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A DESCRIPTION OF THE ESTABLISHED MODIFIABLE RISK FACTORS FOR HYPERTENSION AMONGST ADULT BATSWANA IN THE GABORONE DISTRICT

JANET KUHLMANN

A RESEARCH REPORT SUBMITTED TO THE FACULTY OF HEALTH SCIENCES, UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE (NURSING)

1999

DECLARATION

I, Janet Kuhlmann, declare that this research is my own unaided work. It is being submitted in partial fulfilment for the degree of Master of Science (Nursing) in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

....

Janet Kuhlmann Date

DEDICATION

To my Mother,

Johannah.

The stoic woman, who taught me that through prayer we shall always overcome.

To my daughter,

Mary-Anne

For her friendship and support without whom this work could not have been possible.

To my friend,

MorwaHuma

His support was invaluable throughout this project.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude and appreciation to the following:

- My supervisors Mrs Judy Bruce and Mrs Linda Cloete, who encouraged me and guided me throughout this study.
- Boerhinger Mannheim Pharmaceutical company for sponsoring me with the use of their cholesterol and glucose measuring machines.
- Mrs EC McKibbin, for granting her verbal permission to modify her research questionnaire tool to suit my study.
- Ms Esther Viljoen of the Medical Research Council for her invaluable assistance with the statistical analysis of the data.
- Mr Eugenius Senaoane, Statistician at the Main University campus for his invaluable input.
- Florence Nunoo at the Business Centre (Gaborone Sun) for formatting the report and Dr. L. Mukulalwendo at the University of Botswana for editing the report.
- The nursing staff and Matron at the Extension 11 Primary Health Care Clinic, for their support.
- All the clients who willingly participated in this study.

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ABSTRACT

Hypertension is a major disease in the black population of Sub-Saharan Africa and the United States of America. It is one of the major risks for cardiovascular mortality and morbidity which contributes to disability and increased health care costs. Studies have revealed that socio- economic changes, influenced by Western lifestyles in developing countries, have to a large extent resulted in this health problem.

The researcher set out to conduct a survey to describe the established modifiable risk factors for hypertension among Batswana in the Gaborone District. The modifiable risk factors for hypertension consist of high salt intake, alcohol consumption, high blood cholesterol, high fat consumption, obesity, physical inactivity, diabetes and stress. The setting was in a Primary Health Care clinic. The sample consisted of 158 adults who were 18 years and above and who had been diagnosed with hypertension and seen during a follow up over a period of two months.

A face to face structured interview plus record review was used to collect data on biographical factors, socio economic factors, lifestyle factors and medical history. A finger pin prick to obtain a blood sample for cholesterol and glucose was done. Weight and height were measured to work out body mass index.

Descriptive statistics were used to present the interpretation of data which was coded and analysed by computer using Statistical Package for Social Sciences.

Data analysis of the study revealed that:

1. All the respondents had at least four or more of the risk factors described.
2. High salt intake with low potassium intake, high animal fat, lack of exercise and multiple stressors were the most contributory risk factors for hypertension
3. Most of the respondents were obese women who had a body mass index of 30 and above.
4. The majority of the respondents resided in the urban area of Gaborone, and were of low socio economic class.

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ABBREVIATIONS

ANC	-	Ante Natal Clinic
BMI	-	Body Mass Index
CORIS	-	Coronary Risk Factor Study
Kg	-	Kilograms
KPa	-	Kilo Pascals
H/T	-	Hypertension
mm	-	Millimetres
Mgs		Milligrams
MmHg	-	Millimetres of Mercury
Mmo/L	-	Millimoles per litre
WHO	-	World Health Organisation
>	-	Greater than
<	-	Less than
E.g.	-	Example
i.e.	-	That is

CHAPTER ONE

1.0 INTRODUCTION

The background to this study will focus on the enormity of the problem of hypertension as seen globally, and specifically as seen in Sub Saharan Africa, Botswana, and South Africa. The definition of hypertension and its sequelae will also be addressed together with the effect of urbanization on the emergence of hypertension. This chapter will then state the problem, purpose of the study, objectives of the study, significance of the study to nursing and give operational definitions of the variables in the study.

1.1 BACKGROUND TO THE STUDY

Hypertension is a major disease in the black population of Sub Saharan Africa and the United States of America. The prevalence of hypertension varies from 1-30% in the adult population (Seedat, 1997). It is one of the major risks for cardiovascular mortality accounting for 20-50% of all deaths. Morbidity resulting from hypertension, contributes to disability and escalated health care costs (WHO Report, 1994). According to the WHO Expert Committee on Hypertension Control, 1994, modifiable or reversible risk factors for hypertension include smoking, high blood cholesterol, alcohol intake, obesity, physical inactivity, diabetes and stress. Non-modifiable or irreversible factors are age and family histo y of cardiovascular disease.

Stroke, congestive heart failure, renal disease and coronary artery disease represent end points affecting the hypertensive patient (Randeree, Seedat & Naidoo, 1995). According to

Killian (1995), most patients with organ damage end in medical wards, intensive care units and acute care rehabilitation. In the intensive units, the care given to these patients becomes four times more expensive than routine hospital care in terms of technology and expert skill, hence the need to prevent hypertensive complications.

High diastolic pressure has commonly been used to define hypertension. This arbitrary choice was based on the fact that diastolic blood pressure was used as the criterion for inclusion in most randomized therapeutic trials, including those with mild hypertension. There is, however, mounting evidence that systolic values should be taken into account in defining as well as managing hypertension (Kannel, Dawber & Mc Gee, 1986). Cardiovascular risk is as strongly associated with systolic as with diastolic values. Some of the intervention trials on mild hypertension indicate that cardiovascular events more closely correlate with systolic than with diastolic values achieved by treatment (Strasser & Wilhelmsen, 1993).

Hypertension should therefore be defined using both diastolic and systolic blood pressures. Patients whose resting values of diastolic blood pressure remain persistently at or above 90 mmHg (12.0 kPa) after repeated measurement, are at increased risk of cardiovascular morbidity and mortality. Lowering of diastolic blood pressure values of between 90 and 105 mmHg (12.0-14.0 kPa) has been clearly shown to reduce the risk of stroke by 35–40% and of coronary events by about 15-20% (Collins, 1990). The current definition of hypertension is therefore a level of systolic blood pressure of 140 mmHg (18.7 kPa) or above or a level of diastolic blood pressure of 90-mmHg (12.0) or above. However as

blood pressure is quite variable, before labeling a patient as hypertensive and deciding to initiate treatment, it is necessary to confirm raised levels of blood pressure by repeated measurements over several weeks. (Guidelines for the Management of Mild Hypertension: Memorandum from a WHO/ISH Meeting. Bulletin of the World Health Organization, 1993.).

The prevalence of hypertension in the black West Indians of the West Indies and in the United States of America is higher than those in any part of Sub Saharan Africa – this is probably due to American blacks having been acculturated for 300 years while the Zulu's in South Africa have been acculturated only since the turn of the century. Hypertension is common in the urban blacks of Africa. Throughout Sub-Saharan Africa there is a difference in the prevalence of hypertension between urban and rural blacks. It appears that those who are urbanised are more afflicted (Seedat, 1997).

The best population studies in South Africa have been carried out in Natal Zulus and Indians (Seedat 1983), in the Cape coloured population (Steyn, Jooste & Fourie, 1986), and on three white rural communities in the Cape (Steyn, Roussouw & Jooste, 1993), the latter being the CORIS Study (Coronary Risk Factor Study). In general, these studies show that the Indian population has the lowest incidence of hypertension (14%) followed by the white community with an intermediate value (17 – 18%) while the urbanised Zulus have a higher incidence (25%) (Seedat, 1981). One possibility is that the process of urbanization of black Africans in the country considerably increases the risk of hypertension. Again, this is not unique to South Africa. Similar trends have been observed in Kenya (Poulter,

Khaw & Hopwood 1990), and in Zimbabwe (Mufunda, Somova & Chifamba, 1992). The Kenyan study is an especially excellent example as subjects were followed from the time of urbanization onwards. The mechanisms causing their hypertension probably involved an increased dietary salt intake, weight gain and increased 'stress'. It should be noted that urbanization and migration from rural to an urban environment are stressful life events (Poulter et al., 1990).

Statistical evidence reveals that Botswana is no exception to the problem of hypertension. Over three decades Gaborone has rapidly become urbanized as the capital of Botswana. The country's diamond discovery in 1978 caused more people to move from rural areas to the urban areas like Gaborone. This has greatly led to the breakdown of the culture of extended families which in turn resulted in lifestyle incongruity which has been shown to be associated with elevated blood pressure seen in various developing societies (Kaufmann, Tracy, Dwazo-Arvin and Cooper, 1997). With the country's population that stood at 1.5 million in 1996 and a growth rate of 3.6% per annum, Gaborone district hosts a population of 183,487. In 1996, 27,713 people between the ages of 15 and 45 presented with blood pressure problems in the Gaborone population. This number constitutes the highest in all the districts of Botswana (Health Statistics, 1996). A preliminary record review at Extension 2 Primary Health Care Clinic – a catchment for all clinics in the district and a referral to Princess Marina Hospital showed that between 195 – 300 hypertensive clients are seen monthly.

Among the strategies that have been adopted by the health sector in Botswana to alleviate the problem of hypertension has been the Safe Motherhood Initiative to reduce maternal mortality and morbidity of girls and women through education (Molotsi, 1993). It is through such a strategy that pregnancy related hypertension has been prevented and detected early. Other methods known to the researcher have included rigorous talks in clinics and hospitals on the importance of drug adherence, less sodium intake and follow up visits.

On the aspect of prevention, not enough has been done to educate the community and give reasons why healthy lifestyles like low fat consumption, weight control, exercise, reduction of alcohol intake, stopping smoking and control of stress are important to keep hypertension at bay. It became the interest of the researcher to explore these risk factors for hypertension in order to raise awareness and prevention.

1.2 PROBLEM STATEMENT

It has been well documented that hypertension is a major public health problem and that blacks who follow western lifestyles experience high risk for hypertension. Although there is a shortage of literature that addresses the lifestyles and risks for hypertension amongst Batswana, health statistics reveal that both the rural and the urban population are affected. It is in the Gaborone district where hypertension is particularly prevalent. According to the 1995 outpatient morbidity records, blood pressure problems increased with age and was highest at age group 45 years and over (Health Statistics, 1996).

Seedat (1997), states that hypertension is a westernization health problem where the urban population tends to be more affected than the rural population. Recent trends indicate that one can no longer generalize about the so called rural-urban gradient because of unemployment, drought and destructive lifestyle habits, e.g. drinking, smoking, high salt intake and high fat consumption which also affect rural areas of the country (Ellis, 1995). While migrating to the towns may create a chaotic world, stress also plays a major role in rural life where people feel trapped in the rural area with uncertainties of limited financial power and dependence on the weather for subsistence farming.

In addition to all these factors, both rural and urban dwellers may in turn be affected by stressful personal circumstances such as unsupportive marriages (especially for women) along with family disruption (Ellis, 1995).

In a personal communication, Dr Onen (1998), a chief specialist physician at Princess Marina Hospital, pointed out that the length of stay in hospital of patients with hypertensive complications, e.g. a patient having suffered cardiovascular accident and requiring rehabilitation, exceeds the average hospital admission stay by eight days. This means that the health costs of treating this complication is high. In addition, the country of Botswana has not yet acquired sufficient technological and manpower expertise. The vast country hosts only two six bedded intensive care units, so that, in some complications of hypertension, for example renal failure needing dialysis, or renal transplant, patients have to be referred to South Africa. This becomes expensive for a developing country with scarce resources like Botswana

The modifiable risk factors for hypertension are well documented. The world conference on hypertension has indicated that in the developing countries, primary prevention may be the only workable approach to hypertension control in the population. It thus became the interest of the researcher to describe which of the known risk factors are prevalent in the Batswana population diagnosed with hypertension.

1.3 PURPOSE OF THE STUDY

The purpose of this study was to describe hypertensive modifiable factors prevalent amongst adult Batswana, with the aim of creating awareness of the prevalent factors for hypertension so as to enhance prevention and limit the high cost of nursing these patients in intensive care units.

1.4 OBJECTIVES

The objectives of this study were:

- To determine which factors affected by Westernization may influence the development of modifiable risk factors for hypertension.
- To determine and identify which lifestyle factors affected by western influence, predispose to the development of hypertension.
- To determine whether lifestyle and socio-economic factors differ between urban and rural hypertensive subjects.
- To determine blood glucose and cholesterol levels among hypertensives in Botswana.

1.5 SIGNIFICANCE OF THE STUDY.

The significance of this study to nursing is to enhance the awareness that:

- Hypertension is a major cause of death in the adult population of Botswana. According to the WHO Verbal Autopsy Study (1996 - 1997). It was established that at Princess Marina Hospital in Gaborone, 20% of cardiovascular mortality out of 220 of all cause mortality in the adult aged 30 years and more was due to hypertention, with cerebrovascular accidents being the commonest cardiovascular event. It occurs without any distressing symptoms until complications set in. Therefore, attention needs to be focused on the primary prevention approach to hypertension, in order to prevent hypertensive complications which need acute care in the intensive care units.
- Botswana functions in the primary health care model. The country also hosts only two intensive care units, which are not technologically advanced. The preventive strategy that this study hopes to achieve is meant to minimize intensive care costs, in terms of material and human resources in the country and elsewhere.
- Once the modifiable risk factors have been identified in the population, prevention strategies can be implemented. This can be achieved by educating and motivating the public to eat less salted foods, limit cigarette smoking, drink less alcohol, reduce fat content in foods and become more active. The National Food Control Board could also be made aware of the promotion of health foods.

1.6 DEFINITION OF TERMS

1.6.1 Hypertension (H/T)

Hypertension is defined as the level of systolic blood pressure of 140mmHg (18.7kPa) or above or a level of diastolic blood pressure of 90 (12.0kPa) or above. In this study the patient will have been diagnosed with H/T, if he or she has medication for H/T or has a written medical history of treated H/T, or has both.

1.6.2 Socio-economic Factors

Transition and/or changes in the social and economic status of individuals under the influence of Western culture brought about by urbanization.

1.6.3 Primary Prevention

Prevention of disease by promoting general health or specifically protecting disease before pathogenesis, by means of screening and education.

1.6.4 Modifiable Risk Factors

In this study, modifiable risk factors are lifestyle behaviors, social, psychological and/or physical influences, which can be reversed, associated with an increased probability for cardiovascular disease. These are discussed below:

- **Obesity**

Body Mass Index (BMI) or Quetelets Index is calculated from body weight (in kgs) divided by the square of the height (in centimeters). At the time of the study a BMI of >27 in

males, and >25 in females was used to signify being overweight. BMI of 30 and above was used as a cut off point and signified obesity.

- **Physical Activity**

For the purpose of this study, physical activity will refer to occupational and leisure time activities as follows:

Occupational:

- Inactive sitting deskwork, e.g. consulting.
- Moderately active, e.g. housework, repairing, supervising.
- Active, e.g. manual labour.

Leisure time:

- Inactive sitting activity, e.g. eating, reading, watching television, listening to radio, sleeping, resting.
- Moderately active light sports, e.g. regular walking, gardening, light carpentry, bicycling on level ground.
- Active – vigorous activity, e.g. digging in the garden, strenuous sports, jogging, brisk walking of 30-45 minutes for about 3 to 4 times a week, heavy carpentry, bicycling on hills (cited from Mc Kibbin, 1990). For the purpose of this study, the latter type of exercise will be regarded as healthy.

