FACTORS INFLUENCING ADHERENCE TO RECOMMENDED LIFESTYLE-MODIFICATION AMONGST HYPERTENSIVE CLIENTS AT MALAMULO HOSPITAL THYOLO

M.S.C. (ADULT HEALTH NURSING) DISSERTATION

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APRIL, 2019

DECLARATION

I, **Ndaona Kamanga-Chitani**, hereby declare that this thesis is my original work and that I have not submitted the whole of it or any part for any degree at any other University within or outside Malawi. Work of other people in this thesis has been acknowledged appropriately.

Ndaona Kamanga- Chitani

_____

_____

Signature

17th April, 2019

Date

Certificate of Approval

The undersigned certify that this represents the student's own work and effort, and has been submitted with our approval.

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Chriford Mandayachepa Nyando PhD, RNM Date

Main Supervisor

_____

_____

Mary Mbeba, PhD, RNM Date

Co-Supervisor

Dedication

I dedicate this work to my husband, Happy Chitani; son, Alexander Chitani, and mother Dorothy Kamanga. This is truly a product of your great perseverance, support and encouragement.

ACKNOWLEDGEMENTS

I am grateful to God for His mercies bestowed upon me throughout the study period. My sincere appreciation to my family for your prayers and moral support during the time the academic pressure surmounted me.

I am also sincerely thanking my research supervisors, Dr. Mandayachepa Chriford Nyando & Associate Professor Mary Kachingwe-Sisya Mbeba, lecturers at the University of Malawi, Kamuzu College of Nursing; for their guidance, critique and inspiration during my research journey.

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I am also grateful to Global Aids Interfaith Alliance (GAIA) for granting me the scholarship without which I wouldn't be able to achieve my goals.

ABSTRACT

Back ground: Adherence to recommended lifestyle modification regarding hypertension control remains a serious problem despite widely publicized hypertension treatment guidelines and lifestyle modification recommendations. As such, blood pressure control is still poor in Malawi.

Objectives: This study examined factors that influence hypertensive clients' adherence to recommended lifestyle modification at Malamulo hospital, Thyolo.

Methodology: It was a descriptive quantitative study. Data was collected through face-to face interviews with 108 clients, using a structured questionnaire. Systematic random sampling was used to recruit respondents into the study. Statistical packages for the social sciences (SPSS) version 22 was used for descriptive analysis; and logistic regression for multivariate data analysis.

Results: Results showed knowledge rate of 92%, and adherence rate of 53.8%. Multivariate analysis of significant variables, in a logistic regression model, indicated that having *family support* was found to be nearly 5 times more likely to facilitate adherence to recommended lifestyle modification than in cases where families were not involved in the care of their clients *(OR = 4.587, 95% CI: 1.625, 12.947).* Having *support groups* was also found to be 4 times likely to facilitate adherence compared to situations where there were no support groups (*OR = 4.043, 95% CI: 1.496, 10.926)*. The study also revealed that *poor provider-client relationships* were also found to be nearly 5 times more likely to hinder adherence as compared to cases where provider-client

relationship was good *(OR = 4.653, CI: 1.633, 13.256).* Furthermore, *being away from home* was found to be nearly 3 times more likely to hinder adherence as compared to cases where clients are at home *(OR = 2.783, CI = 1.042, 7.734).*

Conclusion: patients demonstrated adequate knowledge on recommended lifestyle modification. However, their practices were found to be poor.

Recommendations: There is need for encouraging family support, improving provider-client relationships and emphasizing on the importance of modifying lifestyles at Malamulo Hospital in order to facilitate adherence behaviors amongst clients.

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Friday, January 27, 2017

Ndaona Chitani

Kamuzu College of Nursing

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Lilongwe

Dear Ndaona Chitani,

ACCEPTANCE LETTER TO CONDUCT A RESEARCH AT MALAMULO HOSPITAL - HYPERTENSION CLINIC

Malamulo Hospital is happy to inform you that the ADCOM has approved your request of conducting a hypertension research at its hospital from February to March 2017.

Please be informed that after your research, the hospital shall need a copy of your research.

Thanks in advance for your service, we hope the catchment area and our hospital will benefit much from your service.

Thank you

MALAMULO HOSPITAL
MEDICAL DIRECTOR
MAKWASA, MALAWI

Dr. A. Fekadu, MD,FCS (ECSA)

MEDICAL DIRECTOR

Cc : The Human Resources Manager

File

A SEVENTH-DAY ADVENTIST MEDICAL INSTITUTION

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Abbreviations and Acronyms

BP:	Blood Pressure
COMREC:	College of Medicine Research Ethics Committee
CVA:	Cerebro-vascular Accident
DASH:	Dietary Approaches to Stop Hypertension
ESRD:	End-stage Renal Disease
HTN:	Hypertension
KCN:	Kamuzu College of Nursing
KCN-RPC:	Kamuzu College of Nursing- Research Publications Committee
NCDs:	Non-communicable Diseases
NHANES:	National Health and Nutrition Examination Survey
OPD:	Outpatient Department
RPC:	Research Publications Committee
SPSS:	Statistical Package for the Social Sciences
SLA:	Service Level Agreement
SSA:	Sub-Saharan Africa
STEPS:	Step-wise Approach Survey
USA:	United States of America
WHO:	World Health Organization

Definition of Operational Words

Lifestyle modification: a behaviour and an attitude that requires self-motivation, self-determination and dedication in order to change the risky predisposing lifestyles and to achieve the blood pressure control

Adherence: the extent to which a client's behavior corresponds with recommendations from health care providers

Non-Communicable disease: a chronic medical condition or disease which is caused by genetic or lifestyle factors

Hypertension: an abnormally high arterial blood pressure that is usually indicated by an adult systolic blood pressure of 140mmHg or greater or a diastolic blood pressure of 90mmHg or greater

Chapter 1

Introduction and Background

Introduction

Hypertension is a recognized risk factor for stroke, chronic kidney disease, coronary heart disease, and heart failure; and a leading cause of death and disability worldwide. Its incidence has drastically increased during the past decades. If not well controlled, hypertension leads to long-term health consequences.

Research indicates that hypertension is the number one cause of high morbidity and mortality in the adult population world-wide (Pires, Sebastião, Langa & Nery, 2013). The total number of hypertensive clients in SSA was estimated at 16.2 % approximating to 75 million in 2008; and projected at 125.5 million by 2025 (Twagirumukiza et al., 2011). To prevent and control the burden which is fast increasing, World Health Organization recommended comprehensive treatment of hypertension which includes provision of health education on adherence to medication and lifestyle modification (WHO, 2010). Lifestyle modification is the first most significant step in the management of hypertension and it includes adoption of DASH diet, reducing salt and sodium intake, cessation of smoking, moderation of alcohol intake, exercises and weight control (Alsaigh, Alanazi, Alkahtani, Alsinani et al., 2018). It is regarded as the first-line treatment in clients who are not on pharmacotherapy and an adjunct to drug therapy in clients who are already on therapy. In highly motivated clients, lifestyle modification can lead to well-controlled hypertension which may subsequently lead into drug step-down or treatment withdrawal (Alsaigh, Alanazi, Alkahtani, Alsinani et al., 2018).

Following a Step-Wise Approach Survey which was conducted in Malawi in the year 2010, health education on lifestyle modification regarding hypertension control has been provided in many Malawian hospitals in order to engage clients and promote adherence behaviors. Despite the continuous provision of health education to clients on behavioral modification, evidence has shown that there is still poor blood pressure (BP) control in Malawi (Chingatichifwe, Dodge, Chideme-Munodawafa, Mwale, & Bvumbwe, 2014; Mbeba & Ehlers, 2017). Literature has proposed several explanations for diverging poor BP control, for example pressing effects of anti-hypertensive drugs, inappropriate drug prescription and poor adherence to treatment (Alsaigh, et al., 2018; Mbeba & Ehler, 2017). Evidence also suggests ways to address issues of side effects of anti-hypertensives, inappropriate prescriptions, and poor adherence to pharmacotherapy in Africa including in Malawi (Alsaigh, et al., 2018; Chingatichifwe, et al., 2014; Mbeba & Ehlers, 2017). However, literature is scanty on factors influencing adherence to lifestyle modification, as part of comprehensive treatment of hypertension. This may be one major reason why hypertension control is still poor. This study therefore, aims at examining factors that influence adherence to recommended lifestyles modification regarding hypertension control.

Background

The comprehensive treatment of hypertension involves lifestyle modification which includes dietary changes, weight control, exercise and medication.

Lifestyle modification has proved to be significant in the successful control and treatment of hypertension, and it involves making specific behavioral changes (Katena, Maradzika, & January, 2015). Its programs target reinforcement of adherence to drugs,

eating habits, weight control and exercises (Middleton, 2009). Lifestyle modification approaches that focus on enjoyment, instilling a sense of competence in clients and social interaction are associated with greater participation in treatment and positive treatment outcomes.

Hypertension is responsible for 13% of total deaths, and 62% of all stroke deaths and disability Worldwide (Mensah, 2008). Evidence shows that out of all the treated hypertensive patients in the USA, only 30% manage to control their blood pressures, which is contrary to their target of at least 50% control rate (Gerin et al., 2007). Recently, the 2017 ACC/AHA and JNC7 report has indicated that hypertension prevalence amongst adult population in the United States was 45.6% (Muntner et al., 2018). Likewise, 45% of adult population in Bangladesh and India, as of 2011, was hypertensive, with 40% of them being who aware of their diagnosis and only 10% adhering to treatment (Hussain, Boonshuyar, & Ekram, 2011).

The national-wide survey conducted in China from 2012 to 2015 indicated that 23.2% of adult population was hypertensive (Wang et al., 2018). The survey also indicated that despite the increase in treatment and control of hypertension almost 60% of clients taking anti-hypertensives remain uncontrolled. Use of lifestyle modification was hence encouraged to achieve a significant percentage of clients with controlled hypertension.

The Sub-Saharan African (SSA) region is geographically drawn apart from Northern Africa by the Sahara desert and includes 47 countries. According to the United Nations Population Division, its mid-2008 population was around 809 million, representing 83.6% of the total African population and 12% of the world Population. In

the SSA, the prevalence of hypertension as of 2008 was estimated at 16.2 % approximating to 75 million people (Twagirumukiza et al., 2011) while the overall prevalence of hypertension as adjusted to World Health Organization (WHO) standard population is 23.3%. These statistics translate in high morbidity and mortality, and are being consistent with an argument that hypertension is the number one cause of death in the adult population world-wide (Pires et al., 2013).

In Angola, hypertension has also been a public health problem (Pires et al., 2013). It was estimated that as of 2013, the prevalence in Angola was at 23% while pre-hypertension prevalence was at 44.8% (Pires et al., 2013). It was also revealed that 83% of the known hypertensive patients admitted to have received health education on non-pharmacological management of hypertension although only few managed to adhere to them. It is therefore necessary that countries should invest more in hypertension prevention and control through the re-enforcement of non-pharmacological measures to prevent fatal and costly hypertension-related complications.

Like in other countries of SSA region, Malawi is also facing the overlapping epidemics of the Non-Communicable Diseases (NCDs) including hypertension. The WHO summary shows that in Malawi, non-communicable diseases especially hypertension, are increasingly becoming a significant cause of morbidity and mortality in adults and is thought to be the second leading cause of deaths (Government of Malawi et al., 2010). The WHO Stepwise approach (STEPS) survey conducted in Malawi indicated that a total of 32.9% of individuals aged 25–64 years were hypertensive and the majority of those people with hypertension approximating at 93.3% were unaware that they had it (Ministry of Health, 2010). It was therefore recommended that health facility and

community based programs for treatment, prevention and control of hypertension be implemented urgently. Following recommendations from the STEPS survey of 2010, Malawi adopted significant advanced measures in the management of hypertension including provision of health education on behavioral and lifestyle modification as a secondary preventive measure. In 2013, Chingatichifwe et al., conducted a study to explore adoption of healthy lifestyle for secondary prevention of stroke, diabetes and hypertension among clients receiving treatment at Mzuzu central hospital (Chingatichifwe et al., 2014). Results indicated that the majority (85.7%) of the patients had received health education on NCDs including stroke, diabetes and hypertension even though they failed to mention and practice the recommended healthy lifestyle as regards to the prevention of the NCDs and their complications. Unpublished data from Malamulo Hospital also shows that between the months of June 2015 and December 2016 at least 55 clients, approximately 11 % of all hypertensive clients, have already developed hypertension-related complications although they have been on treatment and received health education on adherence.

