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Social Services, Health and Sports

PREVALENCE AND MANAGEMENT OF HYPERTENSION IN AFRICAN CULTURE

Literature review

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Abstract

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Abstract

Hypertension is a chronic medical condition that severely increases the risks of other ailments such as heart, kidney and brain diseases. Globally, about 1 billion individuals are hypertensive with an associated death rate of approximately 7.1 million deaths in a year. Contrary to the earlier belief that hypertension is a disease of adulthood, recent findings have shown that hypertension can start early in life (adolescent) and progress to adulthood. The rate of hypertension in Africa is the highest (about 46% of adults) in the world, but only about 50% of those with hypertension in Africa are diagnosed. Over the past few decades, the burden of hypertension, and its contribution to consequent cardiovascular diseases in Africa, has been rising and is expected to nearly double by the year 2030. Cases of hypertension that have not been diagnosed or have been poorly treated or not treated at all among the larger population in the African region is the main reason for this increase. This therefore highlights the need for the implementation of strategies that are timely and appropriate in the diagnosis, control, and prevention of hypertension in Africa. Since it is expensive treating hypertension, especially the in relation to the low income in many African countries. Given the high cost of hypertension treatment, especially medication, relative to average income in many African countries, preventive measures such as higher awareness and enhanced physical activity, regulation of body weight and diet adjustment offers the best chance of mitigating the effects of hypertension on both mortality and morbidity.

This study reviewed the available and recent literature on the prevalence and management/control of hypertension in Africa to understand the main reason or factors responsible for this. This study material will serve as an online learning material for Savonia UAS NURSKL-course.

Low level of hypertension awareness, management and control are the main reasons for the high prevalence of hypertension in Africa. This situation is further compounded by other factors such as lack of standard guidelines on the management of hypertension, unhealthy lifestyle, low compliance with treatment, erroneous cultural belief/practices, use of inappropriate therapy, genetic factors, conflicts, and wars, as well as low level of education and living standards occasioned by poverty.

There is urgent need for involvement of government in African countries in the enhancement of awareness, detection, general control and management of hypertension in the African region.

Keywords

hypertension, African culture, prevalence, causes and management

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1 INTRODUCTION

Raised blood pressure (BP), known as high blood pressure (HBP) or simply hypertension (HTN), is the most common disease in the world (Kearney et al. 2005, Grotto et al. 2006). Hypertension is a chronic medical condition that severely increases the risks of other ailments such as heart, kidney and brain diseases. Hypertension is one of the several diseases involving the heart and blood vessels (Mendis et al. 2011) and classified as cardiovascular diseases (CDV) (Mackay 2004). Hypertension is also considered the biggest contributor to the burden of disease globally, being responsible for 7% of world disability adjusted life years (DALYs) (Lim et al. 2012). It remains also the single greatest cause of preventable death among humans, contributing significantly to both morbidity and mortality (Ekwunife et al. 2010).

Contrary to the earlier belief that HBP is a disease of adulthood, recent findings have shown that HBP can start early in life (adolescent) and progress to adulthood (Singh et al. 2006, Sunder et al. 2013). Increased prevalence of obesity among adolescents have been implicated as the cause for increased prevalence of HBP among adolescents in the last decade (Hanssen et al. 2007; Akgun et al. 2010; Falkner et al. 2010; Sunder et al. 2013). It has also been asserted that early detection and possible management of HBP may prevent complication in adulthood (Karey et al. 2010). To prevent HBP and reduce the global burden of HBP, lifestyle modification is recommended. Population-based initiatives such as reduction in salt intake, improved vegetable and fresh fruits availability is another recommendation. (Unger et al. 2020). Recent evidence-based studies from different countries also suggested redefining hypertension (Whelton et al. 2017), initiating treatment with a single pill combination therapy (Williams et al. 2018), advising wider out-of-office BP measurement (Whelton et al. 2017, Umemura et al. 2019) and lower BP targets (Whelton et al. 2017; Williams et al. 2018) as other management technique to reduce the global burden of HBP (Unger et al. 2020).

Within sub-Saharan Africa, Hypertension is the main cause of heart failure, chronic kidney and ischemic heart diseases, contributing significantly to the proportion of increasing cardiovascular disease burden. Over the past few decades, the burden of hypertension, and its contribution to consequent cardiovascular diseases in Africa has been rising and is expected to be nearly doubled by the year 2030 (Kengne et al. 2012). Cases of hyper-tension that have not been diagnosed, not treated at al or poorly treated among the larger population in the African region is the main reason for this increase. A meta-analysis of the burden of undiagnosed hypertension in the African region by Ataklte et al. (2015) indicated that the prevalence in the region is age dependent. The prevalence of hypertension increased with age but was similar between urban and rural areas, as well as between males and females. The study suggested the highest incidence of hypertension for participants with average ages of 60 years. The study reported high cases of hypertension coupled with very low level of awareness about hypertension, as well as poor treatment, and control of hypertension in the Sub-Saharan African region. This therefore highlights the need for the implementation of strategies that are suitable and timely in the diagnosis, control, and prevention of hypertension in the African region. Given the high cost of hypertension treatment, especially medication, relative

to average income in many African countries, preventive measures such as higher awareness and enhanced physical activity, regulation of body weight and diet adjustment offers the best chance of mitigating the effects of hypertension on both mortality and morbidity.

Although there is awareness of the use of diets and other lifestyle modifications to help prevent certain diseases, greater awareness is needed to effectively manage and control hypertension. For the purpose of planning to meet the need of those who are hypertensive, it is important to have updated and accurate figures as well as good knowledge on whether the adjustment in lifestyle and diet impact on the hypertension incidence and prevalence are clinically and scientifically important. A decrease in incidence due to these interventions could imply that future occurrences are partly adjustable and that carefully handling the adjustable risk factors might slowdown the begining if not completely prevent hypertension development with age (World Health Organization (WHO) 2005).

The main purpose of this study is to find out what kind of factors are causing or worsening the prevalence of hypertension in African cultures. The aim is to (1) contribute to hypertension management by increasing the knowledge of hypertension-based modification in medical nursing field. (2) To look for indicators of change with time in the prevalence and/or incidence of hypertension due to lifestyle and diet modification. (3) To determine what new information can be added about how to further increase awareness of hypertension intervention.

2 HYPERTENSION IN THE AFRICAN CULTURE

The prevalence of HBP globally, is very high. Lower than half of the adults all over the world (42%) with hypertension have been detected and treated (WHO, 2021). This implies that the number of undiagnosed and untreated HBP is high and varies among regions of the world. This chapter is looking at the global problem of hypertension as well as hypertension in the African context, with regards to cause, control and management.

2.1 Hypertension globally

Hypertension is when a individual's systolic blood pressure (SBP) measured in the clinic or office is ≥ 140 mm Hg and/or the diastolic blood pressure (DBP) is ≥ 90 mm Hg after several measurements. This definition is true for adults over the age of 18 years. For determining the right therapeutic method in hypertension management, HBP are categorized into different levels such as (1) High-normal BP, (2) Isolated systolic hypertension (ISH) and (3) confirmed grades 1 and 2 HBP. Individuals with High-normal BP (SBP 130 – 139 mm Hg and/or DBP 85 – 89 mm Hg can benefit from interventions such as lifestyle changes and only get treatment pharmacologically when there are irresistible indications for that. ISH also known as elevated SBP (≥140 mmHg) and low DBP (<90 mmHg) is mostly frequent among the elderly and young persons. ISH is the common form of essential hypertension in young people, which includes children, adolescents as well as young adults. However, among the elderly, Isolated systolic hypertension reflects the thickening of the large arteries with an increased heartbeat pressure. On the other hand, those with confirmed grade 1 (SBP 140 – 159 mm Hg and/or DBP 90 – 99 mm Hg) and grade 2 (SBP ≥ 160 mm Hg and/or DBP ≥ 100 mm Hg) require appropriate pharmacological treatment (Unger et al. (2020).

Differences in blood pressure (BP) readings taking at different settings leads to two conditions of HBP, namely Masked and white Coat Hypertension. White Coat hypertension is a situation where a person's BP taking at the doctor's office is high but normal when measured out of the doctor's office (home or ambulatory measurements). On the other hand, those with masked HBP have normal BP reading in doctor's office but high BP readings when measured out of doctor's office (Home or ambulatory measurements) (William et. al. 2018; Unger et. al. 2020). Both white-coat and masked HBP conditions are common with those undergoing treatment for hypertension as well as those not taking any treatment. It is said that about 10 – 30 % of those visiting clinics due to HBP have white coat hypertension while about 10 – 15 % have masked hypertension.