- **High Sodium Intake**

For the purpose of this study:

Consuming more than 5 grams (a teaspoon) of salt daily, caused by daily adding of salt to cooking, and at table, use of spices containing salt mono sodium glutamate, extract cubes, intake of processed meat and food, e.g. polony, biltong, pies, will be regarded as a risk factor.

- **Tobacco Smoking**

For the purpose of this study, the use of any cigarettes, snuff, pipe or rolled tobacco will be considered a risk factor.

- **High Cholesterol**

In this study, a total cholesterol of >5.0 mmol/l accounted for by consuming more than 30% of daily fat intake, which should be equally divided between the three different types of fat, at 10% each, will be regarded a risk factor. This will be accounted for by not removing fat from meat, which is saturated and chicken skin, which is high in cholesterol prior to cooking, frying of foods, which leads to more adding of either oils or fats.

- **Alcohol Intake**

In this study, an intake of more than two standard drinks three times a week, for example two tots of spirits, 340 mls beer, 150 mls wine will be considered a risk factor.

- **Diabetes**

In this study, the patient will have been diagnosed with diabetes, and be treated with diet or medication or both, or had a written medical history of raised blood sugar. Blood

glucose levels of above six mmol/l in non diabetic subjects will be regarded as high while glucose levels, of >10mmol/l in the diabetics will be considered to be high.

- **Stress**

Lazarus and Folkmann cited in Thelan, Davie, Urden & Lough (1994) state that stress is a particular interaction between the person and the environment, that is appraised by the person as taxing, or exceeding his or her resources, and endangering his or her well being. It can be minimized by balancing the activities and needs of the person, with the happenings and demands of the environment.

In this study, a patient's rating of more than five on any of the categories on the stress scale will be considered as stressed in that category; from one to five will mean the patient is not stressed.

1.7 CONCLUSION

In chapter one, the background to the study, problem statement, objectives, significance of the study and operational definitions have been described. The objectives will be used to guide the study through the literature review, data collection, data analysis, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

Literature on the topic of hypertension abounds worldwide. In Africa, particularly Botswana more studies still need to be done. In Botswana, Kegui and Sayana (1985) and Hohmann and Hoffmann (1985) were among the investigators of hypertension who reported that more women than men were hypertensive and that the majority of the women were obese. Molotsi (1993) studied pregnant women's awareness of hypertensive disorders and vaginal bleeding and their utilization of ante-natal care (ANC) services in Botswana. The study revealed that hypertensive disorders have maternal and foetal complications. It also revealed that pregnant women attended ANC services without full knowledge of why they needed ANC – which suggested the need to update the community risk factors in pregnancy. Also cited in Molotsi (1993) is that, the 1992 World Health Day, with the theme: Heart beat – Rhythm of health,which was held in Botswana, stemmed from the findings that complications from hypertension accounted for a quarter of the total number of deaths each year – meaning that the disease kills about 12 million people every year throughout the world, including Botswana. Hypertension has since been referred to as public enemy number one, which should be brought under control.

In this study, the literature review will be confined to a discussion of the classification and causes of hypertension, pathophysiology and complications. The modifiable risk factors

for hypertension identified in the Framingham study and significant studies pertaining to them will be discussed separately.

2.1 CLASSIFICATION OF HYPERTENSION

Hypertension is commonly divided into the following three categories:

- Primary hypertension often called essential hypertension,
- Secondary hypertension, and
- Malignant hypertension.

2.2 PRIMARY/ESSENTIAL HYPERTENSION

Although the causes of essential or primary hypertension are largely unknown, several reversible and irreversible risk factors have been implicated. The irreversible risk factors or non-modifiable risk factors include genetic factors like family history. Other factors are advancing age, race and being male. The reversible or modifiable risk factors include environmental factors which the researcher is interested in establishing in her subjects, and these include obesity, excessive alcohol intake, physical inactivity, smoking, diabetes, stress, high cholesterol and high salt intake.

In this type of hypertension, the chronic elevation in blood pressure occurs without evidence of other diseases. No single factor has been found to explain essential hypertension. Many factors are probably responsible. The blood pressure is determined by the product of the cardiac output and the peripheral vascular resistance. In the early stages, the increase in blood pressure is due to a small increase in cardiac output. This could be

due to sympathetic overactivity. Later in the disease, the cardiac output is normal but the peripheral resistance is increased. It is possible that the initial increase in cardiac output induces vascular resistance that then sustains and increases the blood pressure. The baro receptors operate at a higher pressure in hypertension (Fauci, Baunwald, Isselbacher, Wilson, Martin, Kasper, Hauser & Longo, 1998).

2.3 SECONDARY HYPERTENSION

In secondary hypertension, the elevation of blood pressure accompanies some disorders such as kidney disease and endocrine disorders. A careful search should be made in hypertensive patients under the age of 35 years. The causes of secondary hypertension can be divided into the following:

- Renal causes,
- Endocrine causes,
- Cardiovascular causes,
- Pregnancy and
- Drugs and Chemicals.

2.3.1 Renal Causes

Renal diseases are the most common causes of secondary hypertension accounting for over 80% of cases. Chronic glomerulonephritis, chronic atrophic pyelonephritis and polycystic kidneys are the conditions usually involved. It may be difficult to determine whether renal disease has caused hypertension or whether the hypertension has produced renal disease. The mechanism by which renal diseases cause hypertension is probably related to salt and

water retention. Occasionally, renal artery stenosis due to fibromuscular hyperplasia or atheroma may cause hypertension (renovascular hypertension) owing to excess renin production (Fauci et al., 1998)

2.3.2 Endocrine Causes

Endocrine causes include the following:

- Conn's syndrome
- Phaechromocytoma
- Cushing's syndrome
- Acromegaly
- Hyperparathyroidism
- Thyrotoxicosis

2.3.3 Cardiovascular Causes

Renovascular hypertension is discussed above. Coarctation of the aorta should be considered in young patients with hypertension and a late systolic murmur.

2.3.4 Pregnancy

Hypertension in the early stages of pregnancy is usually essential hypertension or due to renal disease (Edwards, Boutcher, Chaslett & Chilvers, 1995).

2.3.5 Drugs and Chemicals

Hypertension caused by the ingestion of drugs and chemicals is by far the most important form of secondary hypertension for several reasons. Often, it is iatrogenic, and usually the elevated blood pressure values revert to normal when the causal substance is no longer ingested. This type can be easily prevented (Hollenberg, 1987). Estrogen-progestrone oral contraceptives rank first among the drugs with the potential to cause hypertension. The estrogen component of oral contraceptive agents stimulates the hepatic synthesis of the renin substrate angiotensinogen, which in turn favours the increased production of angiotensin 11 and secondary aldosteronism (Hollenberg, 1987). In women taking 50 micrograms or more of estrogen daily, blood pressure rises almost invariably for up to two years and then remains the same level for as long as the subject continues with the pill. Oral contraceptives should not be taken unless the blood pressure is normal, and it should be checked at least twice a year.

Liquorice frequently eaten in sv. ·ts and taken in cough syrup is used occasionally to treat peptic ulcers. It contains glycyrrhizinic acid, which has a mineralocorticoid. Thus persons who consume large quantities of liquorice may develop raised blood pressures accompanied by sodium retention and potassium depletion (Macleod, 1984:180). The administration of corticosteroids or corticotrophin (ACTH) may increase the arterial blood pressure. With corticotrophin, it seems probable that blood pressure increases mainly because of adrenal release of mineralocorticoids Non steroid anti-inflammatory agents, such as indomethacin, may result in blood pressure elevation (Fauci et al., 1998). Coffee and Coca Cola contain caffeine, tea contains tannin – both these are stimulants which have

been noticed to excite the cardiac muscle and cause palpitations in some individuals. Bush tea does not contain any of the two stimulants and has been regarded as healthy.

2.4 MALIGNANT HYPERTENSION

This type of hypertension may be superimposed on hypertension of any aetiology. It is not a separate disease entity. An accelerated pattern develops with a rapid rise in pressure and severe damage to various organ systems. The characteristic pathological changes are necrosis in the walls of small arteries and arterioles (fibrinoid necrosis) and intravascular thrombosis. Left ventricular failure may occur and also renal impairment with proteinuria and microscopic haematuria. Arterial pressure exceeds the limit of vascular autoregulation to the brain, and cerebral and retinal oedema supervene, leading to hypertensive encephalopathy. The clinical manifestations include headache, confusion, coma and fits. It is a medical emergency that requires immediate therapy. If untreated death occurs within months, due to renal failure, cerebral haemorrhage, or congestive heart failure (Edwards et al., 1995:266).

2.5 PATHOPHYSIOLOGY OF HYPERTENSION

Exposure to continuous sustained high blood pressure in larger arteries (> 1mm diameter) causes the internal elastic lamina to become thickened, smooth muscle to be hypertrophied, and fibrous tissue to be deposited. This causes damage to the blood vessels. They dilate and become tortuous and their walls become less compliant. Atheroma is perpetuated. In smaller arteries (< 1mm) hyaline arteriosclerosis occurs in the wall, the lumen narrows and aneurisms may develop. These structural changes associated with long standing

hypertension affect peripheral resistance vessels, and vessels in the kidneys. They lead to an increase in peripheral vascular resistance, a further rise in blood pressure, and acceleration of atheroma within vessel walls (Edwards et al., 1995).

Reduced renal perfusion pressure, in the presence of renovascular disease, leads to the production of renin and angiotensin and further salt and water retention. Cardiac compensation for the excessive workload by increased systematic pressure is at first sustained by left ventricular hypertrophy. Ultimately, the function of this chamber deteriorates, it dilates, and the symptoms and signs of heart failure appear. Angina pectoris may also occur because of accelerated coronary arterial disease and or increased myocardial mass. On physical examination, the echocardiogram shows an enlarged heart with a prominent left ventricular impulse. On auscultation the sound of aortic closure is accentuated, and there may be a faint murmur of aortic regurgitation. Presystolic heart sounds appear frequently in hypertensive heart disease, and a protodiastolic (ventricular, third heart sound) or summation gallop rhythm may be present. Electrocardiographic changes of left ventricular hypertrophy are common. Evidence of ischaemia or infarction may be observed late in the disease. The majority of deaths due to hypertension result from myocardial infarction or congestive heart failure (Boudoulas, 1986).

2.6 COMPLICATIONS OF HYPERTENSION

It has been documented that untreated hypertension is associated with a shortening of life by 10 to 20 years to an acceleration in part to the severity of the hypertension. Even individuals with relatively mild disease i.e. without evidence of end organ damage, if left

untreated for 7-10 years, have a risk of developing significant complications. Nearly 30% will have end organ damage related to the hypertension itself. Precise staging of hypertension will depend on diagnostic procedures, some of them costly or uncomfortable for the patient (WHO Expert Committee, 1978). The following signs and symptoms that appear as a result of organ damage often necessitate admission to a medical ward or intensive care unit. They include:

- Heart
  - Angina pectoris
  - Myocardial infarction
  - Heart failure
- Brain
  - Stroke
  - Transient ischaemic attack
  - Hypertensive encephalopathy
  - Vascular dementia
- Optic fundi
  - Retinal hemorrhages and exudates with or without papilloedema (these features are diagnostic of the malignant or accelerated phase.)
- Renal failure.
  - Plasma creatinine concentration>2.0 mg/dl.
- Blood Vessel
  - Dissecting aneurysm

Symptomatic arterial occlusive disease. (WHO Expert Committee, 1994).

2.7 MODIFIABLE RISK FACTORS

2.7.1 Obesity

Raised blood pressure is correlated with increased body weight. Obesity that is predominantly located in the upper body (android or visceral) is associated with more cardiovascular morbidity, which is accompanied by greater glucose intolerance and diabetes, dyslipidemia and hypertension (Pouliot, Despr'e & Lemieux, 1994). Being overweight is an added risk with high blood pressure. Virtually all those who are obese are insulin resistant and those with upper body obesity are even more insulin resistant (Karter, Mayer-Davis & Selby, 1996).

Accoring to Porth (1994), there may be mechanisms responsible for elevating blood pressure in the overweight person related to the metabolic needs of the excess adipose tissue, along with the increased demands on the cardiovascular system to provide adequate blood flow through the enlarged tissue mass. It is also possible that the dietary habits of the overweight person include the ingestion of excessive amounts of salt along with increased caloric intake. Hyperinsulinaemia, which reduces sodium excretion and causes neuroendocrine disturbances such as abnormalities of the sympathetic nervous system, may also contribute to the development of hypertension in obese people (Porth, 1994). Even after controlling for blood pressure, obesity puts a load on the left ventricle, increasing left ventricular mass and fibrosis, and leading to a diastolic dysfunction (Jain, Avendano & Dharamsey, 1996). The double burden of obesity and hypertension diminishes cardiac

reserve, leaving the heart to various stresses. Other complications such as stroke or kidney disease occur in persons with hypertension who are overweight (De Simone, Devereux & Mureddu, 1996).

As far as kidney failure is concerned, obese individuals, whether hypertensive or not, tend to have higher rates of glomerular filtration and renal plasma flow which are correlated with fasting insulin levels (Ribstein, duCailar and Mimran, 1995). Furthermore, the hyperfiltration and perfusion are associated with greater albuminuria, posing the threat of greater renal damage in obese hypertensive individuals. In this study, body mass index, which is a person's ideal mass for their height will be used. A BMI of >27 in males , and >25 in females will be used to signify overweight. BMI of 30 and above will be used as a cut-off point and will signify obesity. Weight reduction lowers blood pressure in the majority of hypertensive patients who are more than 10% overweight and has beneficial effects on associated basic factors such as lipid profile and insulin resistance. Weight loss of 5 kg generally leads to reduction in blood pressure of about 5mm Hg. Weight reduction will enhance the effect of blood pressure medication (Management Guidelines in Essential Hypertension, 1993). Overweight hypertensives should therefore be counselled to take a structured and supervised weight reduction program by reducing dietary energy expenditure through regular physical exercise (WHO Report, 1994).

Frequently, overweight individuals develop many defences, rationalizations, and different psychological processes for ego and body image protection. An honest empathetic and

supporting relationship with those intending to assist, is necessary. By explaining that weight excess is a risk factor for hypertension, the focus shifts toward promoting increased patient responsibility for the care of their own bodies.

2.7.2 Physical Inactivity

Physical inactivity is associated with lower high density lipoprotein levels, hypertension, obesity, increased glucose intolerance, and elevated triglycerides (Thelan et al., 1994). Regular aerobic exercise has been shown to lower blood pressure both in young and in older adult humans with hypertension, and is widely recommended as an initial nonpharmacological treatment strategy (Seals & Reiling, 1991). Though the mechanism for this hypotensive effect remains largely unknown, one possibility is that regular physical activity causes favourable changes in arterial structure (i.e. a reduction in arterial wall thickness or in wall: lumen ratio) which would presumably reduce peripheral vascular resistance and blood pressure. The fact that structural changes in the precapillary resistance vasculature are believed to be an important factor development and maintanance of the hypertensive state is consistent with this postulate (Mulvany, 1991).

