

**An Ethnographic Study of Predictors of Hypertension and its Preventive
Strategies in a Rural Community in Delta State, Nigeria**

By

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An Ethnographic Study of Predictors of Hypertension and its Preventive Strategies in a Rural Community in Delta State, Nigeria

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Supervisor: Prof. BP Ncama

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Declaration

In accordance with the regulations of the University of KwaZulu-Natal, I, Mary Isioma Ofili, declare that this PhD thesis entitled “**An Ethnographic Study of Predictors of Hypertension and its Preventive Strategies in a Rural Community in Delta State, Nigeria**”, except where otherwise indicated, is my original and independent research and that:

1. This thesis has not been submitted for any degree or examination at any other university.
2. This thesis does not contain other person’s writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:
 - a) their words have been re-written but the general information attributed to them has been referenced; and
 - b) where their exact words have been used, their writing has been placed inside quotation marks and referenced.

Candidate’s Signature

_____Date_____

Supervisor: Prof. Busisiwe Purity Ncama’s Signature

_____Date_____

Abstract

This study investigated the blood pressure profiles of residents in Ibusa community in Delta State Nigeria. Predictors of hypertension in the community were also established and traditional and cultural practices associated with hypertension management were explored, with the aim of developing guidelines for management of hypertension through a “System Support Strategy” combining appropriate and effective clinical care with community action, and taking into account facilities and social and environmental factors influencing the development of hypertension in rural settings.

Conducted in three phases, the study has given rise to four articles: one covering the literature review and the other three linked to the three phases of the study. The first phase assessed the prevalence of hypertension and associated risk factors in adults in three villages in the community. From a simple random sample of homesteads in the three villages, all adults aged 18 and above who were available and willing to participate (134 individuals: 48 males; 86 females) were recruited into the cross-sectional study. Hypertension prevalence in this rural community was 44%. Increasing age, increasing body mass index and high salt intake emerged as prominent risk factors for hypertension.

The second phase described the experiences of the community in terms of their cultural practices and how these influenced the management of hypertension. Ten known hypertensive patients who had used traditional practices for management of hypertension were purposively selected and an in-depth interview was conducted with each. The traditional and cultural practices identified include medicinal plants, sacrifices, scarification and tribal marks. Where these traditional practices fail, local diets serve as a remedy. Some cultural practices potentially predispose individuals to risk factors for certain diseases (e.g., high

cholesterol palm kernel soup) while some potentially promote their health (e.g., medicinal plants).

The third phase was development of guidelines for the prevention and management of hypertension using nominal group technique in a meeting with experts (six key stakeholders) knowledgeable in the field. Major concepts addressed included blood pressure measurement and assessment and pharmacological and non-pharmacological measures for management.

This study will hopefully help in empowering individuals to take more and greater responsibility for their own health issues, reinforcing community self-reliance and self-determination.

Dedication

This work is dedicated to the glory of the Almighty God, in whom I live and move and have my being; my Omega; the God of all with whom nothing is impossible; the Glory and the Lifter up of my head; my Shield.

To my late dad, Chief James Onuora Ofili (Ogbueshi Akunwafor) for instilling in me values, that have remained with me all my life. Daddy, I know you are in God's bosom, smiling from afar at my achievement; as this was your cherished wish for any of your children.

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List of articles for publication included as part of this thesis

1. “Strategies for prevention and control of hypertension in Nigerian rural communities” – has been published in *Biomedical and Pharmacology Journal* Vol. 7 (1), 39-45 (2014) and a PDF copy of the publication is included in the thesis. This article covers the literature review.
2. “Hypertension in rural communities in Delta State, Nigeria: prevalence, risk factors and barriers to health care” (addresses research objectives 1, 2, 3 and 4). Submitted to *Cardiovascular Journal of Africa* (manuscript no. CVJSA-D-15-00006).
3. “Influence of cultural and traditional practices on the management and prevention of hypertension in some rural settlements in Delta State, Nigeria” (addresses research objectives 5 and 6). Submitted to *Cardiovascular Journal of Africa* (manuscript no. CVJSA-D-14-00152).
4. “Development of guidelines for management of hypertension in rural areas in Delta State, Nigeria” (addresses research objective 7.) Submitted to *Cardiovascular Journal of Africa* (manuscript no. CVJSA-D-14-00153).

Chapter 1

Introduction

1.1 Introduction and background information

This chapter outlines the conceptualization of the study, indicating the background to the study, the problem statement, the purpose and objectives of the research and the significance of the research findings presented in this thesis. It also defines key terms as they are used in the thesis and includes a section detailing the format in which the dissertation is presented.

1.2 Background to the study

Cardiovascular diseases have been documented as currently a leading cause of death in both developed and developing countries (World Health Organization, 2006). In addition, a 2002 World Health Organization (WHO) publication indicates that high blood pressure is a prime risk factor for the development of cardiovascular diseases (World Health Organization, 2002a). Hypertension, otherwise referred to as “high blood pressure” (Izzo, Black, & Goodfriend, 2001), is a disorder in which the resting blood pressure is elevated above the highest accepted normal level (i.e. more than 140/90 mmHg). According to the National Institute for Health and Clinical Excellence (NICE) definition, hypertension exists when clinic blood pressure is 140/90 mmHg or higher and subsequent ambulatory blood pressure monitoring (ABPM) or home blood pressure monitoring (HBPM) average is 135/85mmHg or higher (National Clinical Guideline Centre & British Hypertension Society, 2011). Kearney, Whelton, & Reynolds (2006) note that there has been a steady increase in the prevalence of hypertension in many countries, and that more than a quarter of the world’s adult population, totaling nearly one billion, had hypertension (HT) in 2000 – a proportion that will increase to 29% (1.56 billion) by 2025.

Cardiovascular disorders have been the focus of wide publicity in recent times but in practical terms not much has actually been done to reduce the morbidity and mortality associated with these disorders in most African countries. Hypertension affects approximately 50 million individuals in the United States of America and approximately 4 billion worldwide (Aram, George, & Henry, 2006); the latest WHO estimate is that more than 30 million people in Africa have hypertension (Graziano, 2005). The WHO predicts that, unless preventive steps are taken, by 2020 three-quarters of all deaths in Africa will be attributable to hypertension (Graziano, 2005), and the African Union has identified hypertension as “one of the continent’s greatest health challenges after HIV/AIDS” (Graziano, 2005). Recent data from the Framingham Heart Study showed the lifetime risk of hypertension (for men and women who were non-hypertensive at 55 or 65 years and survived to age 80-85 years) to be approximately 90% (Aram, et al., 2006). The higher the blood pressure, the greater the chance of myocardial infarction, heart failure (HF), stroke and kidney disease. The INTERHEART Africa Study (IHAS) has shown, for example, that hypertension is the strongest risk factor for myocardial infarction (MI) in black Africans, with an exceptional ratio of 6.99 compared with 2.3 to 3.9 in other ethnic groups (Aram, et al., 2006). A 2003 study showed a crude prevalence in Accra, Ghana of 23.8% (Burket, 2006). According to a historical overview by Lore (1997), whereas normotension prevailed prior to the Second World War in African countries such as Kenya, in more recent decades “high blood pressure became established in Kenya and the neighbouring countries, in particular Uganda [and] these trends have been observed in West Africa, notably Ghana, Nigeria, Cote d’Ivoire, and also in Cameroon and Zaire in the central Africa region” (Lore, 1997). Akinkugbe (1996) in a cross-sectional study in Nigeria noted hypertension prevalence increase across the gradient from rural farmers to urban poor to railway workers as 14, 25 and 29 per cent respectively. In a university community in south-western Nigeria, the overall

crude prevalence was 21% in the respondent working population (Erhun, Olayiwola, & Agbani, 2005).

A WHO report (2002b) cites hypertension as causing one in every eight deaths worldwide, making it the third-ranked leading killer in the world; in Africa (where a sizeable proportion of the population resides in rural communities) it occurs in more than 15% of the adult population.