Persons with White coat hypertension are at intermediate cardiovascular risk between normal BP and sustained high BP. Therefore, there is need to confirm the diagnosis with repeated BP measurement in and out of the office. There may not be need for drug treatment if there is no damage of organ caused by hypertension and the cardiovascular risk factor is low. Nonetheless, lifestyle modification should be followed, since the situation can change to sustained HBP that needs treatment with drug later (William et. al. 2018; Unger et. al. 2020). The cardiovascular risk for individuals with Masked hypertension is similar to those with sustained hypertension.

Therefore, there is need to confirm the diagnosis with repeated BP measurement in and out of the office. Drug treatment may be required to normalize the out-of-office BP measurement of individuals with masked hypertension (Unger et. al. 2020.)

The worldwide incidence of hypertension is estimated to be about 1 billion individuals, and approximately 7.1 million deaths in a year may be attributed to hypertension. It has also been reported by the WHO that the suboptimal systolic blood pressure (SBP) >115 mmHg is the reason for sixty two percent of cerebrovascular disease and forty nine percent of ischemic heart disease (IHD), with little gender differences (Chobanian et al. 2003). HBP is considered globally as the most prevalent risk factor for the rising cases of many other cardiovascular diseases such as stroke, chronic kidney diseases and heart failure (WHO 2005, Ordinoha 2013). According to the World Health Organization (WHO), an estimated 1.28 billion adults aged 30-79 years worldwide have hypertension. HBP is therefore globally identified as the leading risk factor for mortality and ranked third as a cause of disability-adjusted life years (Ezzati et al. 2002). Karey et al. (2010) also reported that one in every eight deaths globally, is caused by HBP, making it the third leading killer disease in the world. In 2017, the Global Burden of Disease (GBD) Risk Factor Collaborators rated HBP as the highest reason of death globally, being responsible for 10.4 million deaths annually (Feigin & GBD, 2018). According to WHO, around 46% of adults who are hypertensive, globally, do not know that they are hypertensive, making it even more dangerous.

About 26.4% of the global adult population had HBP in the year 2000, with an estimated increase to about 1 in 3 adults, above 20 years old, in 2025 (Kearney et al. 2005). Based on a methodical examination of several population-based researches, Mills et al. (2016) put the estimate of those with hypertension in 2010 at 1.39 billion people globally. There is a global increase in the prevalence and adverse impact of HBP on cardiovascular morbidity and mortality in both high-income countries (HIC) and low-medium income countries (LMIC) (Mills et al. 2016; Risk 2017). As a trend, the number of people with HBP decreases from low-income to high-income parts of the world (Risk 2017). WHO estimate showed that most (two-thirds) of the hypertensive persons reside in the low-income and middle-income countries of the world. An estimated number of about 1.04 billion and 349 million people had hypertension in low-medium income countries (LMIC) and high-income countries (HIC) respectively (Mills et al. 2016). Low levels of awareness (estimated 38% in LMIC and 67% in HIC), treatment, and control rates in LMIC, as compared to the HIC, is reported as the main reason for the huge difference in the number of hypertension cases between the regions (Mills et al. 2016). According to WHO (2021), only about 1 out of every 5 adults (21%) who are hypertensive have it under control.

2.2 Causes of hypertension in Africa

Although HBP is a major public health problem in both developed and developing countries, Africa has the highest rate (about 46% of adults) of high blood pressure in the world, according to WHO (2013) reports. Incidentally, about 50% of those with hypertension in Africa are undiagnosed (Bosu 2015; Guwatudde et. al. 2015). About 3 in 5 older adults in rural as well as urban Africa is having high blood pressure and the fraction has gradually increased between 2005 and 2018, being high

in the different parts of Africa (Bosu et al. 2019). At some point, high blood pressure was regarded as uncommon disease in sub-Saharan Africa; an assertion which may be true or possibly due to low or no availability of data. Although there is still non availability of comprehensive basic data on the incidence of hypertension in many African countries, an estimated number of 10 to 20 million people, out of the roughly 650 million people living the sub-Saharan Africa, may be hypertensive (Opie and Seedat 2005). Recent systematic reviews of available studies in different parts of Africa, have shown an increasing prevalence of HBP in Africa over the last decade or so (Adeloye & Basquill 2014). In 2010, hypertension prevalence in Africa was said to have risen by 67% from what it was in 1990 and was suggested to have caused the death of 500 000 people and loss of 10 million years of life (Seedat 2015). One study by Kearney et al. (2005) even projected that hypertension in Africa will rise by 89% between 2000 and 2025 compared to an increase of 24% in more advanced countries. A methodological review by Danaei et al. (2011), showed the highest rise of systolic blood pressure (BP) in southern, western, east and central Africa than any other region of the world in the last 10 years before the review. Both in the rural and urban communities of sub-Saharan Africa, hypertension is not only considered the highest ditected risk factor for cardiovascular diseases (CVD) but predicted to contribute significantly to the increasing burden of CVD in the region (Hendriks et al. 2012).

High blood pressure is currently ranked the most common risk factor for the development of CVD such as coronary artery disease, congestive heart failure, chronic kidney disease as well stroke in Africa (Opie & Seedat 2005). Some studies have shown hypertension as the main risk factor for stroke in Africa. In addition, stroke occur at a comparatively younger age in Africa than in other parts of the world. The same review also reported that in sub-Saharan Africa, hypertension was mstly connected with stroke in people younger than 45 years of age (Twagirumukiza and Van Bortel 2011; Ogah & Rayner 2013). A study of patients who had acute heart failures and was treated in 12 hospitals spread across 9 countries within the sub-Saharan Africa region, showed hypertension as being a prominent risk factor for heart failure and responsible for 45.4% of the examined cases (Damasceno et. al. 2012). According to the Global Burden of Disease (GBD), the rating of hypertension became worse, rising from the 4th to the 3rd prominent risk factor for deaths in West Africa from 1990 to 2010 (Institute for Health Metrics and Evaluation 2014). Furthermore, target organ damage and severe hypertension are relative common among those with HBP in Africa (Bosu 2015). Hypertension problems that take place at very young ages in Africa result in the loss of a higher number of years of potential life and due of its high incidence rate, hypertension treatment puts heavy economic pressure on the communities in the African sub-region (Twagirumukiza and Van Bortel 2011).

2.3 Treatment and Management of Hypertension in Africa.

The chronic noncommunicable disease that is easiest to treat is most likely hypertension. This is due to the fact that diagnoses via blood pressure measurement and subsequent monitoring is easy, the drugs are not expensive and usually taking once a day, and not laboratory monitoring is required for the treatment. (Antignac et al. 2018). Despite the global HBP identification, management and control prioritization, as well as availability of inexpensive but effective medications, there are

numerous challenges in the control of HBP in Africa (Kengne et al. 2012; Adeloye & Basquill 2014; Bosu 2015). Officially, there are no data on the risk arising from hypertension or cardiovascular and mortality and morbidity. Estimates from hospital data are generally used to generate data on the risk from hypertension in Africa. Like other non-communicable diseases, control and prevention of hypertension rarely feature on the agenda of countries within the African region (Adeloye & Basquill 2014). Currently, there are no practical or handy guidelines to diagnose and treat hypertension at at the grassroot level in African. According to Twagirumukiza and Van Bortel (2011), many of the published guidelines have rarely been implemented in places like sub-Saharan Africa because they did not provide any functional management procedures for health professionals in poor countries like the countries in Africa. A lot of health professional in Africa relay on simple methods and daily experience in managing HBP, leading to unreasonable use of scarce resources with no uniformity in hypertension treatment protocol in the region (Twagirumukiza and Van Bortel, 2011). The prevailing poverty coupled with ignorance about hypertension in the region, therefore means that hypertension is mostly under-diagnosed and poorly treated, commonly leading to complications, chronic disability and premature mortality (Ogah & Rayner 2013; Adeloye & Basquill 2014).

