can be enlisted.
- Family education - inform families to overcome fears and misconceptions about the disease, to promote an understanding of drug therapy and diet, to foster an awareness of signs and symptoms which could be manifestations of trouble and to help families to identify and deal with stress-provoking situations and learn methods to support.

The major objective is that hypertensive patients must be involved in their treatment and management of hypertension. They need to have the necessary information about their condition to empower them to participate in

their health condition. It is very important to have an open two-way communication system between the patient and the care giver. One of the important causes of uncontrolled blood pressure is poor adherence to therapy. If the patient knows about the following obstacles it will improve adherence to therapy:

- Long duration of therapy.
- Educate patients about their disease, let them measure blood pressure at home and involve the family in treatment.
- Side-effects of medication, adjust therapy to prevent and minimize side-effects.
- Expensive medications, important to keep care inexpensive and simple.
- Maintain contact with patients and encourage a positive attitude about the disease and to achieve their goals.
- Encourage lifestyle modifications.
- Patients must carry on with their daily living and pill-taking must be integrated in their routine activities (Seedat 2006:357).

-

2.8 CONCLUSION

The hypertensive patient need to know what is their risk factors to prevent any further developing of illnesses or heart disease. It is very important to increase their awareness of risk factors so that prevention strategies can be implemented early.

According to the Veriava (2007:20) the following can be seen as major risk factors:

- Levels of systolic and diastolic blood pressure
- Smoking
- Dyslipidaemia, total cholesterol > 6.5mmol/L or LDL > 4mmol/ or HDL men < 1 and women < 1.2 mmol/L

- Diabetes mellitus
- Men >55 years
- Women > 65 years
- Family history of early onset of cardiovascular disease, Men aged < 55 years and Women aged < 65 years
- Waist circumference abdominal obesity: Men > 102 cm and Women > 88 cm

The literature review of hypertension, its causes, predisposing problems, management and lifestyle modifications, as well as knowledge needed by hypertensive patients in the prevention and treatment of hypertension, served as basis to compile a measuring instrument. It was used to test the knowledge of people with hypertension regarding cardiovascular risk factors. The survey or test results would be used to make recommendations and to develop strategies to help them with risk factor modification and to improve their knowledge. The end goal would be to decrease the mortality and morbidity rates of hypertensive patients associated with cardiovascular disease.

The quantitative research approach, which includes a questionnaire as measuring instrument, is described in Chapter 3.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The research design and methodology are discussed in detail in this chapter. In the previous chapter, a literature review was presented regarding factors involved in the maintenance of normal blood pressure, classification of hypertension, impact of hypertension on coronary heart disease and risk factors and the management and treatment of hypertension. The aim of the study is to determine the knowledge of persons suffering from hypertension in a town in the west of Natal and in the eastern Free State, regarding cardiovascular risk factors in order to develop strategies to improve their knowledge and in doing so to help them with risk factor modification.

3.2 RESEARCH DESIGN

The research design is the set of logical steps taken by the researcher to answer the research question. It forms the pattern or recipe for the research and determines the methods used by the researcher to obtain subjects, collect data, analyse the data and interpret results, it is a plan of how you intend to conduct the research (Mouton: 2001:74).

A quantitative, non-experimental, descriptive study was done. Quantitative research involves measurement and quantification: it is therefore a rigorous and controlled design (Polit et al 2001:469). In this study the knowledge of hypertensive patients regarding their own condition (namely hypertension) and cardiovascular risk factors was quantified by using a questionnaire as measurement test.

In descriptive research the researcher tries to obtain complete and accurate information about the characteristics of a particular individual, event or group. It is also an attempt to describe what exists and to determine frequencies there of (Burns & Grove 2001:795). Phenomena under observation needs to be described in order to answer the research question. This study can be

regarded as descriptive because its intention was to describe a specific phenomenon, namely the knowledge of persons with hypertension regarding cardiovascular risk factors.

A quantitative design was the most appropriate type of design and also the most convenient way to obtain the information. The study was carried out in the natural setting. Although there was no manipulation of an independent variable, the setting is controlled to an extent. Data was quantified and reporting was done quantitatively.

3.3 RESEARCH METHOD

A survey is a technique of data collection in which questionnaires or personal interviews are used to gather data about an identified population in order to describe a phenomenon (Burns & Grove 2001:812). A survey was conducted in order to measure the knowledge of the respondents. A survey was appropriate because it would be an efficient way to determine the knowledge of hypertensive patients regarding risk factors of coronary heart disease.

A measuring instrument in the form of a structured questionnaire was used as research instrument. In the questionnaire mostly close-ended multiple choice questions were used but a few open ended questions were included. The purpose of the questionnaire was to measure the respondents knowledge regarding the topic mentioned. A well designed questionnaire should meet the objectives of the study and obtain the most complete and accurate information possible.

Questionnaires are a less time consuming way of obtaining data from a large group of people and are less expensive in terms of time and money. The format of the questionnaire is standard for all respondents or subjects and is not dependent on the mood of the interviewer or interviewee. The respondents feel a greater sense of anonymity than with an interviewer and are more likely to provide honest answers (Polit et al 2001:269) or just do not answer a question which is knowledge related if the answer is not known. These aspects could all contribute to the validity and reliability of a study.

Questionnaires were handed out to the respondents by the researcher, and the researcher remained in the background and had no contribution to the completion of the questionnaire. However, the researcher was available in case of problems or queries.

3.4 POPULATION AND SAMPLE

3.4.1 Population

A population is the entire group of persons or objects that is of interest to the researcher. The accessible population is the entire aggregation of cases that meet a designated set of criteria that are accessible to the researcher (Polit et al 2001:234). The researcher usually draws a sample from an accessible population and is able to generalize to a target population in some circumstances.

In this study the population was all hypertensive patients in the two towns forming the context of this study who are patients of the private general practitioners who consented to assist the researcher in this study.

3.4.2 Sample

A sample refers to the group of people that a researcher selects from a defined population and these are individuals about whom information will be collected. A non-probability sampling strategy was used. In non-probability sampling, the sampling elements are chosen from the population by non random methods. This means that not every element of the population has an opportunity to be included in the sample (Polit et al 2001:234).

Convenience sampling was used for this research. It is also referred to as accidental or availability sampling. Available and willing subjects were included in the study until the desired sample size has been reached.

Convenience sampling was used in this study due to limited patient numbers and the inclusion criteria (see below). The researcher distributed questionnaires to the first 50 informed and willing hypertensive patients from private general practitioners in western Natal and eastern Free State at medical practices where the general practitioner doctor consented to assist this research.

Inclusion criteria were as follows:

- Patients should be able to understand English
- Patients should have been diagnosed by the doctor as hypertensive
- Patients should currently receive treatment for hypertension

3.5 DATA COLLECTION

Data collection refers to the gathering of the specific information needed to address the research problem (Polit et al 2001:460). In this case data were collected by means of self-administered questionnaires. The questionnaires contained mostly multiple-choice questions and a few open-ended questions. In this study, the questionnaire was used specifically as a measurement test. Instructions were provided on how the questions should be answered. Each multiple choice question had only one correct answer and a mark was allocated for each correct answer. Open-ended questions were assessed using a marking guide and marks were allocated according to the marking guide (see Annexure C). The literature review was used as the basis for the compilation of the questionnaire. The questionnaire is discussed later in this chapter.

3.6 DATA ANALYSIS

Polit et al (2001:460) define data analysis as the systematic organisation and synthesis of research data. Quantitative analysis is defined as the manipulation of numerical data through statistical procedures for the purpose of describing phenomena or assessing the magnitude and reliability of relationships among phenomena (Polit et al 2001:469).

Because this is a quantitative study, statistical analysis were employed. By using statistical methods the researcher aimed to reduce, summarize, organize, manipulate, evaluate, interpret and communicate quantitative data. Descriptive statistics will be used to organise and present data, summarise or describe or to compare two or more groups. Tables and graphs will clarify data that will be presented. The assistance of a statistician will be used.

3.7 RELIABILITY OF THE STUDY

3.7.1 Reliability of the instrument

Reliability represents the consistency of the measure obtained (Burns & Grove 2001:809). The reliability of the instrument is important so that the questionnaire will produce consistent and accurate results if repeated. Reliability in this study was maintained by ensuring the consistency of the information given to all respondents.

The following steps were implemented to ensure the reliability of the instrument:

- The purpose of the study was explained to the respondents in order to get their cooperation and participation;
- Pre-testing of the questionnaire was conducted and the necessary adjustments made.
- A non threatening environment was created in which the respondents could complete the questionnaire. This environment was more or less similar for all the respondents.
- The researcher was available in person to answer or explain any unclear aspects to the respondents.

Different formats of multiple-choice questions were used for example true/false and objective item questions. This contributed to the reliability of the research instrument. Most of the questions that were used in the questionnaire did not allow for any possibility of guessing the correct answer.

The researcher attempted to differentiate between knowledge required by health care professionals and patients suffering from hypertension. A special attempt was made to use lay terminology that ordinary hypertension patients could understand. An expert that was employed in the field of cardiac rehabilitation evaluated the questionnaire for the above as well as the degree to which the questions that were asked were relevant.

3.7.2 Reliability of the data collection process

Questionnaires were anonymously completed. The reliability of the data collection process was enhanced by ensuring that the respondents were not identifiable.

A non-threatening environment was ensured. This aspect was important in this study because respondents could perceive a lack of knowledge as shameful. Completed questionnaires were placed in a sealed box. All these actions protected the anonymity of the participants and enhanced the reliability of the data collection process. The researcher did not know the respondents personally and could not identify their handwritings which further contributed to anonymity.

3.8 THE QUESTIONNAIRE

A questionnaire is a printed self-report form designed to elicit information that can be obtained through the written responses of the subject (Burns & Grove 2001:426). In this study, the questionnaire was based on a literature review that was done. The literature review explored the theme of hypertension in general. Hypertension as contributing factor to cardiovascular disease was also studied.

3.8.1 Advantages and disadvantages of a questionnaire

The advantages of a questionnaire are as follows:

- Questions can be presented in a consistent manner.
- Questionnaires can be designed to determine facts about events or situations known by the subject, or levels of knowledge.

- They can be distributed to large or small samples.
- Questionnaires are less costly and require less time and effort to administer than some of the other data collection methods.
- Questionnaires offer the possibility of complete anonymity, which may be crucial in obtaining information about an aspect which may be perceived as embarrassing (Polit et al 2001:269).

The use of questionnaires has the following disadvantages:

- Questions tend to have less depth than interviews.
- The respondent is unable to elaborate on responses unless open ended questions are asked. Even then the responses are usually limited by the available writing space.
- Open-ended questions are not advised when data are being obtained from large samples, because variance in the answers may make reporting thereof difficult.
- The data collector cannot use probing strategies.

The questionnaire was selected as research instrument because it was the best way to measure knowledge as the respondents answers depended merely on knowledge or a lack of knowledge.

3.8.2 Layout of the questionnaire

An information letter, explaining the reason for the survey, was attached to the questionnaire (see Annexure A). The consent form explained that participation was voluntary and that their responses would remain anonymous. The questionnaire was divided into two sections. Each section is discussed below (see Annexure B) and inclusion of questions is motivated.

SECTION A

Instructions of how this section should be completed were provided. This section covered the biographical data of the respondents. The data were

used to describe the sample and population, and the relationships between some variables and the participants' level of knowledge.

SECTION B

This section focussed on knowledge regarding Hypertension and the relationships between hypertension and Coronary Heart Disease. Definitions, hypertension medications, cholesterol and risk factors of coronary heart disease and how you can improve your lifestyle were some of the aspects that were focussed on.

TABLE 3.1: LAYOUT OF THE QUESTIONNAIRE

Section	Description
<p>Section A</p> <p>Biographical data</p> <p>Questions 1, 2, 3 and 4</p> <p>Questions 5, 6 and 7</p> <p>Questions 8-13</p>	<p>Questions 1, 2 and 3 required information about the participants' Gender, Age, Race and level of qualification. This information was used to describe the population.</p> <p>Questions 5, 6 and 7 required information about weight, height and measurement. This information was used to determine each patient's BMI. Obesity is one of the lifestyle Changes that is modifiable that is why BMI is very important. Lifestyle modification is also the first line management of hypertension.</p> <p>Question 8-13 required information about risk factors of coronary heart disease. More than 80% of hypertensive patients have other risk</p>

<p>Question 14-19</p>	<p>factors than hypertension. The primary goal of treatment of hypertension is not only to treat hypertension itself but also coronary heart disease and death.</p> <p>Question 14-19 required information about diet and to see if they know what is important and what to include in a healthy diet. A healthy diet remains one of the cornerstone of management of hypertension (Seedat 2006:343).</p>
<p>Section B Knowledge base Questions 20-21</p> <p>Questions 22-24</p>	<p>Participants were required to give definitions of hypertension and coronary heart disease in order to determine if the patients know that the two diseases are related and that hypertension is one of the risk factors for the development of cardiovascular disease. See Annexure C for the scoring system used and how marks were allocated.</p> <p>Participants were required to indicate Yes or No if they taking aspirin, know what is BMI and if they taking medication for cholesterol. If they answered yes, they need to explain why. According to the hypertensive guidelines, aspirin is</p>

<p>Questions 25-26</p>	<p>recommended in high risk patients and also important in the prevention of coronary heart disease. Weight reduction and increased exercise have been found to elevate HDL cholesterol levels, which is the beneficial fraction of the total cholesterol.</p> <p>Was only applicable by patients who knew that they had elevated cholesterol levels. It tested if they knew the value of normal cholesterol and if they knew their own cholesterol value. Elevated cholesterol levels increase the risk of coronary heart disease. Normal cholesterol levels especially a normal to high HDL reduce the risk of atherosclerosis and coronary heart disease.</p>
<p>Questions 27-29</p>	<p>These were multiple response questions so the respondent had to choose a combination of correct answers. Question 27 investigated if the respondent knew why blood pressure is rising with age .People should realise that when they are older they are less active and have an increase in body weight.</p> <p>In Question 28 the aim of taking blood pressure medication is</p>

<p>Questions 30-37</p> <p>Question 38</p>	<p>investigated. Blood pressure patients should know it is to improve quality of life and to achieve normal or goal blood pressure levels.</p> <p>Question 29 assessed if respondents knew the modifiable risk factors of coronary heart disease. Risk factors like smoking, increased saturated fat intake and inactivity are the factors that patients can do something to.</p> <p>Respondents' knowledge regarding lifestyle modification, blood pressure medication and conditions that can lead to Coronary Artery disease were tested in true/false format questions. Question 37 is in effect five separate questions.</p> <p>This was an open-ended question in which participants were asked if they want to know anything more about Hypertension so that their needs could be addressed and reflected in this study.</p>
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3.8.3 Refinement of the questionnaire

Five participants recruited from the general practitioners' practices took part in pre-testing of the questionnaire in order to rule out the possibility of ambiguously worded questions and to eliminate possible flaws previously overlooked by the researcher. Changes were made according to their recommendations. Multiple-choice questions were changed to true/false statements regarding blood pressure and medication and conditions that can contribute to the development of Coronary Artery Disease. Question 28

about blood pressure medication was two separate questions, in true/false format and has been changed to one question.

Question 29 about risk factors of coronary heart disease was also separate in true/false format and has been changed to one question with six divisions.. A question about systolic and diastolic pressure has been left out because it seemed to be too complex. Two yes/no questions about adding extra table salt to food and one about what antioxidants are have been left out.

3.8.4 Validity of the questionnaire

Validity of an instrument indicates whether an instrument accurately measures what it is supposed to measure in the context in which it is applied.

Burns and Grove (2001:226) state that “study validity, a measure of the truth or accuracy of a claim, is an important concern throughout the research process“. Instrument validity pertains particularly to the instrument. In order for the instrument to be valid, it should accurately measure what it is supposed to measure, given the context in which it is applied. Validity is as important as reliability and is the ability of the instrument to measure what it is intended to measure (De Vos, 2001:166). Content validity and external validity are further elaborated on.

- **Content validity:**

Content validity refers to the degree to which the items in an instrument adequately represent the universe of content (Polit et al 2001:459). Therefore content validity is concerned of how well the instrument represents all the different components of the variable measured. Content validity can be ensured by asking professionals within the field to evaluate the questionnaire. As knowledge is measured in this study experts in the field were requested to assist in determining a score which could be regarded as the minimum score patients should achieve to be regarded as knowledgeable enough on the theme of hypertension in order to make a contribution to their own treatment. This was termed the competency indicator. The questionnaire must therefore adequately reflect and assess

the knowledge of hypertensive persons regarding risk factors of coronary heart disease.

In order to ensure content validity, a literature review was conducted and the questionnaire based on the literature review. Pretesting of the instrument was done to eliminate flaws in the questionnaire previously overlooked by the researcher.

Face validity is not technically a form of validation, since it does not refer to what an instrument actually measures but rather to what it appears to measure (De Vos 2001:167). To ensure face validity a professional nurse expert within the field of intensive care nursing and cardiac rehabilitation was requested to review the questionnaire used in this study. It was decided by the same expert that the competency indicator would be 50% the same measure that is mostly used to indicate if a test is passed or not.

- External validity:

External validity does not apply to this study. External validity is the extent to which study findings can be generalised beyond the sample used in the study (Burns & Grove 2001:798). It does not apply to this study because of the small sample size and limited research context.

3.9 LIMITATIONS OF THE STUDY

The research is aimed to determine the knowledge of hypertensive patients and to improve their quality of life by risk factor modification, but is limited to the hypertensive patients in a small geographical area of Western Natal and the Eastern Free State. It was not possible to generalise findings and conclusions were valid for the specific context only (Polit et al 2001:236).

The researcher made use of convenience sampling. Thus the sample may not be representative of the whole study population and there is a risk of bias.

3.10 ETHICAL CONSIDERATIONS

The researcher applied ethical principles that protect the participants in the research from harm or risk. Anonymity and confidentiality were ensured throughout the study.

The following considerations were addressed in the study by the researcher:

3.10.1 Informed Consent

The researcher provided information regarding participation in the research to all the participants. It was in written form and all participants had the choice to participate or not. (See Annexure A).

3.10.2 Maintaining Privacy and Anonymity

The researcher ensured anonymity using numbers and report data on the entire group only. Participants were not identifiable. Information of individuals was not be shared with their doctors and they were not be identifiable after completion of the study.

3.10.3 Risk/Benefit Assessment

The researcher will protect the participants from any harm and secure the well-being of all participants. Participants will benefit from the research because positive values will be provided to ensure a healthy lifestyle.

3.10.4 Consent to do the study

The doctors of the private practices that were used in this study verbally consented to be of assistance. All of them identified hypertensive patients that could be requested to participate in the study.

3.10.5 Ethical clearance

The Research and Ethics Committee of the Department of Health Studies gave permission that this study could be conducted.