This implies that despite routine and regular lifestyle modification education in Malawi and at Malamulo hospital specifically, there is still poor control of hypertension which may be due to poor adherence to lifestyle modification as a result of incomprehensive treatment of the condition. Literature on factors that influence hypertensive clients' adherence to lifestyle modification in Malawi is scanty. This study therefore, aims at examining factors that influence hypertensive clients' adherence to lifestyle modification regarding hypertension control at Malamulo hospital.

Problem Statement

There is poor control of blood pressure in Malawi. Evidence also shows that there is poor adherence to comprehensive treatment of hypertension which includes, pharmacotherapy and lifestyle modification (Chingatichifwe et al., 2014, Mbeba, et al., 2017). Further, unpublished data from Malamulo hospital has shown that approximately 11 % of hypertensive clients at Malamulo have developed serious hypertension complications within a period of 18 months despite being given routine health education on treatment compliance and lifestyle modification. A lot has been researched on factors influencing adherence to antihypertensive medication; whilst literature on factors influencing adherence to lifestyle modification regarding hypertension control is scanty. It is necessary that a study be conducted to examine such factors with the aim of promoting adherence to recommended lifestyle modifications hence facilitating comprehensive treatment of hypertension.

Rationale of the Study

People who do not adhere to prescriptions are likely to develop costly and fatal complications. It is therefore important to assist clients to adhere to lifestyle changes so that the development of such complications is prevented. This can only be possible if the influencing factors are known.

Study results will help in the provision of holistic comprehensive management of hypertension hence reducing the hypertension burden.

Results will also help health workers to assist in arousing clients' interest, enjoyment and competence when practicing lifestyle modification thereby increasing

their adherence hence preventing the development of complications and improving long-term treatment outcomes.

Prevention of hypertension complications and disabilities is also beneficial to the country's economy as financial resources intended for managing the complications will be used to cater for other necessary services.

Locally, hospital managers will be able to find the basis for addressing the systemic factors that contribute to poor adoption and adherence to lifestyle modification hence preventing the development of fatal complications and disabilities in the clients.

Aim and objectives

Aim.

The aim of the study is to examine factors that influence hypertensive clients' adherence to recommended lifestyle modification regarding hypertension control at Malamulo hospital.

Study objectives.

i. To assess client's knowledge on lifestyle modification
ii. To assess clients' practices on recommended lifestyle modification
iii. To identify factors facilitating lifestyle modification adherence
iv. To identify barriers associated with adherence to recommended lifestyle modification

Chapter 2

Literature Review

Introduction

This chapter reviews literature related to factors influencing adherence to lifestyle modification amongst hypertensive clients. Relevant studies on knowledge, practices and influencing factors of adherence were reviewed.

Literature Search

Literature from Malawi, Africa and other parts of the world was reviewed, analyzed and synthesized using computer electronic database in Pub-Med line, Hinari, EBSCO host, African Journals on-line, Cochrane library and Google Scholar web sites. After identifying a topic, relevant information was searched using a computer assisted and electronic databases. These were used because they offer access to vast quantities of information, retrieved more easily and quickly than manual search. In addition to that, a manual literature search was also conducted at Kamuzu College of Nursing library from different books, National Health Survey reports, and World Health Organization publications to ensure a comprehensive literature search. Peer reviewed articles were also selected deliberately to ensure quality articles were included in this study. The researcher only selected English peer reviewed articles from 2007 and above to ensure scientific evidence relevant to current best practices on lifestyle modification is gathered.

Key words used in the literature search were: Hypertension, Adherence, “Lifestyle modification”, “Adherence AND lifestyle-modification”, “health education AND adherence” and “hypertension AND lifestyle modification”. The articles selected

were those with information on knowledge, practices and other factors influencing adherence to lifestyle modification.

Worldwide Magnitude of Hypertension

Hypertension continues to be a public health problem and a burden globally, and its prevalence has drastically increased over the past decade. It is ranked the third largest killer in the world, with one person in every 8 people worldwide dying from hypertension annually (Khatib et al., 2014). The global number of adults with hypertension as of 1998 was estimated at 972 million adults, and predicted to increase to 29 % by 2025 (Khatib et al., 2014). The National Health and Nutrition Examination Survey (NHANES) of 2005-2006 also showed that every 1 in 3 adults in the United States of America had hypertension. Ostchega, Yoon, & Hughes (2008) interpreted that the above proportion would be estimated at 29% of the total adult population to be hypertensive. However, despite the availability of effective treatment, most of the hypertensive clients worldwide do not adhere to hypertension advice and treatments as prescribed.

In sub-Saharan Africa hypertension has also emerged as a serious public health problem. Addo, Smeeth, & Leon (2007) analyzed hypertension studies and reported that hypertension is much prevalent in urban areas as opposed to rural areas in all countries of the SSA region. It was also reported that at least 40% of the research participants were ignorant of their disease status, 30% were on drug treatment whilst only 20% had their blood pressures controlled. Research has shown some factors have significantly contributed to the increasing prevalence of hypertension in the Sub-Saharan African (SSA) region, and such factors include changes in dietary patterns, westernization, sedentary lifestyles, and urbanization among other factors (Modesti et al., 2013).

The prevalence rate of hypertension in Malawi as of 2011 was 32.9% (Msyamboza et al., 2011). A STEPs survey report released by WHO in 2010 also indicate that at least every one (1) in three Malawian adults is hypertensive (Ministry of Health, 2010). Despite these alarming statistics, Malawi faces many challenges in hypertension detection, diagnosis and management of this serious disease due to inadequate knowledge of its prevention and management, limited health care facilities and resources like personnel and equipment.

The disease burden report published by the WHO analyzing the main causes of death in Malawi placed hypertension at position 7 behind HIV/AIDS, strokes, heart disease, tuberculosis, road accidents and violence. WHO (2011) statistics state that in the 1990's hypertension was not among the main causes of death in Malawi. However, the number of cases with hypertension and hypertension-related complications have been rapidly increasing in Malawi in the last 10 years despite the preventive measures (health education on lifestyle modification) being implemented in different institutions. Chingatichifwe et al. (2014) reflected poor adoption and adherence to lifestyle modification by clients in their study but influencing factors were not investigated, hence the need to investigate the factors.

Lifestyle Modification Overview

Hypertension can be managed with non-pharmacological and pharmacological approaches, depending on the classification. The non-pharmacological approach to hypertension management is also called lifestyle modification and is considered the first line management of hypertension. Lifestyle modification is a behaviour and an attitude that requires self-motivation, self-determination and dedication in order to change the

risky predisposing lifestyles and to achieve blood pressure control (Iyalomhe & Iyalomhe, 2010). Once the risk factors are modified, the blood pressure reduces (Adams, Holland, Bostwick, & King, 2010). Ham & Bong (2011) indicated that hypertension can be controlled by adhering to healthy behaviors in the absence of anti-hypertensive drugs. It is predicted that over 80% of cerebro-vascular diseases could be prevented through lifestyle modification which eventually leads to an improvement in blood pressure (Kelishadi & Azizi-Soleiman, 2014).

Over the years, lifestyle modification has become a focal point in preventing and treating chronic diseases. It is regarded as the cornerstone of helping out hypertensive patients to attain lifestyle behaviors that are healthy (Douglas & Howard, 2015). Research has recommended healthy lifestyles as a better way of managing hypertension and minimizing the risk of developing hypertension and hypertension-related complications (Eskridge, 2010). WHO recommended that lifestyle modification should be practiced by anyone, either hypertensive or non-hypertensive to control the prevalence of the condition and its complications (Huang, Duggan, & Harman, 2008). The lifestyle modifications which are recommended are alcohol moderation, losing weight, regular physical exercises, quitting of smoking, changes in diet and reduction in sodium intake (Eskridge, 2010; Talukder et al., 2011). The type of diet which is suggested to effectively lower and control hypertension is the DASH (Dietary Approaches to Stop Hypertension) diet which recommends reduced salt and sodium intake, increased fruits and vegetable intake, low fat dairy products, low total fat, saturated fat and cholesterol (Douglas & Howard, 2015; Svetkey et al., 2009).

Physical activity and losing weight

Increased physical activity and weight loss lower blood pressure effectively (Svetkey et al., 2009). Inactivity, overweight and obesity are associated with hypertension (Xu et al., 2013; Katalambula et al., 2017). In a 10 year longitudinal study conducted among Indian-Americans with a sample size of 4549, aged between 45 and 74 years, it was revealed that overweight individuals were 1.46 times more likely than those with normal weight to have elevated blood pressure while obese individuals were 1.9 times more likely than those with normal weight to develop hypertension. Inactive people become obese, or gain weight uncontrollably. Weight gain comes with fat deposition in all body structures including the blood vessels (Lewis, Dirksen, Heitkemper, & Bucher, 2014) which increases peripheral resistance. Another cross-section study done in Ethiopia indicated that physical activity was positively associated with optimal hypertension control (Teshome, Demssie, & Zeleke, 2018). People who are physically inactive have fat accumulation in their blood vessels which predisposes them to hypertension (Gianaros, Jennings, Sheu, Derbyshire, & Matthews, 2007). Daily exercising of at least 5 days per week, for at least 30 minutes per session, is one way of burning out the body fats (ESH/ESC Guidelines, 2013). To increase the hypertension reductive effect, physical activity should be conducted synergistically with other modifiable factors such as dietary modifications and reduction of alcohol and fat consumption.

Salt and sodium intake.

Evidence have shown that reduction in dietary salt intake is an essential component of the non-medical treatment of hypertension (Frisoli, Schmieder, Grodzicki, & Messerli, 2012). Excessive consumption of salt predisposes one to hypertension physiologically, genetically and biologically. Salt has properties that retain fluids in the

body. Lowering of dietary sodium intake is statistically associated with lowering blood pressure and minimizing the risk of hypertension in both hypertensives and non-hypertensives (Teshome et al., 2018). In addition, ESH/ESC Guidelines (2013) and McCarley (2009) also recommended that salt intake for hypertensive patients should not go beyond 1500mg per day. Scientific evidence has shown that raw salt is more harmful than cooked salt (Teshome et al., 2018; Addo, Smeeth, & Leon, 2007; Thrift et al., 2010); Therefore, hypertensive clients are not allowed to add raw salt to their food. Evidence has also shown that reducing salt intake can work best in combination with other interventions such as DASH approach (Frisoli et al., 2012). This combination can delay and prevent incidence of anti-hypertensive therapy and reduces cardiovascular diseases morbidity and mortality.

Alcohol consumption.

Limiting alcohol intake can improve one's adherence to treatment and reduces the risk of hypertension and hypertension related complications. Evidence has shown that alcohol intake affects adherence to outpatient medication regimens and lifestyle modification for chronic illnesses (Hareri & Abebe, 2013; Grodensky, Golin, Ochtera, & Turner, 2012). Although literature has shown that it is only the excessive consumption of alcohol which is associated with hypertension (Manandhar, Koju, Sinha, & Humagain, 2012; Hillbom, Saloheimo, & Juvela, 2011), some studies have also shown that alcohol consumption of any level is positively associated with increased hypertension prevalence (Mancia et al., 2007).

However, in a recent study, Katalambula et al., (2017) found no association between increased blood pressure and alcohol intake. It is therefore necessary to tailor

other interventions with minimizing alcohol consumption so that hypertension control can be achieved.

Smoking.

Smoking predisposes one to hypertension (Talukder et al., 2011). The relationship between cigarette smoking and hypertension is thought to be due to the presence of nicotine in cigarettes. Nicotine stimulates the release of noradrenaline from the adrenergic fibres of the adrenal glands. Persistent stimulation of sympathetic nervous system through habitual smoking leads to peripheral vasoconstriction hence elevation of blood pressure (Lewis et al., 2014). On the other hand, Lewis et al., (2014) explains that following the release of the adrenaline, renin is released. Renin catalyzes the conversion of angiotensinogen to angiotensin I which is subsequently converted to angiotensin II. Angiotensin II leads to increased peripheral resistance which subsequently causes hypertension. It also stimulates the release of aldosterone which causes the retention of sodium ions in the extra-cellular fluid compartment, leading to increased circulatory volume, resulting in increased blood pressure.