Many people are unaware that they are hypertensive and only small percentage of those aware are on treatment, depending on many other factors such as profession, level of education etc. (Bosu 2015). Other factors contributing to poor control and management of hypertension in Africa includes lack of access to affordable healthcare and difficulties in the implementation of screening programs (Kengne et al. 2012). Additionally, there is limited knowledge about the etiology and management of hypertension among patients and health personnels, as well as poor compliance to medication among those being treated already (Kengne et al. 2012). One of the studies reviewed by Bosu (2015), reported that in Nigeria, about 73% of university workers attributed hypertension to factors such as worries, stress or too much thinking, while another 65% was not aware that hypertension treatment is a life-long process. In another study carried out in Abeokuta Nigeria, while about 89% of hospital personnel rightly described hypertension as a risk factor for stroke, 15% associated stroke with evil spirits or God's will. Also, while about 61% liked to be treated in the hospital, 13% preferred to be treated spiritually. Due to inadequate counseling about necessary lifestyle modification and HBP treatments, many hypertensive patients believe that they need to take medication only when they have symptoms (Bosu 2015).

Majority of those on treatment, including health professionals are on mono therapy (Bosu 2015). Calcium channel blockers have been reported as the most effective single agent (mono therapy) antihypertensive drug among African patients (Seeley et al. 2020). Recent hypertension guidelines recommend early initiation of combination therapy with advantages such as firmer, timely control of blood pressure and cutback in dose-dependent side effects, in addition to increasing the class outcomes (Williams et al. 2018; Seeley et al. 2020). Combination therapy with calcium channel blocker (CCB) backbone combined with an Angiotensin-converting enzyme (ACE) inhibitor or thiazide diuretic is recommended for African patients (Seeley et al. 2020). However, poverty is a major access barrier to drug therapy in Sub-Saharan Africa, leading many individuals to rely on substandard low-quality drugs, especially drugs from Asian manufacturers/origin, that are available from the

street markets and drug stores with no official approval (Antignac et al. 2018). Common among the poor-quality drugs in the African market is the under-dose of the active ingredients, which greatly affects BP control and could lead to incorrect dosage adjustment by physicians (Antignac et al. 2018).

There is also the issue of the inadequate infrastructure to manage individuals with hypertension as well as the non-comprehensive public health policies needed to control hypertension in the African region (Kengne et al. 2012). Another problem with the management of HBP in Africa is the variation in the BP measurement methods such as type the of equipment used, the number of measurements, the number of visits, and in the values analyzed to arrive at the final BP. The synergy between poverty, occasioned by maladministration, and the poor/inadequate health system represents a major problem in the management of hypertension in Africa. The socioeconomic or wealth status of a patient rather than the actual efficacy of the anti-hypertensive drugs influences the choice of prescribed drugs. Less expensive anti-hypertensive drugs, which may not be the most effective, are most of the times prescribed to poorer patients (Antignac et al. 2018). It is noteworthy that the high degree of diversity in the population risk factors among Africans and the possible benefits of drug classes besides their immediate effect on blood pressure is a major issue in HBP management and control (Seeley et al. 2020).

3 PURPOSE AND AIM OF THE STUDY

The purpose of this study is to find out what kind of factors are causing or worsening the prevalence of hypertension in African cultures. The aim is to (1) contribute to hypertension management by increasing the knowledge of hypertension-based modification in the medical nursing field. (2) To look for indicators of change with time in the prevalence and/or incidence of hypertension due to lifestyle and diet modification. (3) To determine what new information can be added about how to further increase awareness of hypertension intervention.

To achieve this purpose, the author has set the following research questions.

1. What is the current level of awareness about high blood pressure in Africa?
2. What is the current level of treatment and management of high blood pressure in Africa?

4 IMPLEMENTATION

4.1 Literature review

The method used in this research is literature review. Literature review is the comprehensive study and interpretation of literatures (research articles, books, presentations and other publications) that relates to the topic of interest (Aveyard 2014). Identifying the aim and purpose of the literature review is the first among the several steps in the process of a review. The aim of the review clearly specifies what the author is looking at and helps to justify the topic of the review. This is followed by research questions which are set according to the aim and purpose of the review. The whole review exercise is done to provide an answer to the research questions. The search for literature to answer the research questions is the next step and very important too. A thorough search and analysis of available literatures is needed to provide detailed and useful insight into the topic of interest. The next step is to synthesis all the information and knowledge gathered from all the research articles or literature. The last but not the least step of a review, is where the author reflects on all the author has, summarize all the findings and come up with concluding remarks regarding the research questions and topic of the review. The author may also make or add some recommendation for further improvement on the topic of interest. (Coughian & Cronin 2021.)

According to Aveyard (2014), literature reviews are very important for many reasons such as the prohibitive factor of in-creasing rigorous processes of research ethics and governance procedures, which discourages studies based on primary data. The increasing significance of evidence-based practices in areas such as social and health care is another importance. The need to stay in touch coupled with the vast amount of ever-growing research information accessible to health care personnel for instance, highlights the need for the summarized versions provided by literature reviews. Literature review therefore collects all the important information on a particular topic or issue, synthesize and present them in a form that is easily accessible to those that needs them (Houser 2018). Literature review also analyzes recent findings besides the things that are previously understood about the topic (Winchester & Salji 2016).

The review was started by searching for research publications on hypertension globally and narrowing it down to Africa. I searched the two major selected electronic databases namely, PubMed and Google Scholar. The retrieved articles retrieved from the two ele were read and based on the information gathered, I identified an area of need and set the research questions to provide more information on the research topic. In order to answer the research questions, I selected the most suitable and recent studies, mostly review papers, on the prevalence of hypertension in Africa. My supervisor also helped to further scale down the number of articles suitable for this development work. The summarized steps followed is presented (Figure 1).

Qualitative research is usually applied to examine people's perspective based on the experiences they have gone through, and it is used to study human or social subjects such as behavior or feelings. This is usually done with the aim of understanding different phenomena contextually (Holloway 2016; Kyngäs et al. 2019). According to Coughlan & Cronin (2021) qualitative research subjectively takes a holistic vies of the study subject, as a whole and not as numbers or variables.

Additionally, qualitative research does not generalize obtained information but looks at individual experiences. Quantitative research was not used in this development work because we did not have to do direct data handling or direct comparison of studies reviewed.

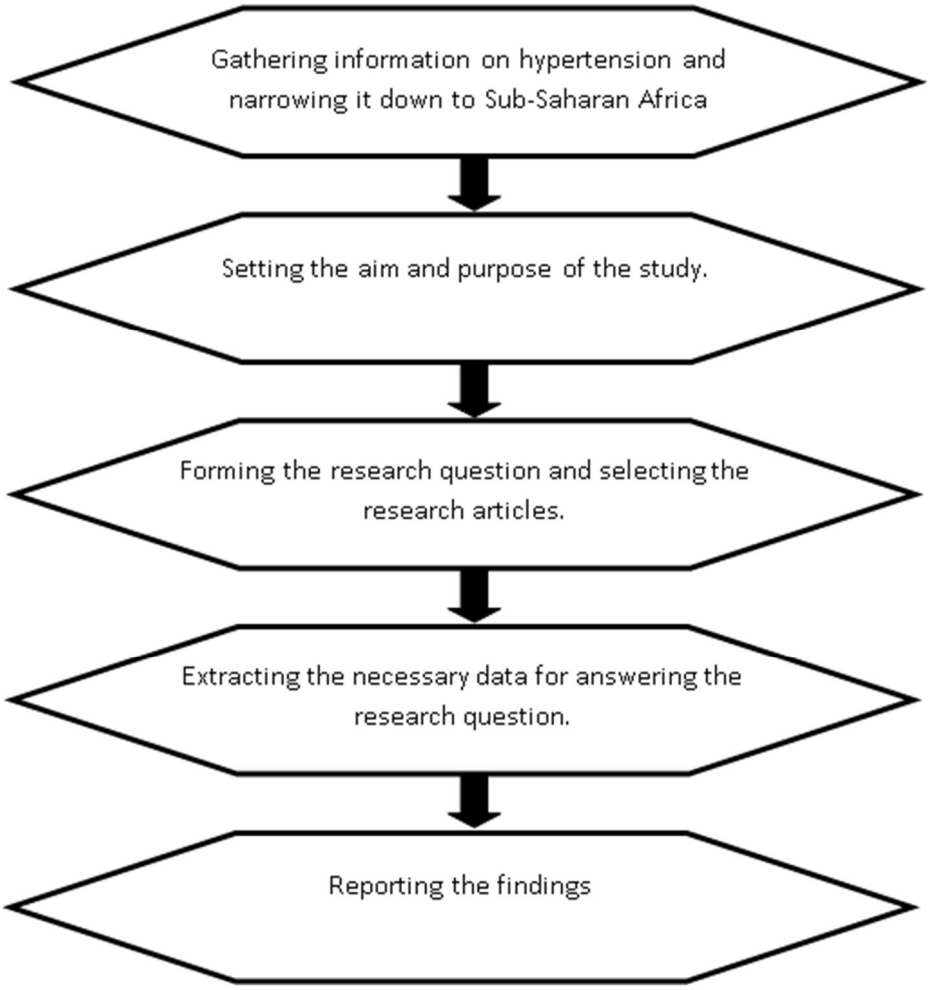

Figure 1: Steps of research implementation

4.2 Data collection

Data collection process involves some key points such as logical search process and strategy. Both the search and the strategic plan must be good enough to suit the eligibility criteria and answer the research question. The data collection process can be repeated many times using the most suitable strategic or logical search process. Select databases from which the search is done, is another important step in data collection. Last but not the list element in the data collection process is the need to strike a balance between specificity and sensitivity. Only limited number of articles may be returned when the search is made too specific. It is also important that the process and strategy used in the search for data are transparent, document and duplicatable by others. (Pursell & McCrae 2020.)