3.11 CONCLUSION

This chapter gave an overview of the research design and methodology, which was described as quantitative, descriptive and contextual. The population and sample, the data collection process, the research instrument, and relevant aspects, such as validity and reliability, were discussed. The data analysis was conducted by the researcher with assistance of the statistician, and will be presented in Chapter 4.

CHAPTER 4

DATA ANALYSIS

4.1 INTRODUCTION

The results of the research study are presented and discussed in this chapter. Where possible, the data has been presented in graphs or tables to illustrate the results. Data was collected by means of questionnaires that were distributed to known hypertensive patients that were identified by their private doctors. A participant information letter was attached to each questionnaire.

A total of fifty questionnaires were distributed in the eastern Free State and western Natal at two Medical practices and 46 were returned. The response rate is therefore 92% which is satisfactory. According to Burns & Grove (2001:430), response rates above 50% is regarded as satisfactory.

Please note the following:

- All percentage values are rounded off to the nearest one decimal place. This may influence the total that may not be reflected as 100%.
- In the test section, the researcher considered unanswered questions as incorrect, as the assumption was made that the respondent could not decide on the correct answer.
- Unless indicated differently, n=46 throughout the data analysis.

4.2 SECTION A: BIOGRAPHICAL DATA

Section A of the questionnaire biographical data of the respondents was requested to be analysed and presented. An explanation of each of these aspects follows below.

4.2.1 Question 1: Gender

Question 1 of the questionnaire in the study determined the gender of the respondents. The results are reflected in figure 4.1.

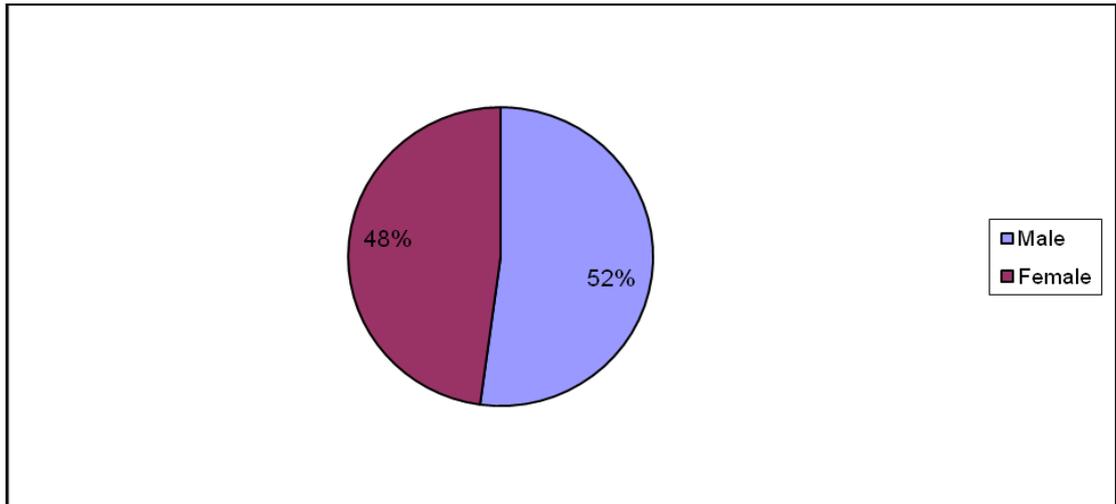


Figure 4.1: Gender of respondents

Of the 46 responses, 24 (52%) indicated that they are males and 22 (48%) indicated that they are females. This study population differs slightly from a study done by Farham (2005:229). In that study the crude rate of hypertension in people older than 20 years in South Africa is 23,9% overall, 22,9% in men and 24,6% in women". According to the study the main burden is carried by men and women over the age of 50. They are also referring to the whole population whereas the researcher in this study only used 46 respondents.

4.2.2 Question 2: Age

Question 2 of the questionnaire in the study determined the age group of the respondents. The results are reflected in figure 4.2.

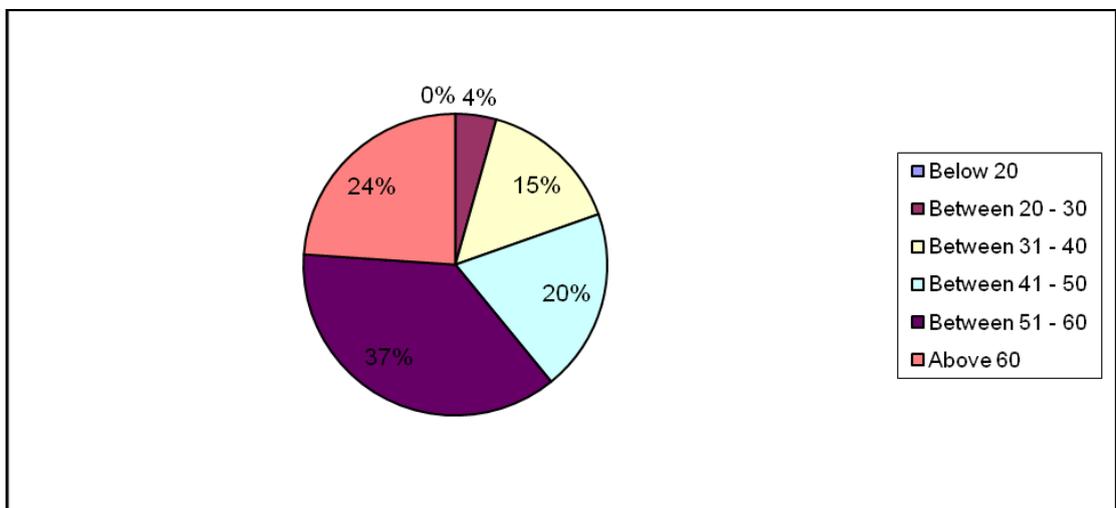


Figure 4.2: Age

From the total number of respondents (n=46) represented in figure 4.2, the majority of the respondents namely 17 (37%) belongs to the age group 51 - 60 years followed by 11 (24%) that belonging to the age group above 60 years. Nine (20%) of the respondents were in the age group 41 - 50 and seven (15%) were between 31 - 40. The remaining two (4%) belong to the age group 20 - 30. Maduna (2006:252) states that more than half of all persons older than 65 years have hypertension and that hypertension is the most common health problem in the age group 50 - 65 years. According to the population group the majority people with hypertension is between 50 - 65 years (refer back to remark under point 4.2.1).

4.2.3 Question 3: Race Group

Question 3 of the questionnaire in the study determined the race group of the respondents. The results are reflected in figure 4.3.

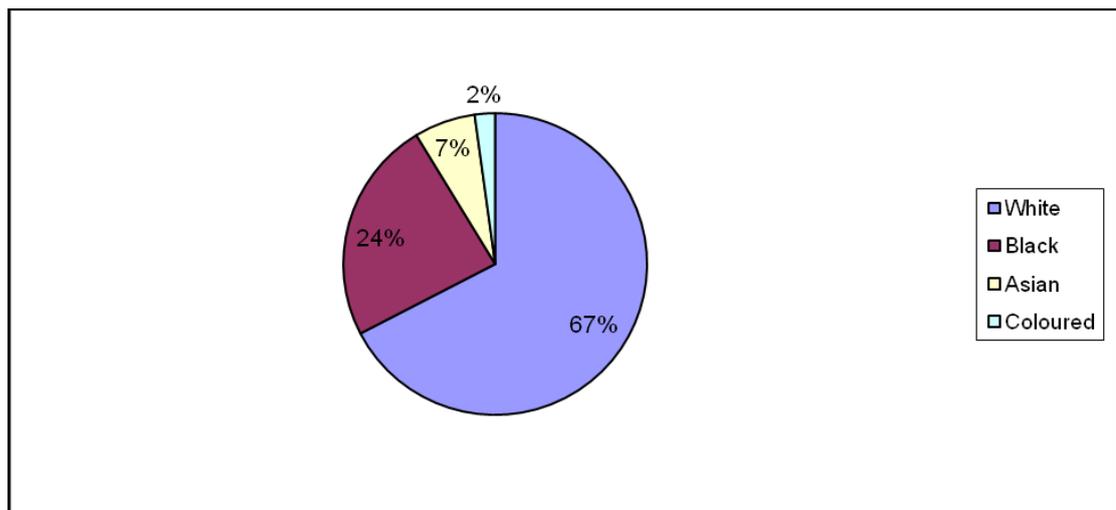


Figure 4.3: Race

Of the 46 respondents who completed the questionnaire, 31 (67%) were White. 11 (24%) of the respondents indicated that they are Black and three (7%) were Asian and the remaining one (2%) was Coloured. This study differs slightly from a study done by Maduna (2006:252). According to that researcher in the USA the prevalence of hypertension in the black population is about 38% compared with the 29% among the whites. This statistics cannot really be seen as representative because the researcher knows from experience that black people use the state clinics and white people go to the

private medical practitioners with hypertension (as was the case in this study).

4.2.4 Question 4: Level of Qualification

Question 4 of the questionnaire in the study determined the level of qualifications the respondents had obtained. The results are reflected in figure 4.4.

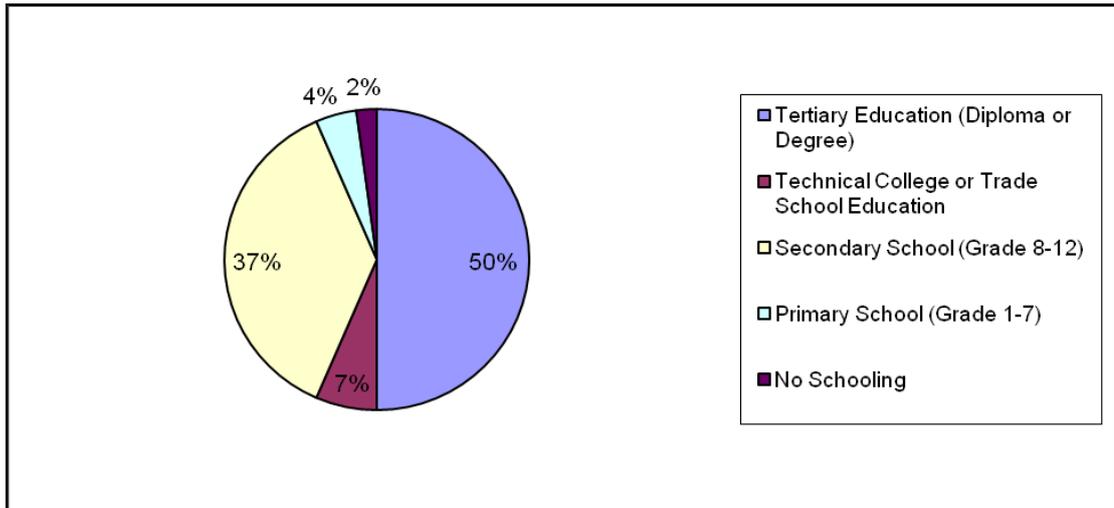


Figure 4.4: Level of Qualification

Of the 46 respondents, 23 (50%) indicated that they had tertiary education (Diploma or Degree) while 17 (37%) indicated that they had completed secondary school (Grade 8 - 12). Another three (7%) indicated that they had attended Technical College or Trade school and two (4%) indicated that they had only completed Primary school. Only one (2%) of the respondents had no schooling. No comparative data could be found in this regard.

4.2.5 Questions 5 and 6: BMI

Question 5 of the questionnaire in the study determined the weight of the respondents and question 6 determined the height of the respondents. These two questions were combined to determine the BMI of the respondents. The results are reflected in figure 4.5.

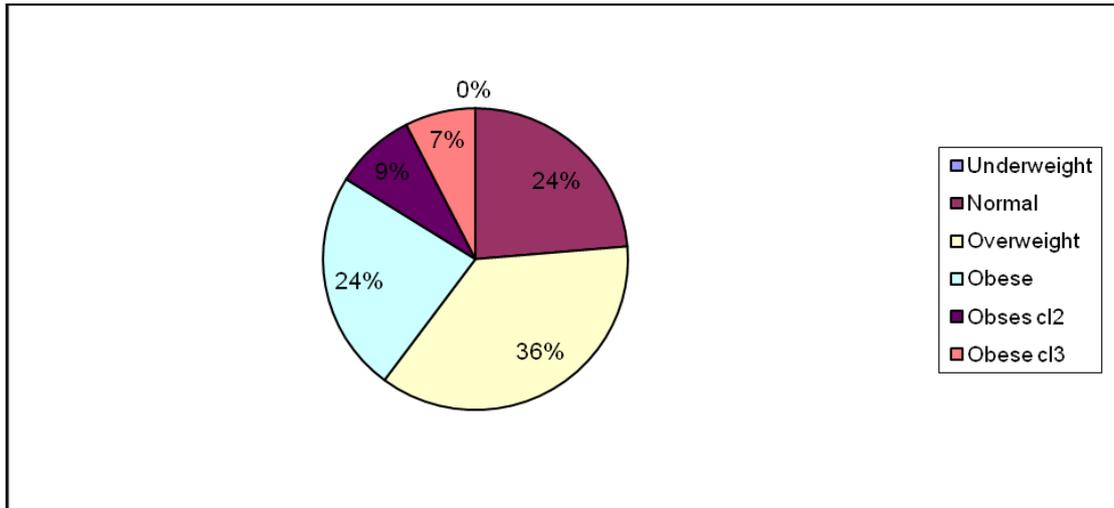


Figure 4.5: BMI

Of the 46 respondents, 17 (36%) were overweight while 11 (24%) were obese and another 11 (24%) were within normal range. Of the 46 respondents, only four (9%) were obese class two and three (7%) were obese class three. None of the respondents were underweight. Only 24% of the group were normal the rest were overweight. Overweight and obesity is one of the modifiable risk factors for hypertension. According to Mabuza (2006:239) obesity is also associated with the metabolic syndrome a condition that includes obesity, high triglyceride levels, low HDL levels, high blood pressure and high fasting plasma glucose levels.

4.2.6 Question 7: Waist in centimetres

In question seven respondents were asked to indicate their waste in centimetres. The responses were separated for male and female and the results are reflected in figure 4.6.1 and figure 4.6.2.

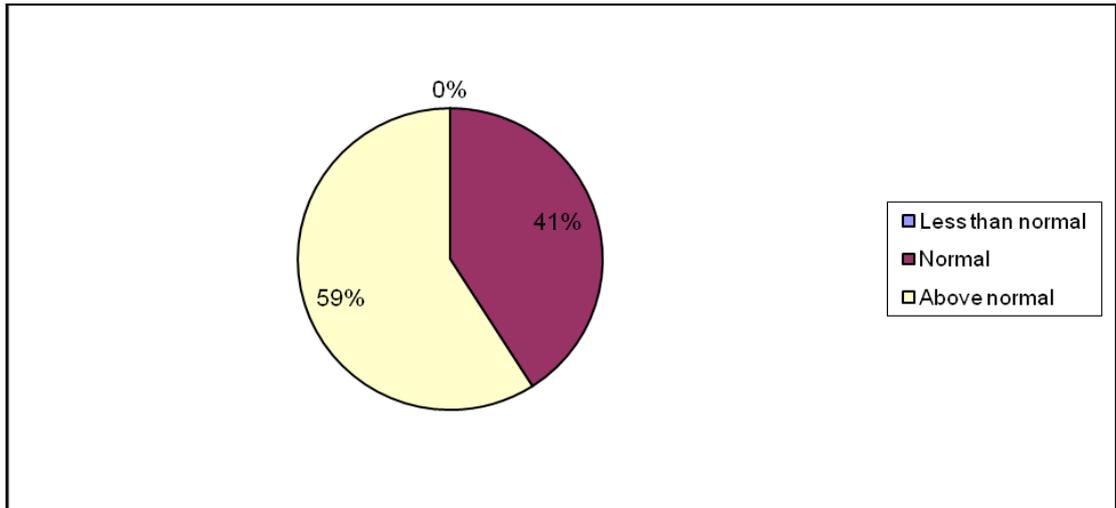


Figure 4.6: Waist in centimetres: female

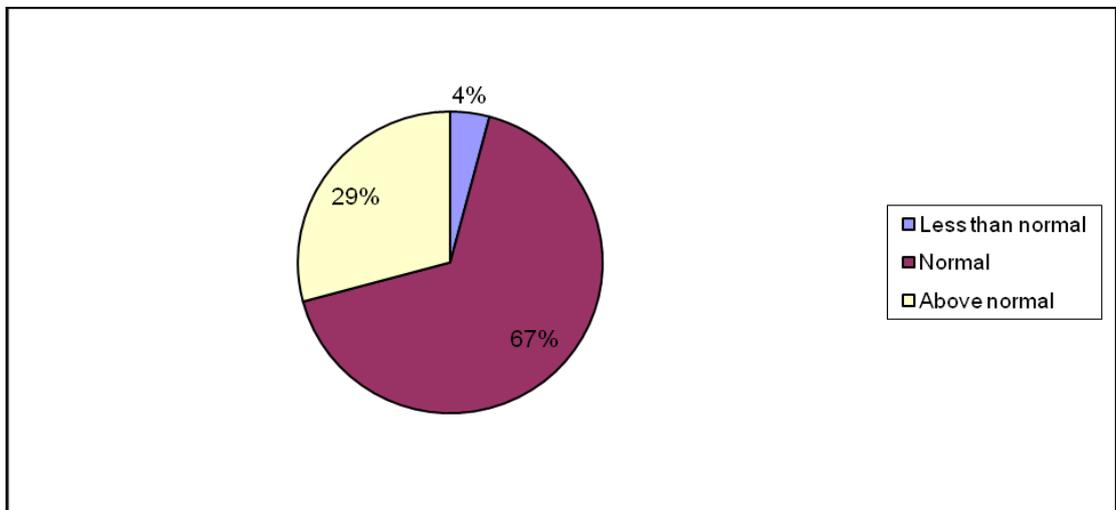


Figure 4.7: Waist in centimetres: male

Of the 46 respondents 22 were female. Of these 22 responses, 13 (59%) of the waist measures were above normal and nine (41%) were normal.

The remaining 24 responses were males. Of these 24 responses, 16 (67%) of the waist measures were normal, seven (29%) were above normal and only one (4%) were less than normal. In a study done by Mabuza (2006:239) it was found that obesity in men, particularly truncal fat can be regarded as that it is an independent risk factor for Coronary Artery disease. Men are at risk for Coronary Artery disease if they have a waist circumference of more than 102cm. In women more than 88cm waist

circumference can be regarded as the problem. Rayner et al (2007:283) completed a study and the waist circumference of the patients were above the recommended 102cm and 88cm, 41,9% were men and 85,1% were women.

4.2.7 Question 8: Diseases present in family

In question eight respondents were asked to indicate which of the following diseases are present in their family: Hypertension, Diabetes, High Cholesterol, Stroke, and Coronary Artery Disease and they also had to indicate if they did not know. The results are reflected in figure 4.8, figure 4.9, figure 4.10, figure 4.11, figure 4.12 and figure 4.13.