The nicotine contained in cigarettes plus the carbon monoxide inhaled through cigarette smoking damage the endothelial of blood vessels and cause increased heart rate and blood pressure (Leone, 2015). However, Gu et al. (2009) indicate that there is no significant positive association between smoking and hypertension. In their prospective cohort that involved 169, 871 participants, it was reported that male smokers had a lower prevalence rate of hypertension than male non-smokers. In addition, another study done in china by Li, Tong, Wang, Lin, & Zhang (2010) with a total sample of 2589 Mongolian people, did not support the argument that smoking is a risk factor of hypertension.

Fat intake.

People who eat a lot of animal fat are more prone to hypertension and atherosclerosis than those who eat less fat (Addo et al., 2007). Excessive fats get deposited into the lumen of the vessels, which lead to thickening and hardening of the vessels. This makes the vessels to lose their elasticity. The thickening and hardening of the vessels also interferes with contractility of smooth muscles which in turn increases peripheral resistance and cause a rise in blood pressure. Red meat might contain a lot of saturated fats, as such McNeill (2014) recommended that it should be replaced with fish. Fish is rich in minerals including potassium which is good for heart muscle contractility.

Fruits and vegetable servings.

Research shows that increased fruits and vegetable servings could control hypertension. Diet full of fruits, vegetables, and whole grains is very necessary in as far as hypertension control is concerned (Svetkey et al., 2009). Such diets are rich in minerals such as potassium, magnesium, and calcium; which are necessary for heart and vessel functions.

Knowledge of lifestyle modification.

Lifestyle modification either delays or prevents development of hypertension (Petkeviciene et al, 2014). In cases of already developed hypertension, lifestyle modification prevents the development of hypertension-related complications (Kelishadi & Azizi-Soleiman, 2014). One of the problems affecting lifestyle modification adherence regarding hypertension control is lack of adequate knowledge regarding recommended diet, smoking, alcohol consumption and physical inactivity amongst clients.

Kim, Lee, Ahn, & Lee (2010) conducted a quantitative, descriptive comparative study with a convenience sample of 100 Korean Americans and 100 native Koreans with hypertension. The study intended to compare the advice on lifestyle given by health care providers and subsequent action or implementation by recipients amongst the participants in comparison. It was found that most Korean Americans received advice on lifestyle less than did native Koreans, and more Korean Americans followed healthy lifestyle advice on dietary change and exercise than did native Koreans. However, weight control was the least adhered to behaviour among the Korean Americans, as almost two-thirds of the participants were overweight or obese. Both groups exceeded the Dietary Reference Intakes of sodium, but perceived their sodium consumption as low.

The differences in the awareness, knowledge, and beliefs about hypertension may also influence the degree to which lifestyle changes are adopted. Unlike other literature which states that African Americans are less knowledgeable on hypertension, its management and control measures, Okonofua, Cutler, Lackland, & Egan (2005) revealed that African Americans have adequate knowledge about the definition, etiology, and consequences of hypertension. They are however, less aware of the value of lifestyle modifications. This explains why despite having such knowledge, the hypertension prevalence amongst African Americans still remains high and adherence to lifestyle modifications is still low.

Valderrama, Tong, & Ayala (2010) examined the 2008 Health Styles survey in order to estimate the prevalence of hypertension, the use of anti-hypertensive medication, advice received from health professionals for specific lifestyle behavior changes, and the actions taken to reduce blood pressure among persons receiving advice. The study found

that 25.8% of the respondents had hypertension and 79.8% of these were taking anti-hypertensive medications. They also found that overall, 21.0% to 24.4% reported receiving advice to adopt specific behavior changes, with younger adults and women having a lower prevalence of receiving advice. Blacks had the highest frequency of receiving advice among the racial ethnic groups. More than half of respondents took action following the receipt of advice. Women were more likely than men to follow advice to go on a diet. Although some patients were following advice from their health professionals and making lifestyle changes to decrease blood pressure, the proportion of patients making changes remained low.

Samal, Greisenegger, Auff, Lang, & Lalouschek (2007) argued that knowledge about hypertension and its control influences blood pressure control in patients with hypertension. Their study recruited 591 participants and it was found that approximately half of patients were acquainted with the non-pharmacological treatment options of physical activity (49%), reduction of salt intake (54%), and reduction of caloric intake (48%), whereas relaxation techniques were only known to 17%. They further discovered that adherence to those treatment options ranged from 42% to 67%.

In another study, Persoskie, Kaufman, & Leyva (2014) argued that hypertensive patients who smoke are in a particular need of lifestyle modification counseling because they are at increased risk for poorer outcomes. This information is also in agreement with another study done by Greenwich (2014), who concluded his study by saying that lifestyle counseling in hypertension may be equally or more effective for smokers compared with nonsmokers. Persoskie, Kaufman, & Leyva (2014) recruited 504,408 participants who were interviewed through telephone calls to examine whether

hypertensive smokers were more or less likely than nonsmokers to report receiving recommendations for diet, salt intake, exercise, alcohol use, and medication and whether receipt of recommendations was deferentially associated with lifestyle changes among smokers versus nonsmokers. They found that smokers were less likely than nonsmokers to report being told by a provider to exercise and change their diet. Receiving dietary recommendations was more strongly associated with self-reported dietary improvements among smokers compared with nonsmokers.

Clients' Practices on Recommended Lifestyle Modification

Adherence to the recommended behavioral and lifestyle changes are a fundamental component in effective prevention, treatment and control of hypertension Slimko & Mensah (2010). The American Society of Hypertension reported that lowering blood pressure solely with medication per se may be inadequate to prevent and control hypertension-related complications since blood pressure elevation usually co-exists with other factors such as obesity, high cholesterol, high fat & salt intake and smoking. Therefore, knowledge of clients' practices on different lifestyle changes helps one to determine the adherence behaviors.

Huang et al., (2008) highlighted that lifestyle modification should be practiced both in hypertension and pre-hypertension, although its effectiveness will be notable in hypertensive clients. In hypertensive clients, treatment step-down or treatment withdrawal may follow if lifestyle modifications are appropriately practiced.

A prospective observational cohort study which was done to assess dietary intakes and compliance with nutritional and lifestyle recommendations in French adults diagnosed with hypertension, diabetes, dyslipidaemia, or cardiovascular disease

compared with healthy individuals found that hypertensive clients do not practice as recommended as compared to diabetes clients (Adriouch et al., 2017).

Serour, Alqhenaei, Al-Saqabi, Mustafa, & Ben-Nakhi (2007) conducted a prospective study to measure adherence and barriers of complying with lifestyle recommendations among patients with high cardiovascular risk factors in Kuwait. The study results indicated that even though 86.2% of the subjects received counselling, more than 60% did not practice as recommended due to clients' unwillingness, difficult to adhere to diet that is different from that of the rest of the family, lack of time, weather conditions and frequent social gatherings with families and friends where clients consume more meat, fats, sugars, rice, wheat flour and lots of fast foods than before. Serour et al., (2007) also indicated that the social economic development of Kuwait has made the clients and the general population to indulge less in activities than before.

In an institutional based cross-sectional study conducted by Ambaw, Alemie, Nohames, & Mengesha (2012) in Ethiopia amongst hypertensive patients on follow up at the University of Gondar hospital, it was found that at least 64.6% of clients adhered to hypertension management. In a different study done by Samin & Sirwan (2010) to examine the compliance of hypertensive patients to management in Duhok Governorate in Iraq, only 54.6% were adherent to practices and management of hypertension. Another cross-sectional analytical study done in Malawi to explore adoption of healthy lifestyle for secondary prevention of stroke, diabetes and hypertension among clients receiving treatment at Mzuzu Central Hospital also indicated that practicing healthy lifestyle was a general problem whereby most clients ate less fruits and vegetables, involved less in activities and lived a sedentary lifestyle (Chingatichifwe et al., 2014).

The above literature reflect that despite receiving health education on recommended lifestyle modifications in most contexts, practices and adherence by patients is generally poor.

Factors Influencing Adherence Behaviors

Several factors influence client's adherence behaviors differently depending on individual characteristics, health-care- tailored factors, environmental factors and also family or community factors. Research has also shown that level of education affects one's adherence behaviors. Samal et al. (2007) conducted a study to assess the relationship between knowledge about hypertension and education in 591 hospitalized patients with stroke in Vienna. It was reported that educational level was significantly associated with knowledge of increased risk, possible consequences of hypertension and knowledge about non-medication treatment options. People with low education status have poor understanding and comprehension of information. In addition, Panagiotakos et al., (2008) indicated that education is associated with healthful behaviors. Educated people have a higher receptivity to new health related information, familiarity with modern medical culture, have access to financial resources, have more decision making power, increased self-worth and self-confidence, have better coping capabilities and more negotiation skills as well as less inferiority complex towards health care, health providers and thus better communication and ability to demand adequate services.

Contrary to these arguments, a study done by Samin & Sirwan (2010) on compliance of hypertensive patients to hypertension management found that low level of education was associated with good adherence. Similarly, in a different study done amongst urban African American adults to assess the relationship of anti-hypertensive

medication adherence to demographic, clinical and cognitive characteristics, it was revealed that lower education attainment was significantly associated with higher adherence in men, but lower in women (Braverman & Dedier, 2009). This translates in that while education may lead to better understanding of the risks involved due to non-adherence, one's level of education does not automatically produce and sustain a healthy behaviour. This means that lifestyle modification can be practiced by anyone regardless of education status.

An assumption would be that the patients diagnosed with hypertension for more than 10 years are likely to adhere to recommended lifestyle modification with an assumption that they have received health education for a long time and they are used to put into practice what they have acquired during counselling. Hyre, Krousel, Muntner, Kawasaki, & DeSalvo (2007) and Knafl & Riegel (2014) in their studies support this assumption. However, some studies done in India by Subhasis, Sankara, & Kavumpurathu (2011) and in Ethiopia by Hareri & Abebe (2013) show that patients diagnosed with hypertension less than 10 years are associated with good adherence behaviors. This shows that experience with the condition does not guarantee obvious adherence among clients in different settings.

Some clients' decision making ability regarding adopting and adhering to lifestyle modification is positively influenced by the opinions of others, be it their family members, friends, partners or other influential community members (Gama, Gibson, McPake, & Maleta, 2011). If people within the clients' network or those already hypertensive have a positive perception of the lifestyle modification, clients' attitudes and

behaviors regarding lifestyle modification and hypertension control are positively influenced, thereby enhancing adherence.

Family members are often reported as important sources of hope and courage that could help clients to seek advice and integrate lifestyle modification into daily life. They could achieve that by providing practical support, encouraging them to adopt and adhere to the modifications, reminding them of the recommended behaviors as given by health care providers (Trivedi, Ayotte, Edelman, & Bosworth, 2008). For a successful patient education, the family members should be involved in education program. Family makes it easy for the patient to implement the changes since they offer encouragement and motivation needed for behavioral change. In addition, Heru & Berman, (2008) stated that guardian involvement allow clients to spend more time with them and build guardians' abilities to model the good behaviour for their clients. Guardians tend to enhance their clients' skills when they are supportive, courageous and actively involved. However, research has demonstrated that guardians or families are less involved in the treatment of their clients despite their need to be involved, although some families are not willing to be involved in their patients' treatment (Heru & Berman, 2008). Literature has revealed some barriers to family involvement, such as poor verbal exchange between families and staffs, family members feel ignored by staff, or staff blaming family for patient's problems or health status (Coyne, 2013; Heru & Berman, 2008).

Formation of social groups has also proved to be one of the effective ways to enhance adherence behaviors in clients. Social groups would help to influence positive behaviour modification by providing an interpersonal support which in the long run becomes a significant catalyst for self-efficacy and sustained motivation for clients

(Gama et al., 2011). Lau, Chiu, & Lee (2001) indicated that perceptions that an idea is shared at an audience make it more likely to be used as a common ground for adoption and practice. This means that social groups provide a plat-form from which clients socialize and learn new ways of doing things thereby adopting healthful behaviors. According to Zou et al., (2009) people's thoughts and behaviors are guided by the perception of what others believe as opposed to their in-ward looking conceptions. What others believe can be known if people are brought together and share their experiences and beliefs, thus supporting the finding of this study that social group's formation influence adherence.