As the author, I decided to use electronic databases after a long and careful consideration of all the available information and sources of data for this project. After consulting with my supervisor

and the librarian, I narrowed my search down to two major databases namely PubMed and Google Scholar. PubMed houses over 30 million research and literatures of medical and life sciences (Na tional Center for Biotechnology Information s.a.) while Google Scholar is such a trusted source that offers a very large amount of information on qualified research articles and academic literature from several fields including nursing sciences.

Duplicability and authenticity of the findings in this project is further increased by the inclusion of the exclusion criteria for the articles (Figure 2). The inclusion criteria for the articles are also hereby implied. Articles were especially included when they are written in English, answering the research question and mostly review articles not limited to one location in Africa. Recent articles not published earlier than 1990 were chosen in order to make the project report up to date. All the articles where peer reviewed by researchers and scholars in the same field. A peer-reviewed article is an article that that is reporting a study evaluated by one or more scholars and researchers in the same field of study (Pursell & McCrae 2020).

A search with 3 key words "prevalence", "hypertension" and "Africa" returned 5964 articles. In PubMed and 170000 articles in Google Scholar. These numbers were too much. After screening the titles of the articles, especially as it relates to the topic of the thesis and the research question, 300 articles were chosen. This number was reduced to 50 after going through the abstracts. On the bases of the full text, Pursell & McCrae (2020) the number of articles was reduced further to 30. With the help of my supervisor, 12 out of the 30 articles were chosen and used for the project.

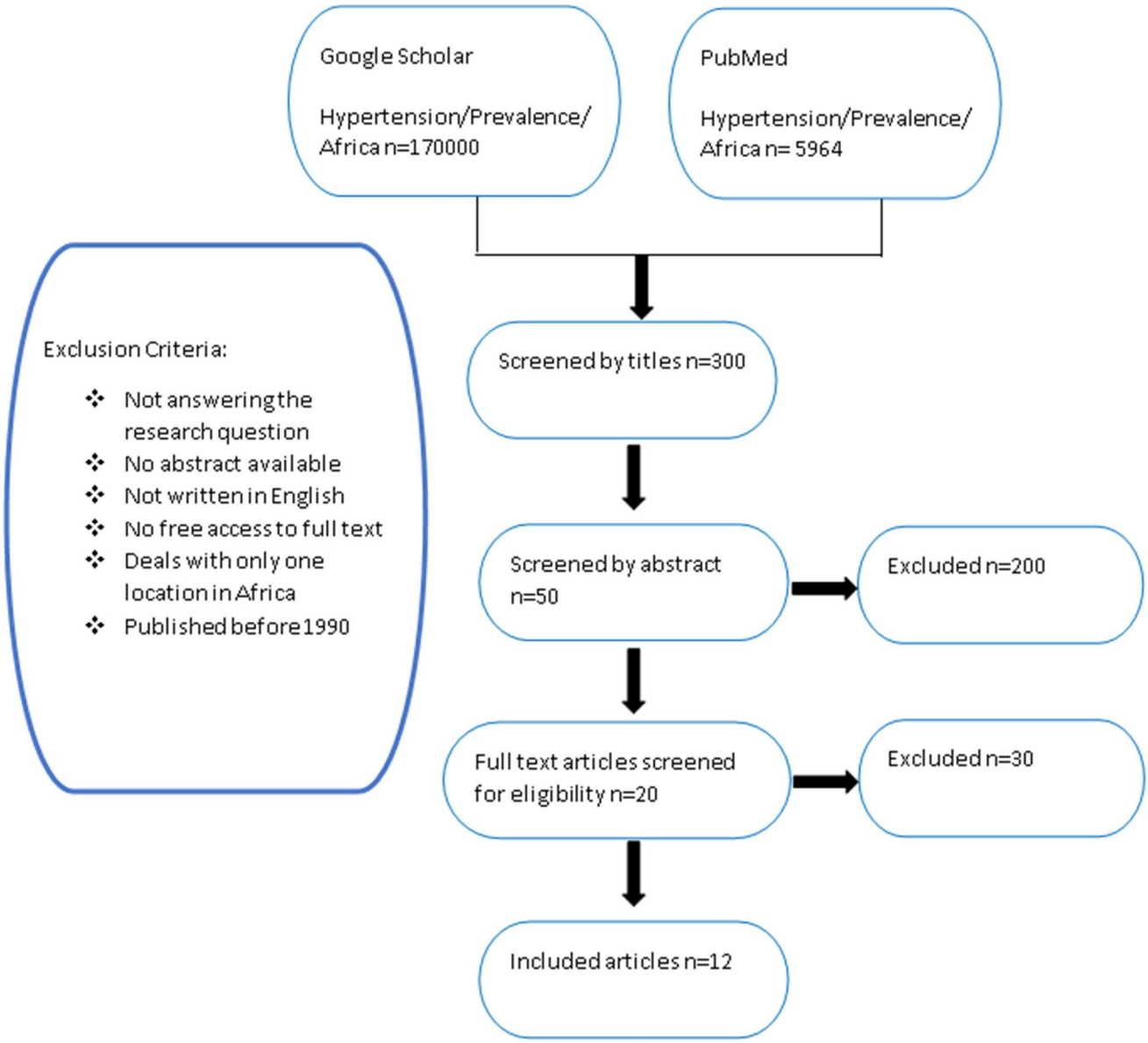

Figure 2: Process of Article selection and exclusion criteria

4.3 Content analysis

Content analysis is a very good method that may be used to analyze quantitative or qualitative data. This can be done in an inductive or deductive way. In Nursing science research, qualitative content analysis is a widely used method (Elo & Kyngäs 2008). It is noteworthy that literature review method used in this thesis does not offer the tools for the comprehensive analysis of the chosen materials. However, in order to compress, categorize and present the research materials in literature review studies, there is need for content analysis (Tuomi & Sarajärvi 2018). In this study, the content or findings of the reviewed articles were combined and summarized to gain a better knowledge of hypertension control, management, and treatment in African context, which the individual articles may not give. This was done with the aim of fully describing the challenges hypertension possess in African and suggest what can be done to help the situation. This was possible because different categories of articles can be objectively and systematically analyzed through content analysis.

Content analysis can also be used to sort, quantify and describe the subject of a study, as it offers a way to categorize and describe the subject and build models that can compress and generalize the subject phenomena. In order to achieve this however, the author need to deeply study the research materials in line with the purpose of the research (Kyngäs & Vanhanen 1999)

In this study, I used inductive content analysis method as the principal research method. Inductive content analysis method was needed in order to integrate all the information from different sources and studies considered. In order to provide answer to the research questions, the inductive content analysis was done in phases or stages such as, reduction of data, grouping of data and categorization of information gathered. The content analytical process included reading of the materials, organization and integration of data, formation of categories and themes by observing the differences and similarities in the materials considered in the study (Kyngäs et al. 2019). After carefully going through the materials, I was able to identify the main themes and categories of information as it relates to the research articles. The analytical units chosen to help in answering the research question, were phrases or sentences from the mail articles. The set themes helped in the identification of the analytical units. The analytical units were simplified and sub-categorized from the reduced data, after they were collected and repeatedly studied. This was followed by putting the sub-categorized data under generic categories. The final step involved putting the generic categories into the main categories derived from the research questions (Figure 3) and (Table 1). Generally, I extracted 48 original expression (n = 48), 15 sub-categories (n = 15), 7 generic categories (n = 7) and two main categories (n = 2).