4.2.7.1 Hypertension

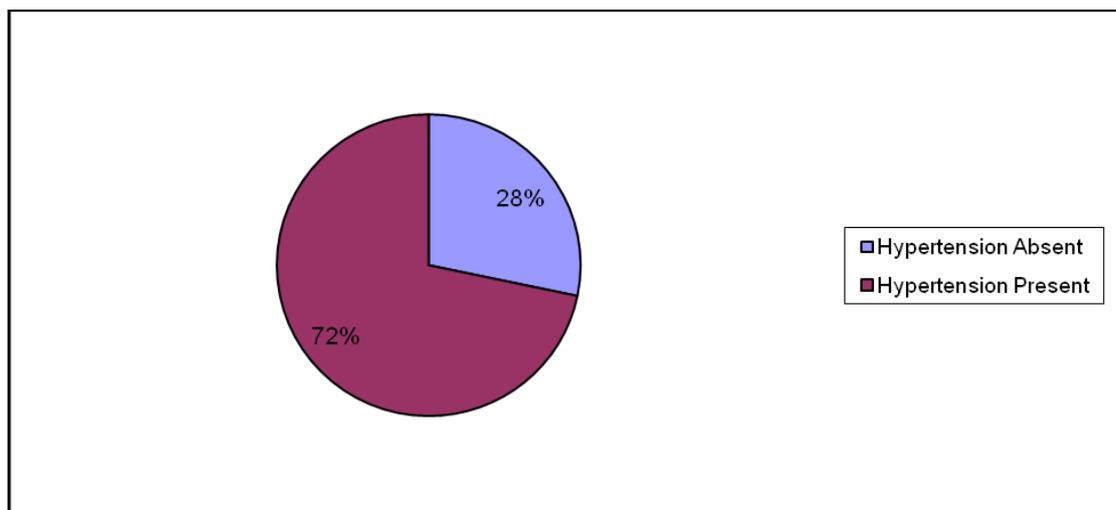


Figure 4.8: Hypertension

Of the 46 respondents, 33 (72%) indicated that Hypertension is present in their family and 13 (28%) indicated that it is not present.

4.2.7.2 Diabetes

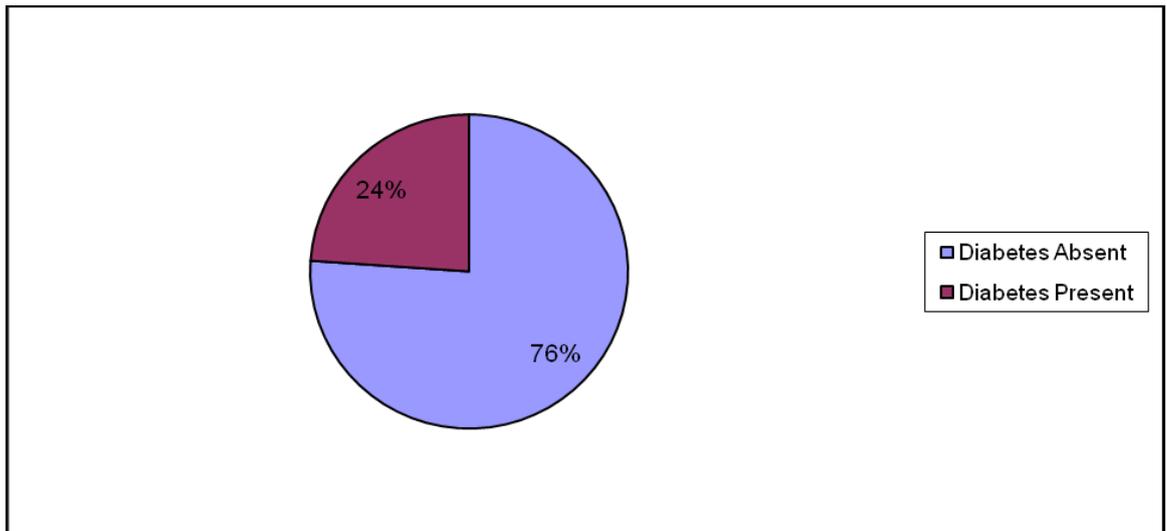


Figure 4.9: Diabetes

Of the 46 respondents, 35 (76%) indicated that Diabetes is absent in their family and 11 (24%) indicated that it is present.

4.2.7.3 Elevated cholesterol

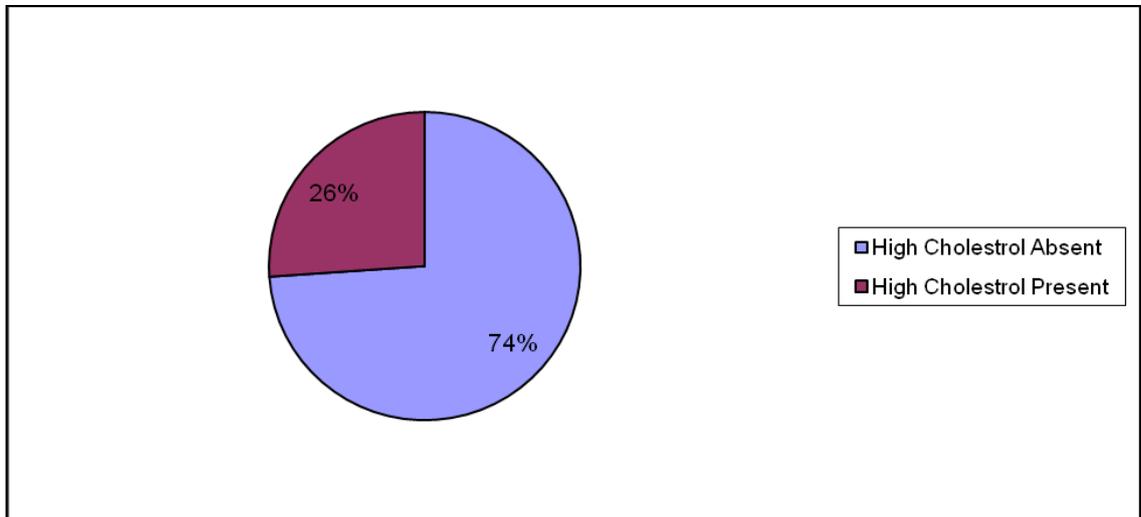


Figure 4.10: High Cholesterol

Of the 46 respondents, 34 (74%) indicated that elevated Cholesterol is absent in their family as far as they know and 12 (26%) indicated that it is present.

4.2.7.4 Stroke

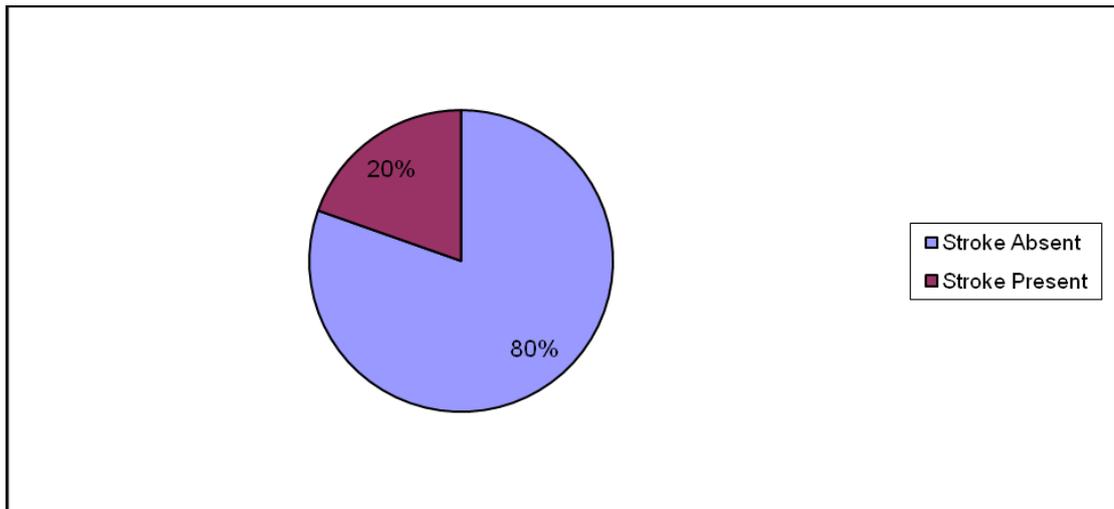


Figure 4.11: Stroke

Of the 46 respondents, 37 (80%) indicated that in their family stroke does not occur and nine (20%) indicated that family members do suffer from it.

4.2.7.5 Coronary Artery disease

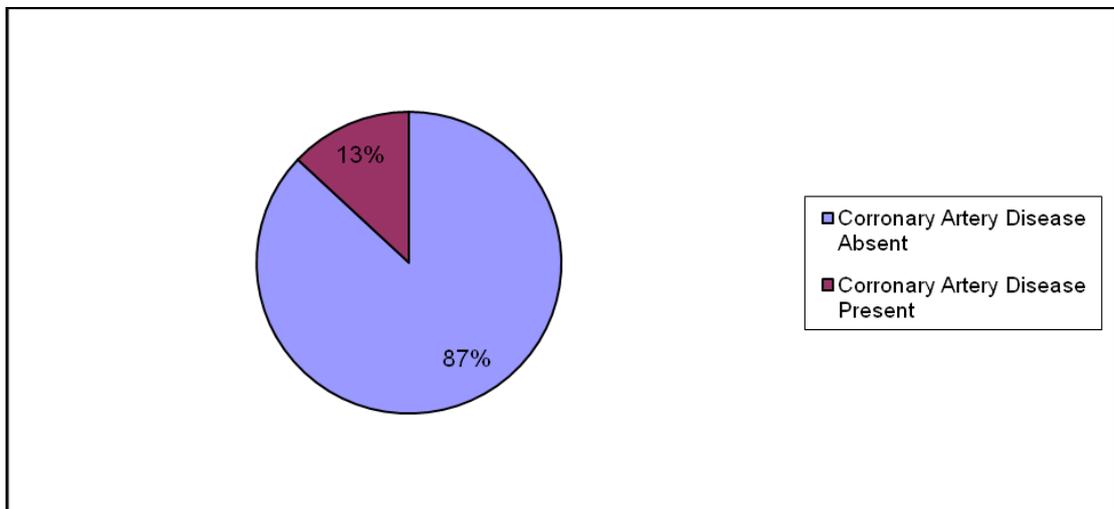


Figure 4.12: Coronary Artery Disease

Of the 46 respondents, 40 (87%) indicated that family members do not suffer from Coronary Artery Disease and six (13%) indicated that family members do suffer from this disease.

4.2.7.6 Do not know if diseases are present

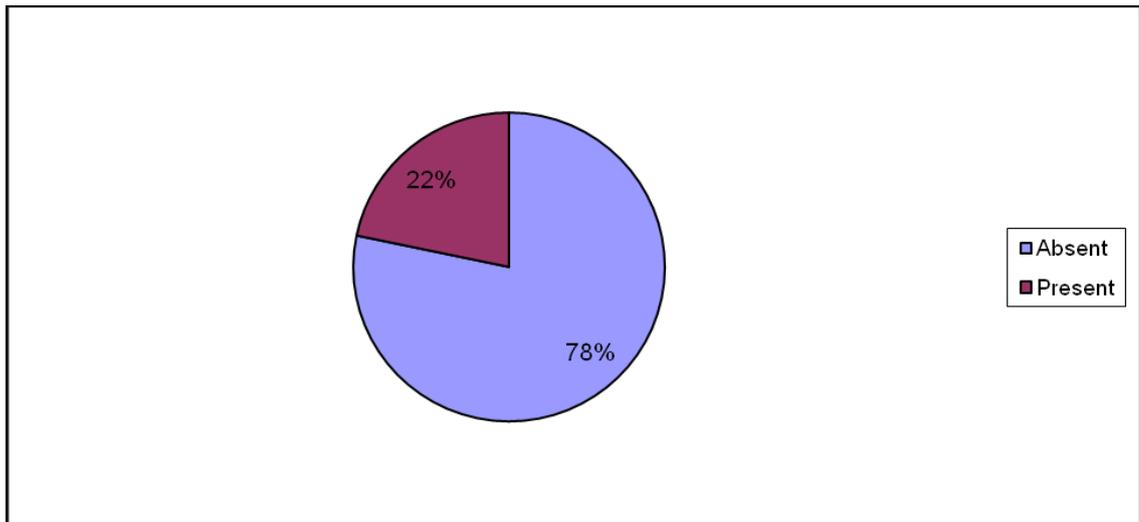


Figure 4.13: Do not know if diseases are present

Of the 46 respondents, ten (22%) indicated that they don't know if the diseases mentioned in question are present in their family. It seems as if this question was misinterpreted by the participants. This question would need attention.

4.2.8 Question 9: Smoking

In question nine respondents were asked to indicate if they smoked or not. The results are reflected in figure 4.14.

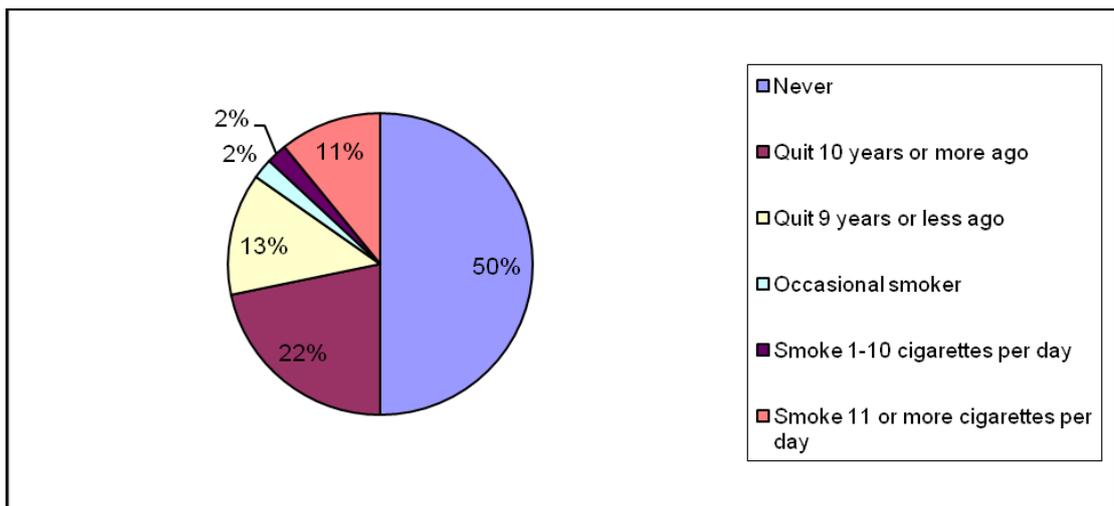


Figure 4.14: Smoking

Of the 46 respondents, 23 (50%) indicated that they never smoked and ten (22%) indicated that they quit ten years or more ago. While six (13%) indicated that they quit nine years or less ago. Five (11%) indicated that they smoke 11 or more cigarettes a day and only one (2%) indicated that they smoke 1 - 10 cigarettes a day and another one (2%) indicated that they are occasional smokers. According to a study by Farham (2005:264) “it is by now well known that tobacco use increases the risk of developing several cancers and diseases of the cardiovascular and respiratory systems. This makes tobacco use one of the main preventable causes of chronic disease and death in developed countries and it is indeed the second leading cause of death world wide”.

4.2.9 Question 10: Stress

Question 10 of the questionnaire in the study determined if the participants experience stress. The results are reflected in figure 4.15.

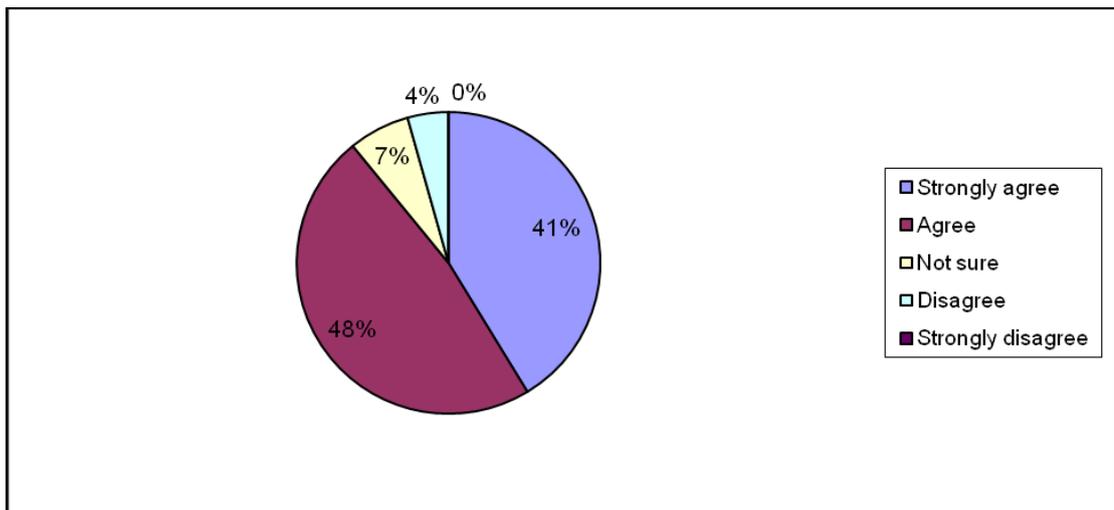


Figure 4.15: Stress

Of the 46 responses, 22 (48%) indicated that they agree, and therefore do have some stress, 19 (41%) strongly agree that they experience stress, three (7%) is not sure if they do have stress and only two (4%) disagree on the question if they experience stress and it can therefore be assumed that they do not have stress. Available literature does not support the use of relaxation therapies for definitive therapy or prevention of hypertension. Ker

(2006:181) states that: “stress management is beneficial to the patient’s well being, but rarely sufficient to control hypertension”.

4.2.10 Question 11: Self-concept related to obesity/ within weight limits

In question 11 the respondents were asked if they consider themselves as very lean, lean, average, slightly obese and obese. The researcher compared the information in section 4.5.2 with their own rating in question 11. The results are reflected in figure 4.16.