Regular physical activity may be beneficial for both prevention and treatment of hypertension. Sedentary and unfit normotensive individuals have 20-50% higher risk of developing hypertension than those who are more active. Exercise lowers systolic and diastolic blood pressure by 5 mmHg (0.67-1.3 kPa) (Arakawa, 1993). In a WHO study, dynamic isotonic exercise such as walking for 30-45 minutes 3-5 times a week is possibly better than strenuous exercise such as running (WHO Report, 1994). Exercise also

enhances weight loss, improves overall level of fitness, strengthens the heart and increases the oxygen and energy levels in the blood. For the purpose of this study, it is the exercise recommended by WHO that will be used as a p ention of risk factor.

2.7.3 High Sodium Intake

Both epidemiological observation and clinical trials show an association between dietary sodium intake and blood pressure (Intersalt Cooperative Research Group, 1998). Accumulation of salt in the body increases the extra cellular fluid volume for two basic reasons. When there is excess salt in the body, the osmolality of the body fluids increases, and this in turn stimulates the thirst centre, making the person drink extra amounts of water to dilute the extra cellular salts to a normal concentration. This obviously increases the extra cellular fluid volume.

The increase in osmolality in the extra cellular fluid also stimulates the hypothalamic posterior pituitary gland secretary mechanism to secrete increased quantities of antidiuretic hormone. The antidiuretic hormone in turn causes the kidneys to reabsorb greately increased quantities of water from the renal tubular fluid before it is excreted as urine, thereby deminishing the volume of urine while increasing the extra cellular volume. Because only small increases in extra cellular fluids can often increase the arterial pressure greatly, the accumulation of even small amounts of extra salts in the body can lead to considerable elevation of the arterial pressure (Guyton 1992)

Interestingly, it has been observed that excessive salt intake does not cause hypertension in all people, nor does the reduction in salt intake reduce blood pressure in all hypertensives

(Porth, 1994). This probably means that some people are more susceptible than others to the effects of increased sodium intake. Opie (1995) has suggested that in addition to excess salt intake, a reduction in potassium intake may contribute to elevated blood pressure levels.

Recommended daily intake of salt should not be more than five grams daily. In this study, it has been recommended that a way to cut down on salt is to use less salt during cooking and refrain from salt shakers at table. Because many prepared foods are high in sodium, it is recommended that people who can read, consult package labels for the sodium content of canned foods, spices, stock cubes, frozen foods, soft drinks, and other foods and beverages to reduce sodium intake adequately. The sodium glutamate that is found in most spices is simply salt.

Increased potassium intake is recommended for people with normal renal function in order to ensure increased elimination of salt. Fresh fruit and vegetables contain essential potassium required by the body. Fruit and vegetables, such as bananas, oranges, potatoes and spinach are thought to be high in potassium content.

2.7.4 Alcohol

Regular alcohol consumption raises blood pressure in both men and women in different ethnic groups; and contributes significantly to the prevalence of hypertension in the population where drinking is a habit (WHO Report, 1994). In individuals who have an intake of three or more standard drinks daily, the prevalence of mild hypertension is

increased three fold (blood pressure of plus minus 140/90) compared with non drinkers (Pudley, Beilin, Vandongen, Rouse & Rogers, 1985).

Cited in Porth (1994), The Framingham study (1977), documented a modest but definite effect of alcohol on high blood pressure. According to their results, the first drink lowers blood pressure. However, as a person consumes more, the blood pressure rises-with the systolic pressures markedly more affected than diastolic pressures. Once beyond the moderate intake range, the blood pressure progressively elevates. The Kaiser-Permanente study of 84,000 people that correlated known drinking patterns and blood pressure verifies this and further demonstrates that three or more drinks daily is a definite risk factor for hypertension.

Reduction of alcohol intake over a period of one to four weeks, results in lowering of blood pressure. Moderating alcohol intake and reducing excess weight have a cumulative effect in reducing overall cardiovascular risk. In this study, it is recommended that no more than two tots in the case of spirits per day and no more than two standard drinks/glasses, i.e. 340 mls in the case of beer and 150 mls wine may be taken daily. Significantly raised hypertension may develop during withdrawal from heavy alcohol intake, but the pressor effects of alcohol withdrawal usually subside within a few days after alcohol withdrawal (WHO Report 1994).

2.7.5 Smoking

Smoking causes a sharp and marked rise in blood pressure and the heart rate, which is so prolonged and still visible 20-30 minutes after its termination when the next cigarette is lit (Grassi, Seravale, Calhoun, Bolla & Mancia, 1992). This is caused by a nicotine-dependent stimulation of norepinephrine and epinephrine secretion of the sympathetic nervous system. Several studies indicate that the risk of cardiovascular disease development is directly proportional to the number of cigarettes smoked per day. Those at risk are women smokers who are also using oral contraceptives, young men who smoke in excess of three packs per day, and middle aged men with elevated cholesterol levels (Thelan et al., 1994).

It has been recently reported that cigarette smoking is also accompanied by a sustained reduction in radial artery diameter, which indicates that another adverse heamodynamic effect of smoking is the reduction of distensibility of muscle-type conduit arteries (Giannattassio, Mangoni, Stella, Faila, Carugo, Grassi & Mancia, 1995). The pathophysiological implication thereof is that an overall marked reduction in arterial distensibility increases cardiac work in addition to the increase caused by the pressor and tachycardiac responses themselves. Thus, through a variety of mechanisms, cigarette smoking represents a real and heavy burden on the heart. Assessing the prevalence of cigarette smoking is fraught with problems as most people will not readily admit to smoking. The majority of women are in the habit of taking snuff, which they do not regard as smoking. A study on smoking habits of black South African patients with diabetes mellitus revealed that measuring urinary cotinine estimation detects 'covert' smokers and

has also been used to verify reported cessation of smoking (Gill, Rolfe, MacFarlane & Huddle, 1996). According to the Report of the Surgeon General, 1983, cited in McKibbin (1990), over 4000 substances have been identified in cigarettes smoke, many of which are pharmacologically active, toxic, mutagenic, carcinogenic and antigenic. This tends to suggest that snuff, the black stuff that is usually inhaled to be left lining the nasal mucosa or even "packed" along the sides of the mouth could be particularly carcinogenic. In this study, smoking cigarettes or taking snuff, irrespective of the frequency is regarded as a cardiovascular risk.

Education is necessary to increase awareness of the need for control of smoking in public places, and legislation phased accordingly (Handforth, Solan & Yach, 1989). Places like clinics, hospitals, work places and indeed most public places should have a clear ban on smoking and active anti smoking policies. Literature on the health implications of smoking should be freely available. Collaboration with educational authorities and other organisations could lead to greater impact in preparing health education programs. Since smoking is such a complex habit of behaviour and addiction, the greater benefit would come from helping children never to start smoking.

2.7.6 Diabetes

Diabetes and hypertension are two relatively common conditions each producing its own morbidity and mortality but in co-association having synergism. These conditions may be associated by chance alone, but diabetes also predisposes to hypertension (Joshi, 1995).

There are numerous possible associations of diabetes with hypertension, and these are:

Endocrine disease causing both hypertension and diabetes

Acromegaly

Cushing's syndrome

Conn's syndrome

Phaechromocytoma

Drugs causing both hypertension and diabetes

Oral contraceptives (combined preparation)

Steroids

Antihypertensive drugs causing diabetes

Potassium-losing diuretics (especially chlorthalidone)

Beta-blockers

Diazoxide

Hypertension secondary diabetic complications

Nephropathy

Recurrent pyelonephritis

Atherosclerosis with systolic hypertension

Hypertension associated with insulin-resistance syndrome

Hypertension associated with insulin therapy

Coincidental hypertension in diabetics

Essential hypertension

Isolated systolic hypertension (Joshi, 1995).

Non insulin dependent diabetes is commonly associated with a constellation of features referred to as 'syndrome x'. These comprise obesity, hypertension, hyperinsulinaemia, insulin resistance and hyperlipidaemia, and have been recognised as pentent. The central role player appears to be the insulin resistance, which in turn leads to the constellation of these interdependent factors, indicated by central obesity i.e. increased waist to hip ratio. The patients at risk are those with insulin dependent diabetes mellitus and micro-and macro proteinura, those with vascular diseases, smokers, and those with dyslipidaemia. These patients should be seen at least every three to six months (Joshi, 1995). Hypertension in diabetes needs to be diagnosed early, and managed appropriately. It accelerates atherosclerosis in combination with uncontrolled diabetes, and leads to macrovascular disease, which is the leading cause of death in type II diabetes. (Joshi, 1995).

In this study, blood glucose levels less than six mmol/l in those subjects without diabetes, will be considered as normal. In the diabetic subjects, more than 10 mmol/l will be considered as high.

Several life style measures (regular exercise, moderate weight reduction and a low fat, high carbohydrate, high fibre diet) can improve insulin sensitivity and may help reduce the contribution of insulin resistance to increasing blood pressure (Epstein & Sowers 1992).

2.7.7 Stress

There is some suggestion that individuals who tend to repress hostile feelings or who feel that they are unable to control their lives or environment may be more prone to

hypertension. In one study, blood pressure elevation was particularly prominent in alcohol drinkers who felt they lacked control of their work situation (Medicine Group, 1993). When arterial blood pressure was continually monitored on a 24-hour basis as people performed their normal activities, marked fluctuations in pressures were associated with normal life stresses, increasing during periods of physical discomfort and family crisis and declining during rest and sleep (Porth, 1994).

The breakdown of families, poverty, stressful life events, and limited social support are being studied as potential precipitating factors. Stress is associated with increased circulating catecholamines, which may precipitate hypertension, alteration in platelet function, increased fatty acids mobilization, and a resultant elevation of free fatty acids. These increased fatty acids may contribute to atherosclerotic plaque formation (Thelan et al., 1994).

In this study, a patient's rating of more than five on the stress scale will be considered as stressed in that part. Ratings from more than five down to one denotes that stress is decreased.

The above factors seem to suggest that incorporation into health education programmes should be the role of professional health workers to help individuals pinpoint their problems and learn to cope with stressors which help protect against stress and represent individual attempt to re-establish a harmonic balance. Psychological techniques involving biofeedback, relaxation, and transcendental meditation have emerged as methods to control alterations in blood pressure (Porth, 1994).

2.7.8 Elevated Serum Lipids

High serum cholesterol, high levels of low density lipoprotein cholesterol and low levels of high density lipoprotein cholesterol levels increase the risk of atherosclerotic complications of hypertension. There is though, some uncertainty whether this is true above the age of 70 (Berns, De Vries & Katan, 1988). High levels of cholesterol in the blood stream can lead to a build up of cholesterol in the walls of the arteries, reducing blood supply to the heart and increasing the risk of coronary attack. Blood cholesterol is influenced by the amount of fat, especially saturated fat, in one's diet. In this study total cholesterol exceeding 5.0 mmol/l will be considered as high. In geographical areas where the consumption of saturated fat is high, there is a higher prevalence of hypertension. A study by Rouse & Beilin (1984) has demonstrated that an 'inverted' diet with a high unsaturated saturated fat ratio tends to reduce the blood pressure. That is why members of religious groups observing a diet poor in animal meat have lower pressures than do people who are not prevented from eating an omnivorous diet. It has been documented in numerous epidemiological studies in developed and underdeveloped countries that the total cholesteroleamia and Body Mass Index (BMI), two well known cardiovascular risk factors, are also influenced directly by diet (Stamler, 1990; Pauletto, Puato, Caroli, Casiglia, Munhambo & Cazzolato, 1996; Bens, De Vries & Katan, 1998; Stasse-Wolthuis, Hautvast & Hermus, 1989).

Excess body weight is therefore a medical problem both in the industrialised world and for developing populations that have abandoned rural nutritional models in favour of western ones (Stamler, 1990). Nutritional models in favour of western ones are seen in dietary

changes associated with urbanisation (for example, an increase in consumption of saturated fatty acids and an increase in blood pressure (Mtabaji, Nara & Yamori, 1990). The researcher has observed that some Batswana are in the habit of overcooking the vegetable fibres, e.g. cabbage, spinach, in which saturated fat, e.g. holsum or unsaturated sunflower oil as well as spices have been added. This habit only serves to destroy the essential potassium and because of fat and salt, they help increase body weight.

Numerous epidemiological studies have detected a close correlation between dietary habits and socio- economic status on the one hand, and levels of cholesterol on the other. For example, Swai, McLarty, Kitange, Kilima, Tatalia & Keen (1993) showed that serum cholesterol levels and blood pressure being higher in the more developed Kilimanjaro area of Tanzania than they were in rural areas was related to a greater consumption of meat in Kilimanjaro. In the same way Connor, Cerqueira, Connor, Wallace, Malinov and Casdorph (1988) studying the Taharama Mexican Indians, whose diet consists of cereals, beans and fruit, demonstrated that obesity was absent and that these Indians had low blood pressures and low blood cholesterols.

According to Gillum and Grant (1982), black Americans have higher values of blood pressure than black Africans. This has been attributed to exposure to the lifestyle of the Western world. Blood pressure values among the black Brazilians were also higher than those of the Africans, confirming the importance of the environment (Wilson, Hollifield & Grim, 1991). However, their blood pressures were also higher than that of their white

country men, in agreement with the data in the literature demonstrating that high blood pressure is more prevalent in blacks than in whites (Falkner, 1990).

Increased physical activity and nutritional counselling are both recommended for treating and preventing hyperglyceridemia and should be an essential component of a primary prevention programme that aims at reducing the rise of cardiovascular disease (WHO Expert Committee, 1994). The community should be encouraged to eat skinless poultry in place of meat, to choose lean meat and trim all visible fat before cooking, not to fry food, to avoid fatty take aways and commercially baked products, and to cut down on full cream dairy products.

2.7.9 Conclusion

In this chapter, relevant literature on the classification, causes, pathophysiology and risk factors have been discussed. The literature has been aimed at being consistent with the title of the research It has been shown that untreated hypertension increases the risk of vascular damage involving both small arteries, arterioles and large arteries. These lesions lead to coronary heart disease, congestive heart disease, stroke and renal dysfunction. Concurrence of other risk factors, such as smoking, alcohol intake, obesity, raised serum cholesterol, physical inactivity, and diabetes will augment and accelerate organ damage.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 INTRODUCTION

This chapter discusses the research design, research setting, population, sample selection, limitations, data collection instruments, data collection procedure, reliability and validity. Pilot testing and ethical considerations will also be discussed.

3.1 RESEARCH DESIGN

This was a descriptive survey of the established modifiable risk factors for hypertension amongst Batswana in the Gaborone District, using a structured interview. According to Polit and Hungler (1991:192), a survey focuses on what people do; how or what they eat, how they care for their health needs, their compliance in taking medications. Surveys also collect information on people's knowledge, opinions, attitudes, and values. For this study, using the survey method for data collection was found to be the most suitable as people would be consulted regarding their health risks and problems. The design also enabled the researcher to ask respondents for information about their personal background or situation such as age, education, and sex, which, according to Polit and Hungler (1991:460) was shown most repeatedly to be related to a person's behaviour and attitudes.

N.B. The researcher has used the terms respondents and clients interchangeably throughout the study.

3.2 RESEARCH SETTING

The setting was a primary health care clinic in Gaborone. It includes a maternity wing, X-ray department, laboratory, dispensary, injection room, minor surgery, dressing room and three consulting rooms. It functions 24 hours a day. The staff is as follows:
A doctor, matron, switch board operator, secretary, two administrative staff, 10 registered nurses, five enrolled nurses, four welfare workers, five cleaners, a driver and a messenger.