Because the lifetime risk of developing hypertension is very high (Aram, et al., 2006), the prevalence of hypertension may continue to increase; hence the need for broad and effective preventive measures, including both primary and secondary measures, to reduce or minimize the causal factors in any population. Prevention efforts that focus on the adoption of healthy lifestyle changes by all individuals are therefore crucial both for reducing the prevalence of high blood pressure and as an indispensable part of the management of those with hypertension (Chobanian et al., 2003). Major lifestyle modifications or changes approved by the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC 7) include weight reduction in individuals who are overweight or obese; adoption of the Dietary Approaches to Stop Hypertension (DASH) eating plan, which is rich in potassium and calcium; dietary sodium reduction; healthy diets (fruits, vegetables, grains and low-fat dairy foods); physical activity or exercise; smoking cessation; moderation of alcohol consumption; and regular blood pressure checking (at least once every two years) regardless of risk factors (U.S. Department of Health and Human Services, et al., 2004). These measures reduce blood pressure, enhance anti-hypertensive drug efficacy and reduce cardiovascular risk (U.S. Department of Health and Human Services, et al., 2004), but studies that show the effectiveness of this JNC7 recommendation on lifestyle modifications (in particular, its “Facts About the DASH Eating Plan”) have mostly been

conducted in developed countries like the United States (U.S. Department of Health and Human Services, et al., 2004).

For too long now, health care systems have adopted the traditional curative approach such as life-saving surgery or intensive and acute medical care/therapy, with little attention paid to health promotion and disease prevention. However, with gradual improvement in the quality of life and its consequent effect on longevity, and with demographic shifts to an aging population, proactive management of chronic and life-restricting diseases has become imperative if the goal of health for all in the present century is to be more than just a mirage. Prominent among such diseases is hypertension – rightly termed “a silent killer” in that the symptoms are hidden and sufferers may be unaware of it for years until the late stages by which time complications have already set in.

Programmes on hypertension prevention and control do exist in developing countries, two examples being Iran (Aghajani et al., 2009) and also Nigeria – where hypertension prevention is part of a urban-focus global programme for health (Nigeria Global Health Initiative, 2010).

“Health of the Nation” strategies in many countries have addressed the problem of hypertension, coupled with risk assessment approaches to cardiovascular diseases. An aim of the Pan American Hypertension Initiative (PAHI) is to advance prevention and quality management of high blood pressure in the Americas (Pan American Hypertension Initiative, 2007). A health risk assessment was also provided for in the annual wellness visit for Medicare as well as counseling services aimed at reducing risk factors for chronic disease including hypertension, diabetes and stroke (Yoon, Gillespie, George, Wall & CDC, 2012). Also in 2000, the National High Blood Pressure Prevention and Control Strategy was developed by the Canadian Coalition for High Blood Pressure Prevention and Control and

Health Canada (Chockalingam et al., 2000). The developing countries were not left out. In Kenya, there was the Kenya Strategy 2011–2014; in Nigeria, at the urban level, an equivalent initiative is the Nigeria Global Health Strategy 2010-2015, and at rural level a prevention initiative termed Quality Improvement Cardiovascular Care Kwara - I (QUICK - I), functions in the context of a community-based health insurance scheme in Kwara State, Nigeria.

Risk assessment approaches used in urban settings may not be feasible in rural settings, where primary health care workers lacking clinical decision-support tools that estimate risk often find it difficult to see multiple risk factors that must be taken into account for accurate assessment of cardiovascular risk. In 2000, the WHO developed and subsequently validated a CVD risk-management package to facilitate multiple risk factor assessment and treatment in low-resource settings (World Health Organization, 2002a), but its effect on patient management outcomes in Delta State, Nigeria, has not yet been evaluated. In addition, the determinants of high blood pressure have not been well defined in rural settings – where morbidity and mortality from cardiovascular diseases may understandably be high if there is little or no access to health care (Agyemang, 2006). The poor condition of rural transport networks in Nigeria has in no small measure affected the provision in rural communities of essential public facilities such as hospitals, or of public or private sector employment opportunities (Aderamo & Magaji, 2010).

1.2.1 Hypertension and co-morbid conditions

There is a correlation between hypertension and co-morbid conditions like diabetes mellitus, kidney and cardiac diseases. The association of hypertension and diabetes mellitus is less strong among patients with type 2 diabetes mellitus because up to 50 per cent of patients have hypertension before the onset of albuminuria (Veterans, Administration, & Defense, 2004). Early treatment of hypertension in patients with diabetes, particularly type 2 diabetes

mellitus, is therefore important in order to delay the onset and/or retard the progression of cardiovascular disease and diabetes mellitus.

Another co-morbid condition associated with hypertension is kidney disease. Kidney disease is a recognized complication of hypertension and the commonest cause of secondary hypertension (Onwubere, 2005). Hypertensive nephrosclerosis, which is associated with major lesion in the kidneys, affects the afferent arteries more than the others, thus leading to progressive reduction in renal function (Onwubere, 2005). Chronic kidney disease and hypertension are both independent risk factors for cardiovascular diseases. Patients with chronic kidney disease and hypertension often require multiple blood-pressure medications to achieve target blood pressure (Abel, Darby, & Ramachandran, 1994). Patients with chronic kidney disease frequently have hypertension and other co-morbid conditions such as heart failure, diabetes, and atherosclerosis (Veterans, et al., 2004). Hypertension enhances coronary atheroma, predisposing the individual to myocardial infarction which can cause heart disease (Nigerian Hypertension Society, 2005), the commonest cause of death in hypertensive subjects in Nigeria. Lifestyle factors have an important role to play in the management of hypertension with co-morbid conditions. This can be achieved through factors like diet, alcohol and salt reduction, smoking cessation and physical activity.

1.2.2 Cultural concepts relevant to an ethnographic study

The traditional African system of health care is holistic and interwoven with religion, integral to a way of life and daily living. (Juntunen, 2000). Health and sickness are seen in a wide context of individual well-being in the social and spiritual environment. According to the Ibo culture in Nigeria, the causes of illness/disease are usually held to be violation of a taboo or an insult given to an ancestor or spirits, and the illness/disease has to be healed by acts of reconciliation. Some of the cultural concepts relevant to ethnographic concerns which will be

implied in this study include cultural care practices and patterns of different ethnic groups. These extend to lifestyles, behaviours, norms, values and health beliefs about a disease condition, preventive and curative strategies using traditional and local food/diet, herbs/leaves, water, drinks, body creams/pomade, bathing soaps, virtuous living within the framework of a strict moral code, exorcism of spiritual possession, and other traditional activities involving oracles and deity. Further cultural concepts that come into the picture are environment and population, cultural values and ways of life, religious and philosophical factors, kinship and social factors, political and legal factors, economic factors, and technological and educational factors. Cultural care practices that have been studied from an ethnographic perspective, as reported by Juntunen (2000), include infant feeding styles of West Indian women (by Corbett [1999], cited in Juntunen, 2000) and postpartum depression among Jordanian women living in Australia (by Nahas & Amasheh [1999], cited in Juntunen, 2000). Nikkonen ([1996], cited in Juntunen, 2000) used ethnography in her study of long-term psychiatric patients' way of life when moving from mental hospital to a community.

1.2.3 Motivation for the study

The researcher's 2009 study "Knowledge, Attitude and Practice of Nurses in Prevention of High Blood Pressure in selected Primary Health Care Centres in Delta State" revealed that individuals in the rural community do suffer premature death as sequel to undetected and uncontrolled hypertension, of which some of the causes are attributed to traditional practices.

Her findings, as reported by the nurses' working at the various primary health care centres who participated in the study, showed that members of the community did not visit the clinics for routine screening for high blood pressure and consequently under-utilized the services provided for prevention and management of high blood pressure at the rural settings. Hence, most deaths that were sequel to hypertension were not recorded because the patients

had not been able to visit the clinic and/or attend routine screening activities for prevention and management of hypertension, thus leaving the local government and health care systems at the rural level with no option than to ignore and disregard the importance of screening activities for prevention and management of hypertension and other chronic diseases.