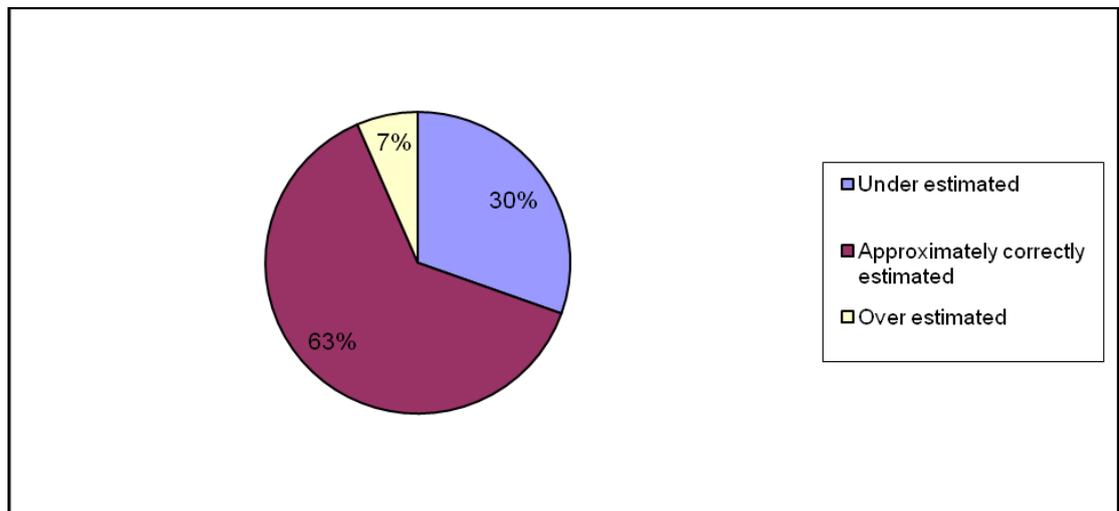


Figure 4.16: Weight

Of the 46 respondents, 29 (63%) approximately correctly estimated themselves within the borders of their own BMI, 14 (30%) under estimated themselves and three (7%) over estimated themselves. It can thus be stated that the most patients were realistic with regard to their own BMI.

4.2.11 Question 12: Exercise

In question 12 respondents were asked to indicate how many times per week they exercise. The results are reflected in figure 4.17.

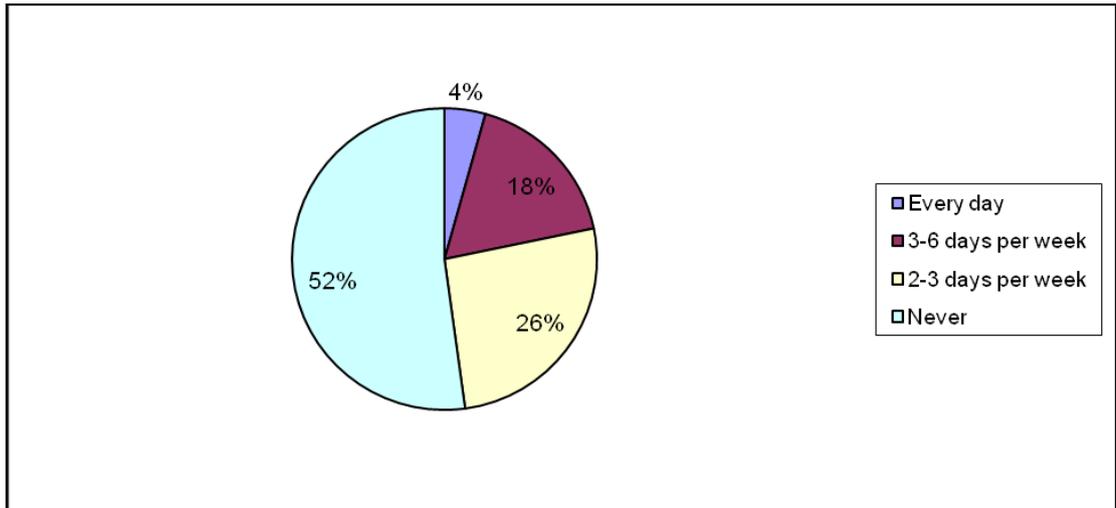


Figure 4.17: Exercise

Of the 46 respondents, 24 (53%) never exercised, 12 (26%) exercise 2 - 3 days per week, eight (17%) exercise 3 - 6 days per week and only two (4%) of the respondents exercise every day. The results were compared with information in the section about BMI. And according to that 17 (36%) are overweight, 11 (24%) are obese and 11 (24%) are also normal, four (9%) are obese class two and three (7%) are obese class three. Increase exercise lowers blood pressure and may allow people to reduce or stop medication, exercise is also an important adjunct to diet in reducing weight. There is evidence from epidemiological surveys that moderate exercise reduces mortality and morbidity original from cardiovascular disease (Morgan 2001:33).

4.2.12 Question 13: Activity level in work situation

In question 13 respondents were asked to indicate how active they are in their work situation or if they do sit a lot. The results are reflected in figure 18.

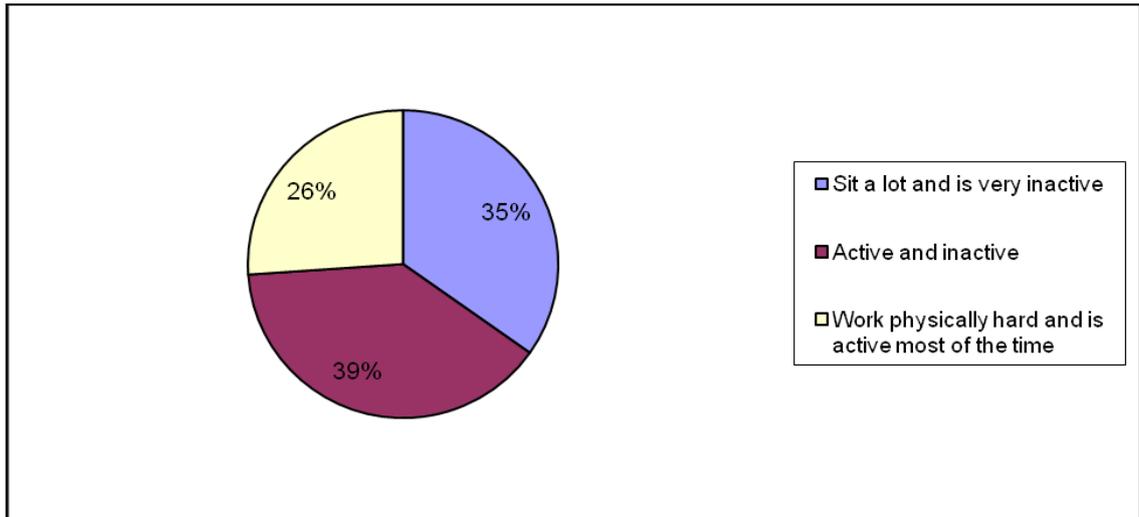


Figure 4.18: Work situation

Of the 46 respondents, 18 (39%) indicated that they are somewhat between active and inactive, 16 (35%) indicated that they sit a lot and is very inactive and 12 (26%) indicated they work physically hard and is active most of the time. The results were also compared to figure 4.5, the BMI. And according to that 17 (36%) are overweight, 11 (24%) are obese and also 11 (24%) are also normal, four (9%) are obese class two and three (7%) are obese class three. Physical inactivity has been shown to increase the risk of hypertension by 30%. Physical fitness is an independent predictor of cardiovascular mortality. According to Mabuza (2006:239) clinical trials have shown that moderate consistent exercise reduces the risk of development of Coronary Artery Disease in high risk patients. In this case the activity involves the work situation and it can be assumed that it could contribute to general fitness.

4.2.13 Question 14: Period treated for high blood pressure

In question 14 the respondents were asked for how long they have been treated for high blood pressure. The results are reflected in figure 19.

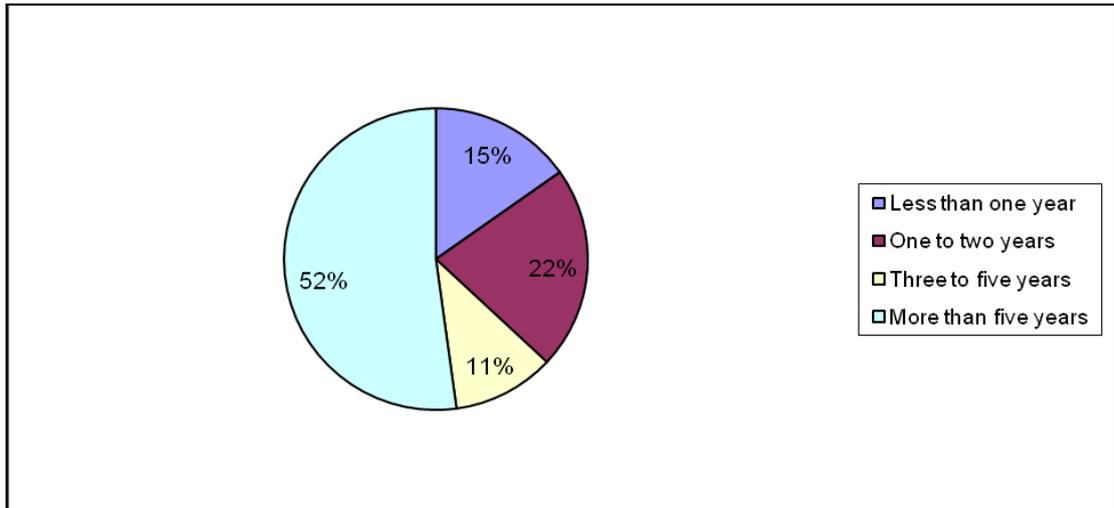


Figure 4.19: Period treated for high blood pressure

Of the 46 respondents who completed the questionnaire, 24 (52%) were treated for more than five years for high blood pressure, ten (22%) were treated for one to two years, seven (15%) were treated less than one year and five (11%) were treated three to five years. No comparative data could be found.

4.2.14 Question 15: Frequency of eating meals

In question 15 the respondents were asked to indicate how often they eat meals. The results are reflected in figure 4.20.

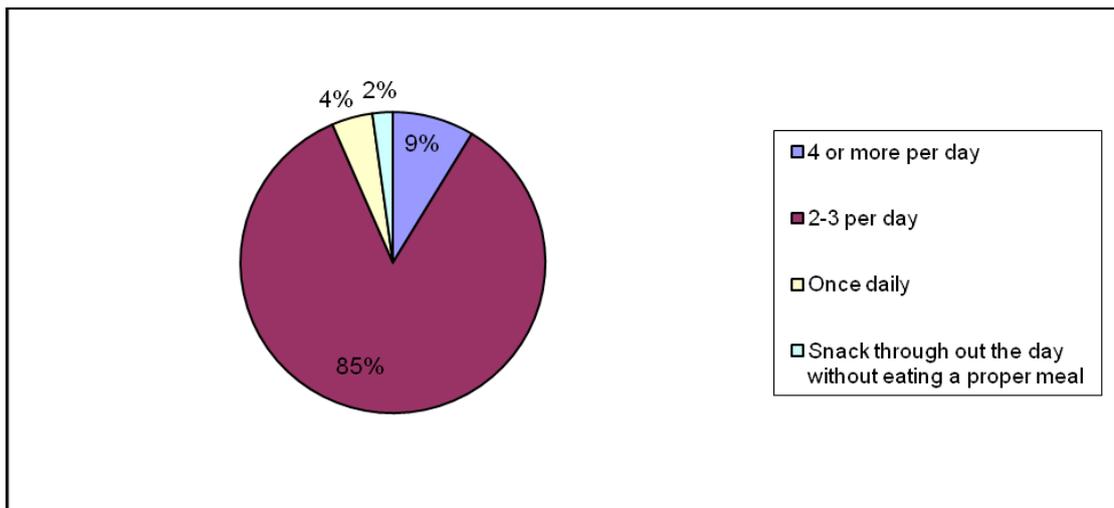


Figure 4.20: Eating of meals

Of the 46 responses 39 (85%) indicated that they eat 2 - 3 times per day, four (9%) indicated that they eat four or more times per day, two (4%) indicated that they eat only once daily and one (2%) indicated that they snack throughout the day without eating a proper meal. According to the Dietary Approaches to Stop Hypertension (DASH) diet three meals a day and snacks like apricots, pretzels, mixed nuts are appropriate. If patients eating according to the DASH diet they must centre their meals around carbohydrates, and meat must be a part of the whole meal and not the focus of the meal and they must use fruits. The DASH diet must be part of your lifestyle and those includes keeping a healthy weight, being physical active and if you drink alcohol do it in moderation (Joint National Committee 1997:33).

4.2.15 Question 16: Alcohol consumption

In question 16 the respondents were asked to indicate how often they drink alcohol. The results are reflected in figure 21.

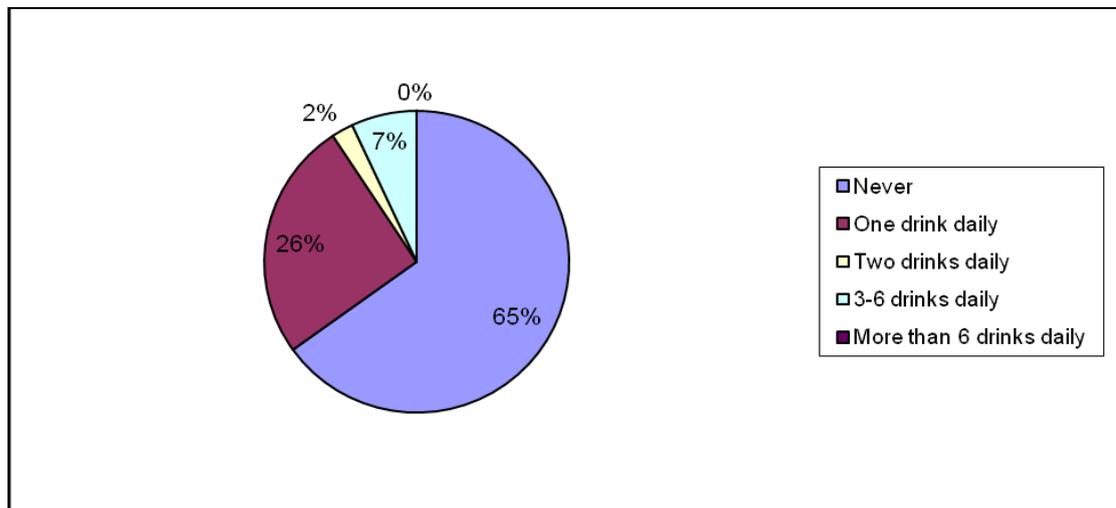


Figure 4.21: Alcohol

In this question n=43 because three of the 46 respondents didn't answer the question. Of the 43 responses, 28 (65%) indicated that they never drink, 11 (26%) indicated that they drink one drink daily, three (7%) indicated that they drink 3 - 6 drinks daily and one (2%) indicated that they drink two drinks daily. In community surveys there is an association between alcohol intake

and blood pressure, it is claimed that blood pressure rises by 1mmHg for each standard drink (Morgan 2001:32).

4.2.16 Question 17: Enjoy their job

In question 17 respondents were asked to indicate if they enjoy their job. The results are reflected in figure 4.22.

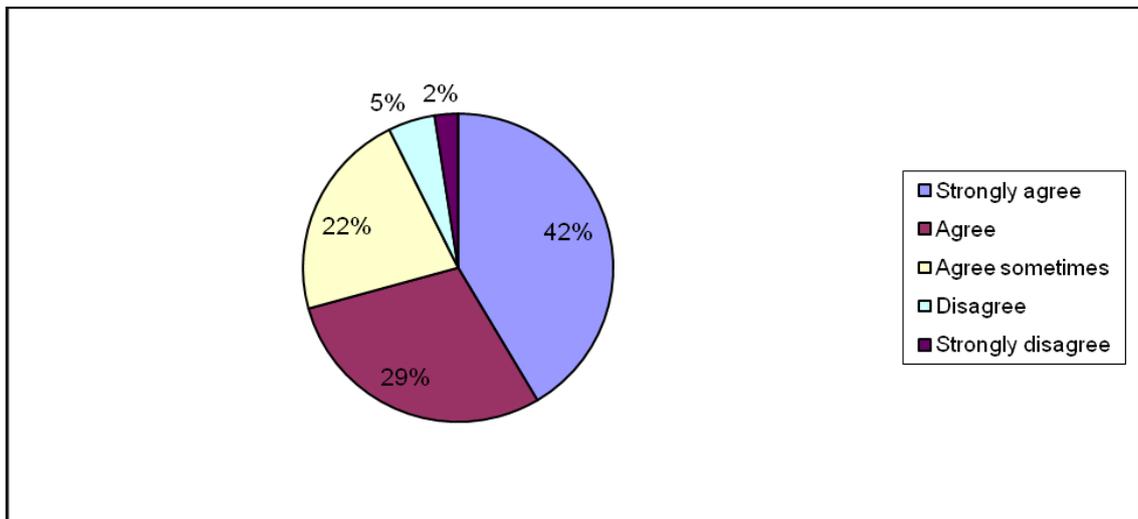


Figure 4.22: Enjoyment of job

In this question $n=41$ because five of the 46 respondents were pensioners and therefore did not answer this question. Of the 41 respondents, 17 (42%) indicated that they strongly agree and enjoy their job, 12 (29%) indicated that they agree, nine (22%) indicated that they sometimes agree, two (5%) indicated that they disagree and only one (2%) indicated that they strongly disagree.

4.2.17 Question 18: Own Blood pressure value

In question 18 respondents were asked to indicate if they know what their blood pressure is. The results are reflected in figure 4.23.

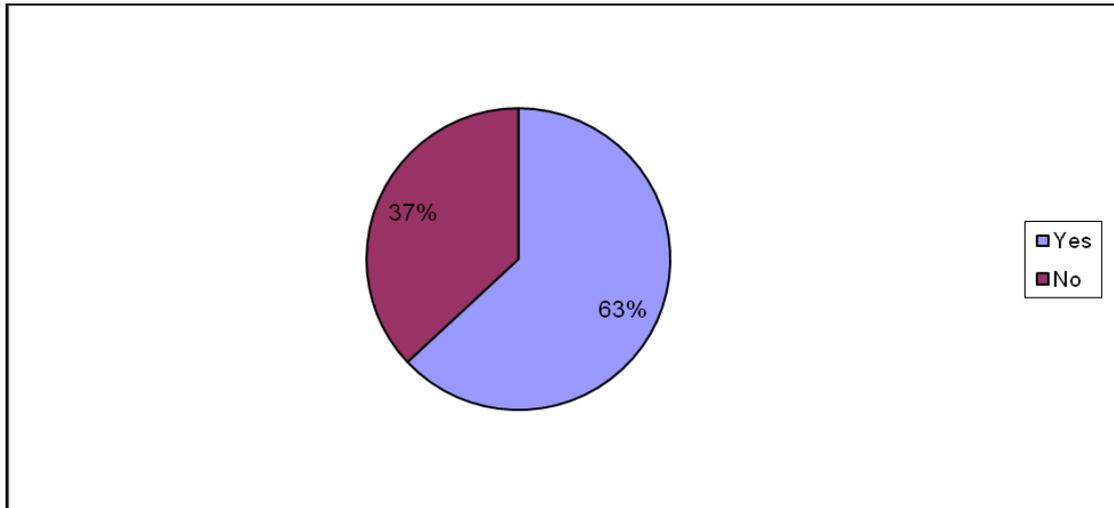


Figure 4.23: Blood pressure

Of the 46 respondents, 29 (63%) know their blood pressure value and 17 (37%) did not know their blood pressure. This finding was encouraging to an extent, because awareness of blood pressure values could serve as an entrance point for further patient education.