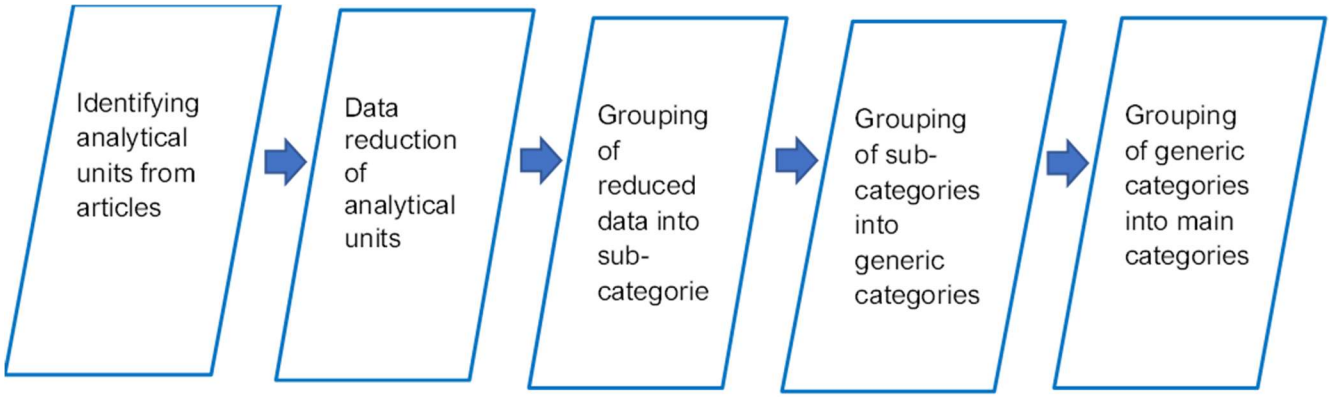

Figure 3: Process of content data analysis

Table 1: Examples of content analysis

Analytical units from Articles	**Reduction of data**	**Sub-category**	**Generic category**	**Main category**
Our studies showed that 58% of Indian patients and 77% of white subjects had hypertension that was untreated, or they had discontinued therapy. Compliance in SSA is a major problem in the treatment of hypertension. (Seedat 2015).	-Untreated -Discontinued therapy -Compliance	Lack of compliance	treatment	treatment and management of high blood pressure in Africa
The high burden of undiagnosed and untreated hypertension also signals the need to increase detection rates of existing hypertension and provide resources for adequate treatment (et al. 2015)	-undiagnosed -Detection rate	Inadequate health systems	management	

5 RESULTS

5.1 Current level of Hypertension awareness in Africa

Low HBP awareness in Africa. The studies reported very low level of hypertension awareness among Africans (Figure 4). Unlike the developed regions of the world, knowledge of hypertension is still unacceptably low in Africa (Ogah & Rayner 2013; Adeloye & Basquill 2014). Workers in the organized sector are expected to undertake pre-employment as well as periodic medical screening during their work life, but the knowledge of hypertension is low even among these workers (Addo et al. 2009). The awareness patterns also vary among different groups of workers except the highly educated and health workers (Guwatudde et al. 2015). Many people are unaware that they are hypertensive and only small percentage of those aware are on treatment, depending on many other factors such as profession, level of education etc. (Bosu 2015). Additionally, there is limited understanding about the etiology and management of HBP among health professionals and patients (Kengne et al. 2012).

Educational attainment, wealth and other economic factors have been shown to significantly affect hypertension in Africa (Ogah and Rayner 2013). The more educated people take better care of their health and are more aware of HBP than the uneducated people. Majority of the workers in the African region are engaged in the unofficial sector and do not have access to any organized occupational health program to safeguard and aid their health. There are inadequate national cardiovascular health programs in Africa and even when they are available, informal sectors groups are rarely targeted, with models of workplace or employee health programs being almost completely based on organized formal work sector (Bosu 2015). Reports of high level of hypertension prevalence among the informal sector groups, especially those with sedentary lifestyle such as traders are common (Bosu et al. 2019).

In recent times, many African countries have been going through different stages of strife and conflicts with associated starvation/famine being connected to increasing HBP. It has been reported that those given birth to or raised during the time of war and time of extreme food scarcity are more likely to have certain health conditions which may include raised BP after the conflict period (Ogah and Rayner 2013.) During war or conflict times, it is also not possible to adopt the recommended primary prevention methods of hypertension in the form of healthy lifestyles such as salt reduction in food, more exercise, weight control, increased consumption of potassium by way of fresh vegetables and fruits, lesser intake of alcohol, and abstinence from cigarette smoking (Seedat 2015, chobanian et al. 2003). It is a common knowledge that hypertension awareness is at the lowest level during wars and conflicts.

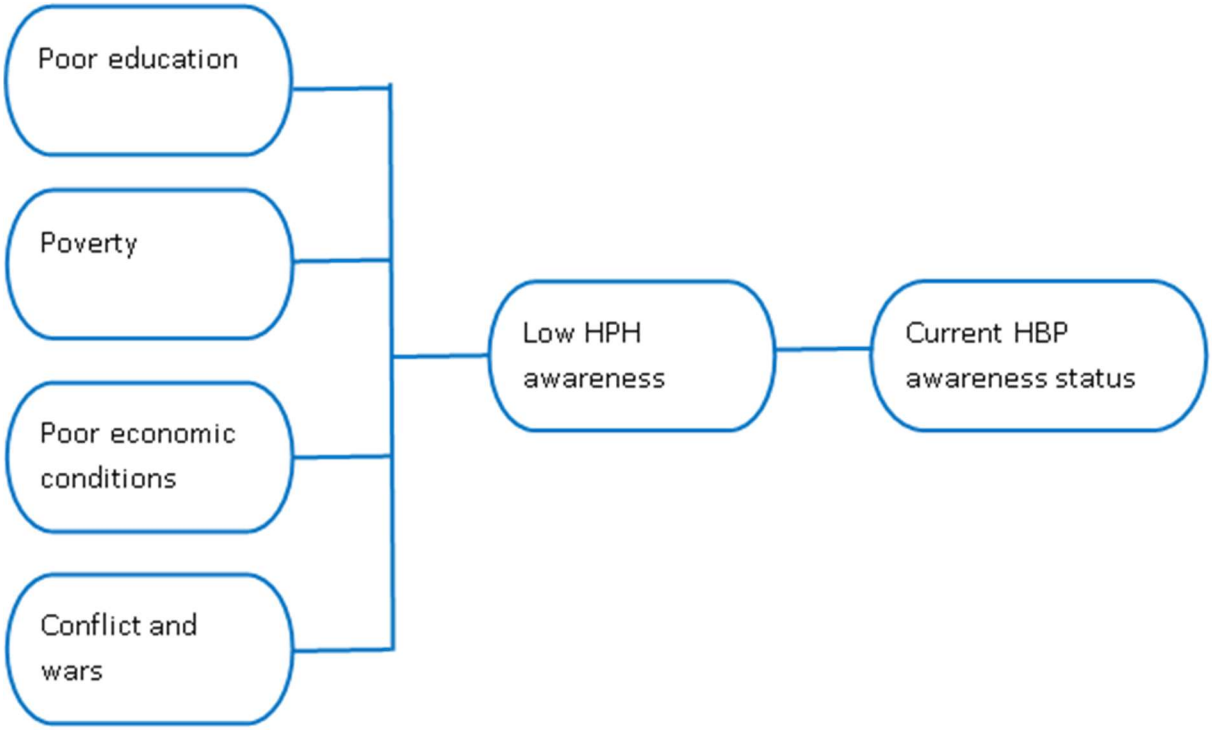

Figure 4: Current level of hypertension awareness in Africa

5.2 Current treatment and management of hypertension in Africa

Poor management of HBP in Africa: The studies reported very poor management of hypertension in Africa due to several factors (Figure 5). Control of hypertension is still unacceptably low in Africa as there are numerous challenges to hypertension control (Kengne et al. 2012; Ogah & Rayner 2013; Adeloye & Basquill 2014; Bosu 2015). Knowledge of hypertension as well as hypertension control rate is very low, even among organized sector workers who are expected to undertake pre-employment as well as periodic medical screening during their work life. (Addo et al. 2009). There is also the problem of inability to afford the hypertension medications, which are usually based on polypharmacy and long duration of use (Ogah and Rayner 2013). Like other developing countries of the world, poor economic conditions in Africa indicates that the highest profit in the control of hypertension lie in targeting hypertension prevention measures as well as enhanced knowledge for those who are hypertensive.