This study therefore seeks to use a population study framework for a rural community to explore variables that could be used as predictors of risk status for hypertension, in conjunction with cultural and traditional practices associated with hypertension prevention and management in Ibusa community of Delta State, Nigeria. The study provides epidemiological data for the records, together with guidelines on screening programmes, standards of assessment, and management and review of patients, using an integrated “System Support Strategy” approach which combines appropriate and effective clinical care with community action. It is intended to inform critical consideration of strategic guidelines and intervention planning for control of hypertension in the study community, taking into account facilities, social and environmental factors and other issues that have a bearing on raised blood pressure in rural settings in Delta State, Nigeria.

1.3 Problem statement

Hypertension has been identified as a major public health problem and its prevalence is probably on the increase in developing countries where adoption of western lifestyles and the stress of urbanization, both expected to increase the morbidity associated with unhealthy lifestyles, continue unabated (Erhun, et al., 2005). Cross-sectional studies of these issues have, however, mostly been done with little or no descriptive input or documented information on possible predictors and their relationship with hypertension prevalence in rural settings in Nigeria.

There is little or no information about what is being done to evaluate blood-pressure profiles and predictors of hypertension among adults in rural communities who may not have the high-risk lifestyles that are predominant among elite urban dwellers in Nigeria. It is therefore easy to understand our failure to create awareness and/or institute lasting preventive and non-drug control measures for hypertension in these rural communities in Nigeria, especially in ethnic minority communities. Screening measures, for instance, are an important component of any prevention and control programme (Lemogoum, Seedat, & Mabadeje, 2003) but very few such initiatives are to be seen for early primary prevention as a first step for prompt diagnosis, management and control of hypertension at the community level. Community screening activities are important for population subgroups who are at especially high risk of developing cardiovascular disease and have limited access to medical care, and while rural communities comprise the majority of the Nigerian population (Nigeria National Population commission, 2006) they tend to have poor access to resources for health promotion and early detection of disease and or disorders. It is these considerations that have given impetus to the present study.

1.4 Research questions

This study seeks to provide answers to the following questions:

1. What is the prevalence of high blood pressure (hypertension) in a selected rural community in Nigeria?
2. What are the factors associated with raised blood pressure in the Ibusa population?
3. Is there any association(s) between the various factors and the prevalence of high blood pressure in the community?
4. What are the obstacles to health care for management of hypertension in Ibusa community?
5. What cultural and traditional practices are associated with hypertension prevention and management in Ibusa community?

6. To what extent do the cultural and traditional practices influence hypertension prevention and management in the community?
7. What are the most appropriate strategies for prevention and management of high blood pressure in a selected rural community in Delta State, Nigeria?

1.5 Study objectives

1.5.1 Purpose of the study

This study investigates the blood pressure profiles of residents in Ibusa community. Epidemiological variables related to blood pressure and predictors of high blood pressure in the community are also established. Traditional and cultural practices associated with hypertension prevention and management in the community are identified and explored with the aim of developing guidelines for screening programmes, standards of assessment, and management and review of patients, using an integrated approach and taking into account facilities, social and environmental factors and other issues that have a bearing on raised blood pressure in rural settings in Delta State, Nigeria.

1.5.2 Specific objectives

The study has the following specific objectives:

1. to assess the prevalence of high blood pressure in a selected rural community in Nigeria.
2. to identify factors associated with raised blood pressure in the Ibusa population.
3. to establish what association exists between the identified factors and hypertension in the community.
4. to identify the obstacles to health care for management of hypertension in Ibusa community.
5. to identify cultural and traditional practices associated with hypertension prevention and management in Ibusa community.

6. to explore the extent of the cultural and traditional practices influence on hypertension prevention and management in the community.
7. to develop guidelines for the prevention and management of high blood pressure in a selected rural community in Delta State, Nigeria.

1.6 Significance of the study

While there have been numerous studies on hypertension in both Caucasian and Negroid populations, most of this research has been hospital-based and cross-sectional in approach, and focused chiefly on urban communities. Yet no adult, rural or urban, is immune to hypertension, and it is entirely possible that some rural inhabitants will either have been impaired by the complications of hypertension or have suffered premature death as a sequel to undetected and uncontrolled hypertension. This community-based study therefore seeks to elucidate risk factors that pre-dispose members of a typical rural community to high blood pressure, thereby establishing baseline data for planning preventive and culturally sensitive therapeutic programmes for hypertension in Ibusa community and to serve as a blueprint for action in other rural communities.

The findings of the study provide information on the impact of hypertensive risk factors and highlight the need for intervention programmes such the establishment of blood pressure stations. It is anticipated that the findings will also give added impetus for risk factor modification and health promotion activities such as smoking cessation, weight reduction in overweight subjects, and exercise. Lastly, the study will serve as a model for further ethnographic studies on hypertension in rural communities and help to refine theoretical formulations on hypertension in this part of the world.

1.7 Definition of operational terms

Hypertension: A disorder in which resting blood pressure is elevated above the highest accepted normal level ($\geq 140/90$ mmHg) on three separate occasions (Adebayo et al., 2013).

Predictors: Possible risk factors that could pre-dispose the residents of Ibusa community to high blood pressure (Alikor, Emem-Chioma, & Odia, 2013).

Rural community: A community made up of homesteads and lacking adequate infrastructure such as pipe-borne water, good quality tarred roads, etc. (Aderamo & Magaji, 2010).

Prevention strategy: Comprehensive approach for prevention and management of high blood pressure (Ofili & Ncama, 2014).

1.8 Format and outline of the thesis

The thesis is in the Thesis by Publication format, and comprises four papers for publication as journal articles, detailing original research, which have been developed from this study and which address the seven research objectives.

- | | |
|------------------------|--|
| Paper 1 (Chapter 2) | “Strategies for prevention and control of hypertension in Nigeria rural communities” – has been published in <i>Biomedical and Pharmacology Journal</i> Vol. 7 (1), 39-45 (2014) and a PDF copy of the publication is included in the thesis. This article covers the literature review. |
| Paper 2 (Chapter 3) | “Hypertension in rural communities in Delta State, Nigeria: prevalence, risk factors and barriers to health care” (addresses research objectives 1, 2, 3 and 4). |
| Paper 3 | “Influence of cultural and traditional practices on the management and prevention of hypertension in some rural settlements in Delta State, |

(Chapter 4) Nigeria” (addresses research objectives 5 and 6).

Paper 4 “Development of guidelines for management of hypertension in rural
(Chapter 5) areas in Delta State, Nigeria” (addresses research objective 7.)

The author guides for the journals to which the as yet unpublished papers have been submitted are included in the appendices together with proofs of submission and processing fee payments.

Chapter 2

Strategies for prevention and control of hypertension in Nigeria rural communities

Biomedical & Pharmacology Journal

Vol. 7(1), 39-45 (2014)

Strategies for Prevention and Control of Hypertension in Nigeria Rural Communities

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ABSTRACT

Hypertension (high blood pressure) is presently one of the most important risk factors for the development of cardiovascular diseases. In 2002, World Health Organization, (WHO), reported that hypertension causes one in every eight deaths worldwide making the disease the third killer in the world and more than 30 million people in Africa have hypertension. Hypertension increases the risk of myocardial infarction, heart failure, stroke and kidney dysfunction. Cultural perception has been identified to affect disease progression and management. Several developed and developing nations including Nigeria have adopted various initiatives to prevent and/or manage hypertension. However, the success of such strategies need to be constantly assessed and adjustments made if it becomes imperative.

Key words: Hypertension, Heart, Kidney, High blood pressure, Nigeria, Stroke.

INTRODUCTION

Demography of Hypertension

Hypertension literally means "High Blood Pressure". (World Health Organization, 2002) defined it as a persistent rise in blood pressure above what is considered normal for that age and that sex. It is a major public health problem in most African countries. (Graziano, 2005). It is the leading cause of death in developed and many developing countries being responsible for the deaths of 17 million people each year (World Health Organization, 2002). Hypertension affects approximately 50 million individuals in the United States and approximately 4 billion individuals Worldwide (Aram, George, & Henry, 2006). In Ghana, among urban adults, the prevalence of hypertension was 8% to 13% compared to 4.5% among rural adults (Muna, 1993). In a university community in South West Nigeria,

the overall crude prevalence among a working population was 21% in the respondent population (Erhun, Olayiwola, & Agbani, 2005).