4.2.18 Question 19: Diet

In question 19 the respondents were asked to describe their diet. The researcher compared the answers of the respondents with principles specified in the DASH diet. The results are reflected in figure 4.24

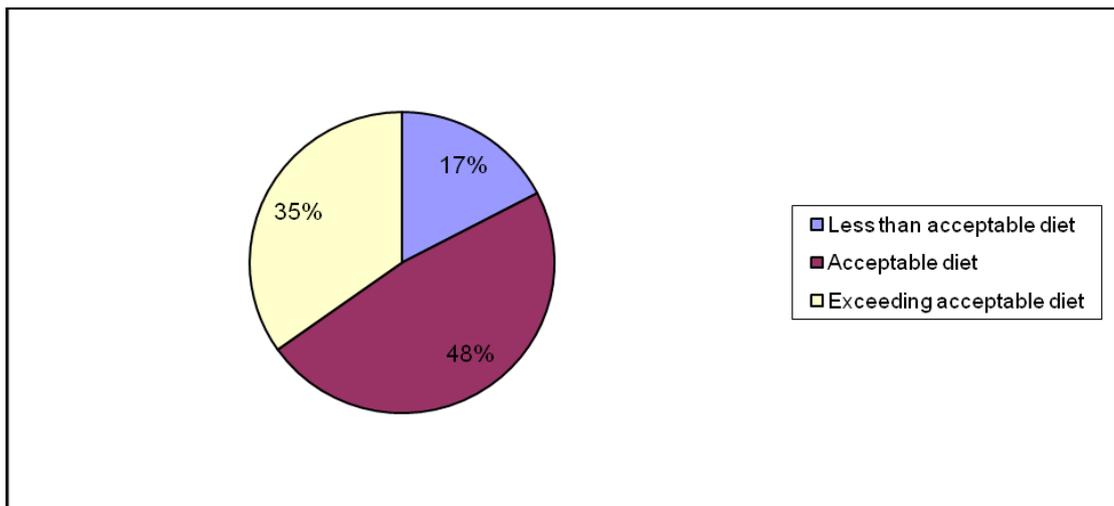


Figure 4.24: Diet

Of the 46 respondents, 22 (48%) had an acceptable diet, 16 (35%) had more food than is needed and eight (17%) of the respondents' diet was less than acceptable. As guideline to compare the respondents' diets to, the DASH diet (Joint National Committee 1997:66) was used.

The following are components of this diet:

Breakfast: two fruits, one dairy (low-fat or non fat dairy foods), two grains and one fat, *Lunch:* one poultry, one grain, one vegetable, two dairy and one fruit, *Dinner:* one fish, meat or poultry, two grains, three vegetables, ½ fat, *Snacks:* one fruit, one grain and one nuts.

The researcher realised during data analysis that this questionnaire could only broadly categorise the participants into the three groups, namely those that are acceptable, less than or more than acceptable diet. This question would need to be refined in future studies. The researcher could, for example, not measure the portions of food the respondents mentioned.

Although mainly biographical and physiological data are presented above, some aspects of patients knowledge is also reflected because for example, a patient that knows his own blood pressure and know what to eat can be considered as being empowered.

4.3 SECTION B: KNOWLEDGE BASE

4.3.1 Introduction

Section two of the questionnaire assessed the actual knowledge of the respondents concerning elevated blood pressure and prevention strategies for Coronary Heart Disease.

4.3.2 Question 20: Definition of blood pressure

The aim of this question was to determine whether the respondents were familiar with the definition of hypertension. The results are reflected in figure 4.25. Marks were allocated according to a marking guide out of three marks compiled by the researcher. The three most critical aspects that was

required from a lay person were included in the definition (see Annexure C for marking guide).

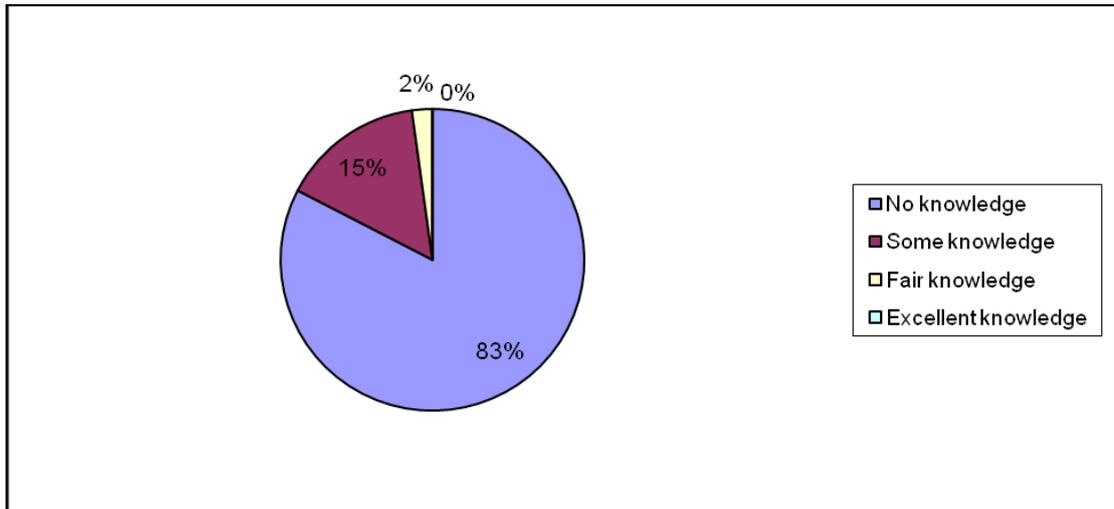


Figure 4.25: Definition of Hypertension

One respondent (2%) had fair knowledge, seven (15%) respondents had some knowledge and 38 (83%) had no knowledge. This indicates that the respondents had poor knowledge and that this is an area that would need much attention.

4.3.3 Question 21: Coronary Heart Disease defined

The aim of this question was to determine whether the respondents were familiar with the definition of Coronary Heart disease. The results are reflected in figure 4.26. Marks were allocated according to a marking guide out of three marks compiled by the researcher. The three most critical aspects that were required from a lay person were included in the definition (see Annexure C for marking guide).

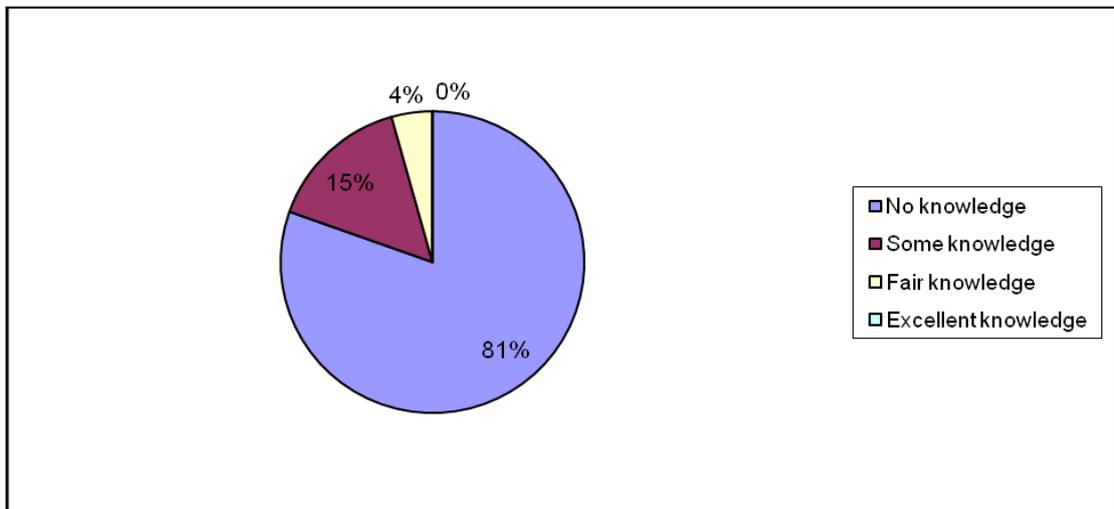


Figure 4.26: Definition of Coronary Heart Disease

Two respondents (4%) had fair knowledge, seven (15%) respondents had some knowledge and 37 (81%) had no knowledge. Indicating that the respondents had poor knowledge and that this is an area that would need attention.

4.3.4 Question 22: Prescription of Aspirin

This question determined if aspirin was prescribed for each of the respondents or not. Many respondents did not answer this question. During analyses it was found that it could only contribute to further describe characteristics of the study group, but it did not contribute to the knowledge base section. Twenty-eight (61%) of the respondents indicated that aspirin was prescribed. According to the National Department of Health (2003:177) and Hypertensive guidelines aspirin should be prescribed for high risk hypertensive patients and also patients with diabetes and elevated cholesterol. Normally it could be an indication that the doctor may be of the opinion that the patient already has Coronary Heart Disease.

4.3.5 Question 23: The term BMI

The aim of this question was to determine whether the respondents were familiar with the term BMI and the importance of it. The results are reflected in figure 4.27. Marks were allocated according to a marking guide out of two marks compiled by the researcher. The two most critical aspects that was

required from lay persons were included in the definitions (see Annexure C for marking guide).

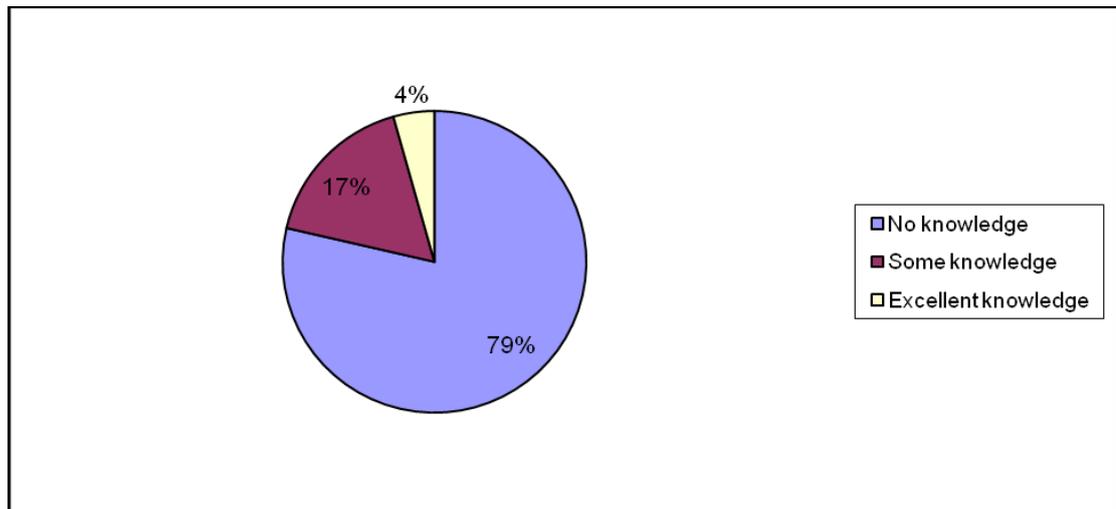


Figure 4.27: BMI

Only two (4%) respondents had excellent knowledge, eight (17%) had some knowledge and 36 (79%) had no knowledge, indicating very poor knowledge of the group on this question.

4.3.6 Questions 24, 25 & 26: Blood Cholesterol levels

Initially the aim of these questions was to determine the knowledge of the respondents that are using cholesterol lowering medication. Only a few respondents answered these questions and it could not be analysed statistically. It did not contribute to the knowledge base section in the end. It was clear that questions 25 and 26 were not interpreted correctly by the respondents, because there were discrepancies between those that indicated they were using cholesterol medication and the responses that were required. For example, not all respondents using cholesterol medication answered these questions. In future studies these questions should be left out or should be reformulated in the questionnaire.

4.3.7 Question 27: Reasons for blood pressure rising with age

The question determined whether the correct factors could be identified that could contribute to increased blood pressure with increasing age. The results are reflected in figure 4.28.

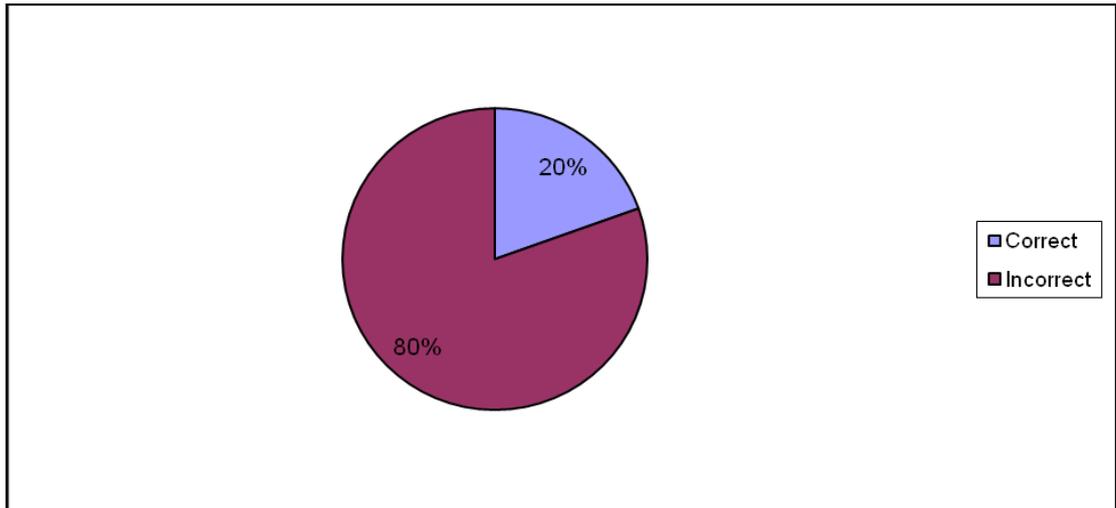


Figure 4.28: Increased blood pressure with age

Only nine (20%) respondents could answer this question correctly, indicating poor knowledge in the group. As 37 (80%) respondents in this study were above 50 years or more this is an area that they could be made more aware of, because factors like inactivity and increased body weight could be addressed.

4.3.8 Question 28: Aim of taking medication for blood pressure

This question determined whether the correct factors could be identified for taking blood pressure medication and therefore indirectly indicating the aim of taking it. The results are reflected in figure 4.29.

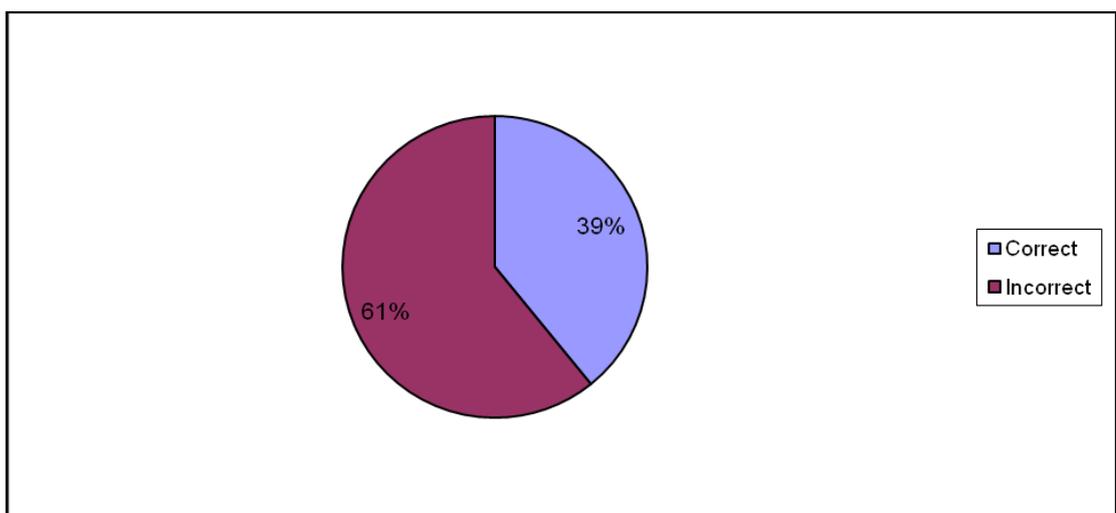


Figure 4.29: Blood pressure medications

The results of this question was surprising because only eighteen (39%) of the respondents could answer this question correctly, indicating poor knowledge of the group. If patients do not know why they are taking medication for high blood pressure, compliance might also be a factor that could be improved.

4.3.9 Question 29: Risk factors for Coronary artery disease that something can be done to

The question determined whether the respondents could identify the risk factors for Coronary Artery Disease which they can do something about to improve their life. The results are reflected in figure 4.30.

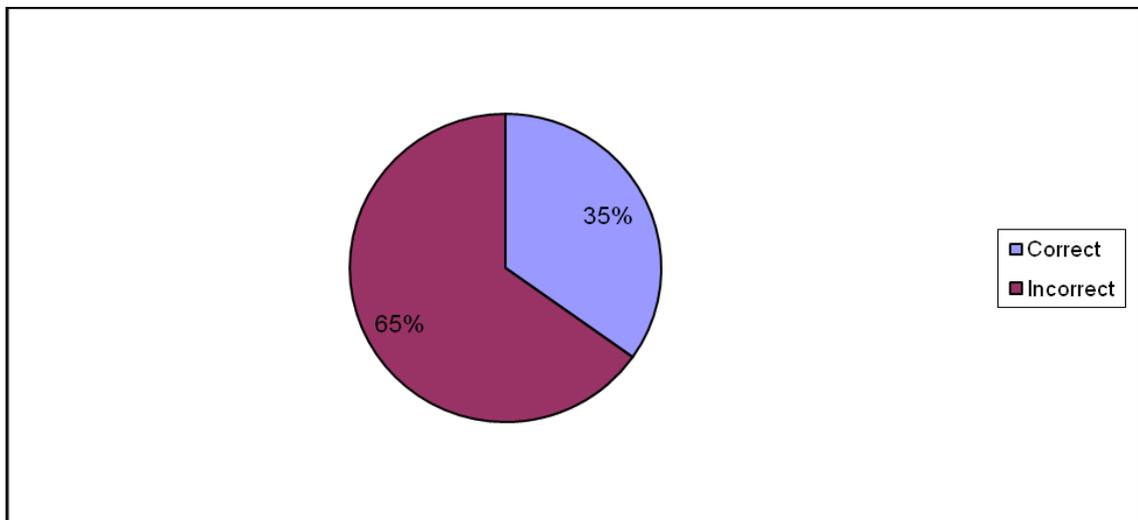


Figure 4.30: Risk factors that can be modified

Only sixteen (35%) of the respondents could answer this question completely correctly, indicating poor knowledge about an area the researcher thought non professional people had knowledge on. However, knowledge about this should also receive attention in patient education.

4.3.10 Question 30: Exercise and reduction in blood pressure

The question determined if the respondents knew that regular exercise decreases blood pressure. Figure 4.31 reflects the results.