There are presently no functional regulations governing community level detection and treatment of hypertension in African (Twagirumukiza and Van Bortel 2011). According to Twagirumukiza and Van Bortel (2011), many of the published guidelines have rarely been implemented in places like sub-Saharan Africa because they did not contain any useful management protocol for health care workers in poor countries like those of Africa. A lot of health professional in Africa relay on simple methods and daily experience in managing HBP, leading to wasteful use of scarce resources as well as lack of uniformity in in the treatment of hypertension within the region (Twagirumukiza and Van Bortel, 2011). There are only unofficial data concerning the risk arising from cardiovascular mortality and morbidity or hypertension. All the data emanating from Africa on hypertension risk are based

on information collected directly from hospital data. Like other non-communicable diseases, hypertension control and prevention measures rarely feature on the agenda of countries within the African region (Adeloye & Basquill 2014).

Lack of access to affordable healthcare and complications in the application of screening programs is another factor affecting the management of hypertension in Africa (Kengne et al. 2012). There is also the issue of lack of infrastructural facilities to manage those who are hypertensive and the non-comprehensive nature of healthcare policies aimed at controlling hypertension in the African sub-region (Kengne et al. 2012). According to Seedat (2007), poverty is one of key underlying reasons for hypertension and cardiovascular diseases in the African sub-region. Although the countries in the African continent are blessed with, and serve as sources of, huge deposits of precious natural resources, the high level of corruption and maladministration have so much affected the continent to the point that it is regarded as the poorest continent in the world. Africa have the least per capita income in the world. Therefore, the increasing number of people who are poor, those who earn below a dollar per day, have significantly impacted on the health of the people, especially on the management of cardio-vascular diseases such as HBP (Seedat 2007; 2015, Antignac et al. 2018). The synergy between poverty, occasioned by maladministration, and poor/inadequate health system represents a key hindrance in hypertension management in Africa (Seedat 2007).

According to Twagirumukiza and Van Bortel (2011), the "inhabitants of sub-Saharan Africa have a higher risk to become hypertensive". Hypertension was found to be significant amongst people with African ancestry and living in the United States of America in the 1930s. By the 1960s, twofold greater prevalence of hypertension in blacks than the whites have been established by different surveys (Cooper and Rotimi, 1994). Hence, children of parents with HBP often manifest with HBP later in their life, although this can at least be delayed by adopting a healthy lifestyle (World Health Organization 2005).

Except for the very rich class, it is generally not a common practice in Africa to visit health facilities for regular medical check-up unless there is a health condition. Despite being a major health challenge in the African region, several research have shown that most of the hypertensive patients (in Africa) are diagnosed for the first time when they report to the hospital with complications such as heart failure and stroke (Bosu 2015; Guwatudde et. al. 2015.) There are also cases of autopsy results confirming sudden deaths from undiagnosed hypertension. Lack of essential and funtional healthcare services in many of the countries, leading to only non-comprehensive cares with little or no record kept of previous visits, is one of the discouraging factors besides poverty and poor habit. Another reason for infrequent medical visit is that many of the clinics are poorly staffed without enough equipment and right medication. There is also the issue of long queues of patients having to wait for long period of time before being attended to in a clinic by medical personnel (Seedat 2015.)

Lowering the amount of salt intake have been shown to reduce some kind of HBP. A recent study in South Africa reported a strong and independent relation between the urinary index of salt intake and central (aortic) systolic blood pressure among the black communities (Ogah and Rayner 2013.)

The authors rightly pointed out that the consequence of high salt intake on BP may have been initially underestimated in the African region. Except in few countries within the sub-region, there is generally no mandatory regulations on the maximum amount of sodium concentration in processed food, which usually contains most of the salt being consumed (Adeloye & Basquill 2014.) Again, since there is no regulation on the amount of salt, cutting down on salt intake would be hard in populations where salt is used for food poreservation.

Obesity is generally associated with hypertension in black population (Seedat 2015). Obesity rates in West Africa, for example, was reported to have risen by around 115% to get to 15% in the period from 1990 to 2004 (Abubakari et al. 2008). There are evidence of NCDs risk factors in African adolescents and children, and around 10.6% of those are overweight/obese (Muthuri et al. 2014). According to Bosu (2015), obese or overweight people are 2.25 times more likely to be hypertensive (78.3% vs. 34.8%) than those who have normal weight. Another demographic and health review done in South Africa in 1998, indicated obesity (with BMI ≥ 30 kg/m2) prevalence of 30% among black females and 8% among black males (Steyn et al. 2001). It is believed that increasing urbanization (increasing rural urban migration) in Africa has led to the replacement of the relatively healthy rural diet with diet that has higher fat and lower carbohydrate content. An urban-rural divide has also been reported in the hypertension load in Africa (Guwatudde et al. 2015.)

Poor treatment of HBP in Africa: The studies also reported poor status of hypertension treatment in Africa due to several factors (Figure 5). Majority of those on treatment, including health professionals are on mono therapy (Bosu 2015). Calcium channel blockers have been reported as the most effective single agent (mono therapy) antihypertensive drug among African patients (Seeley et al. 2020). However, recent hypertension guidelines recommend early initiation of combination therapy with advantages such as firmer, timely control of blood pressure and decrease in the dose-dependent side effects, in addition to increasing the effects of class (Williams et al. 2018; Seeley et al. 2020). Combination therapy with calcium channel blocker (CCB) backbone combined with an Angiotensin-converting enzyme (ACE) inhibitor or thiazide diuretic is recommended for African patients (Seeley et al. 2020).

Another barrier to effective hypertension treatment in Africa is low compliance with treatment. Compliance in this context, is the extent to which a person adheres to medical and health advice such as attending health-related pre-fixed meetings, taking medications and observing necessary lifestyle adjustments (in areas such as alcohol consumption, diet, physical exercise and smoking cessation) (seedat 2015). Like other health challenges, compliance plays a key role in the successful control and management of hypertension. Low compliance is a key challenge in HBP treatment in Africa. Unhealthy behaviors such as low compliance with medical treatment is common, even among health professionals. For example, one study found high prevalence of hypertension among health workers (Guwatudde et al. 2015.) and educated workers like lecturers and senior officials, which was attributed to lack of compliance with treatment and unhealthy behavior (Bosu 2015).

There is also the issue of using wrong therapy as well as plant medication with unknown effectiveness. For patients to be compliant with recommended control drugs or medication, the drug or

medication needs to be available and affordable. Not much is known about how the price of drugs are determined in Africa. Th patients bear the complete cost of their medication (out-of-pocket expenditure) with no government support or social subsidy whatsoever. Therefore, the price of antihypertensive drugs does not only vary within and between classes but are high and unpredictable (Seedat 2015). This coupled with high poverty rate makes the larger number of people resort to other inappropriate therapy such as local herbs with unproven efficacy. There is also the issue of cultural beliefs, mostly in the rural areas of Africa, associating diseases such as hypertension with spiritual forces and hence resorting to the use of herbs and spiritual sacrifices with no proven result or efficacy (Bosu 2015.)

Poverty is another major factor in every facet of poor hypertension treatment in Africa. As a major access barrier to drug therapy in Sub-Saharan Africa, poverty leads many individuals to rely on poor-quality drugs, especially those imported from Asian manufacturers/origin, found commonly in the unlicensed stores and street markets (Antignac et al. 2018). Poverty in Africa is also associated with critical maladministration/ shortage of health professionals coupled with mass exodus of the few trained ones in search of greener pasture. Poverty and cultural factors are also said to prevent the application of the DASH (Dietary Approach to Stop Hypertension) via high-vegetable, lesser-salt and high-fruit diets, that have been shown to be efficacious African Americans (Douglas et al. 2003).