The latest estimate of the World Health Organization is that more than 30 million people in Africa have hypertension (Graziano, 2005). World Health Organization also predicts that if nothing is done about it by 2020, three quarters of all deaths in Africa will be attributable to hypertension (Graziano, 2005). The African Union has also called hypertension 'one of the continent's greatest health challenges after HIV/AIDS (Graziano, 2005). Recent data from the Framingham Heart study showed the life time risk of hypertension to be approximately 90% for men and women who were non-hypertensive at 55 or 65 years and survived to age 80-85 years (Aram, *et al.*, 2006).

Epidemiological evidence demonstrates a multifactorial cause for this condition with major risk factors including obesity, diet (specifically high sodium, low potassium and excess energy intake), stress and physical inactivity. Rural-urban migration coupled with acculturation and modernization has also been implicated in development of high blood pressure. The epidemiological studies conducted in Ghana and Kenya corroborates this finding. In a survey carried out in the rural community of Mamre, located in the Western Cape – South Africa, high prevalence of smoking, heavy alcohol use (in men), obesity (in women) and physical inactivity were reported as the major predictors/determinants of high blood pressure in the community. (Kaufman, Tracy, & Durazo – Arvizu, 1997). In this same survey, the prevalence of hypertension in people aged 15 years or more was 13.9% in men and 16.3% in women. Of the hypertension subjects, 27% were not aware of their hypertension, a further 14.4% were not on treatment and only 16.8% has blood pressure (BP) controlled below 140/90mm Hg.

A study published in 2003, showed a crude prevalence of 23.8% in the capital city of Accra, Ghana (Burket, 2006). (Lore, 1997) in what looks like an historical account stated that until the Second World War, normotension was the norm among many African countries like Kenya but about twenty-five years ago, high blood pressure became established in Kenya and the neighboring countries in particular Uganda. These trends were also observed in West Africa notably Ghana, Nigeria, Cote d'Ivoire, Cameroon and Zaire in the central Africa region. (Lore, 1997). (Akinkugbe, 1996) in a cross-sectional study in Nigeria noted hypertension prevalence increase across the gradient from rural farmers to urban poor to railway workers as 14, 25 and 29 percent respectively. Also in a university community in southwest Nigeria, the overall crude prevalence among a working population was 21% in the respondent population (Erhun, *et al.*, 2005). These trends if unchecked portend great danger for these developing countries. It is therefore easy to understand the worries over escalation of the disease and the health professionals' efforts to checkmate its growth. The present study is part of that global effort.

Global Perspectives and Strategies for the Prevention and Control of High Blood Pressure

World-wide perspectives

Hypertension is ubiquitous, though the public health burden it represents relatively differs from country to country. Its ubiquity as a major public health problem was the justification for the World Conference 1995. There are many approaches to the prevention and control of hypertension in the world's populations, and in most of these approaches, populations have roles to play. This conference has enabled the World Hypertension League (WHL) to obtain a global view of the approaches, difficulties and solutions associated with the prevention and control of hypertension, which should benefit all participants and societies. A review of selected national programs of hypertension control and cardiovascular disease prevention has shown the importance of mobilizing broad segments of the society, including medical and non-medical organizations, acting in partnership (Frohlich, 1995). Hypertension control programs must include provision for evaluation with regard to process and outcome as well as its impact on the levels of blood pressure of the populations or communities for which the programs are designed (Gyrfas & Strasser, 1995). Developing countries may need specific consideration in this regard and much can be achieved with modest means, if there is adequate societal support. Thus, hypertension control measures should be firmly based in primary health care. Health education, lifestyle counseling and screening programs especially in the rural settings can be powerful support measures.

The conclusions of the World Conference on Hypertension Control 1995 may be summed up as follows:

- 1) The goals of the World Hypertension League should continue to be emphasized and supported.
- 2) The establishment and building up of national leagues and societies in developing countries and in other countries with economic constraints needs particular attention.
- 3) The commitment of national leagues and societies to the control and prevention of hypertension should be stimulated. National societies concerned mainly with research

on hypertension and the communication of research findings, may benefit from their programs practical aspects of hypertension control. Coalitions of national associations and leagues dedicated to hypertension prevention and control should be fostered, and should promote the concept of hypertension control as an important component of health promotion.

- 4) Co-operative international projects concerned with assessing the quality and impact of hypertension control programs or promoting the education of patients are concrete approaches to the advancement of hypertension control. Through such programs and similar activities, the World Hypertension League complements the International Society of Hypertension, the International Society and Federation of Cardiology and the World Health Organization.

By emphasizing that hypertension control programs should be continued with comprehensive cardiovascular health risk reduction, the World Hypertension League can contribute to the improvement of the health of the populations throughout the world.

Strategies for the Prevention and Control of High Blood Pressure

The prevention and control of high blood pressure no doubt would have a strong impact on the health, quality of life and mortality rate among rural communities in Nigerian. It would also reduce the health care expenditure needs of cardiovascular diseases.

Program Strategies

The short and long-term program outcomes will be achieved through the development and implementation of strategies involving both health and other developmental sectors. These strategies will address the behavioral and environmental factors associated with high blood pressure prevention and control in order to achieve three sub goals (prevention, early detection and control of hypertension). There are three main strategies namely: Community Health Promotion, Health Services System and System Support Strategy.

Theoretical Bases

The Social Cognitive Theory (SCT) and Health Belief Model (HBM)

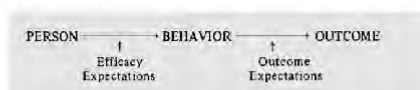
According to (Becker, 1974), the HBM hypothesizes that health-related action depends upon the simultaneous occurrence of three classes of factors:

1. The existence of sufficient motivation (or health concern) to make health issues salient or relevant.
2. The belief that one is susceptible (vulnerable) to a serious health problem or to the sequel of that illness or condition. This is often termed perceived threat.
3. The belief that following a particular health recommendation would be beneficial in reducing the perceived threat, and at a subjectively-acceptable cost. Cost here refers to perceived barriers that must be overcome in order to follow the health recommendation; it includes, but is not restricted to financial outlays.

Bandura's social learning theory (SLT), which he has been recently relabeled social cognitive theory (SCT) holds that behavior is determined by expectancies and incentives (Irwin, Victor, & Marshall, 1988). Behavior is regulated by its consequences (reinforcements), but only as those consequences are interpreted and understood by the individual. Thus, for example, in prevention and control of high blood pressure, individuals who value the perceived effects of changed lifestyles (incentives) will attempt to change if they believe that (a) their current lifestyles pose threats to any personally valued outcomes, such as health or appearance (environmental cues), (b) that particular behavioral changes will reduce the threats (outcome expectations) and (c) that they are personally capable of adopting the new behaviors (efficacy expectations).

Social cognitive theory has made at least two contributions to explanations of health-related behavior that were not included in the HBM. The first is the emphasis on the several sources of information for acquiring expectations particularly on the informative and motivational role of reinforcement and on the role of observational learning through modeling (imitating) the behavior of others. The

delineation of sources of expectations suggests a number of potentially-effective strategies for altering behavior through modifying expectations. A second major contribution is the introduction of the concept of self-efficacy (efficacy expectation) as distinct from outcome expectation. Outcome expectation (defined as a person's estimate that a given behavior will lead to certain outcomes) is quite similar to the HBM concept of "perceived benefits". The distinction between outcome and efficacy expectations is important because both are required for behavior. The diagram below from Bandura shows the relationship:



For example, in prevention and control of hypertension, a man (PERSON) is to quit smoking (BEHAVIOR) for health reasons (OUTCOME), he must believe both that cessation will benefit his health (OUTCOME EXPECTATION) and also that he is capable of quitting (EFFICACY EXPECTATION).