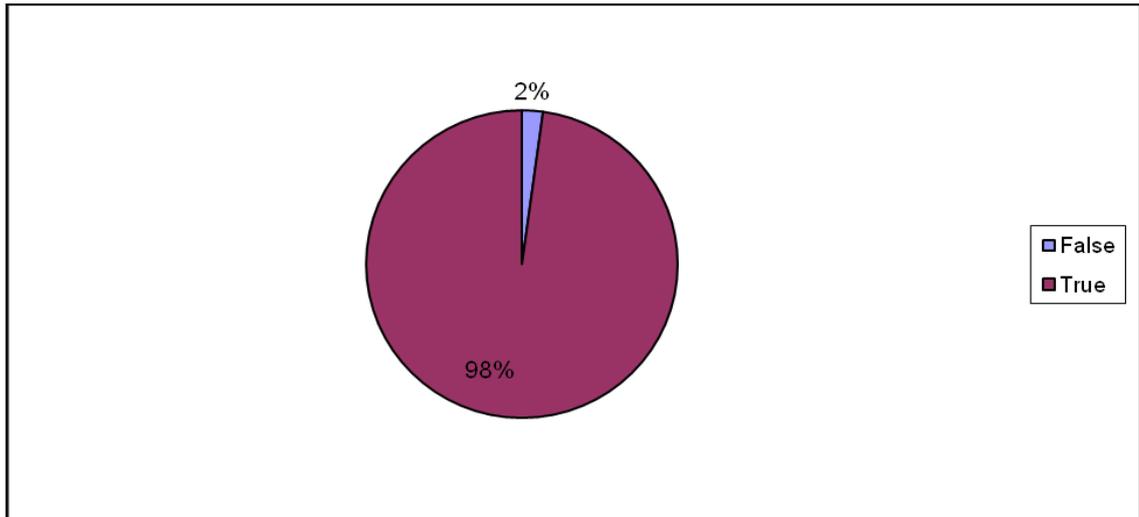


Figure 4.31: Exercise as factor in decreasing blood pressure

Forty five (98%) respondents could answer this question correctly, indicating that they are familiar with the fact that regular exercise contributes to lowering blood pressure.

4.3.11 Question 31: Management of blood pressure together with chronic illness

The question determined if the respondents knew that high blood pressure cannot be managed in isolation from other related chronic illnesses like Diabetes Mellitus. Figure 4.32 reflects the results.

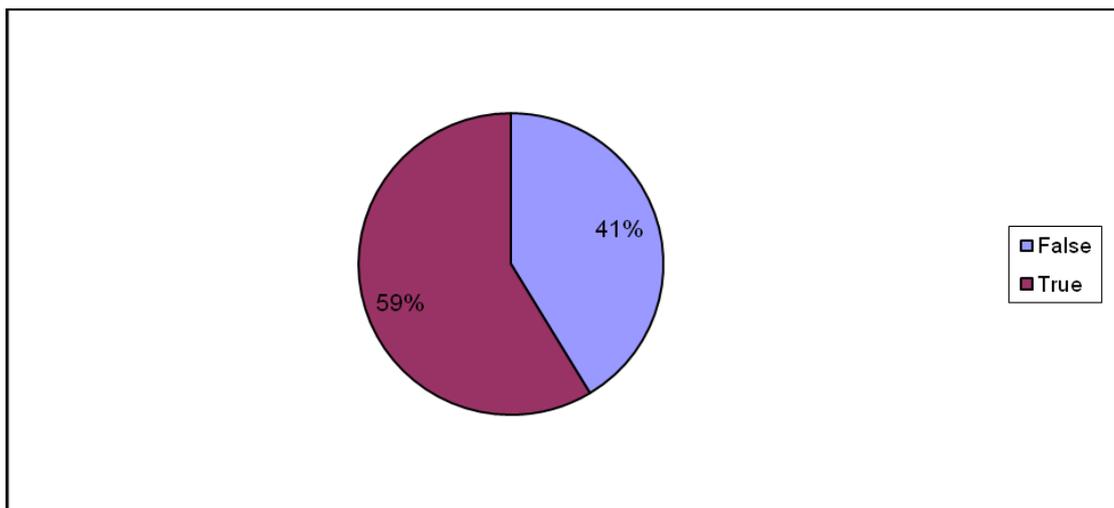


Figure 4.32: Diabetes Mellitus management together with hypertension

Nineteen (41%) of the respondents could answer this question correctly, indicating average knowledge. But still there is space for improvement and education.

4.3.12 Question 32: Antihypertensive drug efficacy and regular exercise

The question determined if the respondents were aware of the fact that regular exercise enhances antihypertensive drug efficiency. Figure 4.33 reflects the results.

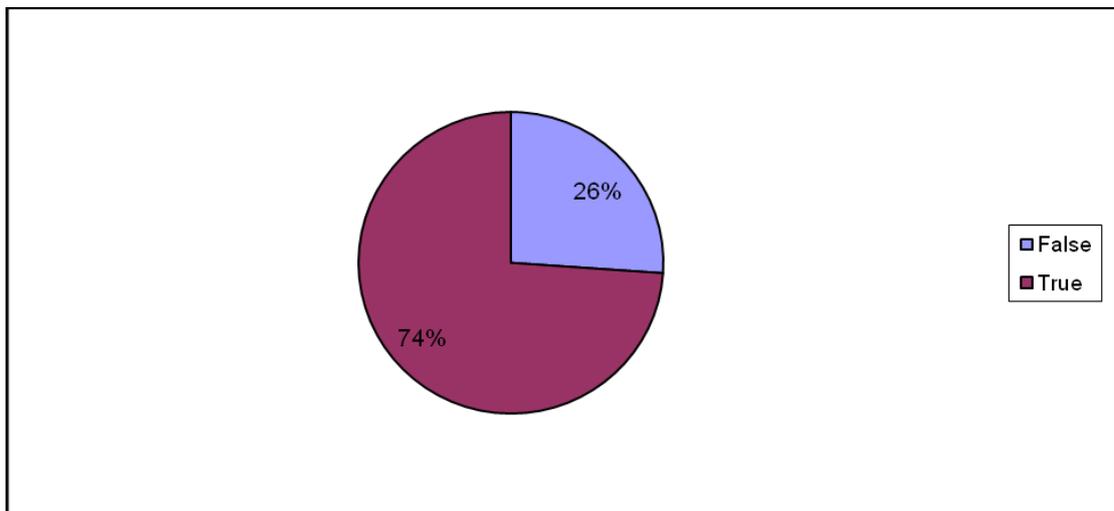


Figure 4.33: Enhancing effect of exercise on drug efficiency

Thirty four (74%) of the respondents could answer this question correctly, indicating good knowledge in this area. If this is compared with question 30 (see 4.3.10 page 73) it is an indication that there is an awareness of the impact of exercise.

4.3.13 Question 33: Medication as only measure to lower blood pressure

The question determined if the respondents knew that taking blood pressure medication daily is not the only way to maintain a normal blood pressure. Figure 4.34 reflects the results.

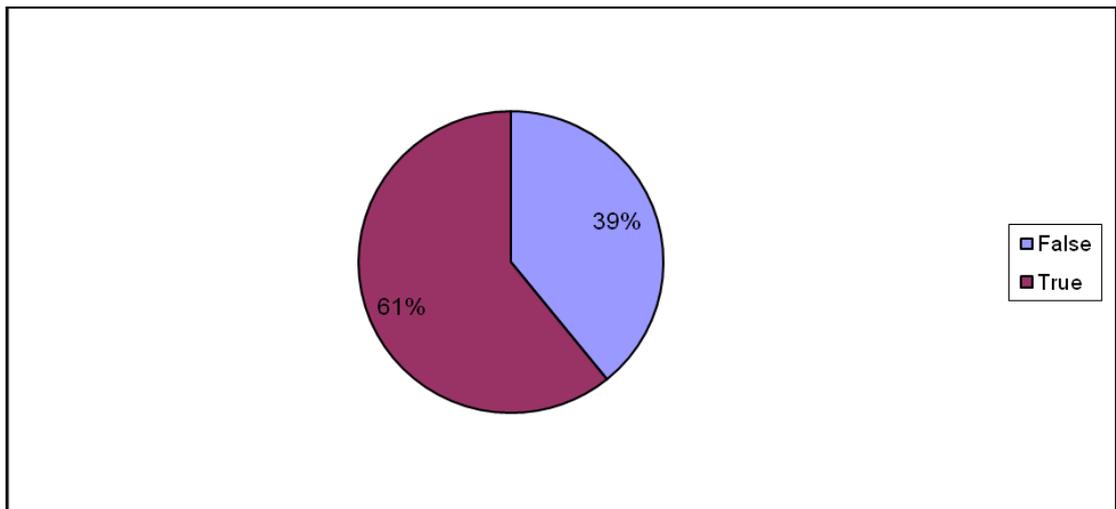


Figure 4.34: Maintaining blood pressure

Thirty-nine (18%) respondents could answer this question correctly, indicating average knowledge. However, patient education in this area could be implemented as it is essential that patients realise medication is not the sole solution.

4.3.14 Question 34: Diet and high blood pressure

The question determined if the respondents knew that high blood pressure can be reduced by making changes in your diet. Results are reflected in figure 4.35.

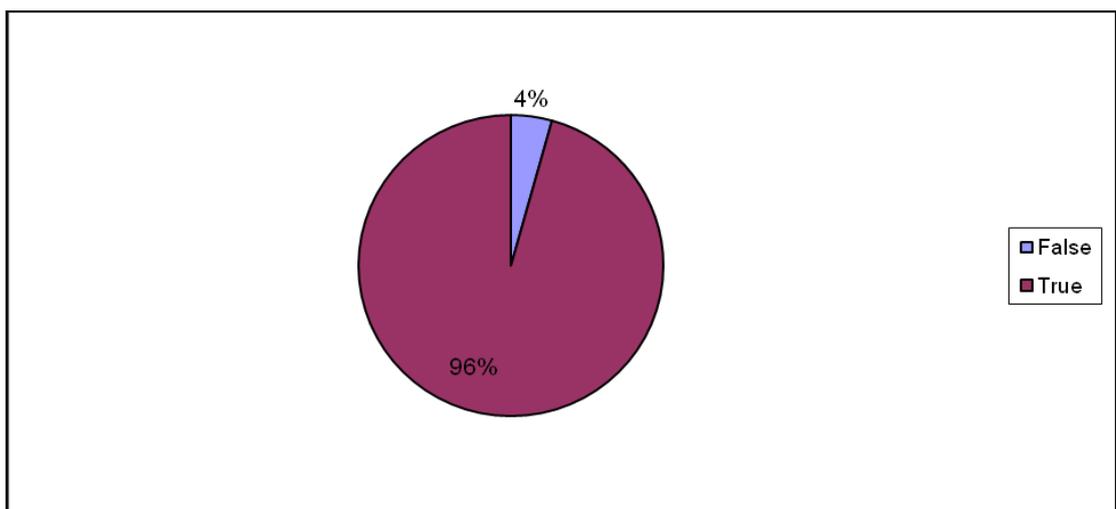


Figure 4.35: Reducing high blood pressure by changing diet

Forty-four (96%) of the respondents could answer this question correctly, indicating that they had very good knowledge in this area. However, looking at the biographical data and specifically the BMI, it was realised that although the respondents are aware of the implications of diet, their BMI does not reflect it. They do not practise what they preach.

4.3.15 Question 35: Taking of blood pressure medication

The question determined if the respondents are aware of the importance of taking blood pressure medication regularly as prescribed even although they may think their blood pressure is normal because they are feeling healthy. Results are reflected in figure 4.36.

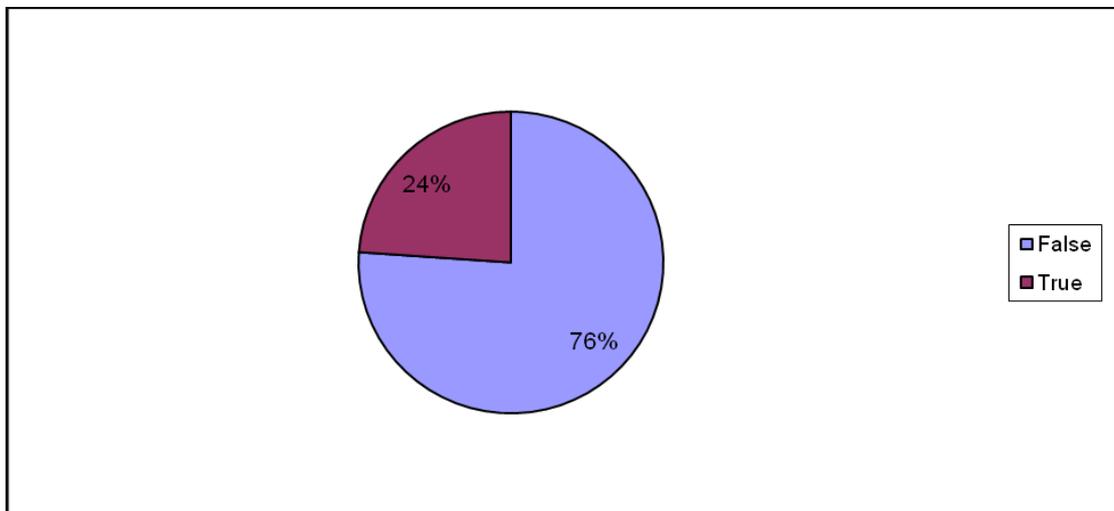


Figure 4.36: Regular taking of blood pressure medication

Thirty-five (76%) of the respondents could answer this question correctly, indicating that they realise the importance of compliance.

4.3.16 Question 36: Passive smoking and hypertension

This question determined whether the respondents were aware of the fact that passive second hand smoke exposure could also increase the risk for a heart attack. Figure 4.37 reflects the results.

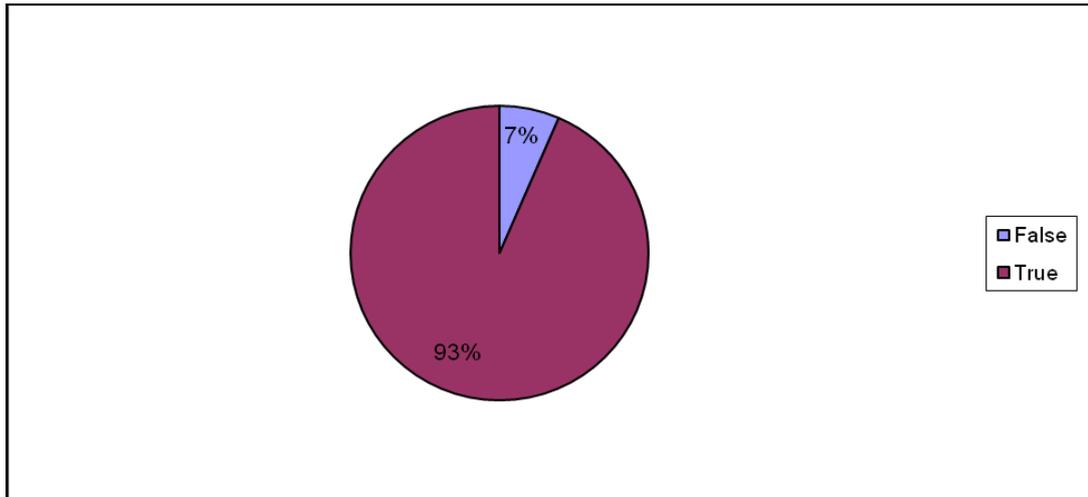


Figure 4.37: Passive second hand smoking

Forty-three (93%) of the respondents could answer this question correctly, indicating very good knowledge of this fact within this group of respondents.

4.3.17 Question 37: Risk factors for a heart attack

The question determined whether the respondents knew that certain conditions could contribute to the development of a heart attack. The researcher analysed each of the conditions separately. This means that in effect this was five separate questions.

4.3.17.1 High blood pressure as contributing factor in the development of a heart attack

The question determined whether the respondents knew that high blood pressure can contribute to the development of a heart attack. Figure 4.38 reflects the results.

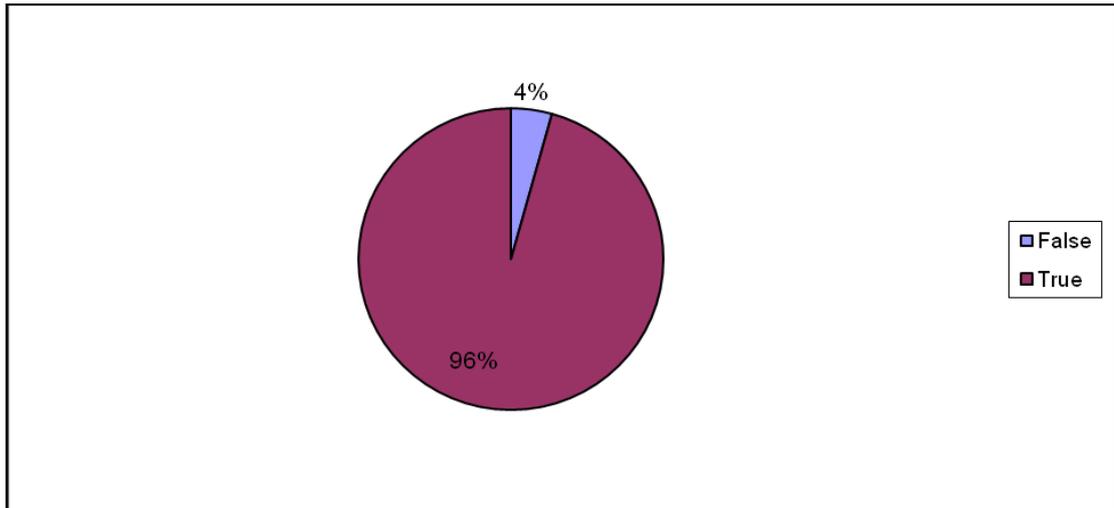


Figure 4.38: Heart Attack

Forty-four (96%) respondents could answer this question correctly, indicating very good knowledge.

4.3.17.2 Cigarette smoking

The question determined whether the respondents knew that cigarette smoking can contribute to the development of a heart attack. Figure 4.39 reflects the results.

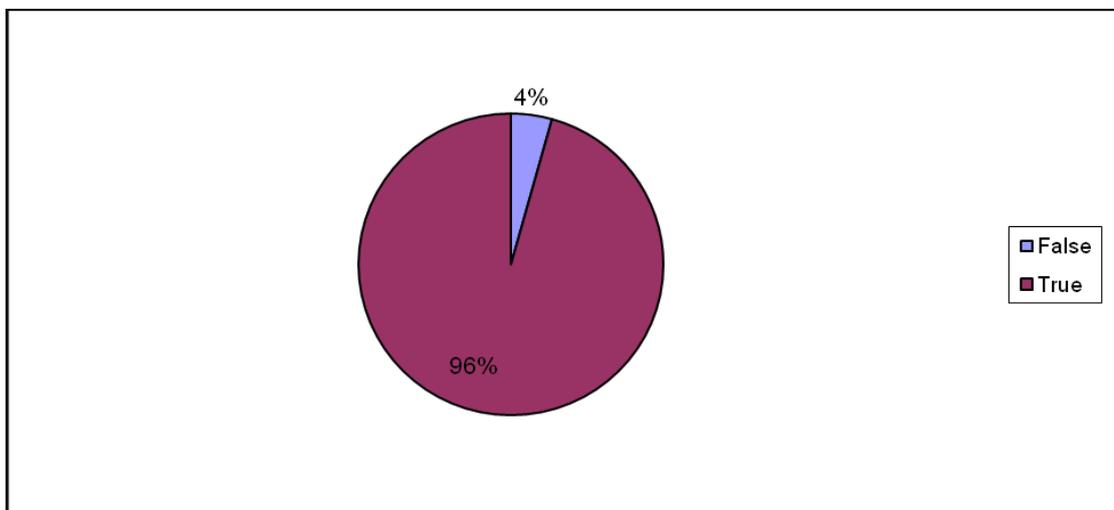


Figure 4.39: Cigarette smoking

Forty-four (96%) respondents could answer this question correctly, indicating very good knowledge.