Health facilities play a significant role in the well-being of clients. The systems and organization of a facility influence people's attitudes and behaviors either positively or negatively. For instance, reducing waiting hours at the hospital can be significantly associated with positive adherence behaviors. In an Interpretive Phenomenological Analysis to seek deeper insight into the patients' experiences about treatment in order to understand why patients with chronic illnesses are not adherent to treatment, Dalvi & Mekoth (2017) found that economic factors, health-system related factors, social factors and psychological factors impact patient non-adherence. One factor which emerged under health systems-related factors is the issue of long waiting hours. When clients are kept for a long time waiting for treatment without any explanation and assurance by health workers they lose interest in other activities that usually follow. The problem of long waiting hours emerges from increased utilization of health services which has put so much pressure on the limited medical staff in the hospitals (Atinga, Mensah, Asenso-Boadi, & Adjei, 2012).

Afolabil, Ogundele, & Awokola conducted a study to explore perceived social problems influencing management in the primary care in a semi-urban tertiary hospital in Nigeria. The study revealed structural limitations such as lack of time in consultation among other problems. This shows that less consultation times influence the treatment outcomes negatively as opposed to longer consultation times which results in more preventive health advice, less prescribing and increased patient satisfaction rates (Wallace et al., 2015). Pressure of work has made health workers not to give their adequate time in managing clients with chronic diseases like hypertension. In a study conducted by Wallace et al., (2015), general practitioners highlighted lack of time as a barrier to providing care for patients with chronic illnesses. It was also reported that increased consultation times increases patient enablement and reduce general practitioners' stresses. When clients are given enough time for treatment and advice, they develop a sense of security and trust in the health workers.

Poor adherence is a common problem in many chronic diseases. Information regarding associated challenges or factors hindering adherence is significant in designing interventions that promote adherence to treatment or behavioral changes.

Poor provider-patient relationship is associated with poor lifestyle modification Shams & Fineman (2013). Evidence shows that improved patient outcomes and satisfaction result from patient-centered approaches and clinical practices. Shams & Fineman (2013) reported that patient-centered approaches and practices establish a trustworthy relationship, identify motivation for change and the need for improved communication. If the health workers relate poorly with the clients, they lose trust and interest in their services, as such they don't get motivated to practice what they learn.

Although most providers would testify that they have never produced ill words to clients, most of the health workers tend not to consider non-verbal communication that is significant in building rapport with the clients. Shams & Fineman (2013) indicated that non-verbal communication like head nodding, eye contact, tone voice and speaking time help clients to assimilate a healing relationship and the positive rapport. Furthermore, Gamez (2009) indicated that poor patient-provider relationship is associated with poorer treatment adherence in cases of dismissing attachment. However, a MOSAIc study done in 18 countries indicated that good provider-patient relationship promotes adherence amongst clients (Linetzky, Jiang, Funnell, Curtis, & Polonsky, 2017).

This literature review shows that adherence to lifestyle modification regarding hypertension control is still a problem despite clients having some knowledge on the issue. This can be as a result of lack of knowledge on hypertension complications, lack of family support, lack of motivation, and individual attitudes and beliefs. This study therefore, serves to assess some factors that contribute to poor adherence to lifestyle modification, at Malamulo.

Conclusion

This chapter presented literature review on lifestyle modification in regards to hypertension control. Most studies that were reviewed looked at knowledge and factors influencing adherence to lifestyle modification amongst hypertension clients. Generally, it has been found that people have different levels of knowledge on the concept and adherence is a problem across all levels. The review has also revealed different factors responsible for poor adherence in various locations. In addition, some clients are faced with different barriers and challenges which decrease their interest to engage in lifestyle

modification for example poor relationship with the health workers, abusive language, poor institutional organization, individual beliefs and attitudes and lack of family support.

Chapter 3

Methodology

Introduction

This chapter presents the research design, study setting, study population, sampling method, sample size, inclusion and exclusion criteria, data collection plan, data management and analysis plan, result dissemination plan and ethical considerations.

Research Design

The study utilized a descriptive quantitative design. The design was chosen in order to establish associations and determine relationships between dependent variable *"adherence to recommended lifestyle modification"* and independent variables *"independent factors of adherence"* (Creswel, 2013*;* Boswell & Cannon, 2011). Descriptive design was also used in order to identify problems with current practice so that appropriate judgment and justification are made.

Study Setting

This study was conducted at Malamulo hospital which is located in Thyolo, 22 kilometers away from Thyolo district council. The hospital developed into a referral hospital in 1953, has a bed capacity of 212, and serves as referral hospital for 4 health centers. Its catchment area covers a population of 40, 217 people. The hospital conducts hypertension clinics on every Wednesday of the week with at least 500 clients monthly. Raw data shows that at least 11% of the clients have developed hypertension-related complications within 18 months (from July 2015 to December 2016) despite routine

provision of health education on adherence to recommended lifestyle modification regarding hypertension control. This motivated the researcher to consider it as a study setting so that the factors are examined, hence informing the practice thereby controlling the burden.

Study Population

The study considered all adult hypertensive clients who were diagnosed more than a year prior to the study either at Malamulo or elsewhere, and they had been involved in counseling sessions on behavior modification and drug adherence. Records from the clinic indicated that overall the clinic reviews at least 500 clients monthly. Out of 500 clients, 142 (28.4%) were newly diagnosed clients (less than a year); while 358 clients were those who had been diagnosed more than a year ago and had been receiving health education on adherence to recommended lifestyle modification. One hundred and eight (30.2%) of the old clients had their hypertension controlled while 250 of them (69.8%) had poorly controlled hypertension due to poor adherence to management. These figures trimmed the study population to 250 clients.

Sample Size and Sampling Method

In quantitative research, inappropriate, inadequate and excessive sample sizes influence the quality and accuracy of research findings (Polit & Beck, 2008). However, a large sample recruitment is encouraged to give a true representation of the subjects and to maximize chances of generalizability of the research findings to the whole population (Polit & Beck, 2008).

Using a Confidence Level of 95% (Z-score = 1.96), P = 0.5, level of precision (e) of 5% (0.05) and the population size (N) of 250 hypertensive clients whose hypertensions are poorly controlled; the study used the Slovin's formula to calculate the sample size:

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{250}{1+250(0.05)^2} = 250/1.625$$

n =153.8

n = 154 respondents

Therefore, the sample size = 154.

The researcher used systematic sampling method to recruit respondents. Systematic sampling was chosen in order to give the respondents equal chance of getting recruited into the study, as it guaranteed even selection of respondents from the population. The first participant was selected by simple random sampling and the rest of the participants were located by the sampling interval to avoid bias. About 250 hypertensive clients met the inclusion criteria of the study. This is the pool where the sample for this study was drawn using the formula below:

$$k \text{ (The random interval)} = \frac{\text{the size of the population}}{\text{Size of the desired sample}} = N/n$$

The random interval = 250/154 = 1.6 which is approximately 2.

Therefore, every 2nd respondent was included in the study until the required number was fulfilled.

Inclusion and exclusion criteria.

According to Polit and Beck (2008), inclusion sampling criteria is defined as those characteristics that a respondent must possess to be part of the study; while exclusion sampling criteria are those characteristics that can cause a person to be excluded from the study population.

The respondents **included in** this study were adult hypertensive clients who had been diagnosed at least one year prior to the study, had been receiving health education but they poorly adhered to advice, were above 18 years, willing to participate, out-patients and were mentally stable. By "mental stability" the researcher referred to those whose cognition was not impaired and were not taking antipsychotic drugs. The study considered only those who were mentally stable because according to the laws and constitution of Malawi, an informed consent is only given by someone whose cognitive is not impaired.

Respondents who were **excluded from** this study were hypertensive clients who were newly diagnosed (less than 1 year with the diagnosis), were below 18 years old (children), had cognitive impairment, were in-patients and not willing to participate in the study.

Data Collection Plan

This section presents a plan of data collection methods such as the data collection procedures; and instrumentation such as the planned instrument to be used for data collection, how the instrument's validity and reliability was checked and instrument pretesting.

Data collection instrument.

This study's questionnaire was adapted from the non-communicable diseases WHO STEP wise Approach survey questionnaire so that crucial elements were captured. Then the "**subject-matter experts**" were given the tool to critique and modify it so that it would capture other information specific to our context. The questionnaire was developed in English (Appendix 6) and was translated into Chichewa (Appendix 9) to allow for effective expression and communication with the participants. The instrument had five sections. The first part collected demographic data: age, sex, marital status, education level, employment status, religion and length of time since the first diagnosis. This information is important as it influences one's perception towards lifestyle changes and the ability to adhere to lifestyle modification. The second part of the questionnaire assessed the clients' knowledge on the lifestyle modification. Knowledge also influences perception and ability to adhere to lifestyle changes. The third part assessed clients' practices on lifestyle modification. The fourth and fifth parts examined the facilitating factors and associated challenges of adherence to recommended lifestyle modification respectively. Based on their knowledge and experience, clients were requested to rate the extent to which the factors would hinder or facilitate their ability to adhere to behavior modification. Since it was a quantitative study, all sections had close-ended questions with yes or no questions.

Data collection procedure.

During health education at the hypertension clinic, the briefed nurses and clinicians were inviting clients who met the inclusion criteria to participate in the study. Information sheets (Appendices 4 and 7) were used for invitation. Those willing clients

were requested to meet the researcher in an identified room for interviews after receiving medical care.

In the identified room, the researcher explained the details of the study to the participants, for example the aim of the study and the involved procedures, so that the informed consent (either Appendix 5 or 8) depending on one's preferred language was signed. Those who understood English language were given the English version questionnaires (appendix 6), those who could read and write only Chichewa were given Chichewa version questionnaires (appendix 9) to answer; while face-to-face interviews were conducted with those who could not read and write any language.

Validity and reliability of the Data collection instrument.

Validity

Validity is the degree to which an instrument measures what is supposed to measure (Polit & Beck, 2008). To ensure validity, after the tool was developed, it was checked by the supervisors, a statistician and a medical consultant to ensure that it covered all the areas needed for the study.

Reliability

Reliability is the consistency with which an instrument measures the attribute (Polit & Beck, 2008). In this study, reliability was enhanced by pretesting the data collection tool. Reliability was also enhance by accurate and careful phrasing of the questions which maximized the consistency of the instrument (Gerrish & Lacey, 2010).

Pre-testing.

The questionnaire was pre-tested at Thyolo District Hospital on five hypertensive patients who had been diagnosed more than one year ago, had been on lifestyle modification counselling but their hypertension was poorly controlled. Then the questionnaire was modified accordingly before the actual study begun. This study considered pretesting to identify and rectify parts of the instrument package which were difficult or that might be misinterpreted by the respondents, questions that were offensive to the respondents, whether the sequencing of questions was sensible and if the instrument would yield sufficient data with a wide variation (Polit & Beck, 2008).

Data Management and Analysis

Data management.

The consent forms and questionnaires were kept in different files which were kept in the researcher's lockable drawer so that only the researcher would access them. The questionnaires were checked by the supervisors for completeness before entering into a password protected computer program for analysis. Data were kept until the research process is done. The researcher also planned to keep data for 5 more years after the study for referencing purposes by the researcher and anyone interested in raw data.

Data analysis and presentation.

Data in this study were analyzed using statistical packages for the social sciences (SPSS) version 22. Descriptive analysis was applied to analyze demographic data, clients' knowledge and practices on recommended lifestyles and the results were presented as frequencies, and percentages in a table. Descriptive analysis were used to describe, simplify and summarize basic features of the data in the study. Chi-Square (x^2)

test was used to test each predictor variable for statistical significance. The significant predictors were entered into logistic regression model to determine the independent predictors of recommended lifestyle modifications amongst clients. Odds ratio (OR) at 95% Confidence Interval (CI) was used to declare the independent effect of each variable on the outcome variable.

Dissemination of the Results

The researcher will first disseminate the results to clients at Malamulo Mission Hospital, hypertension clinic. The researcher will also organize a dissemination seminar for Ministry of Health officials, Management of Malamulo Hospital, nurses and clinicians working at the hypertension clinic and other health care professionals. This will be done to promote knowledge and evidence based practice. Copies of the final report will be submitted to COMREC and all the University of Malawi libraries for reference. The researcher will also utilize local, regional and international conferences, workshops or seminars to disseminate results in order to reach the majority. Finally the researcher plans to publish the study in peer-reviewed journals for evidence based practice.

Ethical Considerations

Clearance by ethics committee.