It is a main clinic in the district, which serves a population of 183,487 people. The clinic refers patients to Princess Marina Hospital, the only referral hospital, in South of Botswana. The clinic's attendance register revealed that the clinic sees patients with various conditions, including ante natal care, post natal care and child health.

3.3 POPULATION

The population consisted of all the hypertensive patients who had been attending the clinic, for follow up and treatment during the period from the beginning of January 1997 to the 31 August 1998. During a preliminary review of attendance register at the Primary Care Clinic, it was revealed that between 200 and 300 hypertensive patients attended the clinic on a monthly basis, either as newly diagnosed subjects or as repeats for check up. Due to this cyclical nature of attendance, the population was established at between 200-300 people. A statistician was consulted.

3.4 SAMPLE SELECTION

Only one clinic was used, which was selected on the basis that it is the largest clinic in the district. A convenience sampling method was used. According to Burns and Grove (1987:216), convenience sampling is described as using all, available subjects by entering them into the study until the desired sample size is reached. A statistician's advice was that the population size be used as the sample size. In this particular study, hypertensive clients attending the clinic were isolated before or after consultation. All hypertensive clients who came for follow up treatment during 1st July and 31st August, 1998 who were 18 years and older were included in the study. The sample size obtained at the end of two months (1st July - 31st August) was 158 clients diagnosed with hypertension.

The researcher collected data over a two month period by working at the clinic five days in a week from 8 a.m. until 4 p.m. in order to accommodate early and late arrivals. Clients who had already been interviewed were not re–interviewed. This was ensured by asking clients if they had already been interviewed by the researcher. An attempt was made to interview missed clients in the next visit.

3.5 EXCLUSION CRITERIA

Pregnant women and those under 18 years of age were excluded from the study.

3.6 LIMITATIONS

The following are the limitations that the researcher came across during data collection and analysis:

- The statistician reported some missing values during the analysis. The researcher however revisited the raw data to attempt to get missing values. However, the missing values reported still leaves the sample size large enough to render unbiased results.
- Some patients requested explanation of the risk factors. Finding the right vernacular word to explain medical terms, took more time with each patient hence lengthening the interview.
- Most of the hypertensive clients attended their own clinics in the rural areas unless referred to this particular clinic under study. This resulted in low numbers of hypertensive clients coming from the rural areas as compared to the urban dwellers. This resulted in insufficient rigorous comparison.
- The numbers of respondents who drink alcohol and those who smoke was too low to be of any significance probably due to the sensitivity of the question.
- In the African setting, as in Botswana men appear to be poor consumers of health, hence the low percentage of males than females. The results of the study thus may be skewed because of the predominantly female sample.
- To obtain more meaning to the identification of modifiable risk factors, the researcher could have subjected the respondents who both smoked and consumed alcohol to bivariate analysis but did not do so because of low numbers who responded "yes" to questions relating to smoking and alcohol consumption

3.7 RESEARCH INSTRUMENT

The structured interview schedule was adopted and modified from McKibbin's instrument (1990), with her verbal permission. Open and closed ended questions were constructed in English and then translated into Setswana. The interview schedule (see Appendix 1) was divided into the following sections. The following changes were made::

Her study described risk factors, (reversible and irreversible) for coronary heart disease in patients aged 55 years and younger (as a cut-off point) with proven heart disease.

My study described the established modifiable/reversible factors for hypertension amongst adult Batswana who were 18 years and above in the Gaborone district. Changes were made to suit the study. Open and closed ended questions were constructed in English and translated into Setswana. The interview schedule (see Appendix 1) was divided into the following sections:

- Part one consisted of the client's biographical data and socio-economic factors. This included items such as sex, age, employment, monetary income, level of education, area of residence and type of swelling, which furnished the researcher with the clients' biographical data and their socio-economic status.
- Part two consisted of risk factor questions that would elicit possible lifestyle factors that would contribute to hypertension according to WHO Report, 1994 and the Framingham Studies. The established risk factors for hypertension include:

Smoking history, physical inactivity, obesity, alcohol intake, high fat consumption, high salt intake and elevated stress.

- Part three consisted of medical history. Any history and treatment of significant cardiovascular disease was documented. This included hypertension, chest pain, renal disease and cerebrovascular accident.

History of and treatment for any significant metabolic disease such as diabetes and hypercholesterolaemia was documented. Questions were also included to assess for any possible family history of hypertension and diabetes. Additional risk factors in females such as contraceptive drug usage, menopause, and pregnancy induced hypertension history were obtained.

A weighing scale with a rigid rod to measure the body mass and height, plus a glucose and cholesterol Accutrend measuring machine, from Boeringer Mannheim were made available and were used.

3.8 DATA COLLECTION PROCEDURE

An empty side cubicle away from the clinic's activities was used for the purpose of interviewing the clients. A face to face interview was conducted with the researcher filling in the responses of the clients.

When clients were unable to furnish the interviewer with the relevant information, clinic records plus client's out patient's files were reviewed in order to obtain information that the client was not able to give, e.g. type of treatment. Verbal permission was obtained from the clinic's matron to review patients' files when indicated.

Each client was interviewed and a pinprick was done on the finger to obtain a drop of capillary blood for total cholesterol and blood sugar measurements.
Mass was measured on a weight scale.

A glucose and cholesterol Accutrend meter from Boeringer Mannheim was used to determine capillary blood glucose and cholesterol levels. A softclix pricker was used to perform the pinprick and to obtain a drop of blood from the finger.

3.9 RELIABILITY AND VALIDITY

To ensure face validity, two physicians assessed the instrument separately for authenticity of the questions. A Setswana expert checked the instrument for correct semantics. The assistance of two statisticians was elicited, because the first statistician had gone on an extended vacation. The instrument was also tested on 5% of the sample (i.e. 15 patients) to ensure that questions were clear and understandable. These patients were not included in the main study. To ensure reliability, the weighing scale was calibrated every morning to ensure accurate results.

Calibration of the glucometer and cholesterol meter was done by checking the code of the glucose and cholesterol strip with that on the machine to ensure accuracy. Control testing was done towards the finishing of each container of strips to ensure that the results obtained were within the normal ranges.

3.10 PILOT STUDY

A pilot study was conducted on 15 hypertensive clients to ensure that all clients understood the same questions in the same manner, and to clarify the questions in order to bring about what the researcher intended to establish.

The following were the additions that were made to the following items:

Question 16.1: If the respondent answered yes to question 16, then they were to respond by stating whether life was:

- More difficult in urban.
- Less difficult in urban.
- More difficult in rural.
- Less difficult in rural.
- The same.
- Do not know.

Question 39. Clients were asked how much salt they added to their food. Whether salt was added as follows:

- One teaspoon.
- Tip of a teaspoon.
- Added until tasted.

Question 43: Rooi bos tea was added to the beverages taken.

3.11 ETHICAL CONSIDERATIONS

Permission to conduct research was obtained from the following:

The committee for Research on Human Subjects (Medical) of the University of the Witwatersrand gave permission for the study to be undertaken on the 01/06/1998, the protocol number was M980522 (see Appendix VI).

The Ministry of Health and Health Research Unit in Botswana were requested for permission to undertake a study in the clinic, and to interview clients. Permission was given on the 08/06/1998 (see Appendix V).

The Matron-in-Chief of the clinic where the research was conducted was requested for permission. Permission was granted on the 10/06/1998 (see Appendix VII).

All the clients were required to provide written informed consent (Appendix IV) after having been given an information letter (Appendix III) which was written in their own language. Those who were unable to read were provided with a full explanation of the contents of the letter by the researcher. To give their consent they either had to attach their signature or a thumb print.

All clients were informed that if they preferred to be excluded from the study, their treatment at the clinic would not be altered in any way.

To ensure anonymity, all questionnaires were allocated a number so as to avoid using the client's names, for differentiation. In order to maintain confidentiality, all completed

3.11 ETHICAL CONSIDERATIONS

Permission to conduct research was obtained from the following:

The committee for Research on Human Subjects (Medical) of the University of the Witwatersrand gave permission for the study to be undertaken on the 01/06/1998, the protocol number was M980522 (see Appendix VI).

The Ministry of Health and Health Research Unit in Botswana were requested for permission to undertake a study in the clinic, and to interview clients. Permission was given on the 08/06/1998 (see Appendix V).

The Matron-in-Chief of the clinic where the research was conducted was requested for permission. Permission was granted on the 10/06/1998 (see Appendix VII).

All the clients were required to provide written informed consent (Appendix IV) after having been given an information letter (Appendix III) which was written in their own language. Those who were unable to read were provided with a full explanation of the contents of the letter by the researcher. To give their consent they either had to attach their signature or a thumb print.

All clients were informed that if they preferred to be excluded from the study, their treatment at the clinic would not be altered in any way.

To ensure anonymity, all questionnaires were allocated a number so as to avoid using the client's names, for differentiation. In order to maintain confidentiality, all completed

questionnaires were placed in a box and were stored safely away from all patients and all health personnel.

In order to maintain privacy, an empty side cubicle away from the clinic activities was used for the purpose of interviewing clients.

In order to minimise injury and pain, a softclix pricker was used to obtain a capillary blood sample. To ensure universal precautions against diseases such as AIDS/HIV and hepatitis, gloves were worn by the researcher between clients.

3.12 CONCLUSION

The chapter on research methodology dealt with the research design, setting, population, sample selection, data collection, limitations, research instrument, reliability and validity, pilot study and ethical considerations.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF FINDINGS

4.0 INTRODUCTION

This chapter presents the findings and analysis of the prevalence of risk factors in the 158 hypertensive clients who underwent interviews for the presence of modifiable risk factors for hypertension. Data were coded and analysed by computer using Statistical Package for Social Sciences (SPSS). Narrative and descriptive statistics such as frequencies and percentages were used to present the data. The statistician reported some missing values during the analysis, this however still leaves the sample size large enough to render unbiased results. The results of the study were presented in the following order: biographical data and socio economic factors, medical plus family history, blood sugar and cholesterol levels.

4.1 PART 1: BIOGRAPHICAL DATA

4.1.1 Sex

The majority of hypertensives who were seen were females at 83.5%(132) and 16.5%(26) were males.

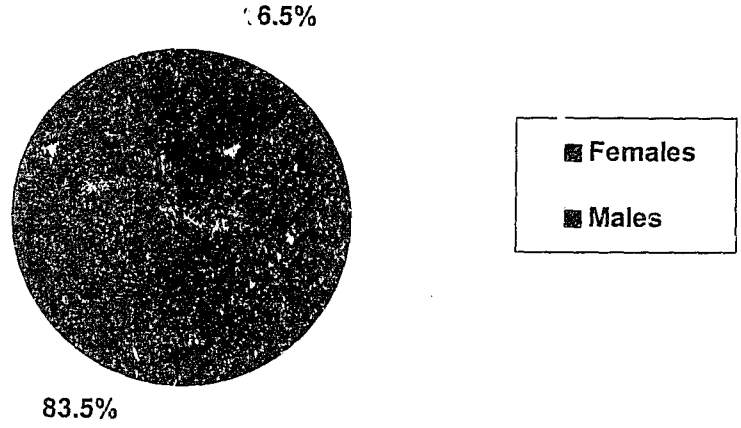


Figure 4.1: Sex of the Respondents (n = 158)

4.1.2 Age

The mean age of those seen with hypertension was 45.89 years with a standard deviation of 11.74 and the range of 65; the minimum age was 22 years and maximum of 87 years.

4.1.3 Race

All the respondents were black and Setswana speaking.

4.1.4 Marital Status

As can be seen from Table 4.1, 33.5% (53) of the hypertensive respondents were married, 10.8% (17) were widowed, 40.5% (64) were single and was the biggest group. There were 8.2% (13) who were divorced and 7.0% (11) were cohabiting. The question about

"cohabiting" appeared to be a sensitive one hence the possibility of having more respondents cohabiting.

Table 4.1: Marital Status of respondents (n=158)

Marital Status	Frequency	Percentage
Married	53	33.5
Widowed	17	10.8
Single	64	40.5
Divorced	13	8.2
Cohabiting	11	7.0
Total	**158**	**100.0**

4.1.5 Body Mass Index

The mean Body Mass Index was 30.02 with a standard deviation of 5.54 and range of 32 with a minimum of 17 and maximum of 49. Further findings revealed that out of a total of 132 women in the study, 38 (29%) of the women were obese, at a body mass index of 30 and above. Six (23%) out of the twenty six males in the study were obese, at a body mass index of 30 and above.

4.2 PART 11: SOCIO ECONOMIC FACTORS

4.2.1 Employment of the Respondents

Those subjects who were employed constituted 76.6% (121) of the sample, which indicates that the majority of those afflicted with hypertension were working. The unemployed

ranked 10.1% (15) and housewives ranked 8.3% (13), scholars 1.3% (2) and those looking for work accounted for 3.7% (5). It is assumed it may be particularly stress provoking to be engaged in seeking work. Two (2) respondents did not answer.

4.2.2 Type of Occupation of the Employed

Of those clients who were employed, 47.9% (58) belonged to labourer type of occupation. According to Figure 4.2, those who did clerical jobs accounted for 24.8% (30), managerial positions accounted for 9.4% (9), teachers accounted for 5.1% (6), nurses 1.7% (2), salespersons 2.5% (3) and the self-employed 10.7% (13).

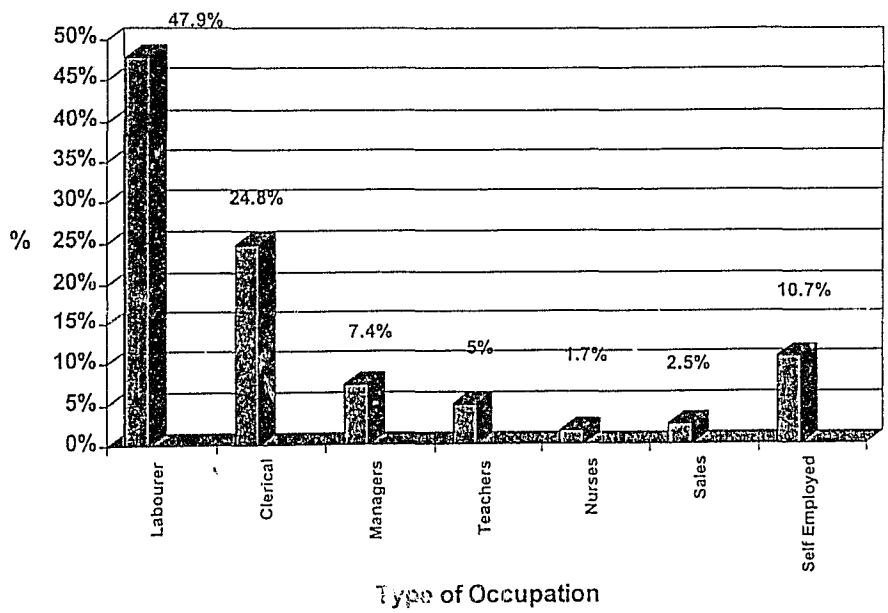


Figure 4.2: Type of Occupation of Those Employed (n = 121)

4.2.3 Monetary Income for the Employed and the Self-employed Respondents

Those earning less than 500 Pula made up 35.5% (43) of the sample. Those earning between 500 and 1000 Pula made up 37.2% (45) of the sample and comprised most of the hypertensive clients. The category earning between 1000 and 2000 Pula accounted for 14% (17). Those earning between 2000 and 3000 Pula made up 9.9%(12), between 3000 and 4000 came to 1.7% (2), 4000 and above was 1.7% (2). It should be noted that there is a wide disparity between the rich and the poor of Botswana – this enables the majority of clients in higher income brackets to belong to Medical Aid Schemes, and seek medical care at a private practitioner or the private hospital. Figure 4.3 illustrates the monetary income profile of the respondents who were employed and the self employed.