This study adopted the HBM and SCT. This is because there are some ideas/concepts in the SCT that are not in the HBM which brings out the true picture of the study. Actually, a considerable overlap should be expected.

Philosophical Bases

Pragmatism and Community Empowerment

Pragmatism means for a layman the school of thought that insists on the relevance of practical consequences and values. The concept of any object should not be confused forgetting the concept of actual possible practical effects. In other words, reality should not be thwarted by digression, divergence and political rhetoric. Pragmatism is an empowerment in life as it instills wakefulness and relates life to here and now.

This study is focused on the potential of a pragmatist paradigm to empower a rural community by increasing their self efficacy and reducing the development of hypertension in that setting. Empowerment, in its most general sense, refers to the ability of people to gain understanding and control over personal, social, economic and political forces

in order to take action to improve their life situations (Jenni, Frankish, & Glen, 2001). A critical element of community engagement relates to empowerment (mobilizing and organizing individuals, grass-roots and community-based organizations and institutions and enabling them to take action, influence and make decisions on critical issues). It is important to note that no external entity should assume that it can bestow on a community the power to act in its own self interest. Rather, those working to engage the community can provide important tools and resources so that community members can act to gain mastery over their lives.

First I will provide an overview of the empowerment concept both at the level of the individual, organization and community but focusing predominantly on community empowerment. Empowerment takes place at three levels: the (1) individual (2) organizational or group and (3) community levels (Rich, Edlestein, Hallman, & Wandersman, 1995); (Fawcett, Paine-Andrews, Francisco, & Vliet, 1993). Empowerment at one level can influence empowerment at the other levels (Fawcett, *et al.*, 1995). At the individual level, it is generally referred to as psychological empowerment (McMillan, Florin, Stevenson, Kerman, & Mitchell, 1995); (Rich, *et al.*, 1995). Individual level empowerment can be described along three dimensions: (1) intra-personal (an individual's perceived personal capacity to influence social and political systems) (2) interactional (knowledge and skills to master the systems) and (3) behavioral (actions that influence the systems) (Rich, *et al.*, 1995). This concept of psychological empowerment has been found to relate to an individual's participation in organizations, the benefits of participation, organizational climate and the sense of community or perceived severity of problem.

At the group or organizational level, it distinguishes between (1) empowering organizations, which facilitate confidence and competencies of individuals and (2) empowered organizations, which influence their environment (Rich, *et al.*, 1995). The degree to which an organization is empowering for its members may be dependent upon the benefits members receive and organizational climate as well as the levels of commitment and sense of community among members (McMillan, *et al.*, 1995).

Community level empowerment (i.e. the capacity of communities to respond effectively to collective problems) occurs when both individuals and institutions have sufficient power to achieve substantially satisfactory outcomes (Rich, *et al.*, 1995). Individuals and their organizations gain power and influence by having information about problems and an open process of accumulating and evaluating evidence and information (Rich, *et al.*, 1995). Community empowerment focuses on the social contexts where empowerment takes place (Wallerstein and Bernstein, 1994).

Empowerment involves the ability to reach decisions that solve problems or produce desired outcomes requiring citizens and formal institutions working together to reach decisions (Rich, *et al.*, 1995).

In this light, if empowerment is defined as a continuous construction of a multi-dimensional participatory competence that encompasses both cognitive and behavioral changes (Fitzgerald, 2008), it shows the relationship between empowerment and pragmatist theory. That is, by the use of strategies such as engagement with subject matter, affective/ social learning strategies and pragmatist assessment and evaluation, learners can develop competence to bring about desired intellectual and life changes which can influence their particular learning communities. Thus the use of pragmatist learning strategies can help community members to develop the competence (and empowerment) they need to engage with their own learning communities fully.

Construction of knowledge must develop in a social context of communities and collaboration. Since all learners (community members) enter the process with different knowledge, backgrounds, experiences and cultural practices, a learning environment based on a combination of these two theoretical approaches can help to assure that each member can relate new concepts to existing knowledge in meaningful ways. Hence, in this study, empowering will encourage individuals to take more and greater responsibility for their own health issues, including community self reliance and self determination. The community members will have the right to determine their own needs and play an

important role in the planning and delivery of health services. In doing this, the community workgroups who are seen as empowering engines in the community and serve as community organizations having leadership and system for communication will be needed. Community workgroups help to mobilize new groups and networks to search for new information, to search for knowledge required for problem solving, to manage problem solving and to influence the political and social environment in order to achieve a more supportive environment for social/political action and change.

Empowerment could also be seen as a process indicator. In this study, the community empowerment operational domains which has been modified by (Bush, Dover, & Mutch, 2002) will be discussed. The domains consist of four components 1) activation of the community 2) competence of the community in solving its own problems 3) program management skills and 4) ability of mobilizing resources (political, social, intellectual, financial and health). The activation of the community is understood as community members' participation in community problem solving process, creation of community groups, leaders and networks and their involvement level and relationship quality. Competence of the community is defined as the knowledge and skills the community has to solve its problems, for problem-specific awareness, information dissemination skills and communication skills within and between groups. Program management skills are understood as the ability of the community groups to use evidence-based methods in identifying and solving their problems during program development, implementation and evaluation. Mobilizing resources is defined as the ability to invest in social, intellectual, political and financial capital. These operational domains represent those aspects of community empowerment that allow individuals and groups to organize and mobilize themselves towards commonly defined goals of political, social and health change (Laverack & Wallerstein, 2001).

Most authors have defined empowerment mainly as a process (Swift & Levin, 1987); (Wallerstein, 1992); (Rissel, 1994). It is understood as a process of increasing the ability of individuals, groups, organizations or communities to (1) analyze their environment (2) identify problems, needs,

issues and opportunities (3) formulate strategies to deal with these problems, issues and needs and seize the relevant opportunities (4) design a plan of action (5) assemble and use effectively and on a sustainable basis resources to implement, monitor and evaluate the plan of actions and (6) use feedback to learn lessons (UNDP, 1995).

Community empowerment includes efforts to deter community threats, improve quality of life and facilitate citizen participation. The community empowerment model suggested by (Wallerstein, 1992) is multi-dimensional and includes the dimension of improved self-concept, critical analysis of the world, identification with the community members and participation in organizing community change (which is the main concept of this research study). In earnest, effective health interventions (for example guidelines for prevention and control of hypertension) require empowerment related processes and outcomes across multiple levels of analysis.

CONCLUSION

Hypertension control measures should be firmly based at primary level. The three main strategies (community health promotion, health services and system support strategy) for the prevention and control of high blood pressure no doubt would have a strong impact on the health, quality of life and mortality rate among rural communities in Nigeria. Epidemiological evidence demonstrates a multifactorial cause for this condition with major risk factors including obesity, diet (specifically high sodium, low potassium and excess energy intake), stress and physical inactivity. The Bandura's social learning theory also known as the social cognitive theory in junction with the health belief model see a person as performing a behavior (e.g quitting smoking) for prevention and control of hypertension with the belief that the behavior will benefit his health based on his capability. The application of pragmatism paradigm an empowerment in life, instills wakefulness and relates life to here and now. This is possible through community empowerment including community self reliance and self determination. The trend of this disease if unchecked especially in developing countries portend great danger.