Treatment of hypertension in Africa is also affected by poor level of education and other environmental factors. Environmental factors, wealth and educational attainment have been shown to significantly affect hypertension in Africa (Ogah and Rayner 2013). The more educated people take better care of their health and are more aware of HBP than the uneducated people. Most of the African workers are engaged in the unofficial sector and therefore have no access to any organized or occupational healthcare program to safeguard and enhance their health. There are inadequate national cardiovascular health programs in Africa and even when they are available, informal sectors groups are rarely targeted, with models of workers health programs being almost entirely dependent on organized official work sector (Bosu 2015.) Reports of high level of hypertension prevalence among the informal sector groups, especially those with sedentary lifestyle such as traders are common. Another problem with the management of HBP in Africa is the variation in the methods of BP measurements in terms of kind of measuring equipment, the number of hospital visits and measurements, as well as the values used to arrive at the final BP (Bosu 2015, Adeoye & Basquill 2014).

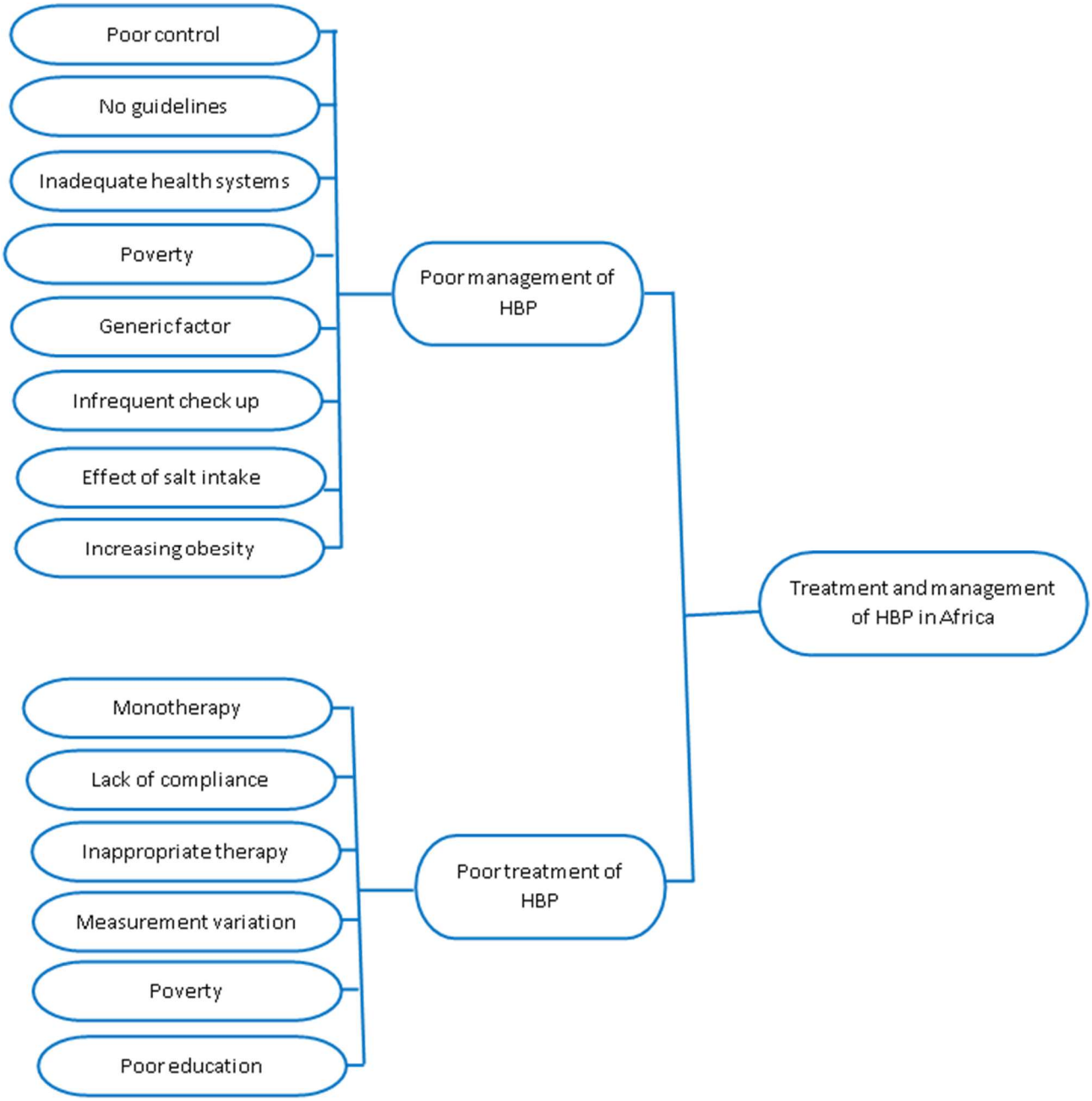

Figure 5: Current treatment and management status of hypertension in Africa

6 CONCLUSION

6.1 Consideration of the results

This study looked at the current awareness level, management, and treatment of hypertension within the African Sub-region. Previous studies have highlighted variations in the prevalence and consequent fallout of hypertension between black, especially of African origin, and white living in different places (Kearney et al. 2005, Wolf-Maier et al. 2004, Banegas et al. 1998). The study concludes that hypertension prevalence is high in Africa, mainly as a result of low level of hypertension awareness, management, and control. This finding is agreement with the prediction that burden of hypertension, and its contribution to consequent cardiovascular diseases in sub-Saharan Africa has been rising and is expected to increase to double the current rate by the year 2030 (Kengne et al. 2012, Addo et al. 2007, 2009). It is also in agreement with predicted global increase in the prevalence of hypertension (Mills et al. 2016; Risk 2017).

As reported in previous studies, this situation is also compounded by other factors such as lack of standard guidelines on the management of hypertension, unhealthy lifestyle, low compliance with treatment, erroneous cultural belief/practices, use of inappropriate therapy, genetic factors, conflicts, and wars, as well as low level of education and living standards occasioned by Poverty (Addo et al. 2007, Ataklte et al. 2015, Mills et al. 2016). Consequently, it is recommended for African countries to partner with international organization for funding to carry out research in this area. Stake holders and policy makers in the health sector of African countries to initiate population-based campaigns aimed at increased hypertension awareness (WHO 2005). There should also be effort to educate and support people, in the formal and informal sector, to address the risk factors of hypertension such as unhealthy lifestyle and diet, dangerous use of alcohol, smoking, and so on (Oyediran et al. 1976). It is believed that the outcome of this thesis will assist the student to understand the current state and need for involvement at national level towards enhanced hypertension detection, overall management and control in Africa.

6.2 Ethicalness and reliability

Ethical principles of research was followed in carrying out this study (Kananen 2011, Finnish Advisory Board on Research Integrity TENK 2012) . The Rectors' Conference of Finnish University of Applied Sciences Arene (2020) was studied, and the knowledge applied. Each step was implemented as thoroughly as possible This study used mostly recent and relatively high-quality review articles on this subject and is therefore believed to be reporting all the major research findings in the African region. I used only ethically sustainable, trusted, and well-known databases and literatures available at school as sources of the research material. However, it is necessary to point out some of the major possible limitations in this study such as the small number of articles covered. The reason for this is that there is still scarcity of high standard research articles from the region due to poor of funding of research. Another reason is that several the available research papers on this subject have missing or invalid data sets. Besides the number of articles, the blood pressure cut offs used in the definition of hypertension also varied among the different studies used in most of the review papers covered. Although the study did not involve raw data analysis, there was variation in the

quality data/data collection methods in the articles covered in this review. Additionally, this is just a bachelor's thesis and so has a limited scope.

6.3 Professional growth

Literature review as a method in thesis writing is a new experience for me, hence the entire process was rigorous, but I have learnt a lot. I now have a deeper knowledge of literature review and workflow processes used in scientific studies (Savonia University of Applied Sciences. s.a. Curricula). This study helped to sharpen my critical thinking ability, data collection and analysis, as well as my academic writing skills. I am also better equipped now to make logical inferences and conclusions from data collected on a specific subject area. I am originally from Africa and going through this study has given me a better understanding of the reason for our experience with hypertension. This know I believe will help me as a registered nurse to attend to patients who are hypertensive, especially those of African descent. I have also learned from the feedbacks I got from my supervisor while conducting this study. I am particularly pleased with how I learned to incorporate the feedback from my supervisor into the study and I believe that this will be very helpful in the future for me. The study has taught me how to source for information from different scientific data bases, study them and process the data into useful information for scientific publications.

6.4 Applicability and development ideas

The main purpose of this study is to examine what kind of factors are causing or worsening the hypertension prevalence in the African cultures. The study results clearly indicated that the high prevalence of hypertension in Africa, was mainly due to low level of hypertension awareness, management, and control among other factors. There is evident in the very low level of detection leading to alarmingly high level of undiagnosed cases and low treatment and control levels (Ado et al. 2007).