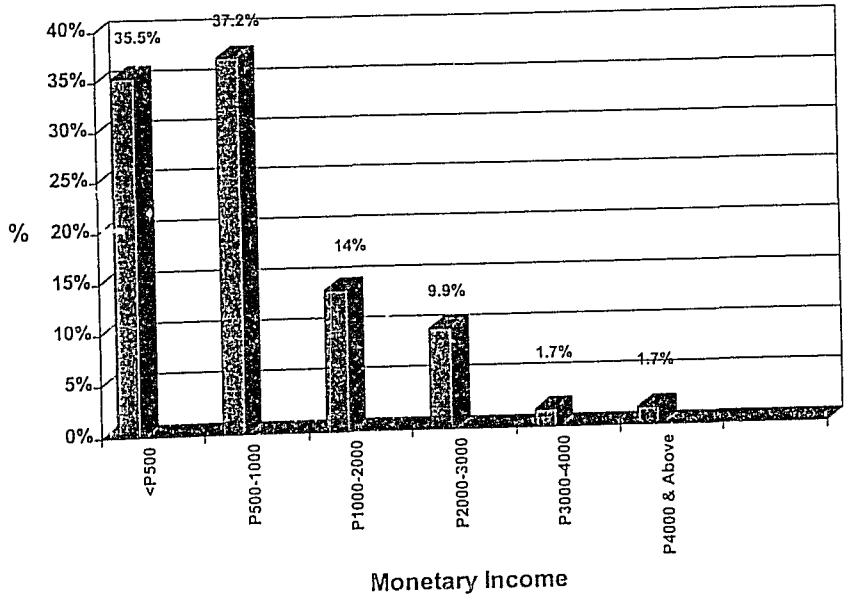


Figure 4.3: Monetary Income of the Employed and Self Employed (n=121)

4.2.4 Level of Education of the Respondents

According to Figure 4.4, those who had received no education at all constituted 9.5%(15) of the sample. Those who had received primary education made up 52.9%(83), and were the highest number of hypertensive clients, Junior Certificate 21.7%(34), senior certificate 14.0%(22) and 1.9%(3) went to university. One (1) respondent did not answer.

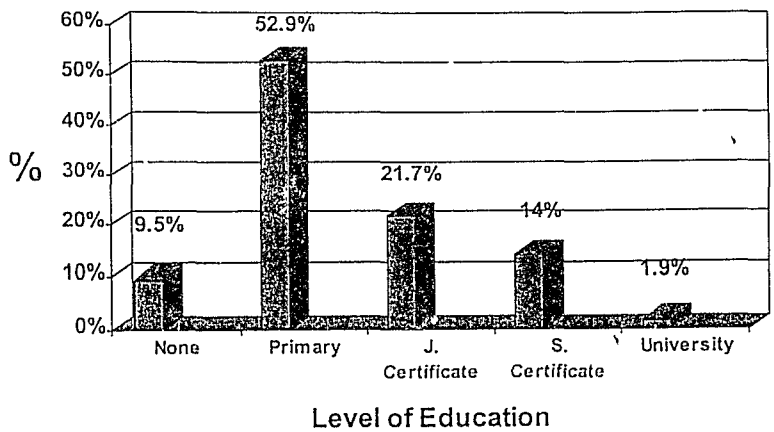


Figure 4.4: Level of Education of the respondents(n=157)

4.2.5 Area of Residence of the respondents

The highest number of respondents, 83.5% (132), resided in the urban area while 16.5% (26) resided in the rural area. Sixty-two point five percent (83) said they had moved from the rural to the urban area while 37.5% (49) had not moved from the rural area but always stayed in the urban area. Only one (3.9%) respondent who lived in the rural area had moved from the urban to the rural area, and 96.1% (25) had not moved from the urban area meaning they always stayed in the rural areas. Hence, those who had never moved from their original area of residence amounted to 46.8% (74) of the sample (n = 158).

4.2.6 Change in Lifestyle of the Respondents

Of those respondents (n = 84) who moved from the urban to the rural or from the rural to the urban area, 90.5 (76) of the respondents said they experienced a change of lifestyle. When asked how they perceived life in different areas of settlement, in terms of cost of living and other stressors, 31.7% (24) said life was more difficult in the urban area. Another 31.7% (24) said life was less difficult in the urban areas; 19.2% (14) said life was more difficult in the rural area; 11.4% (9) said life is difficult in the rural areas; 5.4% (4) said life was equally as difficult in both the rural and the urban areas while 0.6% (1) said they did not know (See Figure 4.5). These close numbers of respondents tend to suggest that both the urban and the rural dwellers experienced stressors in their environments.

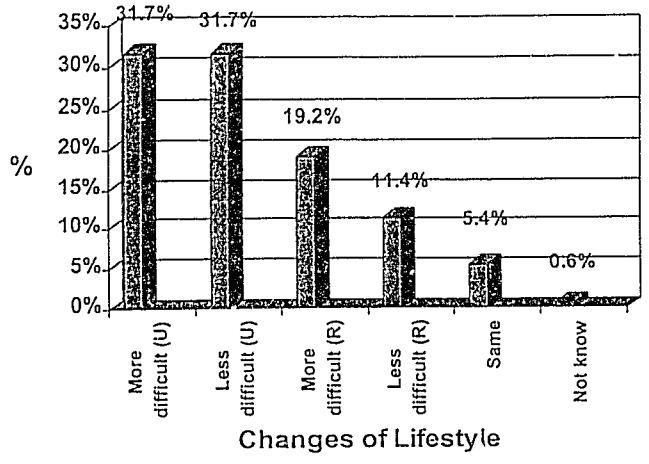


Figure 4.5: Experiences of Change in Lifestyle of the Respondents Who Moved (n = 84)

4.2.7 Type of Dwelling of the Respondents

Those who stayed in rented houses represented 42.4% (67), while 57.6% (91) of the sample owned their houses. Those who stayed in houses made of bricks and corrugated iron accounted for 98.7% (156) of the respondents. Only 1.3% (2) two houses were made of mud with thatched roof. Those who stayed in electrified houses made up 42.4% (67), while 57.6% (91) stayed in unelectrified. Those who used pit latrines came to 62.7% (99), while 37.3% (59) used flushed toilets. Those who had running water in the house came to 37.3% (59) while 62.7% (99) used standpipe water. The type of dwelling served to indicate the socio economic status of the respondents with a view to determining stresses of living as a risk factor for hypertension.

4.3 PART 111: LIFESTYLE FACTORS

4.3.1 Alcohol

Only 22 (13.9%) of the respondents said they drink alcohol. Of this total only one (4.5%) respondent said that he drinks once a week and two (9%) drink three to seven days a week. Those drinking at weekends only, made up 27.4%(6) of the sample and those drinking occasionally came to 59.1%(13). Of the 22 respondents, 59.1%(13) said they take more than two tots when they drink, another 40.9%(9) said they drink less than two tots. The total number for those who drink alcohol was small. The sensitivity of the question could have inhibited more clients admitting to drinking.

4.3.2 Smoking

Only 29 (18.3%) of the respondents admitted to smoking. Of this number, 6 (20.7%) smoked cigarettes while 23 (79.3%) were women who took snuff. These figures show a small number of smokers, like alcohol the question was sensitive.

4.3.3 Diet and Preparation

Respondents who were not vegetarians accounted for 97.5% (154) of the sample, which meant that they ate both meat and vegetables. The respondents also ate more than one type of vegetable. Only 2.5% (4) were strict vegetarians. When asked what type of vegetables they ate, 85.4% (132) of the respondents said they eat carrots while 14.6% (22) did not. Those who ate cabbage made up 93.0% (143) while 7.0% (11) said they did not eat it. Cabbage is both cheap and readily available on the market; 82.3% (126) said they ate pumpkin while 89.9% (138) said they ate spinach; 82.8% (127) said they ate other "morogo", an African delicacy rich in potassium. These vegetables are the most available in the market and contains important minerals like potassium.

Table 4.2: Type of Vegetables Eaten by the Respondents (n = 154)

TYPE OF VEGETABLE	PERCENTAGE & FREQUENCY
Carrots	85.3% (132)
Cabbage	93.0% (143)
Pumpkin	82.3% (127)
Spinach	89.9% (138)
"Morogo"	82.8% (127)

Asked how often they ate vegetables, 8.9% (40) said once a week, 43.3% (68) twice a week, 31.3% (49) every day and 16.5% (26) seldom ate vegetables. It would appear that most subjects ate vegetables, but less than a third (31.3%) of respondents ate vegetables daily which made the highest number of respondents at risk of being deprived of potassium.

4.3.4 Fruit

Those who ate fruit came to 98.7% (156) of all respondents and only 1.3% (2) said they did not eat fruit. Again the respondents ate more than one type of fruit. Those who ate oranges came to 89.9% (140) while 10.1% (16) did not eat oranges. Those who ate apples came to 91.1% (142) and those who did not came to 8.9% (14). Those who ate bananas came to 84.6% (132). Both bananas and oranges are rich sources of potassium.

Table 4.3: Type of Fruit Eaten by the Respondents (n = 158)

TYPE OF FRUIT	PERCENTAGE & FREQUENCY
Oranges	89.9% (140)
Apples	91.9% (142)
Bananas	84.6% (131)

When asked how often they ate fruit 14.6% (23) said they ate fruit everyday 9.6% (15) once a week, 38.2% (60) twice a week, 37.6% (49) seldom ate fruit. Even though most clients said they eat fruit, less than a third of respondents ate fruit daily. This placed the greatest number of respondents at risk for lack of potassium. At least 800mg of potassium

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When asked how often they ate fruit 14.6% (23) said they ate fruit everyday 9.6% (15) once a week, 38.2% (60) twice a week, 37.6% (49) seldom ate fruit. Even though most clients said they eat fruit, less than a third of respondents ate fruit daily. This placed the greatest number of respondents at risk for lack of potassium. At least 800mg of potassium

daily is required in the absence of renal disease. This is obtained in liberal consumption of vegetables and fruits.

4.3 5 Frequency and Type of Meat Eaten

A total of 80.0% (126) clients ate red meat, while 20.0% (32) did not; 72.0% (114) ate poultry and 28.0% (44) did not; 6.0% (9) said they eat fish, while 94% (149) did not. Thus 80% of those who ate red meat ate it once, twice or more times a week while 6.1% (7) seldom ate red meat.

Poultry: Of the 72.0% who ate poultry, ate it once, twice or more times a week while 3.9% ate it seldom.

Fish: Of the 6.0% who ate fish ate it once, twice or more times a week.

Table 4.4: Type of Meat Eaten by the Respondents (n = 158)

TYPE OF MEAT	PERCENTAGE & FREQUENCY
Red meat	80% (126)
Poultry	70% (114)
Fish	6.0% (9)

4.3.6 Fat Consumption

Respondents who said they remove visible fat from meat prior to cooking came to 34.8% (55) while 65.2% (103) was made up of the majority of hypertensives who did not remove fat prior to cooking.

Twenty point nine percent (20.9%) (33) cook their food by boiling, 12.0%(19) fry their food and 67.1% (106) combine boiling and frying when cooking. The researcher should have asked how long boiling is done, as prolonged boiling may destroy essential minerals like potassium.

The majority of the respondents 96.2% (152) used polyunsaturated fat in cooking while the remaining 3.8% (6) used saturated fats.

4.3.7 Salt Intake

Those respondents who added salt in their cooking time, came to 73.1% (114) while 14.7% (23) added salt sometimes and 12.2% (19) never added salt to cooking. Two (2) respondents did not answer. Those who added salt into their food at table came to 4.5% (6) while 20.4% (32) sometimes added salt at table. Those who never added salt at table came to 75.1% (118).

When asked how much salt they added during cooking, 75 (48.2%) of respondents said they added salt until they tasted it, while 46% (72) used a teaspoon tip to add salt during cooking. Only 5.8% (9) used a full teaspoon of salt during cooking. This habit of using salt

implied that more than a tea spoon (5g) was consumed daily. This placed the respondents at risk for high salt intake which increases blood pressure (Hildreth & Saunders, 1991).

Table 4.5: Salt Consumption by the Respondents (n = 156)

Frequency of adding salt to cooking	**Frequency & Percentage**
All the time	73.1% (114)
Sometimes	14.7% (23)
Never	12.2% (19)
Amount of Salt Added	**Frequency & Percentage**
Teaspon tip	46% (72)
One teasponn	5.8% (9)
Until tasted	48.2% (75)
Addition of Salt at Table	**Frequency & Percentage**
Always	4.5% (6)
Sometimes	20.4% (32)
Never	75.2% (118)

4.3.8 Spices

The respondents who said they added spices to cooking came to 55.1% (76) while 34.8% (48) did not, 10.1% (14) sometimes added spices. There were 20 respondents who did not answer. Those who added stock cubes to their cooking came to 50.3% (77) while 49.7% (76) did not. There were five (5) respondents who did not answer. Another 66.7% (42) out of the total said they add other spices like barbecue, steak and chops which are high in sodium glutamate. Those who added chilli spice was 65.8% (100) of the total. Chillies taken in large quantities give rise to palpitations.

4.3.9 Beverages

When asked what beverages they preferred to drink, 48.4% (76) said they drink tea, while 51.6% (82) said they do not drink tea. Those who drink coffee made up 19.7% (31) while 80.3% (127) did not drink coffee. Those who drink bush tea accounted for 42.7% (67) while 57.3% (91) said they did not.

It is worth mentioning here that those who drank bush tea had taken coffee and tea before but felt unwell hence changed to bush tea which was more agreeable to them.

Those who were in the habit of drinking Coca Cola came to 42.0% (66) while 58.0% (92) did not drink Coca Cola. Those who drink fruit drinks made up 36.3% (57) while 63.7% (101) did not drink fruit drinks. Those who drink other beverages like Milo, and chocolate came to 6.9% (11) out of the total sample.

Table 4.6: Type of Beverages Taken by the Respondents (n = 158)

TYPE OF BEVERAGE	PERCENTAGE & FREQUENCY
Tea	48.4% (76)
Coffee	19.7% (31)
Bush tea	42.7% (67)
Coca cola	42% (66)
Fruit drinks	36.3% (57)
Others like Milo & Chocolate	6.9% (11)

4.3.10 Sugar

When asked if they took sugar in their tea or coffee, 83.5% (132) said they did and only 16.5% (26) did not. Of those who took sugar (n = 132), 16.6% (22) said they take only one teaspoon of sugar in their beverages, while 34.8% (46) took 2 teaspoons. 31% (41) took three teaspoons, 9.1% (12) took four tea spoons, 5.3% (7) took 5 teaspoons and 3.0% (4) took more than 6 teaspoons of sugar. The results reveal that at least half the number of those who took sugar took three to six teaspoons per cup of tea or coffee.

4.3.11 Activity at Work

The respondents were asked to answer the questions subjectively (see Page 10). Those who considered themselves inactive at work, came to 34.6% (47) and that included desk work. Those moderately active was 61.7% (84) that included repairing and cleaning. Those who were active, that is doing manual labour such as building, made up 3.7% (5) of the sample.