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Chapter 3

Hypertension in Rural Communities in Delta State, Nigeria: Prevalence, Risk Factors and Barriers to Health Care

CardioVascular Journal of Africa

Hypertension in Rural Communities in Delta State, Nigeria: Prevalence, Risk Factors and Barriers to Health Care --Manuscript Draft--

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| Abstract: | Hypertension is a global health challenge affecting many adults. Hypertension prevalence is increasing rapidly in most African countries and also in rural areas. Few studies on the prevalence and risk factors of hypertension have been conducted in Nigeria and none within Delta State. We assessed the prevalence of hypertension and associated risk factors in adults in three villages in Ibusa community in Delta State, Nigeria. Homesteads were randomly selected and all consenting adults (≥18 years) were recruited into this cross sectional study (134 individuals: 48 males; 86 females). Socio-demographic data and anthropometric measurements (weight, height and abdominal circumference) were captured. Diagnosis of hypertension was based on a blood pressure (BP) threshold ≥ 140/90mmHg. Hypertension prevalence in this rural community was 44% and significantly higher in one village (Ogboli, 82%) and Ibo ethnic group (50%). Multivariable logistic regression analysis suggested increasing age, increasing body mass index and high salt intake as prominent risk factors for hypertension. Lack of funds and equipment shortage in clinics were the most reported barriers to health care. A nutritional education programme promoting low calorie and salt diet is recommended specifically targeting higher risk areas and ethnicity groups. Local barriers to accessing health care need to be addressed. |
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HYPERTENSION IN RURAL COMMUNITIES IN DELTA STATE, NIGERIA: PREVALENCE, RISK FACTORS AND BARRIERS TO HEALTH CARE

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ABSTRACT

Hypertension is a global health challenge affecting many adults. Hypertension prevalence is increasing rapidly in most African countries and also in rural areas. Few studies on the prevalence and risk factors of hypertension have been conducted in Nigeria and none within Delta State. We assessed the prevalence of hypertension and associated risk factors in adults in three villages in Ibusa community in Delta State, Nigeria. Homesteads were randomly selected and all consenting adults (≥ 18 years) were recruited into this cross sectional study (134 individuals: 48 males; 86 females). Socio-demographic data and anthropometric measurements (weight, height and abdominal circumference) were captured. Diagnosis of hypertension was based on a blood pressure (BP) threshold $\geq 140/90$ mmHg. Hypertension prevalence in this rural community was 44% and significantly higher in one village (Ogboli, 82%) and Ibo ethnic group (50%). Multivariable logistic regression analysis suggested increasing age, increasing body mass index and high salt intake as prominent risk factors for hypertension. Lack of funds and equipment shortage in clinics were the most reported

barriers to health care. A nutritional education programme promoting low calorie and salt diet is recommended specifically targeting higher risk areas and ethnicity groups. Local barriers to accessing health care need to be addressed.

Keywords: Nigeria, Hypertension, Blood pressure, Prevalence, Rural communities, Risk factor

Introduction

Hypertension, also known as high blood pressure is one of the most common non-communicable diseases, affecting a high percentage of adult individuals. The latest estimate of the World Health Organization (WHO) is that more than 30 million people in Africa have hypertension (Graziano, 2005). WHO also predicts that if nothing is done about it by 2020, three-quarters of all deaths in Africa will be attributable to hypertension (Graziano, 2005). More recently, studies have revealed that hypertension (in many African countries and rural settings) is on the increase, with prevalence rates approximately 28% (Spencer, Phillips, & Ogedegbe, 2005).

In Nigeria, depending on the study target population, type of measurement, and cut-off value used for defining hypertension, the prevalence of hypertension in rural setting ranges from 13.5% to 46.4%, compared with 8.1% to 42.0% in urban settings (Ogah et al., 2012). In three rural communities of Ife North Local Government Area of Osun State, South West Nigeria, the prevalence of hypertension was 26.4%, indicating a trend towards increasing prevalence of the disease (Adebayo et al., 2013). In Abia State, hypertension was high in both rural and urban settings (Ogah et al., 2013). In the Niger Delta region of Nigeria, the prevalence of hypertension in this rural community was 20.2% (Alikor, Emem-Chioma, & Odia, 2013). These studies also reported increasing age and body mass index (BMI) (i.e., obesity) as the most strongly related risk factors associated with hypertension (Adebayo, et al., 2013; Ogah, et al., 2013; Spencer, et al., 2005).

Despite the various efforts and initiatives adopted by these developing countries to prevent and/or manage hypertension, there are still some barriers inhibiting its optimal success. These barriers could exist at the patient, staff and health system/administrative levels (Sekokotla, Steyn, Bradshaw, & Mbananga, 2003). Examples include lack of funding, non-

availability of health care centres in the community, non-accessibility of the health care centres in the community, lack of public transport, staff shortage in health care centres, communication breakdown/gap, no social workers in the clinics, drug shortage in the clinics, equipment shortage in the clinics, late treatment supply from hospital dispensary, blood pressure machines not in good working condition, consultation room shortage in the clinics, stationery shortage in the clinics and no proper patient health education in the clinics (Allen, 2006; Ofili, 2012; Okwuonu, Ojimadu, & Akemokwe, 2014; Sekokotla, et al., 2003).

However, most of these studies on prevalence and risk factors done in Nigeria were urban dominated and those involving rural areas were mostly conducted in the South West and South East regions of Nigeria. No studies we are aware of have assessed prevalence of hypertension and associated predictors/risk factors for hypertension in South-South Nigeria (Delta State).

Materials and methods

STUDY AREA AND POPULATION: Delta State is one of the six states in the oil-rich South-South region of Nigeria and is made up of 25 local government areas (LGAs); 10 are urban and 15 are rural. Oshimili North Local Government area is one of the 15 rural LGAs (Fig 1). Ibusa community is located in Oshimili North Local Government Area and is made up of ten villages with an overall population of 20,166 (Nigeria National Population Commission, 2009). Each of the villages has at least a primary school but only four villages have a secondary school in the village. There are three primary health care centres (two are functional), one general hospital, and one maternal and child health centre serving the ten villages in this community. There are no facilities for pipe-borne water, although some villages have functional boreholes. The villages are linked together by untarred roads and the residents are predominantly farmers and hunters. The study population comprised adults ≥ 18

years who are residents of Idinisagba, Umuodafe and Ogboli villages in Ibusa community in Oshimili North Local Government Area of Delta State, Nigeria.

STUDY DESIGN, SAMPLING METHOD AND SAMPLE SIZE: The part of the study being reported was an epidemiological (homestead-to-homestead) survey conducted in Ibusa community. Ibusa is made up of ten villages. Three out of the ten villages (Idinisagba, Umuodafe and Ogboli) were randomly selected as study sites. In each of the three villages, homesteads were sampled using simple random sampling (8 homesteads from Idinisagba, 10 homesteads from Umuodafe and 6 homesteads from Ogboli). The three villages, comprising a total of 24 homesteads, had an overall population size of 210. In each village, all available individuals were recruited who met the inclusion criteria (adult ≥ 18 years) and were willing to participate, giving a total sample of 134 adults, made up of 45 participants from Idinisagba, 67 from Umuodafe and 22 from Ogboli.

STUDY PROCEDURES: The questionnaire collected various socio-demographic information and data on the respondents' family history of hypertension as well as their general health care practices. It also contained questions related to potential risk factors associated with raised blood pressure and obstacles to health care for the management of hypertension. The questionnaire was designed to achieve research objectives 1, 2, 3 and 4 which constituted the first phase of the study (i.e. the survey).

We also measured participants' blood pressure, height, weight and abdominal circumference, using a digital automatic blood pressure monitor (clinically validated – OMRON MX2 model U A-742V) for evaluation of blood pressure, portable electronic weighing scale (Hana) for weight, and a tape measure (Sandex Powerlock-P5NE and England – NINGBO) for height and abdominal circumference. The portable electronic weighing scale was re-calibrated to 0.0kg after each weighing and the digital automated blood pressure

monitor was re-calibrated to 0mmHg after each measurement. Anthropometric indices of body weight was to the nearest 0.1kg (after removal of shoes, heavier clothing and pocket contents), and of height (without shoes and head scarf) and abdominal circumference were to the nearest 0.5cm. Abdominal circumference was measured midway between the last rib and the iliac crest. Abdominal circumference ≥ 102 cm for males and ≥ 88 cm for females were regarded as abdominal obesity. Body mass index (BMI) was calculated as weight in kilogram divided by the square of height in meters. WHO classification of BMI categories was used in this study (WHO, 1995, 2000, 2004): normal weight 18.5–24.9 kg/m² ; overweight 25.0–29.9 kg/m²; and obese ≥ 30 kg/m². With the subject in a seated position and after at least 5mins rest, blood pressure was measured in the left arm using cuffs of a size appropriate to the arm circumference. Three blood pressure readings were taken per subject with at least three minutes intervals between measurements using a digital automatic blood pressure monitor which has been clinically validated as providing blood pressures directly comparable with standard mercury sphygmomanometers. Digit preference was monitored. The average of the three readings was used in the analysis. As defined by the National Institute for Health and Clinical Excellence (NICE) hypertension exists when clinic blood pressure is 140/90 mmHg or higher and subsequent ambulatory blood pressure monitoring (ABPM) or home blood pressure monitoring (HBPM) average is 135/85mmHg or higher (National Clinical Guideline Centre & British Hypertension Society, 2011). In our study, hypertension was defined as either blood pressure $\geq 140/90$ mmHg or self-reported anti-hypertensive medication use (U.S. Department of Health and Human Services, et al., 2004).