It is therefore hoped that the findings of this thesis will help the student understand the current state and need for involvement at national level aimed at enhanced hypertension detection, overall management and control in Africa. It will help the student in their planning as well as to be better

informed on how to implement nursing care for patient of African origin who may not know anything or only have little knowledge about hypertension. They will also be able to explain the pharmacodynamics of hypertension to African patients, guide them through safe medication administration and explain the effectiveness of hypertension medication for the treatment of hypertension. Finally, based on the knowledge from this study, the students can also understand how to guide and psychologically support African hypertensive patients and their families, known their level of awareness.

The study also revealed the need for more government involvement in the management, control, and treatment of hypertension in Africa. There is also need for functional protocols/guideline to enable easy and early detection and treatment of hypertension at community level in sub-Saharan Africa. Health personnel in Africa needs better training and more standardized methods of measuring hypertension, as well as better hypertension management system. Although this study present useful information that may be useful to enhance hypertension awareness, control and treatment in Africa, more research is needed to expand the findings of the study (Nkengasong et al. 2021).

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SELECTED ARTICLES

The Authors names are written in Alphabetical order of the first Author's name and year of publication, where 2 articles have the same first author.

	Authors, title, Country, and year of publication	Purpose	Participants	Study design	Main Findings
1	Adeloye Davies and Basquill Catriona Estimating the Prevalence and Awareness Rates of Hypertension in Africa: A Systematic Analysis UK 2014	To estimate the prevalence and awareness rates of hypertension in Africa based on the cut off ''≥140/90 mm Hg''	Literature review	a meta-regression epidemiological model	The prevalence of hypertension is increasing in Africa, and many hypertensive individuals are not aware of their condition.
2	Antignac Marie, Ibrahima Bara Diop, Diane Macquart de Terline, Kouadio Euloge Kramoh, Dadhi M. Balde, Anastase Dzudie, Beatriz Ferreira et al Socioeconomic status and hypertension control in sub-Saharan Africa: the Multination EIGHT study (Evaluation of Hypertension in Sub-Saharan Africa). France, 2018	To study the association of socioeconomic factors, both at the individual level and at the country level, with hypertension control in 12 SubSaharan African countries.	Urban clinics of 12 countries, both low income and middle income, in Sub-Saharan Africa	A cross sectional survey	strikingly high proportion of uncontrolled BP in low- and middle-income countries. Also, the rate and severity of uncontrolled hypertension was proportional to the individual wealth.
3	Ataklte Feven, Sebhat Erqou, Stephen Kaptoge, Betiglu Taye, Justin B. Echouffo-Tcheugui, and Andre P. Kengne. Burden of Undiagnosed Hypertension in Sub-Saharan Africa A Systematic Review and Meta-Analysis UK 2015	To assess the recent burden of undiagnosed, untreated, and uncontrolled hypertension in Sub-Saharan Africa, based on studies published between 2000 and 2013.	Literature review	Systematic review and meta-analysis of the extant literature	A high prevalence of hypertension, as well as low percentage of hypertension awareness, treatment, and control in Sub-Saharan Africa

4	Bosu William K. The prevalence, awareness, and control of hypertension among workers in West Africa: a systematic review Burkina Faso 2015	To assess the prevalence of hypertension and the level of awareness and control among workers in West Africa	Review of studies on formal and informal sector workers aged ≥15 years in West Africa published between 1980 and September 2014	A systematic review	There is a high prevalence of hypertension among West Africa's workforce, of which significant proportion is undiagnosed, severe, or complicated
5	Bosu William Kofi, Reilly Siobhan Theresa, Aheto Justice Moses Kwaku, and Zucchelli Eugenio. Hypertension in older adults in Africa: A systematic review and meta-analysis. Burkina Faso 2019	To estimate the prevalence of hypertension in older adults living in Africa	Literature review	a systematic review and meta-analysis of studies published between 1 January 1980 to 28 May 2018 reporting the prevalence of hypertension for adults aged ≥ 50 years living in Africa	The persistent high prevalence of hypertension among older adults in Africa, even in rural populations warrants more attention to the cardiovascular health of this group by public health authorities.
6	Gebreselassie, Kirubel Zemedkun, and Mojgan Padyab. Epidemiology of Hypertension Stages in Two Countries in Sub-Sahara Africa: Factors Associated with Hypertension Stages Sweden, 2015	To determines the prevalence and independent predictors of different stages of hypertension in two countries in Sub-Saharan Africa, Ghana and South Africa	Young adults from Ghana and South Africa	A cross sectional study	High prevalence of hypertension in SSA is dependent on several factors
7	Guwatudde David, Nankya-Mutyoba Joan, Kalyesubula Robert, Laurence Carien, Adebamowo Clement, Ajayi IkeOluwapo, Bajunirwe Francis, Njelekela Marina, Chiwanga, Faraja S., Reid Todd. and Volmink Jimmy, Adami	To estimate the prevalence of pre-hypertension, the prevalence of hypertension, and to identify the factors associated with	Participants were from five different population groups defined by occupation and degree of urbanization,	a cohort study	: The prevalence of hypertension and pre-hypertension are high, and differ by population group defined by occupation and degree of urbanization.

	Hans-Olov, Holmes Michelle D & Dalal Shona. The burden of hypertension in sub-Saharan Africa: a four-country cross sectional study. Uganda, 2015	hypertension in four SSA countries	including rural and peri-urban residents in Uganda, school teachers in South Africa and Tanzania, and nurses in Nigeria		
8	Hendriks Marleen E., Wit W.N.M. Ferdinand, Roos T.L. Marijke, Brewster M. Lizzy, Akande M. Tanimola, de Beer H. Ingrid, Mfinanga G. Sayoki, Kahwa M. Amos, Gatongi Peter, Rooy Gert Van, Janssens Wendy, Lammers Judith, Kramer Berber, Bonfrer Igna, Gaeb Esegiel, van der Gaag Jacques, de Wit Tobias F. Rinke, Lange M. A. Joep & Schultsz Constance. Hypertension in Sub-Saharan Africa: Cross-Sectional Surveys in Four Rural and Urban Communities Netherlands, 2012	To assess the prevalence of hypertension and determinants of blood pressure in four SSA populations in rural Nigeria and Kenya, and urban Namibia and Tanzania.	Participants were drawn from rural Nigeria and Kenya, and urban Namibia and Tanzania.	cross-sectional household surveys	Hypertension was the most frequently observed risk factor for CVD in both urban and rural communities in SSA and will contribute to the growing burden of CVD in SSA.
9	Ogah Okechukwu S & Brian L. Rayner Recent advances in hypertension in sub-Saharan Africa. Nigeria, 2013	To summarize new information on hypertension in SSA that has been published since the last major review in 2008	Literature review	Literature review	Need for proactive public health interventions at a population to control the growing hypertension epidemic. Needs for a major improvement in access to hypertensive care for the individual

10	Seedat YK Why is control of hypertension in sub-Saharan Africa poor? South Africa, 2015	To analyze the causes of poor compliance in the treatment of hypertension in SSA and provides suggestions on the treatment of hypertension in a poverty-stricken continent	Patients from South Africa	Health Survey	Treatment of hypertension in the poverty-stricken continent of SSA presents a challenge that needs to be addressed urgently.
11	Seeley Anna, Prynn Josephine, Perera Rachel, Street Rebecca, Davis Daniel, and Etyang O Anthony. Pharmacotherapy for hypertension in Sub-Saharan Africa: a systematic review and network meta-analysis. UK, 2020	To outline the impact of all commonly used pharmacological agents on both blood pressure reduction and cardiovascular morbidity and mortality in SSA.	Literature review	Systematic reviews and Meta-Analyses	CCBs as first-line therapy suggested. The need for Urgent expansion of research, which both addresses patient centred outcomes and takes into account population diversity for SSA to meet global targets and curb the mounting crisis.
12	Twagirumukiza Marc, and Van Bortel L. M. Management of hypertension at the community level in Sub-Saharan Africa (SSA): towards a rational use of available resources Belgium 2011	To interpret the available facts on the management of hypertension, to consider the realities of SSA and to suggest practical algorithms of hypertension detection and management at the community level in SSA low- and middle-income settings	Literature review	A systematic review	In contrast with western countries, there is a higher risk for hypertension in SSA and the higher risk is particularly found at the young age (less than 45 years)