4.3.12 Activity During Leisure Time

Those who said that they were inactive during leisure time came to 24.1% (38) that includes reading or watching television. The moderately active amounted to 74.1% (117) e.g. gardening. Those who were active was e.g. digging in the garden, jogging, made up 1.9% (8) of the sample.

4.3.13 Mode of Travel to Work

The majority of the respondents 52.4% (64), used a taxi or bus to go to work. Those who used their own car made 13.1% (16) while 23.0% (28) walked to work and 11.5% (14) did not have to travel to work as they were housewives and maids staying in the yard of their work place. The low numbers of respondents who were active indicate that they were at risk for hypertension.

4.3.14 Stress

On the stress scale, respondents indicated the degree of their stressors in their jobs, with the spouses, their children, finances, personal health and sex. The respondents were asked to tell the researcher where to rate their response between one and ten, five to one means decreasing stress while five to ten means increasing stress. Figure 4.6 displays the stress related data on the job, with spouse, children, finances, health, those related to sex and other.

Job Stress

From a total of 158, 122 (77.2%) respondents answered the question on job stress. Of these, 106 (86%.9) of respondents rated job stress five and above on the stress scale, indicating that respondents were stressed; while 13.1% (16) did not experience job stress, by rating job stress five and below.

Spouse Stress

From a total of 64 (64.5%) who were married and cohabilating experienced spouse stress; 35.5% (22) were not stressed.

Children

Ninety-one (65%) out of 140 respondents were stressed, while 35% (49) were not stressed by their children.

Financial Stress

One hundred and thirty-two (91.6%) out of 144 respondents were stressed while 8.4% (12) did not experience financial stress.

Personal Health

One hundred and twenty-five (84.9%) out of 147 respondents indicated stress with their personal health while 15.1% (22) were not stressed by their personal health.

Sex

Thirty-three (67.5%) out of a total of 49 respondents rated five and less on the scale showing that respondents had little problems with their sex lives. While those who were stressed in this category was only 32.5% (16). The low response could be due to the sensitivity of the question.

Other

One hundred and eleven (87.2%) respondents out of a total of 127 said they were stressed due to factors like fear of HIV/AIDS, domestic problems with siblings and parents. 12.8% (16) were not stressed.

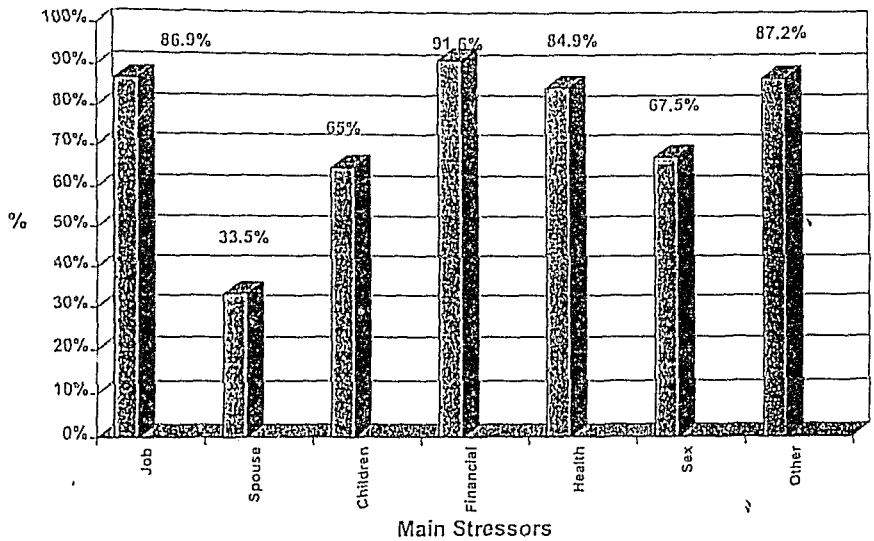


Figure 4.6: Main Stressors of Respondents (n=158)

Job: 86.9% (122)

Spouse: 33.5% (64)

Children: 65% (140)

Financial: 91.6% (144)

Health: 84.9% (147)

Sex: 67.5% (49)

Other: 87.2% (127)

4.3.15 Coping Mechanisms for Stress

From the options that help respondents cope with stress, the highest percentage was 62.0% (97) for adequate rest followed by 56.3% (88) for communication. The lowest percentage, 10.1% (6) used time management skills; 17.7% (27) used goal setting and 15.2% (24) used assertiveness. This tends to reveal that the respondents had various stressors in their daily lives. Before responding to the coping scale most respondents did not readily understand some concepts e.g. assertiveness meaning that the researcher had to explain the concepts. This suggested that the respondents were not aware of the coping mechanisms for stress.

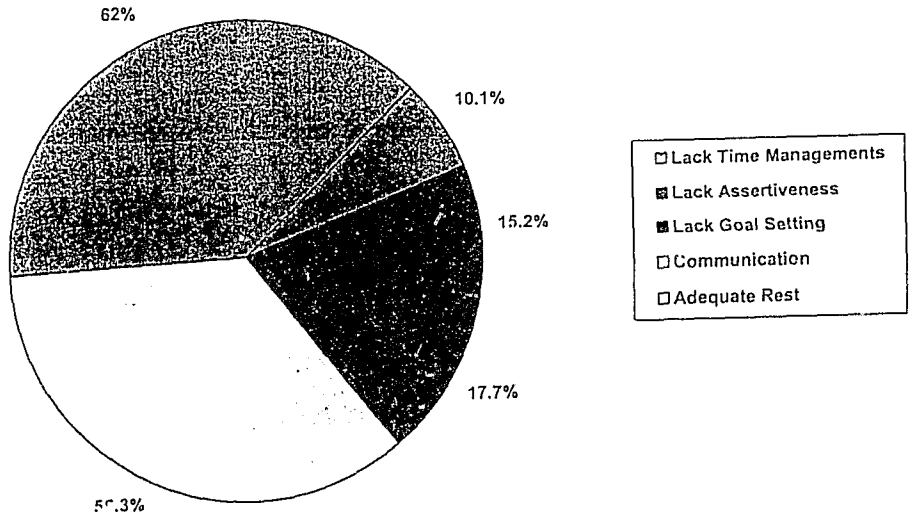


Figure 4.7: Coping Mechanism of the Respondents

PART 1V: MEDICAL HISTORY

4.4.1 Diabetes

Only 8.8% (16) of respondents said they had diabetes while 28.3% (43) said they did not have diabetes; 63.2% (90) said they did not know if they had diabetes and there was no

history of diabetes in their records. On testing the blood sugar on the glucometer, the results showed mean glucose levels of 4.8 mmol/l, SD of 1.55, range of 11.70 with the maximum of 10.07 mmo/l and the minimum of 1.30 mmo/l. This meant that the majority of respondents had normal blood sugar levels.

Those who had families with diabetes came to 21.2% (32). Those who had no diabetes in the family was 66.9% (101) and 11.9% (18) did not know. According to Figure 4.7, for those who had diabetes in the family, 14.9% (5) were fathers, 44.4% (14) mothers, and 40.7% (13) were siblings.

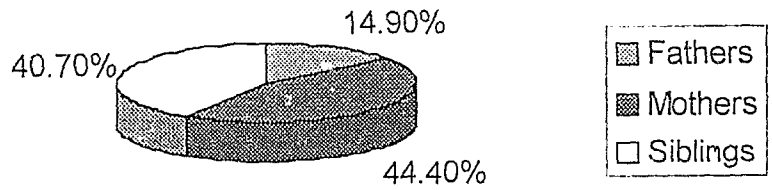


Figure 4.8: Diabetes in the Family (n = 32)

4.4.2 Hypertension

All of the respondents (158) had been diagnosed with hypertension and were all on treatment. The mean number of years of having hypertension was 6.52, SD 62.9, range 29 years, with the maximum of 30 and minimum of one year. The mean systolic blood pressure was 145.9 mmHg with diastolic blood pressure of 93.34 mmHg.

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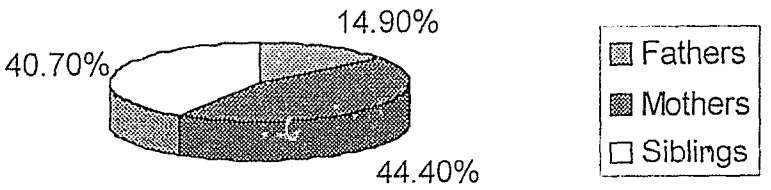


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Those who had family history of hypertension came to 65.1% (103). Those with no family history amounted to 22.0% (33) while 8.0% (12) did not know if they had family members with hypertension. Among those who had hypertension in the family, 16.9% (17) were fathers, 53.6% (56) were mothers, while 29.5% (30) were siblings.

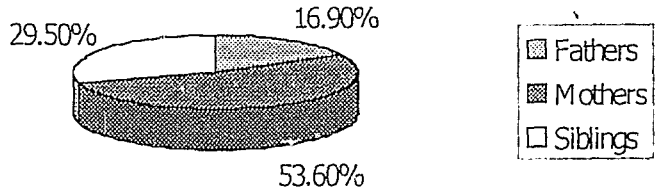


Figure 4.9: Hypertension in the Family (n = 103)

4.4.3 Cholesterol Levels

All the respondents had a normal cholesterol with a mean of 4.79 mmo/l, median of 4.55 mmo/l, mode of 3.90 mmo/l, with a minimum of 2.00 mmo/l and maximum of 7.62 mmo/l.

4.4.4 Cardiovascular Accident

Those who agreed to having had a cardiovascular accident accounted for only four (2.5%) respondents. The majority 97.5% (154) had had no cardiovascular accident. This low number of those who suffered cardiovascular accident could be due to the fact that most of the respondents were on treatment with no complications yet.

4.4.5 Renal Disease

Only one person (0.6%) agreed to having renal disease; 143 (90.5%) respondents did not and only 14 (8.9%) said they did not know as they often felt vague pains in the groins. Their records had no documentation of renal disease.

4.4.6 Over the Counter Medications

Those who said they bought over the counter medications made up 50.0%(79) of the sample. Those who did not buy over the counter medication was 47.3% (75) while only 2.7% (4) said they sometimes bought medications over the counter.

When asked about what type of medications they bought, 20% (31) said they usually buy cough mixtures, 12% (18) buy Comprals while 5% (7) buy Panado; 3% (4) buy Lennon medication and 60% (194) buy various medications to cleanse the bladder, blood and bowels.

4.4.7 Oral Contraceptives

Women who said they once used oral contraceptives but had since stopped, made up 60.3%(79) of the sample; 32.1%(42) said they had never used contraceptives while 7.6%(10) said they were still using oral contraceptives.

4.4.8 Post Menopause

Female respondents made up 27.1% (36) who were menopausal or post menopausal of the sample. Those who were not menopausal formed 72.9% (97) of the sample.

None of the women who were menopausal were on oestrogen replacement.

4.4.9 Hypertension in Pregnancy

Those women who had had no history of hypertension in pregnancy made up 72.5% (95) and 27.5% (36) said they had had hypertension in pregnancy.

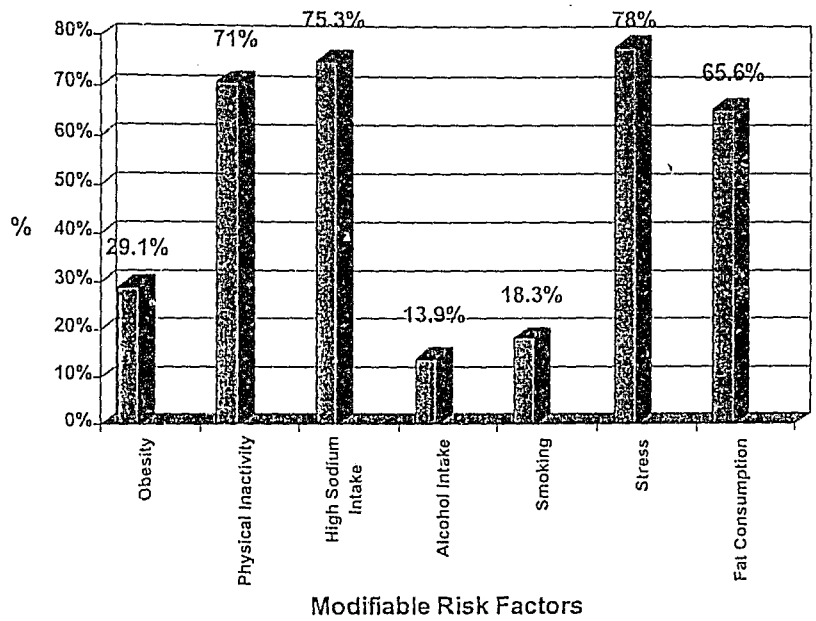


Figure 4.10: Comprehensive Figure Outlining the Major Risk Factors for Hypertension.

Obesity 29.1 (38)

Physical Inactivity 71% (112)

High Sodium Intake 75.3% (108)

Alcohol Intake 13.9% (22)

Smoking 18.3% (29)

Stress 78% (158)

Fat Consumption 65.6% (103)

4.6 CONCLUSION

Chapter 4 presented the findings of the survey on the risk factors for hypertension. The summary of these risk factors for hypertension were illustrated in the form of a comprehensive figure (Figure 4.10). In the next chapter discussion of findings, conclusions and recommendations will be presented.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 INTRODUCTION

This chapter will discuss the findings of the study under the following subheadings: Biographical and Socio economic factors, Lifestyle factors, and Medical history. Concluding remarks will be made before finally making recommendations for nursing practice and research.

5.1 BIOGRAPHICAL AND SOCIO ECONOMIC FACTORS

Four modifiable risk factors i.e. sodium intake, physical inactivity, stress and fat consumption were present in more than 60% of the respondents in Gaborone; stress and a high sodium intake accounting for 78% and 75.3% respectively.

From the fact that most hypertensive clients were single women with families, one can say that numbers of single household families may be rising, and this could be stressful. This is supported by Thelan et al. (1994) who indicated that the breakdown of families, poverty, stressful life events and limited social support are being studied as potential precipitating factors leading to increased circulating catecholamines which cause general vasoconstriction and increased blood pressure.

In the Gaborone district, 35.5% (43) of a total of 121 respondents who were employed and self employed, earned less than 500 Pula, 37.2% (45) earned not more than 1000 Pula, only 1.7% (2) of respondents earned P4000 and above. Even though Botswana's Gross Domestic Product is estimated at a rate of 7.0% accounted for by 30% from diamonds and 72% from export earnings, with a surplus of some 200 million US$ in foreign reserve, thus making it a country with a glowing economic picture, the per capita income for an average Motswana is 500 Pula. This shows an average person earning in this bracket has to struggle to live above the bread line in order to meet the high cost of living. A further indication of low socio economic status is depicted by 62.7% (99) of respondents who used pit latrines and another 62.7% (99) getting their water from standpipes.

According to a study done by Seedat (1983) in Durban, hypertension was more common in those who had low socio economic status, poor living conditions, large families, and had less involvement in community life, drank alcohol, gambled and suffered lack of sleep as a result. The majority of the respondents resided in the urban area of Gaborone. Of this group, (n = 76), 84 respondents who had moved from either the rural or the urban areas experienced a lifestyle change. While 31.7% (24) of respondents said life was more difficult in the urban area, another 31.7% (24) said life was less difficult in the rural area. A smaller number of 19.2% (14) said life was more difficult in the rural areas, 5.4% (4) said life was the same in both the rural and the urban areas and only 0.6% (1) said they did not know the difference. These findings tends to show that respondents experienced some form of stress in which ever areas they were. It is also evident that both rural and urban people experience the same risk factors and migratory stressors.