4.3.17.3 High cholesterol

The question determined whether the respondents knew that high cholesterol levels can contribute to the development of a heart attack. Figure 4.40 reflects the results.

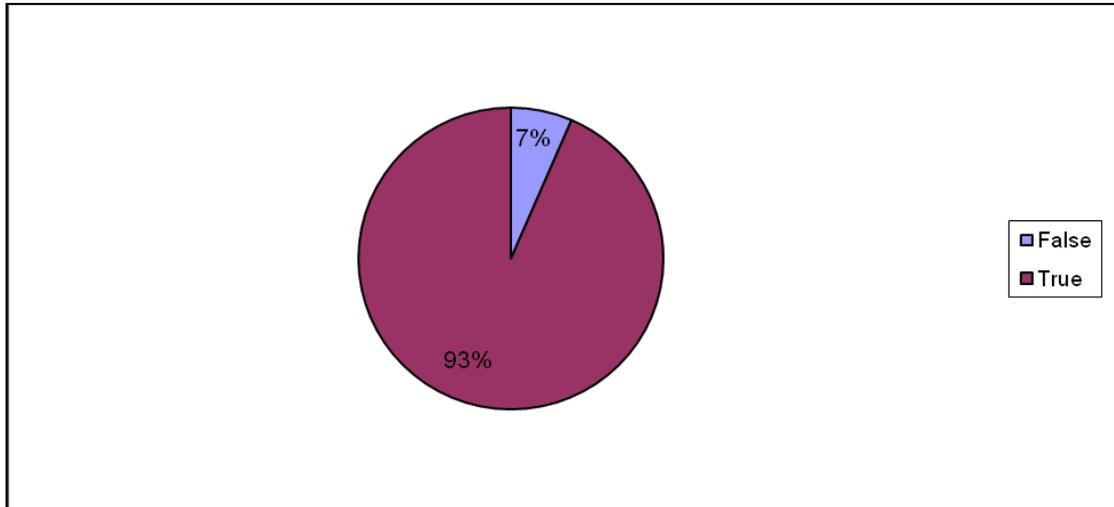


Figure 4.40: High Cholesterol

Forty-three (93%) of the respondents could answer this question correctly, indicating thorough knowledge on this issue.

4.3.17.4 Diabetes

The question determined whether the respondents knew that Diabetes can contribute to the development of a heart attack. Figure 4.41 reflects the results.

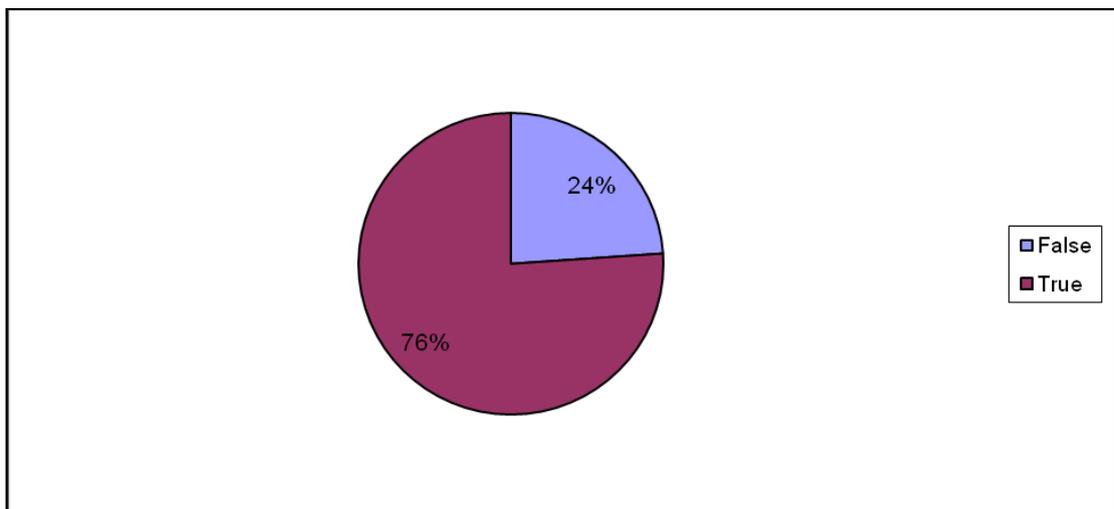


Figure 4.41: Diabetes

Thirty-five (76%) respondents could answer this question correctly, indicating good knowledge on this aspect.

4.3.17.5 Oral contraceptives

The question determined whether the respondents knew that taking birth control pills or hormone therapy do not contribute to the development of a heart attack. Figure 4.42 reflects the results.

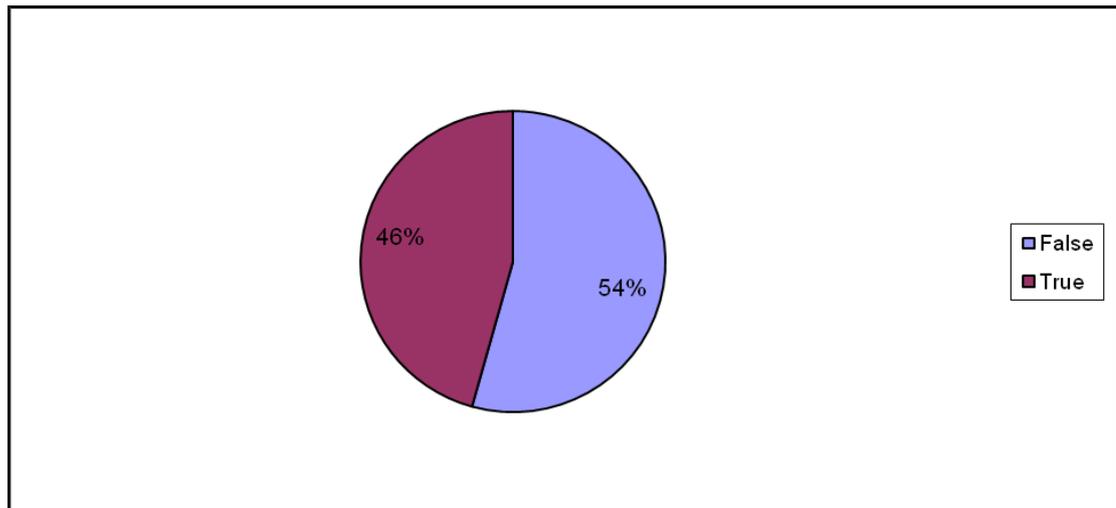


Figure 4.42: Oral contraceptives

Twenty-five (54%) of the respondents could answer this question correctly, indicating satisfactory knowledge.

4.3.17.6 Overview

Taking the results reflected in 4.13.17.1 - 4.13.17.5 into account, it seems as if the group has good knowledge of risk factors in general.

4.3.18 Question 38: Needs of Hypertensive patients

This question was to determine the needs of hypertensive patients related to education on the topic that might not have been touched on in this questionnaire. Sixteen respondents did not answer this question. The researcher analysed the other 30 questionnaires and could identify ten needs. The respondents requested information on the following:

- Medication
- Control of hypertension

- Symptoms
- Prevention without or before taking medication
- Causes of hypertension
- Diet
- Prognosis of hypertension and if it is curable
- Information required after myocardial infarction
- One of the responses was “everything”, indicating that the whole topic had to be addressed.
- Family history

The following needs occurred the most frequent and were therefore most wanted by the respondents: medication, diet, prognosis and the “everything” on hypertension.

4.4 COMPETENCY INDICATOR

4.4.1 Scores of whole group of respondents

Finally scores of each individual patient were calculated in order to measure it against the competency indicator of 50% (refer 3.8.3-p 45). A score out of 23 was calculated as a percentage.

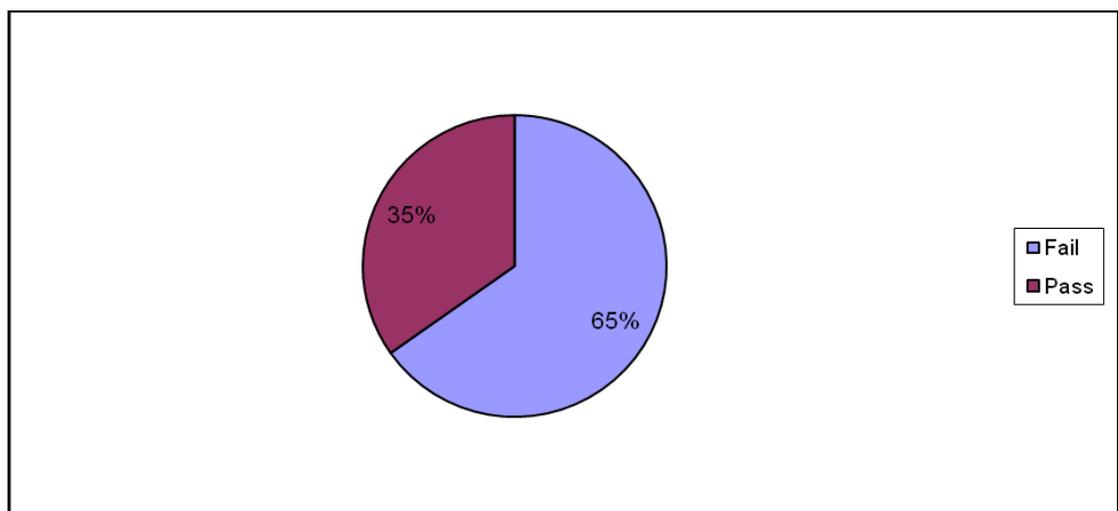


Figure 4.43: Scores as measured against competency indicator

Thirty (65%) of the patients could not achieve the competency indicator of 50%, which means that only 16 (35%) had a knowledge base good enough to score 50% or above. The group was further analysed to determine if some of the biographical data or aspects had an influence on achieving the competency indicator. No conclusions could be made, as groups within the study sample were not equal percentages (ea. male/female).

4.4.2 Gender of group

An equal group of male and female respondents namely eight (50%) could achieve the competency indicator, mark of 50%. Figure 4.44 reflects the results.

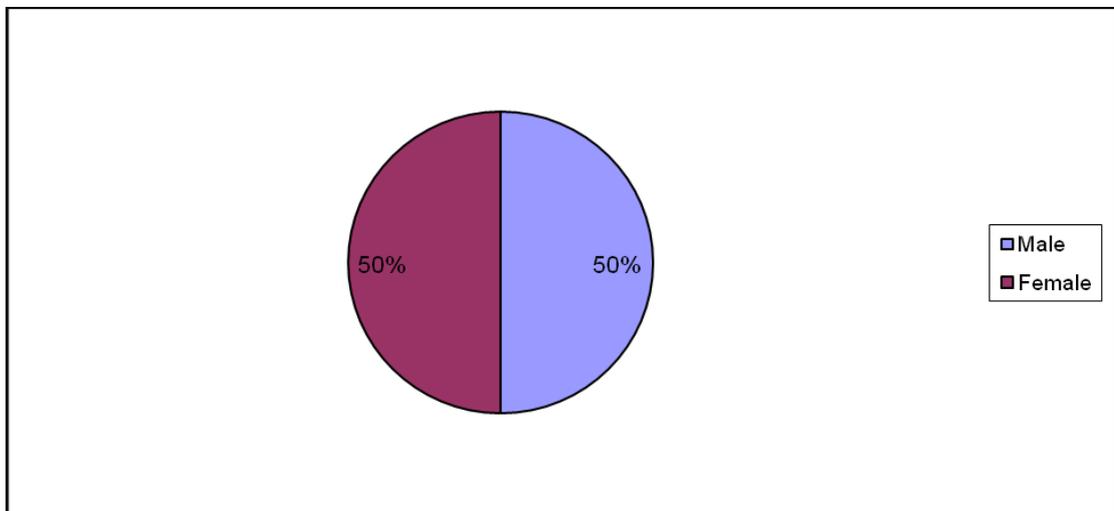


Figure 4.44: Competency indicator and gender of group

4.4.3 Age

Of the sixteen candidates who passed the test, seven (43%) was in the age group 51 - 60, four (25%) was in the age group 31 - 40, two (13%) was in the age group 41 - 50 and two (13%) in the age group above 60 and only one (6%) was in the age group between 20 - 30. Results are reflected in figure 4.45.

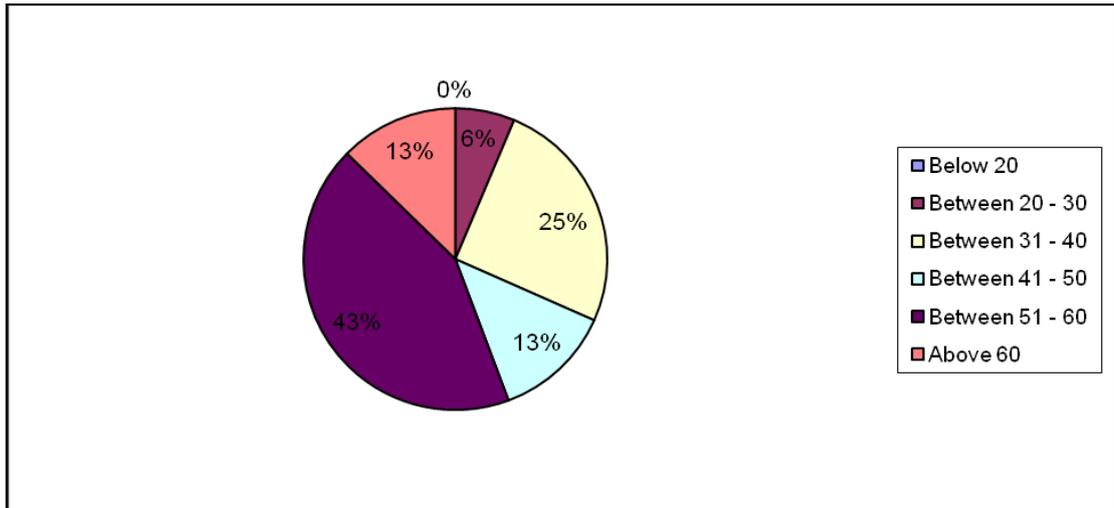


Figure 4.45: Competency indicator and ages of group

4.4.4 Education

Of the sixteen respondents who passed the test, 13 (81%) had tertiary education and three (19%) could complete secondary school. Results reflect in figure 4.46.

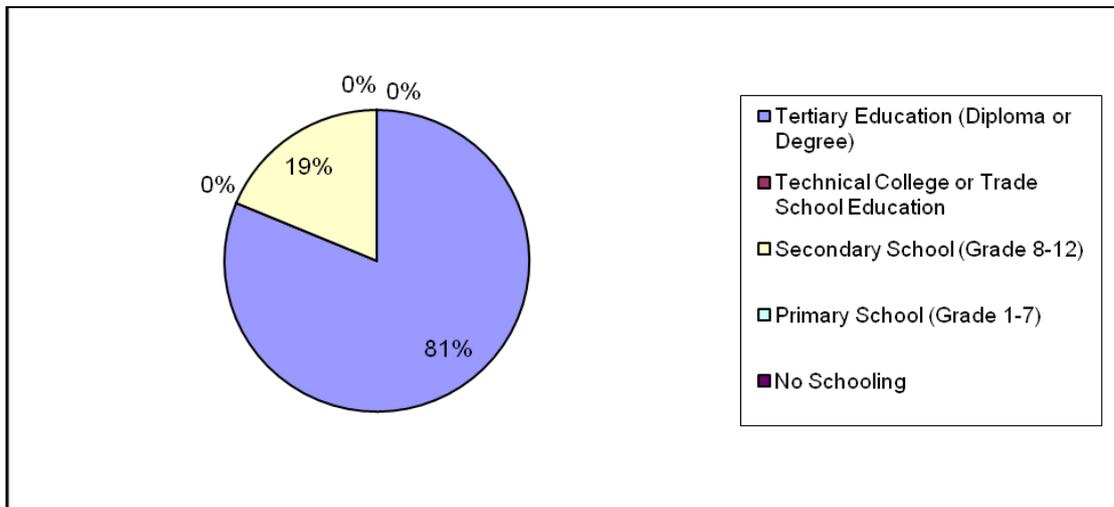


Figure 4.46: Competency indicator and education of group

4.5 NORMAL DISTRIBUTION

If the mean achievement of the entire group of participants is calculated, mean is 10.96 out of 23 or 47,65%. The highest mark out of 23 was 17 or 73,9% and the lowest mark was 2 or 8,6%.

The histogram of marks out of 23 is represented in figure 4.47.

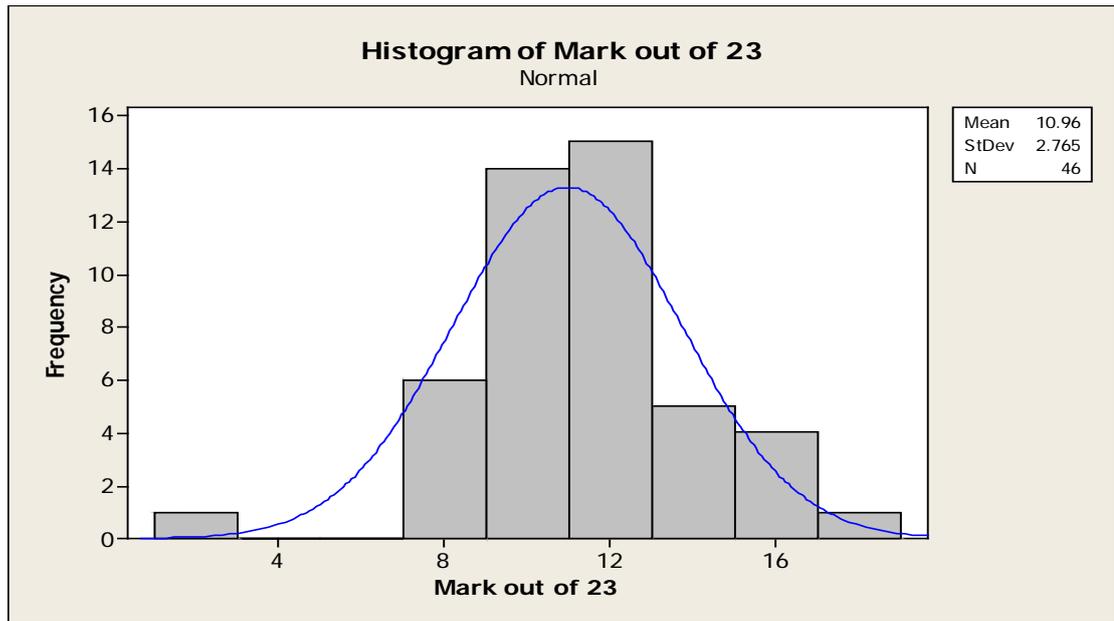


Figure 4.47: The Histogram of marks out of 23

The standard deviation is 2.765. The Kolmogorov-Smirnov test at a 5% level of significance was done which then concluded that the variable mark out of 23 follow a normal distribution.