The research proposal was presented to College of Medicine Research and Ethics Committee (COMREC) through the Kamuzu College of Nursing Research Publications Committee (KCN-RPC). Since the study involved human beings, the COMREC and KCN-RPC were involved to protect the human beings from any harm; and also to check if the study had some processes and procedures that might infringe on the participants' human rights.

Permission to carry out the study.

Permission was obtained from the Medical Director of Malamulo hospital (appendix i). After approval, consents were sought from the subjects where the purpose, the significance, the benefits, potential risks, duration, data collection procedures and ethical considerations of the study were explained. All volunteer subjects were required to sign the consent forms (appendix iv) to participate in the study.

Respect for autonomy.

Patients have rights, and are autonomous if they are mentally sound, alert and above 18 years old. Enrolment into the study was strictly on voluntary basis. Although there were no direct benefits from the study, clients were encouraged to participate in the study in order to improve care at the clinic. On the same, respondents were informed of their right to decline participation or to withdraw at any point of the study. Further, respondents were told that there were no associated risks, punishment or consequences following their refusal to participate or withdrawal from the study at any time (appendix iii).

Confidentiality and anonymity.

The data were collected in a private closed room where noises were kept at minimum. The data was only being accessed by the researcher and the research supervisor. Code numbers instead of names were used during data collection and reporting of the findings to protect participants' confidentiality and anonymity.

Chapter 4

Presentation of Study Results

Introduction

This chapter presents results of this study according to the study's objectives. Summaries of the results are presented in tables and graphs. A total of 108 respondents were interviewed using a structured questionnaire that was developed based on the study objectives. Almost all of the respondents, 99% (n =107), responded to all the sections, and 0.9% (n=1) respondents responded to only one section.

Demographic Characteristics

Table 1 summarizes the respondents' demographic characteristics.

Table 1: Respondents Demographic Characteristics

Characteristic	Value	Sample size n (%)
Sex of participant	Male	43 (39.8)
	Female	65 (60.2)
Age of participants (in years)	18-25	1(0.9)
	26-35	10 (9.3)
	36-45	9 (8.3)
	46-55	33 (30.6)
	over 55	55 (50.9)
Marital status	Single	11(10.2)
	Married	50 (46.3)
	Divorced	16 (14.8)
	Widow/Widower	31 (28.7)
Tribe	Chewa	8 (7.4)
	Sena	1(0.9)
	Lhomwe	65 (60.2)
	Mang'anja	20 (18.5)
	Others	14 (13.0)
Highest education level	None	59 (54.6)
	Primary	33 (30.6)
	Secondary	13 (12.0)
	Tertiary	3 (2.8)
Employment status	Employed	16 (14.8)
	Unemployed	92 (85.2)
Type of occupation	None	24 (22.2)
	Farmer	55 (50.9)
	Teacher	1(0.9)
	Business	21(19.0)
	Driver	7 (6.5)
Religion of participant	Christian	103 (95.4)
	Muslim	5 (4.6)

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	Business	21(19.0)
	Driver	7 (6.5)
Religion of participant	Christian	103 (95.4)
Years with Hypertension (in years)	Less than 5	48(44.4)
	Between 6-10	35(32.4)
	More than 10	25(23.2)
	Median	6

By gender, the majority, 61.1 % (n=65), of respondents were females. More than half, 50.9% (n=55), of the respondents were over 55 years of age otherwise most respondents, 30.6% (n=33), were aged between 46 and 55 years of age. The respondents were predominantly from Lhomwe tribe, 60.2% (n=65), seconded by the Mang'anja tribe, 18.5% (n=20). Less than half of the respondents, 46.3% (n=50), were married while 28.7% (n=31) were widows/widowers. In terms of educational level, most respondents, 54.6% (n=59), had never gone to school, while 30.6% (n=33) of them had primary education only. The majority, 85.2% (n=92), of the respondents were unemployed while only 14.8% (n=16) were in some form of employment. More than half of the respondents, 50.9% (n=55), were subsistence farmers, seconded by small scale businesses 19% (n=21). The majority, 95.4% (n=103), were Christians, while only 4.6% (n=5) were Muslims. In terms of how long they have lived with hypertension, 44.4% (n=48) of the respondents had stayed with hypertension for less than 5 years; while 32.4% (n=35) of them had lived with hypertension between 6 and 10 years. The respondents had lived with hypertension for a median[1] of 6 years.

Respondent's Knowledge and Practices of Life Style Modification

Knowledge and practices on lifestyle modification were assessed. Figure 1 presents the summary of the respondents' knowledge and their practices on recommended life style modification.

[1] This statistic was used because years with hypertension were positively-skewed.

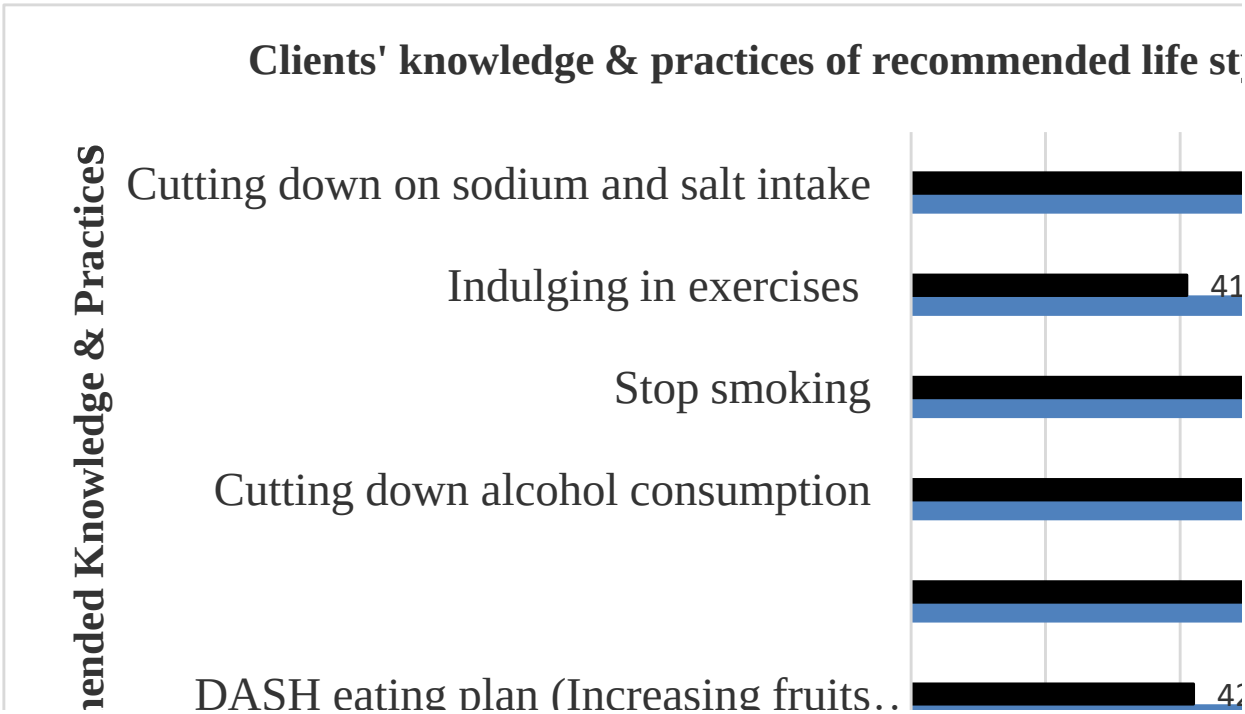

Figure 1: Respondents' knowledge & practices on recommended lifestyle modification (n=107)

The majority of the respondents, 99% (n=106), acknowledged to have heard about lifestyle modification; from health workers, 100% (n=107). All respondents (100%) indicated that cutting down sodium and salt intake controls hypertension although only 54% (n=58) of them adhered to the recommended practice. Most of them, 99% (n=106), indicated that indulging in exercises controls hypertension; despite only less than half, 41% (n=44), of the respondents adhering to the practice. 99% of the respondents also indicated that cessation of smoking controls hypertension. However, only 56% (n=60) adhered to cessation of smoking as a recommended lifestyle modification. The majority, 97% (n=104) also reported that cutting down alcohol consumption would control hypertension; only 52% (n=56) of them adhered to it. More than half, 65% (n=70) of the respondents agreed that adoption of DASH eating plan controls hypertension; whilst only

42% (n=45) of them adhered to the practice. On average, this study found overall knowledge rate of 92%; with an overall adherence rate of ***53.8%.***

Relationship between respondents' socio-demographic data and adherence to recommended lifestyles.

The Chi-square test was used to check the association between respondents' socio-demographic data and adherence to the recommended lifestyle modification. Table 2 shows the association between socio-demographic factors and adherence to recommended lifestyle modification, regarding hypertension control.

Table 2: Association between socio-demographic factors and adherence to recommended lifestyle modification

Factor	**X^2**	**Df**	**p-value**
Sex of participant (female vs male)	***4.481***	1	***0.034***
Age of participants	*.710*	1	*0.301*
Marital status	*.389*	3	*0.115*
Education level	***7.852***	3	***0.003***
Number of years suffered HTN	***4.148***	1	***0.041***

Sex, education level and number of years one suffered from hypertension were the variables which were associated with good adherence to recommended life style modification

Factors Influencing Adherence to Recommended Life-Style Modification

Facilitating factors and barriers associated with adherence to recommended lifestyle modification were entered into logistic regression model for analysis. Logistic regression model is the appropriate, predictive analysis which is conducted when the dependent (outcome) variable is dichotomous (binary). The model is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variables. This study looked at "adherence to lifestyle modification" as an outcome variable which had scores 0 for "No Adherence" and 1 for "Adherence", while some of the independent/predictor variables were nominal, some ordinal and some were measured in intervals.

Facilitating factors of adherence.

Chi-square test was used to check the association between each factor and adherence to recommended lifestyle modification. The predictor variables tested were: *seeing positive results, having adequate knowledge on recommended lifestyle modification, understanding the need for adherence, holding individual counseling, family support, support groups* and *having fixed routines for practicing the recommended lifestyles*; against "**adherence to recommended lifestyle modification**" as a dependent variable.

Table 3 presents the association between the facilitating factors and adherence.

Table 3: Association between facilitating factors and adherence

Factor	X^2	Df	p-value
Seeing Positive results	***5.020***	1	***0.033***
Adequate knowledge of recommended lifestyles	***5.424***	1	***0.023***
Understanding the need for adherence	0.058	1	0.810
Individual counseling	2.401	1	0.121
Family support	***5.476***	2	***0.019***
Support groups	***5.438***	1	***0.020***
Fixed routines for implementation	1.071	1	0.301

Seeing positive result (p = 0.033), adequate knowledge of recommended lifestyles (p = 0.023), family support (p = 0.019) and *support groups (p = 0.020)* were the variables which were associated with adherence to recommended lifestyle modification at Malamulo hospital.

Multivariate analysis of significant variables, in a logistic regression model, has shown that having *family support* was found to be nearly 5 times more likely to facilitate adherence to recommended lifestyle modification than in cases where families are not involved in the care of the clients *(OR = 4.587, 95% CI: 1.625, 12.947).* Having *support*

groups was also found to be 4 times likely to facilitate adherence compared to situations where there are no support groups (*OR = 4.043, 95% CI: 1.496, 10.926)*. The association of the other 2 variables, *seeing positive results* and *adequate knowledge of recommended lifestyles,* with **adherence to recommended lifestyle modification** were not significant. Table 4 summarizes the multivariate analysis of the significant facilitating factors of adherence.

Table 4: Multivariate analysis of significant facilitating factors of adherence

Factor	**Wald X^2**	**Sig.**	**OR**	**95% C.I**	
				Lower	**Upper**
Family support	7.804	***0.004***	***.587***	.625	2.947
Support groups	7.585	***0.006***	***.043***	.496	0.926
Seeing positive results	2.653	0.234	.277	.241	*1.137*
Adequate knowledge of recommended lifestyles	0.048	0.074	.049	.966	2.101

Assessment of Model Fit

The Hosmer and Lemeshow test was also used to assess the Goodness of Fit, thus whether logistic regression model fits well with the data. Specifically, the Hosmer and Lemeshow test calculates if the observed event rates match the expected event rates in the subgroups of the model population. If the p-value is less than 0.05, the model is rejected, unlike if the p-value is bigger than 0.05.