Ethical approval for this study was granted by the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal, Durban, South Africa

(protocol reference number: HSS/0525/013D). Gate-keeper's permission was also obtained from the ruler of Ibusa community (the Obuzor of Ibusa).

Data analysis

Data were processed and analysed using Stata 13.0 (StataCorp, 2013). Significant association between various explanatory variables and hypertension were assessed using the standard Pearson's chi-square (χ^2) test. If an expected cell count in the cross tabulation had less than five observations (sparse numbers) then exact methods (viz., Fisher's exact test) were used instead. Bivariate and multivariable adjusted logistic regression were also used to assess the influence of various explanatory variables and/or confounders on hypertension status. Factors associated with hypertension with a p-value cut-off <0.2 based on the bivariate associations were selected for entry into the adjusted multivariable logistic model. An explanatory variable with an adjusted p-value of <0.05 was deemed statistically significant. A goodness-of-fit test was performed to measure adequacy of the final model.

Results

Table 1 presents a summary of the characteristics of the study participants (N=134). Half the sample was obtained in Umuodafe village (67/134 or 50%). The age range of respondents was between 20 and 91 years, with a mean age (standard deviation [SD]) of 52.6 (20.6) years and median age (interquartile range) of 54.5 (31-72) years. The majority of participants were female 86/134 (64%). The mean BMI was 25.3 (SD 5.9) kg/m^2 and median BMI (interquartile range) 24.7 (21.3 - 27.9) kg/m^2 . The majority were married, at 101/134 (75%), and all but one were Christian. The majority were from the Igbo ethnic group (116/134 or 87%), and 60% (78/134) reported secondary school or higher as their highest educational level.

In Table 2, the overall prevalence of hypertension in Ibusa community was 44%, based on our combined classification of known hypertensive status (or hypertensive as based on observed measurement during the survey).

Table 3 shows the prevalence of hypertension by various characteristics. Females had a significantly higher prevalence of hypertension compared to males (females 52.3%; males 29.2%; $p=0.011$). Prevalence of hypertension increased significantly with age ($p<0.001$), was significantly higher in Ogboli village compared to Idinisagba and Umuodafe (81.2% versus 37.8 and 35.8% respectively, $p<0.001$), and was significantly higher among married individuals compared to single (56.4 versus 6.1%, $p<0.001$).

In Table 4, bivariate and multivariable logistic regression analyses were used to identify risk factors associated with hypertension after adjustment for potential confounding from other variables. After multivariable adjustment, increasing age and BMI as well as high salt intake remained significantly associated with hypertension ($p<0.001$). No significant difference in risk existed when comparing Umuodafe to Idinisagba as the reference village. However, Ogboli showed pronouncedly increased odds (risk) of hypertension compared to Idinisagba after multivariable adjustment ($p<0.001$). Ibo ethnicity showed marginally significant higher risk of hypertension after multivariable adjustment ($p = 0.062$).

Table 5 shows the reported obstacles to health care for the management of hypertension. The obstacles most frequently reported by the study participants were lack of funds (73.13%), equipment shortage in clinics (67.16, no proper patient health education in clinics (59.7%) %) and drug shortage in clinics (58.96%). Lack of public transport within the community (14.18%) was one of the least frequently reported obstacles.

Table 6 shows differences in the reported obstacles for the management of hypertension among the hypertensive patients as determined by bivariate logistic regression analysis. Equipment shortage in clinics was significantly more likely to be reported as a problem when comparing hypertensive and non-hypertensive patients ($p < 0.001$).

Discussion

The overall prevalence of hypertension found in this study (viz., 44%) is comparable with studies in most rural communities in the neighbouring West African countries (Agyemang, 2006; Spencer, et al., 2005). However, it appears higher than the prevalence of 20.2% (Alikor, et al., 2013), 22.5% (Ogah, et al., 2013) and 26.4% (Adebayo, et al., 2013) reported in rural communities in the Niger Delta Region, in South Eastern Nigeria (Abia State) and in South Western Nigeria (Osun State) respectively. These differences could be attributed to the target population used in the various studies, especially in terms of age. The age cut-off (≥ 18 years) used in this study, compared to ≥ 15 years used in the South Eastern and South Western Nigeria studies, may explain the higher prevalence of hypertension in this study, as it has been shown that blood pressure increases steadily with age, irrespective of gender (Ogah, et al., 2012). There was also pronouncedly increased likelihood (risk) of hypertension in Ogboli village compared to other villages. This, and the overall high prevalence, may be attributed to the different cultural behaviours, including traditional food and diet such as palm kernel soup (a high-cholesterol diet).

Besides culture-attributable factors, other factors such as gender, age, BMI and some lifestyle factors are well-known risk factors for the development of high blood pressure. In this study, the prevalence of hypertension was found to be higher in females than in males (Males 29.2%; Females 52.3%), unlike findings in other studies, globally and within the country of study, which showed a higher prevalence of hypertension in males than in females

(Adebayo, et al., 2013; Agyemang, 2006; Alikor, et al., 2013). This high prevalence in females was also reported in a study in Abia State, in South-Eastern Nigeria (Ogah, et al., 2013), though more females were recruited in both studies than men . In line with previous research (Alikor, et al., 2013), our study also revealed that hypertension prevalence was significantly high in married individuals. The issue of family, and family burden, in relation to blood pressure cannot be over-emphasised. This may be attributed to increased responsibilities or social stress faced by this group of people (Alikor, et al., 2013; Erhun, et al., 2005). None of the student participants in this study population were hypertensive. This may be because most of them were in the younger age group (20-30 years) who are biologically less prone to hypertension.

Multivariable logistic regression also indicated a positive and significant association between hypertension and increasing age as well as BMI status (overweight/obese). In this study, age, BMI and high salt intake were the strongest predictors/risk factors for hypertension. This is consistent with previous studies (Adebayo, et al., 2013; Alikor, et al., 2013; Ogah, et al., 2013). Increasing age, overweight and obesity are well-known risk factors for development of high blood pressure (Adebayo, et al., 2013; Alikor, et al., 2013; Clarice, Millicent, & Karen, 2000; David, Deyu, & Nilagoon, 2000; Izzo, et al., 2001; Karmal, Curb, & C, 1997; Kaufman & Barkey, 1993; Ogah, et al., 2013; Ogah, et al., 2012; Onwubere, 2005; Tesfaye, Nawi, & Van Minh, 2006). The association between high salt intake and hypertension is well-established. The source of high salt intake in this study population is likely attributable to the local diet in these communities. Delta State is a riverine area, rich in fish, and the main method of preservation is salting and smoking.

Another key finding in this study is the issue of obstacles to health in management of hypertension. Among hypertensive patients, when compared to non-hypertensive patients, the

most significant obstacle reported was equipment shortage in clinics (e.g., x-ray and echocardiography machines). These equipment shortages were also a constraint on health workers' ability to do their work properly. In comparison, studies done in South East Nigeria and in the Limpopo Province of South Africa reported financial constraints (Okwuonu, et al., 2014) and non-compliance with treatment, lack of public transport, staff shortage, drug shortage and late treatment supply from hospital dispensary (Sekokotla, et al., 2003) respectively as obstacles or problems experienced in managing hypertension in local health care centres.