In this study, 86.9% (122) were stressed in their jobs and 91.6% (144) in financial matters. Both stressors carried the highest percentage on the stress scale for both rural and urban dwellers. This tended to agree with respondents' stressful experiences of either rural or urban life. The results in this study are similar with those in the study done by Ellis (1995) which shows that recent trends indicate that one can no longer generalise about the so called rural urban gradient because of unemployment, drought and destructive lifestyle habits e.g. drinking, smoking, high salt intake and high fat consumption, which also affects rural areas of the country (Ellis, 1995).

Though local studies on the effects of urbanization have not been done in Botswana, follow-up studies on subjects from the time of urbanization done in South Africa (the Coris study) (Steyn, Jooste & Fourie, 1986), in Kenya (Poulter, Khaw & Hopwood, 1990) and in Zimbabwe (Mufunda, Somova & Chifamba, 1992) all show increased dietary salt intake, a decrease in potassium intake, weight gain and "stress".

It should be noted that urbanization and migration from a rural to an urban environment are stressful life events (Poulter et al., 1990). According to Seedat (1983), the prevalence of hypertension in the USA is higher than those in any part of Sub Saharan Africa. This difference may be due to acculturation. West Indian blacks have been acculturated far longer than the blacks of the Sub Saharan Africa. In this study, the Batswana in Gaborone District became urbanized after Botswana's independence in 1966.

5.2 LIFESTYLE FACTORS

Only 13.9% of respondents said they drink alcohol, and therefore were at risk. Alcohol is a major risk factor for hypertension, but this risk factor seems to be missing in this hypertensive group. The low frequency rate and amount of alcohol consumed could be due to the sensitivity of the question. One can speculate that perhaps it was not easy for respondents to readily admit to drinking alcohol to a health worker. Use of more two tots, 340mls beer, or 150 mls wine per day, is considered too much and, therefore, a risk factor. Studies have revealed that regular consumption of alcohol is directly associated with development of hypertension. Evidence for this has arisen from population studies (Marmot, Elliot, Shipley, Dyer, Ueshima & Beevers, 1994). The strength of this association is determined both by the quantity and the frequency of alcohol consumption (Russell, Cooper, Fronem & Welter, 1991).

Smoking was regarded as a cardiovascular risk, irrespective of frequency and amount. In this study, there was a low response rate to the question of cigarette smoking. Only 29 (18.3%) respondents could be classified as at risk. Like alcohol, cigarette smoking is a sensitive question. In Setswana culture it is embarrassing and unapproved for a woman to be seen smoking publicly. Those who smoke cigarettes, therefore, often do so in hiding. In this study women who took snuff, 23 (73%) out of 29, did not regard it as smoking. A study done at Baragwanath hospital on black South African diabetics and smokers revealed that 30% of regular snuff takers with a negative questionnaire response had a raised urine cotinine level (Gill, Rolfe, MacFarlane & Huddle, 1996), revealing covert smoking. Some international studies have shown that cigarette smoking causes marked hemodynamic

alterations (Groppeli, Omboni, Parati & Mancia 1992) that is, during smoking, there is (1) a sharp, clearcut and prolonged rise in blood pressure, (2) a sharp, clearcut and prolonged rise in heart rate and (3) a clearcut and sustained systemic vasoconstriction which includes coronary vessels (Czernin, Sun, Brunken, Bottcher, Phelps & Schelbert 1995).

Those respondents who said they ate a combination of meat and vegetables accounted for 97.5% (154) of the total. These respondents said they ate the commonly found vegetables like carrots, cabbage, pumpkin and spinach. Of these, 43.3% (68) ate vegetables twice a week, while 31.3% (49) ate vegetables everyday. Those who said they first boiled their food then proceed to fry it conprised of 67.1% (106) of the sample. The infrequency of vegetable consumption and the boiling, means that the amount of potassium found in some vegetables is destroyed by high temperatures, therefore placing respondents at risk. Studies have already argued that black subjects may have an increased sodium sensitivity and defects of membrane sodium sensitivity. This factor would be of special importance if combined with a decreased potassium intake. At least 800 mgs of potassium in the absence of renal disease is required daily. This potassium has been discovered to counteract sodium effects (Hildereth & Saunders, 1991).

Of the 98.7% (156) respondents who said they ate common fruit like oranges, apples and bananas which are rich in potassium 38.2% (60) said they eat fruit twice a week, 37.6% (49) seldom, 14.6% (23) everyday, 9.6% (15) once a week. Fruit, which is rich in potassium is eaten infrequently, placing respondents at risk.

Those respondents who said they added salt in their cooking all the time accounted for 73.1% (222) of the sample. Those who said they added salt amounted to 14.7% (23), while 12.2% (19) said they never added salt. In this study not more than five grams is allowed for daily consumption. It was revealed in the study that respondents have a risk factor for hypertension by consuming more than 5 grams of salt. This is accounted for by 48.2% (75) from a total of 98.7% (156) who said they added salt to their cooking until they tasted it, without measuring. Salt intake was also increased in the form of adding spices like stock cubes in 55.1% (76) out of a total of 65.2% (90). Salt is also added to all other dishes which are meant to taste salty like some vegetables.

An important factor is the increase of hypertension with urbanization due to many complex factors probably including dietary salt, the psychogenic stress involved, and a variety of factors including weight gain, smoking and alcohol (Hildereth &Saunders 1991). The above finding would support the high prevalence of hypertension among the respondents in this study, who have undergone urbanization.

Those who said they do not remove fat from meat prior to cooking accounted for 62.2% (103) of the respondents. The daily fat intake should not exceed 30% of daily energy intake, 10% of which is saturated fat, while 20% is monounsaturated and polyunsaturated fats which help lower blood cholesterol levels. From this study it is evident that more than 10% of animal fat is consumed as shown by 62.2% of respondents who do not remove animal fat prior to cooking. In geographical areas where the consumption of saturated fat is high, there is a higher prevalence of hypertension (Beilin, 1990). Studies have

demonstrated recently that an inverted diet with a high unsaturated saturated fat ratio tends to reduce the blood pressure (Beilin, 1990). This is why members of religious groups observing a diet poor in animal meat have lower blood pressures than do people who are not prevented from omnivorous diet (Rouse, 1983). Batswana culturally have reared livestock as a means of their livelihood – this makes meat readily available to them. The number of respondents who are strict vegetarians was only 2.5%. According to Rouse and Beilin (1990) blood pressure in vegetarians tends to increase only slightly with increasing age.

With regard to physical activity at work, 61.8% (84) of respondents said they were moderately active in their occupation, 34.5% (47) were inactive and only 3.7% (5) thought their work involved a lot of activity. At leisure, 74.1% (117) said they were moderately active, while 24.0% (38) were inactive during leisure time, and 1.9% (3) said they were active.

The low percentage of 8% responses to active under occupation and leisure, shows that most of the respondents were not involved in healthy exercise. Majority of the respondents were women with an inclination to sedentary type of jobs and 52.5% (64) from a total of 122 respondents used taxis to go to work. This could explain the lack of exercise which often leads to obesity. This study reveals that 38 (29%) women out of a total 132, had a BMI of 30 and above, signifying obesity. A study done by Kegui and Sayana (1985), on the prevalence of blood pressure in Botswana revealed that many women who were hypertensive were obese. In this study, regular aerobic exercise which can reduce systolic

pressure in hypertensive patients by about 10 mmHg is recommended. Even moderate 30-45 minutes of brisk walking for 3-5 times a week would be beneficial.

5.3 MEDICAL HISTORY

It is evident in this study that 21.2% (32) and 70% (103) respondents had family members suffering from diabetes and hypertension respectively. This is supported by a study revealing that a family history of elevated blood pressure is one of the strongest risk factors for future development of hypertension in individuals (Joshi, 1995). The blood pressure of first order adult relatives (parents and siblings) corrected for age and sex have been shown to aggregate at all levels of blood pressure with a regression coefficient of 0.2-0.3 (Whetton 1994). The mean of glucose in this study for the diabetic and the non diabetic was 4.88mmol/l. This shows the blood glucose of diabetics was under control presumably due to treatment. Lifestyle modification are important key words in the approach to the treatment of both hypertension and diabetes and it must be realised that lifestyle modification often markedly reduces blood pressure and blood glucose, and may obviate the need for long term therapy.

In this study 132 (83.5%) out of 158 respondents indicated that they consumed sugar in their coffee or tea. Apart from the fact that it has already been mentioned that coffee contains caffeine, while tea contains tannin, both of which are stimulants that raise the blood pressure, sugar contains calories that only add to weight gain.

The respondents' total cholesterol results showed normal cholesterol, with a mean of 4.79 mmol/l. This showed that this risk factor appeared to be missing in the respondents who were obese, even though the two are usually found together. These results could be due to lifestyle modification, however a study done by Steyn et al. (1986), which looked at the lipid and lipoprotein profile of the South African population of the Cape Peninsula showed low total and mean total cholesterol levels in blacks as compared to coloureds, whites and Indians. This could also be true of Batswana, whose country is in close proximity to South Africa and its influence, to some extent, in terms of lifestyles.

In 50% of respondents there was a habit of buying medications over the counter such as cough mixtures which contain liqourice and comprals which contain caffeine. This could aggravate the hypertension already in existence. According to McCleod (1984) large quantities of liquorice may develop raised blood pressure accompanied by sodium retention and potassium.

The highest percentage 60.3% (74) out of a sample of 131 were women who once took contraceptives then stopped; 7.6% (10) were still on contraceptives and 32.1% (42) had never been on contraceptives. It has been stated that contraceptives contribute to the incidence of hypertension among different women because of its oestrogen & progesterone contents (Porth, 1994). Fortunately, the hypertension associated with oral contraceptives usually disappears once the drug has been discontinued, although it may take as long as 6 months for this to happen. However in some women, the blood pressure may not return to

normal; they may be among the population at risk for developing hypertension (Porth, 1994).

5.4 RECOMMENDATIONS

5.4.1 For Nursing

Professional nurses need to integrate Primary Health Care to their practice. In their role as curative and rehabilitation nurses, they not only through technology and theoretical expertise restore clients' lives to as normal as possible, but also have to prevent the complications of hypertension.

Rehabilitation starts in the curative setting, even though the patient may be too ill to be stimulated, establishing rapport with the family from the beginning makes an opening for teaching and referring to other collaborative sectors concerned with health care.

To reduce the risk of mortality, morbidity or progression of the disease should be the task of the practising nurse when patients are highly motivated to change. According to Oldridge, Guyatt, Fischer and Rimm (1988), many patients are willing to consider behaviours in the period soon after their cardiac event, in other words they are willing to comply to life style modification in order to avoid recurrence of the attack.

Measures which have been shown to lower blood pressure include weight reduction, reduction of alcohol intake, increased physical activity and moderation of dietary sodium. Concurrence of other risk factors like smoking and raised serum cholesterol will augment

and accelerate organ damage. The client needs to be urged to alter his/her lifestyle in this regard.

The practicing nurse needs to be knowledgeable and should recognise it as her/his major role in education and lifestyle modification planning. The nurse also needs to critically evaluate the level of awareness, knowledge, motivation, skills and maintenance of healthy lifestyle changes in his/her clients.

Educating the patient about the heart's anatomy and physiology, hypertensive disease process, as well as about the risk factors related to blood pressure is a good place to start to reinforce behavioural changes. It is especially important to target women who attend clinics, to teach them nutrition and diet preparation, Advising them on selection of low fat and low salt products would help towards modifying the lifestyles of their children and spouses.

The high incidence of hypertension among close families seems significant enough to be presented as a case for recommending that persons from so called high risk families be encouraged to participate in hypertension screening programmes - including children from such families.

The nurse, in his/her capacity as a patient advocate, is in a unique position to monitor information received by the patient and his family on motivation, values, beliefs and

support systems, and to initiate educational programmes, individually, in groups, or self instructional programmes.

Population Approach to Self Management

Patients must take responsibility for carrying out behavioural changes, especially those related to lifestyle. Billings (1989:71) suggests that successful change requires that the patient do the following:

a. Understand the self management process and have the cognitive and physical skills necessary to carry it out.

b. Believe that behavioural change related to risk factors is necessary.

c. Make a conscious decision to adopt the necessary change.

d. Remember the importance of the change when temptation occurs.

He concluded that the benefits of rehabilitation can never be achieved if the patient:

a. does not consider the behaviour to be of value.

b. does not adopt them.

c. does not comply with or adhere to them long enough to gain the perceived or actual benefit.

It is for this reason that a programme success or failure can depend on the leaders ability to motivate and educate the participant. Programmes leaders should focus attention not only on the participant but on those with whom a person relates most directly providing counselling sessions as well as educational sessions.

5.4.2 Specific Recommendations for Botswana

The hypertension control programme that the researcher would recommend for both Botswana's rural and urban areas would aim at looking at a sparse young population – in a developing country, with limited resources, that needs a healthy nation to build it. The programme would involve disseminating in. ıation on hypertension and its risk factors, at primary health care level, in order to prevent end points of hypertension complication. For those in advanced stages of hypertension, the rehabilitation process would mean more than educating the person at the time of discharge; it would involve assisting the patient in their rehabilitation from the moment of admission to the health care system and extends beyond discharge.

According to Botswana's philosophy of health policy, the health care system of Botswana shall be based on the principles of Primary Health Care as contained in the Alma Ata Declaration of 1978. This requires that all involved health professionals including the intensive nurse collaborate on research planning, implementing and evaluation of a programme.

Once the health professional have assessed the allocated resources, the consumer of learning, teacher learner characteristics and decided which health professionals will be participating in the programme, the clinics that cater for hypertensives should be assessed for space (whether there are any rooms that can be converted to classrooms). What buildings (Red Cross, schools, churches, community centers, hotels, libraries) can be used as resource centres?

An appropriate use of communication, for example, media coverage, meetings of pressure groups like Young Women Christian Association, "Emang Basadi", which are patronised by women - and community centres, would be a good place to start. Dissemination of illustrative brochures to describe the programme and its objectives would be most effective. The patients can be allocated time to attend clinic, preferably very early in the morning, and be given talks while waiting to be seen. The programme should involve teaching beneficial exercise to the community or raising awareness on the benefits of brisk walking, learning about the benefit of good nutrition, and what it should be, using illustrations. Some health spa's are engaged in fitness education but because it entails fee paying, exercise groups and/or walk for life groups are some beneficial programmes that can be initiated by some pressure groups or clinics.

It is of interest to know that the traditional health system in Botswana is still an integral part of the Setswana cultural values and traditional beliefs. It is also a fact of life that many Batswana still consult traditional medical practitioners, and only come to modern health care when the disease has progressed. It is widely acknowledged that while modern scientific medicine is excellent at diagnosing and treating somatic or physical problems, its management of problems arising from a combination of psychological and cultural factors can be quite limited. There is therefore a belief that traditional medicine plays a big role in managing these kinds of conditions, usually referred to in modern medicine as neuroses manifestations, like chronic back pain, palpitations and others like headaches. The challenge here will be to find a way of harnessing this potential contribution of traditional medicine (Botswana National Health Policy, 1995). By inviting the practitioners to acquire

a better understanding of hypertension, it may thereafter be hoped that they can channel these patients with hypertension to the modern healthcare for management, instead of trying to 'treat' them.