This study has shown that at 5% significance level, the model passed the test as the Hosmer and Lemeshow test has been found not to be significant ($\chi^2 = 6.598$, $p = 0.581$).

The model has been able to correctly classify 95.0% of those who did not adhere to lifestyle modification, and 32.1% of those who did, for an overall success rate of 78.7% (>70%) of the clients (Pallant, 2011).

The results from the assessment of the model indicate good model fit of the model with "family support" and "support from groups" as facilitators of adherence to recommended lifestyle modification.

Barriers associated with adherence to lifestyle modification.

Similarly, Chi-Square test was used to determine the association between each barrier (predictor variables) and the dependent variable. The predictor variables tested were: *forgetfulness, economic constraints, being away from home, complexity of the information given, poor relationship, patient's attitude, lack of motivation*, and *asymptomatic nature of the disease*; against the dependent variable "**adherence to recommended lifestyle modification**". Table 5 presents the summary of the association between each associated barrier and adherence.

Table 5: Association between associated barriers and adherence

Factor	X^2	Df	Sig.
Forgetfulness	***7.274***	2	***0.0070***
Economic constraints	0.310	1	0.578
Being away from home	***5.756***	1	***0.016***
Complexity of the information	***5.074***	1	***0.037***
Poor relationship	***5.152***	1	***0.023***
Patient's old age	1.650	1	0.199
Lack of motivation	0.076	1	0.783
Asymptomatic nature of the disease	0.082	1	0.775

Forgetfulness *(p = 0.007)*, being away from home (*p = 0.016),* complexity of information *(p = 0.037)* and poor provider-client relationships (*p = 0.023*) were the significant variables associated with adherence to recommended lifestyle modification.

Multivariate analysis of significant variables, in a logistic regression model, has shown that *being away from home* was found to be nearly 3 times more likelihood to hinder adherence as compared to cases where client are at home *(OR = 2.783, CI = 1.042, 7.734). Poor provider-client relationships* were also found to be nearly *(OR = 4.653, CI: 1.633, 13.256)* was 5 times more likely to hinder adhere as compared to cases where provider-client relationship was good. However, *forgetfulness* and *complexity of the information* were not significant barriers of adherence. Table 6 summarizes the multivariate analysis of the significant barriers of adherence.

Table 6: Multivariate analysis of significant barriers associated with adherence

Factor	**Wald X^2**	**Sig.**	**OR**	**95% C.I Lower**	**Upper**
Forgetfulness	2.301	.801	0.391	0.065	.008
Being away from home	4.167	***.041***	***2.783***	1.042	.734

Complexity of the	1.9	(	1.	0.	1
information	21	.995	181	673	.751
Poor provider-client	8.2	***(***	***4.***	1.	1
relationships	85	***.004***	***653***	633	3.256

Assessment of Model Fit

The Hosmer and Lemeshow Goodness of Fit test has been found not to be significant at 5% significance level ($\chi^2 = 3.186$, $p = 0.671$). In addition, the model has been able to correctly classify 80.6% (>70%) of the clients.

The results from the assessment of the model indicates good model fit with "being away from home" and "poor client-provider relationship" as significant barriers associated with adherence to recommended lifestyle modification.

Chapter 5

Discussion of Results

Introduction

This chapter discusses results of the study and their implications in research, theoretical knowledge and clinical practice. The discussion is based on the study objectives.

Adherence

The study determined respondents' adherence to recommended lifestyle since successful management of chronic diseases like hypertension essentially depends on adherence to therapy. On average, the study found an adherence rate of 53.8%, which was significantly lower than the expected adherence index of 80% (World Health Organization, 2010). Zaiken & Zeind (2008) indicated that poor adherence is associated with fatalities, ineffective management of the diseases and decreased quality of life. This explains why a significant percentage of clients at Malamulo hospital have developed decreased quality of life and fatal hypertension-related complications. The poor adherence to lifestyle modification at Malamulo hospital may be explained by provision of inconsistent or ambivalent information by health workers as evidence has shown that different health workers provide information which at times contradict each other (Konkle-Parker, 2001). In addition, this poor adherence may also be explained by poor access to health care services. Literature recommends that health care services should be

universally accessible in terms of affordability, physical accessibility and acceptability, not merely in terms of adequacy of supply (Obrist et al., 2007). However, the largest population around Malamulo hospital catchment area has poor socio-economic status which makes the clients fail to afford the services. Further, physical accessibility to hypertension services is also a challenge since most clients attending the hypertension clinic at Malamulo hospital walk a long distance or would need transportation to access the service. This forces clients to miss most medical appointments hence poor adherence.

Socio-demographic factors as associated with recommended lifestyle modification

Gender

The study found a significant association between gender and adherence level, with female respondents being more adherent than male respondents *(x^2 =24.481; p-value=0.034).* A different study was conducted in Africa by Hareri and Abebe (2013) on assessment of adherence to hypertensive medications and associated factors among patients attending Renal Unit at Tikur Anbessa Specialized Hospital, closer associations between sex and adherence were also reported where female respondents were 40.9% adherent as compared to 28.3% of male respondents' adherence. Similarly, Ambaw, Alemie, Nohames and Mengesha (2012) conducted a study at the University of Gondar Hospital in Ethiopia. The study also found a significant association between sex and adherence, whereby male hypertensive clients were less adherent as compared to female clients. These results could be explained by the fact that men are burdened by the outdoor activities which make them busy and forget to practice the recommended lifestyles in

regards to hypertension control (Serour et al., 2007; Khan, Shah & Hameed, 2014; Nair et al., 2011; Vervloet et al., 2011).

Experience with hypertension

Number of years with hypertension was also significantly associated with adherence level at Malamulo hospital. The study has shown that patients who had less than 5 years with hypertension *(x^2 = 34.148; p-value=0.041)* were associated with good adherence to lifestyle modification as compared to those who had more than 5 years with the condition. These results are congruent with studies conducted by Subhasis et al., (2011) in India and Hareri and Abebe (2013) in Ethiopia. However, contrary to these results, Knafl & Riegel (2014) and Hyre et al., (2007) found that lower periods since diagnosis with hypertension were significantly associated with poor adherence. The results show that experience with hypertension does not guarantee adherence amongst hypertensive clients at Malamulo hospital. The differences in the results may be due the differences in the race and social economic statuses. It is reflecting that poor socio-economic statuses are associated with good adherence when they spend less years with the diagnosis. This may also be explained by the fact that people in the higher socio-economic class don't perceive hypertension as a major threatening condition (Khan et al., 2014).

It is essential, therefore, to continuously remind and motivate hypertensive clients to practice the recommended lifestyles so that the adherence behaviour is reinforced.

Level of education

The study also indicated that respondents who attained some level of education were more adherent to recommended life style modification than those without any formal education *(x^2 = 67.852; p-value=0.003).* These results are consistent with another study which was conducted in a totally different socio-economic country to Malawi, which reported that educational level is significantly associated with healthful behaviors (Panagiotakos et al., 2008). This significant association shows that regardless of difference in the statuses, some level of education may help clients to understand and comprehend medical information given. Furthermore, people who are educated may have a better attitude and beliefs towards a disease and its management. Attitudes and beliefs influence the extent to which clients engage in lifestyle modification (Barnes & Lu, 2012) and the degree to which people gets motivated to engage in lifestyle changes and adhering to them.

However, some studies carried out in Iraq and United States on compliance of hypertensive patients to management and adherence to anti-hypertensive medication respectively found that low level of education was associated with good adherence to treatment (Braverman & Dedier, 2009; Samin & Sirwan, 2010). This means that while education may lead to better understanding of the practices and the risks of poor adherence, one's level of education does not automatically produce and sustain a healthy behaviour. Motivation is still a key to maintain adherence practices at Malamulo hospital.

Respondents' Knowledge on recommended lifestyle modification

Respondents' knowledge on recommended lifestyle modification was also assessed. Good adherence to prescribed measures and treatment requires adequate knowledge and therefore poor knowledge contributes to higher incidences of

hypertension-related complications. Results from this study highlighted that 92% of respondents at Malamulo hospital had adequate knowledge on recommended lifestyle modification in regards to hypertension control. However, this result was much higher than the findings reported by Buda, Hanfore, Fite, & Buda, (2017) in South Ethiopia who reported that only 44.9% of respondents were knowledgeable of the lifestyle modification. Similarly, another descriptive cross-sectional study conducted in Nigeria also indicated that there was inadequate knowledge and practices of lifestyle modifications necessary for blood pressure control amongst clients (Okwuonu, Ojimadu, Okaka, & Akemokwe, 2014). Since all studies were conducted in Africa where they experience almost similar financial conditions and race, the differences in the knowledge levels might be explained by the fact that different states have taken different measures to address the hypertension burden. Malawi adopted health education and motivation strategy before consultation with a doctor, as recommended by WHO STEPS survey (Msyamboza et al., 2011), while Ethiopia adopted a comprehensive multi-sector approach and the strengthening of health facilities capacity offer the service related to NCDs and ensures that the health system adequately monitors compliance with national standards (Ethiopia STEPS Survey Report, 2016). The difference in knowledge levels is also attributed to the differences in the study settings. This study was conducted at a rural hospital while the studies conducted in Ethiopia and Nigeria respectively (Buda, et al., 2017; Okwuonu, et al., 2014) were conducted in urban hospitals. This may be interpreted that people living in the rural areas regard hypertension as serious condition; unlike people living in the urban area.

Facilitating factors of adherence to recommended lifestyle modification

Research has shown that clients' efforts to adhere to hypertension treatment directives usually take place in social settings and can alter family and social dynamics (Rosland et al., 2008). This study has demonstrated a strong association between good adherence to recommended lifestyle modification and family support *(OR: 4.587; CI: 1.625; 12.947),* and also support groups *(OR: 4.043; CI: 1.496; 10.926)* at Malamulo hospital. These results are explained by the fact that supportive families and friends promote clients' optimism and self-esteem when managing and adhering to lifestyle changes which in turn buffers the clients' stress of being ill. In addition, Miller & DiMatteo (2013) and Sharma & Agrawal (2017) in their concept papers also indicated that social support helps clients to change their affective states, increase self-efficacy and influence change in negative health behaviors. Some clients' decision making abilities, thoughts and behaviors are also positively influenced by the opinions and perceptions of others, be it their family members, friends, partners or other influential community members as opposed to their in-ward looking conceptions (Zou et al., 2009). Further, Gama et al. (2011) indicated that social support influences positive behaviour modification by providing an interpersonal support which becomes a significant catalyst for self-efficacy and sustained motivation for clients. With social support, weak non-adherent clients learn from the strong and adherent clients, through discussion and sharing of experiences surrounding their condition, hence re-enforcing behavior changes.

However, in other contexts, literature has shown that social support can also be a significant barrier to client's self-management (Rosland et al., 2008). It is indicated that with family support clients feel nagged, criticized and even feel guilty (Coyne, 2013)

which demotivates them from being committed with the lifestyle changes hence yielding negative health outcomes. This calls for motivation and love from care givers when providing the needed support so that clients engage fully in their own self-management, hence adhering to treatment.

Barriers associated with adherence to recommended lifestyle modification

This study has also shown that being away from home *(p = 0.041; OR: 2.783; CI: 1.042; 7.734)* is a significant barrier associated with adherence to recommended lifestyle modification at Malamulo hospital. The more clients are far away from home, the more they fail to practice the recommended lifestyles regarding hypertension control. This could be explained by the fact that when clients are away from home they forget to practice the recommended lifestyles (Vervloet et al., 2011) since they are usually busy and absorbed in activities that usually help them to earn a living and survive in their homes (Nair et al., 2011). It is also difficult to practice and adhere to the prescribed treatment standards and guidelines when one is not at home or has visited friends and relatives since they have little control over the types and quantities of food to take when they are not the ones preparing the food.

Successful lifestyle modification also depends on a healthy patient-provider relationship (Gamez, 2009). Positive provider-patient relationship fosters motivation, reinforcement and encouragement of adherence behaviors. It also permits adequate informing of hypertensive patients about the condition and its treatment. This study found poor provider-client relationship *(OR: 4.653; CI: 1.633; 13.256*) as another barrier which was significantly associated with poor adherence to recommended lifestyle modification amongst hypertensive clients at Malamulo hospital. Similar results were also highlighted

in a cross-sectional study which was done in Tunisia by (Linetzky et al., 2017). These results can be explained by the fact that negative encounter with health workers bar clients from adhering to the recommended lifestyles as it demotivates clients from being engaged in their own care; (Kalogianni, 2011; Shams & Fineman, 2013). The poor client-provider relationship may also lead to missing attachment between the provider and the client which makes the client to lose trust in their providers hence poor adherence (Sharma, Kalra, Dhasmana, & Basera, 2014; Gamez, 2009)..