4.6 CONCLUSION

Findings discussed in this chapter will be grouped in order to draw conclusions regarding the knowledge of persons with hypertension regarding cardiovascular disease and its risk factors. These conclusions as well as recommendations for further research will be discussed in detail in Chapter 5. The limitations of the study and the recommendations for nursing practice, nursing education and nursing research will also be discussed.

4.7 SUMMARY

A quantitative, non-experimental descriptive study was conducted to determine the knowledge of persons with hypertension regarding cardiovascular disease and its risk factors. A questionnaire was used as measurement test in this descriptive study to obtain complete and accurate information. Forty six questionnaires were handed out and were received from patients at selected private general practitioners consulting rooms in the

western part of KwaZulu-Natal and the bordering eastern part of the Free State. Although respondents had a basic knowledge on cardiovascular disease and its risk factors it seems as if all the aspects need to be addressed in a document. The knowledge deficit included the following:

- Medication
- Reasons for developing hypertension
- Risk factors for coronary heart disease
- Importance of exercise
- Importance of managing hypertension together with chronic diseases

CHAPTER 5

CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

5.1 INTRODUCTION

In this chapter the conclusions and recommendations of the study are discussed.

The aim of this study was to determine the knowledge of persons with hypertension in a selected geographical area regarding cardiovascular risk factors in order to make recommendations for patient education. The objectives of the study were as follows:

- The first objective of the study was to determine the knowledge of persons with hypertension regarding cardiovascular disease and its risk factors. This objective was met by doing a survey among hypertensive patients in a selected geographical area. A questionnaire was used as measuring instrument in order to measure these patients' knowledge. The data obtained from the survey was analysed and discussed in chapter 4.
- The second objective of the study was to make recommendations for patient education regarding hypertension and related risk factors. This objective will be reached in this chapter.

5.2 MAIN FINDINGS AND CONCLUSIONS

A questionnaire was used as the data collection instrument. The questionnaire measured the knowledge that persons with hypertension in a selected geographical area have regarding hypertension and cardiovascular risk factors in order to make recommendations for patient education.

Fifty (50) questionnaires were distributed to hypertensive patients, and 46 returned in a town in western Natal and the bordering town in the eastern Free State. All the returned questionnaires were used in the study. Therefore number of respondents that participated in the survey was 46. A

statistician assisted with the data analysis. The research findings were presented and described in the previous chapter.

Only 16 (35%) of the entire group of respondents achieved a percentage on or above the competency indicator of 50%. The majority of the respondents' level of knowledge regarding hypertension and cardiovascular risk factors is below the competency indicator.

5.3 RECOMMENDATIONS FOR PATIENT EDUCATION REGARDING HYPERTENSION AND RELATED CARDIOVASCULAR RISK FACTORS

In this section, the results of all the different sections discussed in Chapter 4 will be used to make recommendations for educating patients.

5.3.1 Biographical data

The biographical data was gathered in the first place to obtain a profile of the participants. However, some conclusions of that part of the study should also have an effect on the patient education namely:

- Except for persons under the age of 20 years, all age groups, all the different race groups, different levels of education (qualification) and men as well as women were represented in the study group. This means that any patient education document should be written and illustrated in such a way that it would accommodate a wide variety of characteristics as was presented in this study group.
- Biographical data on the BMI and waist circumferences which is above normal indicate that the correct diet for hypertensive persons and cardiovascular health should receive much attention in an educational document. This is in spite of the fact that the group could gauge more or less correctly if they should be classified as overweight or not and also the way they indicated that they were taking their meals.

- Life- style issues like activity levels, stress and smoking as well as family history aspects should be addressed in an information document, as it was clear from the biographical data that these are aspects that the study group would need information on.

5.3.2 Knowledge base

5.3.2.1 Definitions assessed in the questionnaire:

- The findings regarding the definition of hypertension are very discouraging because one expected that patients who were treated for hypertension should at least know the definition. This is definitely an area that would need much attention in an information brochure. It is actually also evident from the question that asked if they knew what their own blood pressure was (question 18).
- The definition on coronary heart disease was also poorly answered with only 2 (4%) that had fair knowledge and 37 (81%) had no knowledge. This area also needs some attention, because these patients need to realise that they are at risk for cardiovascular disease and therefore Coronary heart disease.
- Patients in the study group could also not define BMI. Only 2 (4%) respondents had excellent knowledge and 8 (17%) had some knowledge while 36 (79%) had no knowledge on this aspect. These findings are discouraging because knowledge on obesity is very important since it is a modifiable risk factor for coronary heart disease. The patient can do something about it to improve his/her health. This area definitely needs some attention, as was indicated in 5.3.1 also.

5.3.2.2 Other aspects assessed in the knowledge base section of the questionnaire

Although it seemed as if the respondents performed better in the other questions that did not assess definitions, it seems as if all these aspects will have to be addressed in a patient education document.

These aspects will then be:

- Medications, including medication like aspirin and cholesterol lowering medication that might seem not to have any relevance here.
- Reasons for developing hypertension and hypertension and age.
- Risk factors for coronary heart disease and modifying the risk factors that can be modified.
- The importance of exercise.
- The importance of managing hypertension together with other chronic diseases like diabetes mellitus.

What some of the respondents indicated in the last question on what they would like to know about hypertension says a lot – they answered that they would like to know “everything”.

5.4 OTHER RECOMMENDATIONS

5.4.1 Recommendations for nursing practise

- Nurses working in the hospital environment should be made more aware of hypertension patients and their risk to develop Coronary heart disease. They should know what effects these risk factors have on their patients as well as on the patient’s families.
- Nurses working in the hospital environment should be knowledgeable regarding the early detection of hypertension and in the process become involved in making the diagnosis of hypertension.
- Nurses must be able to identify risk factors that can lead to coronary heart disease and recognise in patients potential areas for change and implement lifestyle changes and risk stratification to prevent secondary complications.

Nurses working in the hospital environment should have the knowledge and skills to give health education on the following:

- Diet: Nurses should educate hypertensive patients on their diet. They should be encouraged to follow the DASH diet as well as to limit their dietary intake of sodium.
- Weight: Nurses should know how to calculate BMI and know the different categories of obesity as well as normal and abnormal waist circumference to educate patients on weight reduction strategies.
- Exercise: Nurses should encourage hypertensive patients to exercise at least three times a week for 30 minutes.
- Alcohol: Nurses will have to assess the patients' use of alcohol and recommend appropriate limiting of alcohol use.
- Smoking: Nurses should be knowledgeable about the relationship between smoking and coronary heart disease.

5.4.2 Recommendations for nursing education

Adequate knowledge regarding prevention strategies for hypertension patients in the hospital environment will enable nurses to recognise the patient at risk. Therefore these issues should be emphasized in the content that nursing students are taught.

Nurses working in the hospital environment should be equipped with the knowledge and skills through the basic nursing education curriculum on pathophysiology of hypertension, assessing and monitoring patients with hypertension, providing appropriate patient and family education as well as to support patients in lifestyle changes.

It is also recommended that refresher courses specifically addressing hypertension should be available and it should form part of an in-service training programme for nurses. More emphasis should be placed on risk stratification and prevention strategies for hypertensive patients and the development of Coronary heart disease.

It is also important that all professionals working in hospitals should enhance hypertension care and promote the nurse's role in the management of hypertension.

5.4.3 Recommendations for nursing research

Since nursing is a profession in service of the public, there is a responsibility to maintain certain standards of practise. The need for patient education for hypertensive persons regarding risk factors for Coronary heart disease was clearly identified in this study and should therefore be thoroughly researched in further studies nationally. This study could be replicated in order to compare the knowledge levels of hypertensive patients in other areas or provinces.

This study could be replicated in order to compare the knowledge levels of patients with different educational levels to determine the educational needs of hypertensive patients related to their education.

This study could be repeated with the same study group after implementing a health care education programme based on the recommendations (section 5.3) regarding patient education.

Similar studies testing patients' knowledge regarding other diseases that can also contribute to Coronary heart disease. Diabetes is an example.

After implementing strategies to prevent the development of hypertension with age, studies can be done to see if it had an effect on the development of cardiovascular disease; however, this would be a long term project.

5.5 LIMITATIONS OF THE STUDY

Only two small towns in western Natal and eastern Free State were used in the study and only some of the private practitioners' patients were used. The

study context is thus limited. Therefore, the study findings cannot be generalised and will be valid for the specific context only.

The questionnaire addressed the most important factors about hypertension and the risk factors that could contribute to Coronary heart disease: however the researcher realise that the questionnaire needs improvement.

5.6 REFLECTION ON STUDY

After the distribution and collection of the questionnaires, the researcher received a number of enquiries from some of the private doctors as well as from some of the patients regarding the study, topic and the findings of the study.

The most general comments from the respondents were that the questions asked in the questionnaire revealed that their level of knowledge was inadequate.

Enquiries about an educational programme and information about hypertensive patients as well as a possible diet and exercise programme were also received from some of the private doctors to be implemented.

This study made hypertensive patients to think about their condition and to acknowledge that they have a lack of knowledge regarding hypertension and its risk factors for cardiovascular disease.

5.7 FINAL CONCLUSION

Lifestyle modifications should be the aim in any programme addressing hypertension and cardiovascular disease as it have shown to be effective in lowering blood pressure and can reduce other cardiovascular risk factors at little cost and with minimal risk (Rayner 2007:280).

The knowledge of the majority of hypertensive patients tested was found to be insufficient, particularly in those areas considered important by the researcher. Hypertensive patients should have the knowledge about their

condition in order to prevent any further diseases and they should know that it is more than just an elevated blood pressure. It is usually accompanied by other cardiovascular risk factors and blood pressure is only one component of the total risk. According to Raal (2007:40) in 70% of cases the overall risk for hypertension or myocardial infarction depends on these other cardiovascular risk factors.

Hypertension is one of those risk factors that should be identified and something needs to be done about it. According to Farham (2005:229) hypertension is a leading risk factor for premature mortality and it is ranked third as a cause of disability-adjusted life-years. Mabuza (2006:230) also confirms that prevention is better than cure and that it is a silent disease affecting 1 of 5 of the adult population in Africa. It is generally accepted that lifestyle modification is the first line management of hypertension. It is thus crucial that patients with hypertension should be aware of their risk factors and should actively participate in their own management.

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ANNEXURE A

**Information to respondents and informed
consent**

ANNEXURE A

Mrs. Adri Boulle
082 333 7690

Dear Respondent,

Research Topic: **Knowledge of Hypertensive Persons Regarding Prevention strategies for Coronary Heart Disease**

I am in the process of completing the M.Cur Clinical degree at UNISA. I therefore invite you to participate in my research study. All that is expected from you is to complete the questionnaire attached. The contents of the questionnaire are about Hypertension (in other words High Blood Pressure).

The aim of the research is to determine the knowledge of people with hypertension regarding risk factors for the development of coronary heart disease (in otherwords, factors that may cause a heart attack).

It would be appreciated if you could participate in the study. All information will be treated as confidential and anonymity will be ensured at all times. Permission for conducting this study has been granted by the relevant authorities. Participation in this study is voluntary and you are free to refuse to participate or withdraw your consent and discontinue participation at any time.

In order to ensure anonymity, you are requested not to write your name on this questionnaire.

The implication of completing the questionnaire is that informed consent has been obtained from you. Data obtained from the questionnaire will be treated as strictly confidential. Findings from the research study that may be reported in scientific journals will not include any data that could identify you or any other participants in the study. The information given by you will not be traceable and you will therefore not be able to recall your consent.

Thank You

Adri Boulle

ANNEXURE B

Questionnaire

ANNEXURE B

Questionnaire

(Please do not write your name on this questionnaire)

SECTION A - BIOGRAPHICAL DATA

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

1. **What is your Gender?**

Male	A
Female	B

2. **What is your Age Group?**

Below 20	A
Between 20 - 30	B
Between 31 - 40	C
Between 41 - 50	D
Between 51 - 60	E
Above 60	F

3. **Your Race Group?**

White	A
Black	B
Asian	C
Coloured	D

4. **Your Level of Qualification?**

Tertiary Education (Diploma or Degree)	A
Technical College or Trade School Education (e.g. Skilled craftsman)	B
Secondary School (Grade 8-12 {Standard 6-10})	C
Primary School (Grade 1-7 {Standard 5})	D
No Schooling	E

Please answer the following questions:

5.	What is your weight in Kilogram?	
	My Weight is:	

6.	What is your height in Centimetres?	
	My Height is:	

7.	What is your waist in Centimetres?	
	Measurement?	

8.	Which of the following diseases are present in your family? (own father, mother, brothers, sisters, grandparents, uncles, aunts)	
	Hypertension	A
	Diabetes	B
	High Cholestrol	C
	Stroke	D
	Coronary Artery Disease	E
	Never asked / Do not know	F

9.	Have you ever Smoked	
	Never	A
	Yes, but quit 10 years or more ago	B
	Yes, but quit 9 years or less ago	C
	Yes, I am an occasional smoker (I do not smoke a cigarette every day just now and then, socially)	D
	Yes, I smoke 1-10 cigarettes per day	E
	Yes, I smoke 11 or more cigarettes per day	F

10.	I do experience Stress	
	Strongly agree	A
	Agree	B
	Not sure	C
	Disagree	D
	Strongly disagree	E

11.	I Consider Myself as:	
	Very Lean	A
	Lean	B
	Average	C
	Slightly obese (fat)	D
	Obese (overweight)	E

12.	How often do you exercise for more than 30 minutes per session, which will increase your heart rate?	
	Every Day (7 days per week)	A
	3-6 days per week	B
	2-3 days per week	C
	Never	D

13.	In my work situation,	
	I sit a lot and is very in active	A
	I am active and inactive	B
	I work physically hard and I am active most of the time	C

14.	For how long have you been treated for high blood pressure?	
	Less than one year	A
	One to two years	B
	Three to five years	C
	More than five years	D

15.	How often do you eat meals?	
	4 or more per day	A
	2-3 per day	B
	Once daily	C
	Snack through out the day without eating a proper meal	D

16.	How often do you Drink Alcohol?	
	Never	A
	One drink daily	B
	Two drinks daily	C
	3 - 6 drinks daily	D
	More than 6 drinks daily	E

17.	I enjoy my job :	
	Strongly agree	A
	Agree	B
	Agree sometimes	C
	Disagree	D
	Strongly disagree	E

18.	Do you know what your Blood pressure is	
	Yes	A
	No	B
	If yes, please state value :	

19.	Please describe your diet to the best of your ability :
	Breakfast :
	Lunch :
	Dinner :
	Snacks :

SECTION B - KNOWLEDGE BASE

Explain the following:

20. Give a definition of hypertension in your own words:

21. Give a definition of Coronary Heart disease in your own words:

Indicate **YES** or **NO** by the following statements:

22.	Did your doctor prescribe Aspirin for you, to be taken daily? (If yes, please give the reason why you need to take it) <hr/> <hr/> <hr/>	Yes	No
-----	---	-----	----

23.	Do you know what Body Mass Index (BMI) is, and why is it important to you? (If yes, please explain) <hr/> <hr/> <hr/>	Yes	No
-----	--	-----	----

24.	Are you taking medication for cholesterol?	Yes	No
-----	--	-----	----

QUESTION 25 + 26 ONLY APPLICABLE FOR PATIENTS WITH CHOLESTROL

If your answer was yes at Question 24, please answer the following two questions.

25.	Do you know what NORMAL cholesterol is? (If yes, please state the value) _____ _____ _____	Yes	No
-----	---	-----	----

26.	Do you know what YOUR cholesterol is? (If yes, please state the value) _____ _____ _____	Yes	No
-----	---	-----	----

Read each item and mark with an X in the applicable block. More than one response may be applicable.

27.	Blood pressure is rising with age, because :	
	Increase of body weight	A
	Normal to have high blood pressure when you are older	B
	Reduced physical activity	C
	You are eating lots of fruit and vegetables	D
	Excessive alcohol intake	E

28.	The aim of the medication for your blood pressure is:	
	To lower blood pressure to achieve normal or goal blood pressure levels	A
	Improve your quality of life	B
	It is nice to drink medication when you are older	C
	The more tablets I drink, the better I feel	D

29.	The following risk factors of Coronary Artery Disease which you can do something about, to improve your life:	
	Age	A
	Cigarette smoking	B
	Gender	C
	Diet high in saturated fat	D
	Physical inactivity	E
	Family History	F

Indicate which of the following statements are **TRUE** or **FALSE**:

30.	Regular exercise decreases blood pressure	True	False
-----	---	------	-------

31.	High blood pressure can be managed in isolation from related chronic illness like Diabetes Mellitus	True	False
-----	---	------	-------

32.	Regular exercise enhances antihypertensive drug efficiency	True	False
-----	--	------	-------

33.	The ONLY way to maintain a normal blood pressure is by taking your medication daily	True	False
-----	--	------	-------

34.	High blood pressure can be reduced by making changes in your diet	True	False
-----	---	------	-------

35.	If you think your blood pressure is normal and you are feeling healthy, then it is not necessary to take your medication	True	False
-----	--	------	-------

36.	Passive second hand smoke exposure can also increase your risk for a heart attack	True	False
-----	---	------	-------

37. The following conditions can contribute to the development of a heart attack. (or in other words, Coronary Artery Disease)

High blood pressure	<i>True</i>	<i>False</i>
Cigarette smoking	<i>True</i>	<i>False</i>
High cholesterol	<i>True</i>	<i>False</i>
Diabetes	<i>True</i>	<i>False</i>
Taking birth control pills or hormone replacement therapy	<i>True</i>	<i>False</i>

38. What do you want to know about Hypertension?

ANNEXURE C

Marking guide

ANNEXURE C

Questions were assessed as follows

Question 20

One mark allocated for the following concepts:

- Driving force/ pressure to keep blood moving
- Blood that circulates in arteries with too much force or pressure
- Systolic of 140 and Diastolic of 90

Question 21

One mark allocated for the following concepts

- Narrowing of arteries that supply blood to the heart
- Obstruction of blood supply
- Accumulation of plaque
- Oxygen deficiency

Question 23

One mark allocated for the following concepts

- Determine obesity by calculating weight and height
- Measurement of body fat and to determine if weight falls within a healthy range