Evaluation should be an ongoing process whereby the total programme effectiveness is determined, such as active pursuit of mortality and morbidity statistics. Staff will benefit from continuing education and upgrading in the form of attending conferences, workshops and seminars.

5.4.3 Recommendation for Research

- More exploratory research needs to be done on how to motivate the population for healthy life styles at grass root levels e.g. schools, homes and the workplace.
- Efforts must be concentrated on studying mechanisms by which industries can manufacture foods low in salt content, fat, preservatives and making these more available in stores, for consumption by those who are already motivated or keen to improve their lifestyles.
- Fewer men attended the clinic as compared to women. Studies need to be done especially in the African settings, to determine why men are poor health consumers and how they can be motivated.

5.5 CONCLUSION

This study has revealed that modifiable risk factors for hypertension are present in the clients residing in Gaborone district, and that high salt intake, accompanied by low potassium intake in the form of fresh vegetables and fruit, high fat consumption from animal meat, lack of exercise and various stressors of life are the most contributory factors. Since risk factors interact synergistically to increase the risk of hypertension, every effort must be made to reduce these at grass root level. For this to be effective, rigorous, comprehensive primary programmes need to be established as well as rehabilitation for those already afflicted to reduce on going risk in order to retard the progressive damage of hypertension.

In order to screen high risk individuals and institute prevention measure before secondary prevention, screening programmes to identify modifiable and non modifiable high risk factors can be instituted in worksites, schools, and through campaigns. For example, children of hypertensive parents can be screened at an earlier age through education on lifestyle modification. Community based programmes can go a long way in assisting people to modify their lifestyles for the better.

The fact that this study yielded a low percentage of subjects that have suffered complications of high blood pressure like renal failure and cardiovascular accidents, makes this a captive population for education cn how to manage their hypertension and avoid complications.

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APPENDIX I

CLIENT NO:

DATE:

RESEARCH INTERVIEW

PART I: BIOGRAPHICAL DATA

PLEASE FILL IN THE BLANKS AND TICK WHERE APPLICABLE.

1. **SEX**

Female
Male

2. **AGE**

3. **RACE**

Black	White

4. **MARITAL STATUS**

Married
Widowed
Single
Divorced
Cohabiting

5 **BODY MASS INDEX**

PART II: SOCIO ECONOMIC FACTORS

6 **EMPLOYMENT**

Employed by employer
Not employed
Self-employed
Housewife

Scholar
Looking for work

7 PRESENT OCCUPATION

8 MONETARY INCOME

<P500
P500-1000
P1000-2000
P2000-3000
P3000-4000
P4000-5000
P5000-& Above

9 LEVEL OF EDUCATION

Never been to school
Primary education
Junior certificate
Senior certificate
University graduate
Post graduate

10 AREA OF RESIDENCE

Urban
Rural

11 HAVE YOU EVER MOVED FROM

Rural to urban
Urban to rural
Never moved

12 IF MOVED, DID YOU NOTICE ANY CHANGE IN YOUR LIFESTYLE

YES	NO

13 IF YES, *Is it*

More difficult in urban

Less difficult in urban
More difficult in rural
Less difficult in rural
Same in rural and urban
Do not know

14 TYPE OF DWELLING

Renting
Owned

15 IS IT MADE OF

Mud and thatchded roof
Bricks&corrugated iron
And/ot tile roofing

16 IS THE HOUSE

Electrified
Non electrified

16.1 SANITATION

Pit latrine
Flushed toilet

16.2

Running water
Standpipe water
Other specify

PART III: LIFESTYLE FACTORS.

17 DO YOU DRINK ALCOHOL

YES	NO

18 IF YES

HOW OFTEN DO YOU DRINK

Once a week	Twice a week	Three times a	Every day	Weekend only	Occasionally

		week			

19 **HOW MUCH DO YOU DRINK**

> tots /standard drink
< tots

20. **DO YOU SMOKE TOBACCO/SNUFF**

YES	NO

21 **TYPE**

Cigarette	Pipe	Rolled tobacco	Snuff	Other

DIET AND PREPARATION

22 **ARE YOU A VEGETARIAN**

No
Strict

23 **WHAT VEGETABLES DO YOU EAT**

Carrots
Cabbage
Pumpkin
Spinach
Other (specify):

24 **HOW OFTEN DO YOU EAT VEGETABLES**

1Xweek	2x a week	Every day	Seldom

25 **DO YOU EAT FRUIT**

YES	NO

26 **IF YES, WHAT FRUIT DO YOU EAT**

Orange	Apples	Bananas	Other (specify) :

27 **HOW OFTEN**

Every day	Once a week	Twice a week	Seldom

28 **WHAT TYPE OF MEAT DO YOU FREQUENTLY EAT**

Red meat
Poultry
Any other specify :

29 **HOW OFTEN**

Meat	1x a week	2x a day	3x a week	Every day	Seldom
Chicken	1x a week	2x a day	3x a week	Every day	Seldom
Any other specify	1x a week	2x a day	3x a week	Every day	Seldom

30 **DO YOU REMOVE VISIBLE FAT FROM MEAT PRIOR TO COOKING**

YES	NO

31 **HOW DO YOU PREPARE YOUR MAIN MEAL**

Boil
Fry
Combination of both

32 **HOW OFTEN DO YOU FRY FOOD DURING COOKING**

All the time
Sometimes
Never

33 **WHAT TYPE OF FAT DO YOU USE FOR COOKING**

Saturated fats e.g. Animal fat
Polyunsaturated e.g vegetable oils

34 **HOW OFTEN DO YOU ADD SALT DURING COOKING**

All the time
Sometimes
Never

35 **HOW MUCH SALT DO YOU ADD**

Teaspoon tip
1 teaspoon
Until tasted

36 **HOW OFTEN DO YOU ADD SALT AT TABLE**

Always
Sometimes
Never

37 **DO YOU ADD SPICES TO FOOD WHEN COOKING**

Yes	No	Sometimes

38 **WHAT SPICES DO YOU ADD COOKING**

Stock cubes
Chillies
Other spices (specify)

39 **WHAT BEVERAGES DO YOU PREFER TO DRINK**

Tea
Coffee

33 **WHAT TYPE OF FAT DO YOU USE FOR COOKING**

Saturated fats e.g. Animal fat
Polyunsaturated e.g vegetable oils

34 **HOW OFTEN DO YOU ADD SALT DURING COOKING**

All the time
Sometimes
Never

35 **HOW MUCH SALT DO YOU ADD**

Teaspoon tip
1 teaspoon
Until tasted

36 **HOW OFTEN DO YOU ADD SALT AT TABLE**

Always
Sometimes
Never

37 **DO YOU ADD SPICES TO FOOD WHEN COOKING**

Yes	No	Sometimes

38 **WHAT SPICES DO YOU ADD COOKING**

Stock cubes
Chillies
Other spices (specify)

39 **WHAT BEVERAGES DO YOU PREFER TO DRINK**

Tea
Coffee

Fizzy Drinks
Fruit drinks
Other (specify):

40 **DO YOU ADD SUGAR TO YOUR TEA COFFEE**

YES	NO

41 **IF YES, HOW MANY TEASPOONS**

1	2	3	4	5	6 &above

ACTIVITY

42 **IN YOUR OCCUPATION ARE YOU?**

Inactive	Mod.Active	Active

43 **DURING LEISURE TIME ARE YOU?**

Inactive	Mod. Active	Active

44 **HOW DO YOU TRAVEL TO WORK**

Taxi or bus
Own car
Walk
Other (specify):

RATE ON THE STRESS SCALE 1-10

45 **YOUR MAIN STRESSORS/CONCERNS IN DAILY LIVING:**

1. JOB	1	2	3	4	5	6	7	8	9	10
2. SPOUSE	1	2	3	4	5	6	7	8	9	10
3. CHILDREN	1	2	3	4	5	6	7	8	9	10
4. FINANCES	1	2	3	4	5	6	7	8	9	10
5. PERSONAL HEALTH	1	2	3	4	5	6	7	8	9	10
6. SEX	1	2	3	4	5	6	7	8	9	10
7. OTHER (SPECIFY):	1	2	3	4	5	6	7	8	9	10

46

HOW DO YOU COPE WITH STRESS > 5 RESPONSES IS CONSIDERED ABLE TO COPE

1.Healthy eating
2.Adequate rest
3.Exercise
4.Attain self knowledge
5.Effective communication
6.Learn assertiveness
7.Positive thinking
8.Problem solving
9.Goal setting
10.Time management
11.Other specify

PART IV: MEDICAL HISTORY

47 **DO YOU SUFFER FROM DIABETES**

NO	YES

48 **IF YES, NO. OF YEARS**

49 **PRESENT BLOOD SUGAR LEVEL**

50 **TREATMENT**

Diet	Oral Hypoglycaemic	Insulin

51 DOES ANYBODY IN THE FAMILY SUFFER FROM DIABETES

Yes
No
Unknown

52 IF YES, IS IT

Father
Mother
Sibling

53 DO YOU SUFFER FROM HYPERTENSION

YES	NO

54 IF YES NO. OF YEARS

55 CURRENT B.P.

TREATMENT

56 DOES ANYBODY IN THE FAMILY SUFFER FROM HYPERTENSION

YES	NO	UNKNOWN

57 IF YES, IS IT

Father
Mother
Sibling

58 WHAT IS YOUR TOTAL CHOLESTROL LEVEL

59 DO YOU HAVE A HISTORY OF CARDIOVASCULAR DISEASE

YES	NO

60 DO YOU HAVE A HISTORY OF RENAL DISEASE

YES	NO	DON'T KNOW

YES	NO	DON'T KNOW

61 DO YOU BUY OVER THE COUNTER MEDICATIONS?

YES	NO	SOMETIMES

62 IF YES, SPECIFY WHICH

1	2
3	4

63 ORAL CONTRCEPTIVES

YES
NEVER
NO

STOPPED

64 MENOPAUSE

YES
NO

65 IF YES ARE YOU ON ANY ESTROGEN REPLACEMENT

YES
NO

66 **DO YOU HAVE ANY PREVIOUS HISTORY OF HYPERTENSION IN PREGNANCY**

YES	NO

APPENDIX II

G19 West Campus Village
Witwatersrand University
2050

Dear Sir/Madam,

RE: CONDUCTION OF RESEARCH AT EXTENSION II CLINIC GABORONE

I am at present undertaking a Masters in Nursing degree (Intensive Care) at the University of Witwatersrand. As partial fulfilment of the degree, I am required to submit a research report.

My proposed title is Description of the presence of established modifiable risk factors for hypertension amongst the diagnosed hypertensives in the Gaborone District of Botswana. I intend to conduct this research between June and December 1998.

To observe protection of human rights, I intend to assure participants of confidentiality and anonymity. They may withdraw or have a right to refuse participation which will not affect their treatment. They will be requested to give their informed written consent. The interview will take about 45 minutes for each person in their own language and will be accompanied by a pinprick to obtain a drop of blood to test for total cholesterol.

Should you require more information I will be very willing to come and discuss this with you. You will be supplied with a copy of the proposal as soon as it is finished.

I hereby request your permission to conduct this research.

Yours sincerely,

Janet Kuhlmann

PATIENT INFORMATION LETTER

ANNEX II

G19 West Campus Village.
Witwatersrand University.
2050.

RE: Requesting clients to be included in the study

My name is Janet Kuhlmann. I am at present undertaking a Masters Degree at the University of Witwatersrand. To complete this degree, I am required to submit a research report.

I wish to request for your permission to participate for about 45 minutes, in allowing me to ask you some questions, measure your height and weight - then finally perform a pin prick on your finger, to obtain a drop of blood in order to determine your blood sugar and cholesterol. The outcome of this study will assist in the dissemination of hypertension control and prevention, in the community, by the health care workers.

I wish to inform you that you are not forced to participate in this study. Should you decline, this will not affect you treatment at the clinic in any way.

Your decision to participate in this endeavor will be highly appreciated.

Thank you,
Your sincerely

Janet Kuhlmann

INFORMED CONCENT

I hereby give Ms J. Kuhlmann to ask me some questions, measure my height and weight, then take a drop of blood from my finger using a pin prick,to determine my blood sugar and cholesterol.

I am quite aware that Iam not forced to participate in this study and that I may withdraw at any time.

Your sincerely

APPENDIX V

TELEPHONE:
FAX:
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD
REFERENCE:

MH 13/18/1

REPUBLIC OF BOTSWANA

MINISTRY OF HEALTH,
PRIVATE BAG 0038,
GABORONE.

08 June 1998

Janet Kuhlmann
G19 West Campus village
Witwatersrand University
2050
Pretoria
South Africa

Dear Kuhlmann

Grant of a Research Permit: J. Kuhlmann

Your application for a research permit refers.

We are pleased to inform you that you have been granted permission to conduct research on **"Description of the presence of established modifiable risk factors for hypertension among Batswana in Gaborone."**

The permit does not give authority to enter any premises, private establishment or protected area without permission of concerned parties. Such permission should be negotiated with those concerned. You may also need to request permission from other relevant authorities, i.e. Ministry of Local Governemnt Lands and Housing, (PHC), Local District Health Team, etc.

You are also requested to submit at least one copy of the findings of your study to the Ministry of Health, Health Research Unit.

Yours sincerely

Enock Ngome / For PS.
Tel: 357300

PERMANENT SECRETARY
MINISTRY OF HEALTH
OFFICIAL FREE
1998
P/BAG 0038 GABORONE
REPUBLIC OF BOTSWANA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

APPENDIX VI

Division of the Deputy Registrar (Research)

COMMITTEE FOR RESEARCH ON HUMAN SUBJECTS (MEDICAL)
Ref: R14/49 Kuhlmann

CLEARANCE CERTIFICATE PROTOCOL NUMBER M980522

PROJECT A Description Of The Established Modifiable Factors For Hypertension Amongst Adult Batswana In Gaberone District

INVESTIGATORS Miss J Kuhlmann

DEPARTMENT Dept of Nursing Education, Inst. of Health Sci. Gaberone

DATE CONSIDERED 980529

DECISION OF THE COMMITTEE *

Approved unconditionally

DATE 980601 CHAIRMAN .....(Professor P E Cleaton-Jones)

* Guidelines for written "informed consent" attached where applicable.

c c Supervisor: Mrs J Bruce
Dept of Dept of Nursing Education, Wits Medical School

WorksZNam0015\HumEth97.wdb\M 980522

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DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and ONE COPY returned to the Secretary at Room 10001, 10th Floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

DATE .....SIGNATURE .....

PROTOCOL NO.: M 980522

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX VII

Gaborone City Council
Private Bag 0089
Gaborone

REF: GCC/R/17

10 June 1998

Ms Janet Kuhlmann
P.O. Box 403270
Gaborone

Dear Sir/Madam

CONDUCTION OF RESEARCH AT EXTENSION II CLINIC

I thank you for your letter dated 2nd June 1998 in which you requested for permission to do research at Extension II Clinic.

Madam you are most welcome and I presume you will abide by all conditions as laid down in your correspondence meaning the essence of confidentiality, patients written consent and so forth.

Hypertension in Botswana is so common and I do not think patients are well treated due to late diagnosis and treatment approach.

Finally I have been fascinated by your clause that says we will be supplied by a copy of the proposals emerging from the research exercise because this is not always done.

Good luck.

Yours faithfully

(M. B. Maswabi)

Author Khulmann J
Name of thesis A Description Of The Established Modifiable Risk Factors For Hypertension Amongst Adult Batswana In The Gaborone District Khulmann J 1999

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