Conclusion

The study revealed that family support and support groups are the significant facilitating factors of adherence to recommended lifestyle modifications at Malamulo hospital. The study has also shown that adherence to recommended lifestyle modification is really a challenge and the significant factors associated with poor adherence at Malamulo hospital are being away from home and poor provider-client relationship. Interventions need to be designed immediately to control the disease burden.

Strengths of the Study

- The study was the first one to be done in Malawi. It has revealed and confirmed information on lifestyle modification in regards to hypertension control, which has been taken for granted. The generated knowledge will equip health workers with information on how best they would assist hypertensive clients to adhere to the lifestyle modification or behavioral changes.
- The study used quantitative descriptive method and recruited a reasonable sample size in order to yield objective results which may be rolled out and applied to other health care settings.

- The data was collected using a structured questionnaire which means all the data collected was what was expected without any manipulations; and data was collected by the researcher alone hence first-hand information only was included.
- Data was analyzed using SPSS computer package version 22 which increases the quality of the findings and reduces the chances of yielding results with errors.

Limitations

- The study was conducted at Malamulo hospital only although multiple sites could help to enrich the research findings.
- The study also used a structured questionnaire to collect data although in-depth interviews could have yielded richer data and accommodated new issues which were raised. This was due to the quantitative research approach which was used in this study.
- The study planned to recruit 154 participants but only 108 participants were recruited. This was so because some participants missed appointments due to lack of money to pay for the services on the appointment dates. The change in sample size could decrease the statistical power of the results; thus decreasing the probability of finding statistically significant results.

Recommendations

According to the findings of this study, the following recommendations are highlighted:

- From the study findings, the researcher suggests that social support groups be formed at the hospital and in the catchment area of Malamulo. Support groups connect communities with hospitals, and clients with the same condition. Clients

also have opportunities to share their feelings, ideas and experiences on how to deal with the disease. Support groups also empower the communities in regards to disease control.

- Health workers should change their attitudes in dealing with the clients so that clients get attached to them hence gaining their trust and motivation thereby maximizing adherence.
- The researcher also recommends motivational interviews in the management of hypertension so that individualized schedules are developed with clients hence maximizing adherence when clients are away from home.
- The researcher recommends a qualitative study in the same area so that rich information is yielded.

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Appendices

Appendix 1: Clearance Letter for the Study Site

Kamuzu College of Nursing,

Private Bag 1,

Lilongwe

The Hospital Director,

Malamulo Hospital,

Private Bag 2,

Makwasa.

Dear Sir,

PERMISSION TO CONDUCT A STUDY AT MALAMULO HOSPITAL, HYPERTENSION CLINIC

I write to request for your permission to carry out a study at Malamulo Hospital. I am a nursing student pursuing Master's degree in Adult Health at Kamuzu College of Nursing. In partial fulfillment of the course, I would like to conduct a research study under the topic "**Factors influencing hypertensive clients' adherence to lifestyle modification regarding hypertension control**".

Data collection will be done over a period of four weeks and will probably be done in the month of February, 2017. The study findings will help to address the hindering factors and enhance facilitating factors of adherence hence maximizing hypertension control amongst the clients. At the end of the study, your office will be provided with a written report of the study findings for your action if necessary.

I look forward to your favourable response

Yours faithfully

NDAONA CHITANI

Cc: The Hospital Matron

Phone: 0884241748 **e-mail:**

kamanga2016ndaona@kcn.unima.mw

Appendix 2: Approval Letter from Malamulo Hospital

MALAMULO HOSPITAL

Private Bag 2, Makwasa Malawi, Africa
Telephone: 01 470 051 / 153, 231
E-mail: malamulohosp@gmail.com

Friday, January 27, 2017

Ndaona Chitani

Kamuzu College of Nursing

Private Bag 1

Lilongwe

Dear Ndaona Chitani,

ACCEPTANCE LETTER TO CONDUCT A RESEARCH AT MALAMULO HOSPITAL - HYPERTENSION CLINIC

Malamulo Hospital is happy to inform you that the ADCOM has approved your request of conducting a hypertension research at its hospital from February to March 2017.

Please be informed that after your research, the hospital shall need a copy of your research.

Thanks in advance for your service, we hope the catchment area and our hospital will benefit much from your service.

Thank you,

MALAMULO HOSPITAL
MEDICAL DIRECTOR
MAKWASA, MALAWI

Dr. A. Fekadu, MD,FCS (ECSA)

MEDICAL DIRECTOR

Cc : The Human Resources Manager

File

A SEVENTH-DAY ADVENTIST MEDICAL INSTITUTION

Appendix 3: Certificate of Approval from COMREC

CERTIFICATE OF ETHICS APPROVAL

This is to certify that the College of Medicine Research and Ethics Committee (COMREC) has reviewed and approved a study entitled:

: **P.02/17/2108 –** Factors influencing life style modification adherence amongst hypertensive clients at Malamulo Hospital by Ndaona Kamanga-Chitani

On 16th February 2017

As you proceed with the implementation of your study, we would like you to adhere to international ethical guidelines, national guidelines and all requirements by COMREC as indicated on the next page

Mlombe

Dr. YB. Mlombe - Chairperson (COMREC)

18 February 2017

Date

Appendix 4: Information Sheet

My name is Ndaona Chitani, a student nurse from Kamuzu College of Nursing, currently pursuing Master's degree in Adult Health Nursing. In partial fulfillment for the award of the degree, I am expected to conduct a study, and my study topic is "**Factors influencing hypertensive clients' adherence to lifestyle modification regarding hypertension control".**

The study has been approved by Kamuzu College of Nursing Research Publications Committee and College of Medicine Research Ethics Committee and it will take place at Malamulo hospital, specifically at the hypertension clinic. Before you take part in this study, you are supposed to understand the nature and purpose of the study. If there will be anything that you do not understand about the study, you are free to ask anytime within the study period and even afterwards.

What is the purpose of the study?

The aim of the study is to examine factors that influence hypertensive clients' adherence to lifestyle modification regarding hypertension control at Malamulo hospital. Study findings will help health workers to assist with arousing clients' interest, enjoyment and competence when practicing lifestyle modification thereby increasing their adherence hence preventing the development of complications and improving long-term treatment outcomes.

Can I take part in the study?

Participation in this study is completely voluntary and there are no financial costs to you for participating in the study. You can chose to stop the discussion at any point

and this will not affect the quality of care you receive. However, we strongly wish that you will participate in this study since your views are important.

The information you give to us will be treated in confidential and with adequate privacy. Your name will not be written anywhere. However, you will be given a number as your identity and that number will be written on your questionnaire. At the end of the study all papers will be burnt.

What will happen if I consent to participate in the study?

Upon agreeing to take part in the study you will be required to sign a consent form then answer the attached questionnaire. The questionnaire has 64 questions with different answers. As a participant, you will be required to give answers to the best of you knowledge and to answer all the questions it will take about 30 minutes.

If I have concerns or complaints about the study, what can I do/where can I go?

If you have any concerns about your rights and welfare regarding participation in this study, please contact the researcher on +265 884 24 17 48; email: kamanga2016ndaona@kcn.unima.mw OR the research supervisor, Dr. M. C. Nyando; mobile number: +265 999 57 06 77,e-mail:chrifordnyando@kcn.unima.mw OR the College of Medicine Research and Ethics Committee at College of Medicine, Telephone: +265 (0) 1 871 911

Appendix 5: Informed Consent

PARTICIPANT'S CERTIFICATION

I have read the attached information sheet for this study and understood the purpose of the study and the risks involves.

Explanations and clarifications have been made to my satisfaction.

I agree to voluntarily answer questions to the best of my knowledge.

I understand that I am free to withdraw at any point and there will be no consequences attached.

I understand that information will be kept confidential, as it will be accessed by the researcher and her supervisors only.

I understand that I will not benefit from this study financially.

I also know how to contact the researcher if I have concerns or questions related to the study.

I agree/don't agree to take part in the study.

……
……..

Participant's signature Date

CERTIFICATION OF INFORMED CONSENT

I certify that I have explained the nature and purpose of this research study to the above participant, and I have discussed the potential benefits and possible risks of study participation. Any questions about this study have been answered, and will always be available to address future questions as they arise.

……. …….

……

Researcher's name Researcher's signature

Date

Appendix 6: The Questionnaire (English version): Respondent code:

_____

Topic: "Factors influencing adherence to recommended lifestyle modification amongst hypertensive clients at Malamulo Hospital, Thyolo, Malawi".

Section A: Demographic characteristics

Instruction: *Tick against a box that applies to you, and where you are required to specify, write a brief answer.*

Sex: Male ☐ Female ☐

Age (in years): 18-25 ☐ 25-35 ☐ 35-45 ☐ 45-55 ☐ above 55

Marital status: Single ☐ Married ☐ Divorced ☐

Tribe: Chewa ☐ Tumbuka ☐ Lhomwe ☐ Ngoni ☐ Yao ☐ Other :_____

Highest education level:Primary ☐ Secondary ☐ Tertiary ☐ None ☐

Employment status: Employed ☐ Unemployed ☐

If employed, what is your occupation?

Farmer ☐ Driver ☐ Teacher ☐ Business ☐ other: _____

Religion: Christian ☐ Muslim ☐ Other ☐ (specify):_____

Time since diagnosis with hypertension: _____ Year (s)

Section B: Clients' knowledge of Lifestyle modification

Instruction: *circle the number that applies to each statement:*

1. I have been taught/heard about lifestyle modification i. Yes ii. No
2. Where did you hear about lifestyle modification? i. health workers ii. elsewhere

Due to your high blood pressure (Hypertension) have you ever been told to:

3. Adopt DASH eating plan (diet rich in fruits, vegetables, reduced content of total and saturated fat)? i.Yes ii. No
4. Cut down on salt intake in your diet? i. Yes ii. No
5. Control/lose your weight? i. Yes ii. No
6. Indulge in exercises? i. Yes ii. No
7. Cut down on alcohol consumption? i. Yes ii. No
8. Stop smoking? i. Yes ii. No

Section C: Clients' Practices on lifestyle modification

9. Do you practice as recommended? a. Yes b. No
10. Are you now practicing DASH eating plan? i.Yes ii. No
11. Are you now cutting down salt in your diet? i.Yes ii. No
12. Are you controlling/ losing your weight now? i.Yes ii. No
13. Do you exercise more now? i.Yes ii. No
14. How frequent have you been exercising for the past 3 months? i. Daily ii. Alternate days iii. Weekly iv. Monthly v. I don't know

16. How long do you exercise per each exercising session? i. At least 30 minutes ii. More than 1 hour iii. Decided by the owner iv. I don't know

17. Are you now cutting down on alcohol consumption? i.Yes ii.No iii. Not applicable

18. How much alcohol do you take per day? i. Specify_____ ii. Not applicable

19. Have you stopped/reduced smoking? i. Yes ii. No iii. Not applicable

20. If you have reduced, how many cigars do you smoke per day now? i. Specify____ ii. Not applicable

Sections D: Facilitating factors of adherence to lifestyle modification

The following factors would facilitate adherence behaviors to lifestyle modification

21. Seeing positive results i. Yes ii. No

22. Adequate knowledge on lifestyle modification i. Yes ii. No

23. Understanding the need for compliance and adherence i. Yes ii. No

24. Holding individual counselling i. Yes ii. No

25. Involving guardians in the health education session i. Yes ii. No

26. Family support i. Yes ii. No

27. Support groups i. Yes ii. No

Section E: Barriers of adherence to lifestyle modification

The following factors would bar clients from adhering to lifestyle modification

28. Forgetfulness i. Yes ii. No

29. Economic constraints i. Yes ii. No

30. Being away from home i. Yes ii. No

31. Complexity of the information given i. Yes ii. No

32. Poor client-health worker relationship i. Yes ii. No

33. Patient's age (old age) i. Yes ii. No

34. Lack of motivation due to the incurable nature of the disease i. Yes ii. No

35. Asymptomatic nature of the disease i. Yes ii. No

THE END

Appendix 7: Kalata Yolongosola za Kafukufuku

Werengani kalatayi ndikusyinira pa tsamba lakuseli ngati mukulowa nawo mukafukufuku ameneyu.

Dzina langa ndine Ndaona Chitani, ndikupanga maphunziro a ukachenjede pa sukulu ya anamwino ya Kamuzu College of Nursing. Mbali imodzi yamaphunzirowa ndiye kupanga kafukufuku. Kafukufuku amene ndikupanga ine watsamira pa mutu oti "Zinthu zomwe zimapangitsa anthu odwala Bipii kuti asamatsate ndondomeko za kasinthidwe ka khalidwe pofuna kuchepetsa ukali wa Bipii, mchigawo cha Malamulo"

Kafukufukuyu adzachitikira pa chipatala cha Malamuolo m'boma la Thyolo makamaka ku chipatala cha anthu odwala Bipii. Muli kupemphedwa kutenga nawo mbali mu kafukufukuyu amene wavomerezedwa ndi makomiti oona za research a sukulu ya ukachenjede ya ma nesi komanso ya madotolo. Mukuyenera kumvetsetsa cholinga cha kafukufukuyu musanapange chisankho cholowa nawo mu kafukufukuyu ndipo ngati pangakhale china chomwe simukumvetsa chakafukufukuyu muli ololedwa kufunsa.

<u>Kodi cholinga chakafukufukuyu ndi chani?</u>

Cholinga cha kafukufukuyu nkufuna kudziwa zinthu zomwe zimapangitsa anthu odwala Bipii kuti azitsata kapena asamatsate ndondomeko za kasinthidwe ka khalidwe pofuna kuchepetsa ukali wa Bipii ku Malamulo. Izi zizathandiza akulu azaumoyo kupeza njira zothandizira odwalawa kuti azitha kutsata ndondomekozi. Zotsatira zakafukufukuyi zizathandizanso kupeza njira zoti odwalawa azikhutira ndi maphunziro amene amalandila ndi kudziwa komanso kumvetsetsa kuopsa kosatsatira ndondomekozo.

Kodi ndingatenge nawo mbali pakafukufukuyu?

Ndikufuna kwanu kusankha kutenga nawo mbali mukafukufukuyu kapena ayi. Muli ndi ufulu kusiya nthawi ina iliyonse yomwe mungafune ndipo izi sizizapangitsa kuti inu musalandire thandizo lomwe mwabwerera.

Mayankho anu azasungidwa mwachinsinsi ndipo dzina lanu silizafunika kapena kulembedwa pena paliponse chifukwa tidzagwiritsa ntchito ma nambala. Pamapeto pakafukufuyu, mapepala onse azaotchedwa.

Kodi chidzachitike ndi chani ngati nditatenga nawo mbali mukafufukuyu?

Mukavomera kutenga nawo mbali mukafukufukuyu, mudzapemphedwa kusayinira kalata wosonyeza kuti mwavomereza kutenga nawo mbali mukafukufukuyu ndipo mudzapatsidwa chikalata chamafunso chomwe mudzapemhedwe kuyankha mafunsowo moona mtima. Chikalatachi chili ndi mafunso 64 ndipo pali mayankho angapo pa funso lililonse. Inu mudzafunsidwa kupereka yankho limodzi pa mayankhowo ndipo kuyankha mafunso onse kudzakutengerani inu mphindi 30.

Patapezeka vuto lokhudzana ndi kafukufukuyu ndingachite chiyani?

Ngati mungapeze zovuta kapena kukhala ndi nkhawa zokhudzana ndi kafukufukuyu khalani omasuka kupereka madandaulo anu Kamauzu College of Nursing, nambala yawo ya foni ndi 0111 873 623. Kuti mumve zambiri zakafukufukuyu muyankhule ndi opanga kafukufukuyu a Ndaona Chitani pa **0884 241 748**, e-mail: kamanga2016ndaona@kcn.unima.mw; kapena owayang'anira a Dr. M. C. Nyando pa **0999 570 677**, e-mail: chrifordnyando@kcn.unima.mw. Kapenanso mukhonza kulembera kalata ku keyala iyi: The Secretariate, College of Medicine Research Ethics Committee, P/Bag 360, Blantyre ndipo mukhonza kuyimbako foni pa **0111 871 911.**

Appendix 8: Chivomerezo Cholowera Mukafukufuku

Ndawerenga kalata yolongosola zafukufukuyi ndipo ndamvetsetsa cholinga cha kafukufukuyu ndi zovutazake.

Ndavomereza kutenga nawo mbali ndi kufunsidwa mafunso mu kafukufukuyu mosaumirizidwa. Ndamvetsa kuti ndili ndi ufulu kusiya kutenga nawo mbali mukafukufukuyu nthawi ina iliyonse ndipo zonse zochitika, zolembedwa ndi zokambidwa mukafukufukuyu zidzasungidwa mwachinsinsi ndikuti zidzagwirirtsidwa ntchito ndi opanga kafukufukuyi ndi okhunzidwa ndi kafukufukuyi okha basi.

Ndamvetsetsanso kuti palibepo phindu la ndalama potenga nawo mbali mu kafukufuku ameneyu. Ndikudziwa mmene ndikapezere opanga kafukufukuyu ngati nkofunika kutero.

Ine nkuvomereza/sindikuvomereza kutenga nawo mbali mukafukufukuyu.

……..

Chitsindikizo cha otenga mbali Tsiku

Chitsimikizo choti kalata yolongosola za kafukufuku waperekedwa

Ndikutsimikia kuti ndafotokoza ndondomeko ndi cholinga chakafukufukuyu mwatsatanetsatane ndipo ndafotokoza cholowa ndi kuopsa kotenga nawo mbali mukafukufukuyu kwa otenga nawo mbali amene watsindikiza pa mwambapo. Mafunso onse okhudza kafukufukuyu adayankhidwa ndipo ngati pangapezeke mafunso ena mtsogolomu adzayankhidwanso.

…….. ……

Dzina la opanga kafukufuku Chitsindikizo Tsiku

Appendix 9: Mafunso Akafukufuku Nambala yanu yakafukufuku:

_____

MUTU: "Zinthu zomwe zimapangitsa anthu odwala Bipii kuti azitsata kapena asamatsate ndondomeko za kasinthidwe ka khalidwe pofuna kuchepetsa ukali wa Bipii, mchigawo cha Malamulo"

Gawo A: Mbiri yanu

***Langizo*:** Chongani mu kabokosi komwe kakufotokoza za mbiri yanu ndipo pomwe mwafunsidwa kupereka yankho lomwe kafukufukuyu sanapereke fotokozani mwachidule.

Mamuna ☐ Mkazi ☐

Zaka (za pakati pa): 18-25 ☐ 25-35 ☐ 35-45 ☐ 45-55 ☐ kuposera 55

Ndondomeko ya banja: sindili pa banja ☐ ndili pa banja ☐ banja linatha ☐

Mtundu: Chewa ☐ Tumbuka ☐ Lhomwe ☐ Ngoni ☐ Yao ☐ Other:_____

Sukulu munalekeza pati?:Sindinaphunzire ☐ Pulayimale ☐ Sekondale ☐ Koleji ☐

Muli pa ntchito?: Eya ☐ Ayi ☐

Ngati muli pa ntchito, mumagwira ntchito yanji?

Mlimi ☐ Yoyendetsa galimoto ☐ Mphunzitsi ☐ Yogulitsa katundu ☐ Zina(Lemabani): _____

Chipembedzo: Mkhristu ☐ Msilamu ☐ Zina ☐ (Lembani):_____

Mwadwala matenda a Bipii kwa zaka zingati? Zaka: _____

Gawo B: Chidziwitso cha odwala Bipii pa ndondomeko za kasinthidwe ka khalidwe pofuna kuchepetsa ukali wa Bipii

Langizo: *Zungulizani nambala yomwe ili yankho lanu pa chiganizo chilichonse*

1. Ndinamvapo/ndinaphunzitsidwapo za ndondomeko za kasinthidwe ka khalidwe pofuna kuchepetsa ukali wa Bipii i. Eya ii. Ayii
2. Munazimvera kuti? i. Kwa ogwira ntchito ku chipatala ii. Kwina

Chifukwa chavuto lanu la Bipii, kodi munayamba mwauzidwapo zinthu monga :

3. Kutsata ndondomeko za kadyedwe (kuchulutsa zipatso, masamba, kuchepetsa za mafuta)? i.Eya ii. Ayii
4. Kuchepetsa mchere mu chakudya chanu? i. Eya ii. Ayii
5. Kuchepetsa kulemera kwa thupi lanu? i. Eya ii. Ayii
6. Kupanga masewera olimbitsa thupi (majowajowa)? i. Eya ii. Ayii
7. Kuchepetsa mowa? i. Eya ii. Ayii
8. Kusiya kusuta fodya? i. Eya ii. Ayii

Gawo C: Katsatidwe kandondomeko

9. Kodi inu mumatsatira ndondomekozi momwe munaphuzirira? a. Eya b. Ayii
10. Kodi mukutsata ndondomeko ya kadyedwe monga munaphunzirira? i.Eya ii. Ayi
11. Kodi munachepetsa mchere muchakudya chanu? i.Eya ii. Ayii
12. Kodi mukutsata ndondomeko yochepetsa kulemera kwa thupi lanu? i.Eya ii. Ayi
13. Kodi mumapanga majowajowa? i.Eya ii. Ayii
14. Kodi pa miyezi itatu yapitayi, mwapangapo majowajowa nthawi zotalikirana bwanji? i. Tsiku lililonse ii. Masiku odumphitsadumphitsa iii. Pasabata kamodzi iv. Pamwezi kamodzi v. Sindinapangeko
15. Kodi mukamapanga majowajowa mumatenga nthawi yayitali bwanji mukupangabe masewerowa? i. Mphindi zosachepera makumi atatu ii. Kuposera ola limodzi iii. Nthawi ndimaona ndekha

16. Kodi munachepetsa mowa? i.Eya ii.Ayi iii. Sindimamwa ndi kale
17. Ngati Eya, panopo mumamwa mowa ochuluka bwanji patsiku? i. Lembani _____
18. Kodi munasiya /kuchepetsa fodya? i. Eya ii. Ayii iii. Sindimasuta kale
19. Ngati munachepetsa, patsiku mukumasuta ochuluka bwanji? i. Lembani _____

Sections D: Zomwe zingalimbikitse odwala Bipii kutsatira moyenera ndondomekozi

Mfundo zotsatirazi zingalimbikitse odwala Bipii kutsatira ndi moyenera ndondomeko zoyenera pochepetsa ukali wa Bipii:

20. Kukhala ndi zotsatira zabwino (monga kutsika kwa Bipii) i. Eya ii. Ayii
21. Kukhala ndi chidziwitso chokwanira cha ndondomekozi i. Eya ii. Ayii
22. Kumvetsetsa ubwino otsatira ndi kuchita ndondomekozi i. Eya ii. Ayii
23. Kukhala ndi uphungu wa odwala aliyense payekha payekha i. Eya ii. Ayii
24. Kulandira uphungu limodzi ndi achibale kapena otisamalira/otiyang'anira i. Eya ii. Ayi
25. Kuthandizidwa ndi a pabanja potsatira ndondomekozi i. Eya ii. Ayi
26. Kupanga/kulowa magulu othandizana potsatira ndondomekozi i. Eya ii. Ayi

Gawo E: Zomwe zingapangitse kuti odwala asatsatire moyenera ndondomekozi

Mfundo zotsatirazi zingapangitse kuti odwala Bipii asatsatire moyenera ndondomeko zochepetsera ukali wa Bipii:

27. Kuyiwala i. Eya ii. Ayii
28. Mavuto a zachuma i. Eya ii. Ayii
29. Kukhala kutali ndi kwanu i. Eya ii. Ayii
30. Kukhwima kwa ziphunzitso zomwe zimaperekedwa kuchipatala i. Eya ii. Ayii
31. Kusagwirizana (ubale oipa) pakati pa ogwira ntchito ndi odwala i. Eya ii. Ayi

32. Ukalamba i. Eya ii. Ayi
33. Kusowa chilimbikitso podziwa kuti Bipii ndi nthenda yosachizika i. Eya ii. Ayii
34. Kusaonetsa zizindikiro kwa nthendayi (Bipii) i. Eya ii. Ayii

PA MATHERO