Limitations

The study has some limitations. Determining the ages of study subjects presented difficulties as some could not remember their dates of birth and had lost their birth certificates during the Biafra war. We used a guide sheet of important dates and historic events to estimate their ages. Given study design and sampling strategy, one should be cautious when generalizing these findings (external validity) to other settings in Delta State. The findings are therefore only transferable to other settings with similar population/behavioural/economical characteristics. However, other rural settings within Delta State are likely to be similar to those in the current study and should thus increase the external validity. Additional studies should be conducted in other settings within Delta State and Nigeria to replicate/validate these findings

Conclusion

With the overall prevalence of hypertension in rural settings ranging from 13.5% to 46.4% in the country of study, hypertension prevalence is high (44%) in this rural community. There was also pronouncedly increased likelihood (risk) of hypertension in Ogboli village compared to the other villages. The study findings indicate that high blood pressure and its

management are indeed an important public health problem even in rural African settings. In view of the scarcity of resources and facilities in many developing settings, activities aimed at controlling high blood pressure, especially in rural settings, have to compete with many other pressing health needs. However, morbidity and mortality associated with high blood pressure is considerable. It is therefore pertinent that measures be taken to reduce these risk factors in order to optimise health outcomes. This could be achieved by adopting simple and cost-effective measures such as body weight control and promotion through community organisations, churches and schools of physical activity, reduction of smoking (especially among rural men) and reduction of salt intake. A nutritional education programme on healthy diet (low-cholesterol and low-salt diets) organised within the villages in the community could be helpful. Health policies in community settings should give particular consideration to obstacles such as those that occur exist at staff and administrative levels. More intervention studies are recommended to determine the factors associated with geographical heterogeneity (higher-risk areas). This will have implications for policy makers in terms of re-directing resources for the management of hypertension in high-risk populations.

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Figure legends

Fig 1: Map of the study area and community

There are three maps with highlighted areas, the first one is the study country (Nigeria) located in West Africa, the second is the study state (Delta State in Southern part of Nigeria) while the last is the study community (Ibusa community in Oshimili North of Delta State).

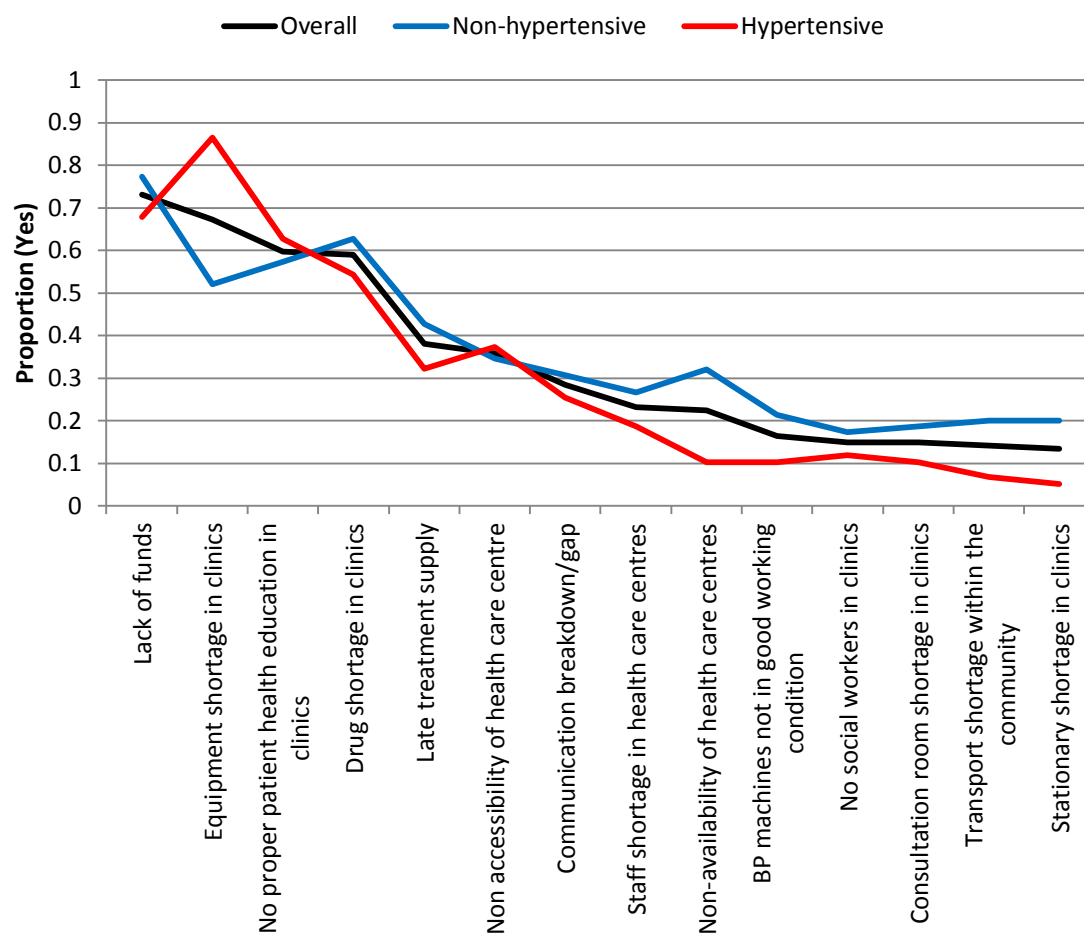
Fig 2: Reported barriers for management of HT [descending order]

This figure shows the reported barriers of hypertension in descending order from 0-1 range, indicating the reported barriers of three categories of the population (overall, non-hypertensive and hypertensive).

Fig 1: Map of the study area and community



Fig 2: Reported barriers for management of HT [descending order]



Tables

Table 1 - Characteristics of the study participants (N=134)

| Characteristic | Frequency (%) |
|----------------------------------|----------------------|
| Age group | |
| 20-30 | 33 (24.6) |
| 31-40 | 10 (7.5) |
| 41-50 | 16 (11.9) |
| 51-60 | 23 (17.2) |
| 61-70 | 16 (11.9) |
| 71-80 | 30 (22.4) |
| 81-90 | 5 (3.7) |
| 91+ | 1 (0.8) |
| Marital Status | |
| Single | 33 (24.6) |
| Married | 101 (75.4) |
| Gender | |
| Male | 48 (35.8) |
| Female | 86 (64.2) |
| Ethnicity | |
| Ibo | 116 (86.6) |
| Hausa | 3 (2.2) |
| Other ¹ | 15 (11.2) |
| Religion | |
| Christianity | 133 (99.2) |
| Islam | 1 (0.8) |
| Highest educational level | |
| None or pre-school | 24 (17.9) |
| Primary | 32 (23.9) |
| Secondary | 44 (32.8) |
| Tertiary | 34 (25.4) |
| Village | |
| Idinisagba | 45 (33.6) |
| Umuodafe | 67 (50.0) |
| Ogboli | 22 (16.4) |

1: Urhobo, Isoko, Ozoro, Tiv, Efik or Ibi

Table 2 - Overall prevalence of hypertension (N=134)

| Classification | Prevalence: n/N (%) |
|--|----------------------------|
| a. Known hypertensive patient | 46 (34.3) |
| b. Hypertensives based on observed measurement ¹ | 45 (33.6) |
| c. Hypertensives based on combination of the above to classifications ² | 59 (44.0) |

1: Agreement between (a) and (b): 79.9% agreement or kappa score of 0.55 (moderate agreement); 2: If known hypertensive (a) or currently observed hypertension ($\geq 140/90$ mmHg) (b) then classified as hypertensive (c)

Table 3 - Pearson's chi-square (χ^2) test analysis of prevalence of hypertension by characteristics of study participants

| Factor | Hypertensive (% or prevalence) | p-value ⁱ |
|---------------------------|--------------------------------------|----------------------|
| Age group | | |
| 20-30 | 0 (0) | <0.001 |
| 31-40 | 3 (30) | |
| 41-50 | 9 (56.3) | |
| 51-60 | 13 (56.5) | |
| 61-70 | 11 (68.8) | |
| 71-80 | 18 (60) | |
| 81-90 | 5 (100) | |
| 91+ | 0 (0) | |
| Marital Status | | |
| Single | 2 (6.1) | <0.001 |
| Married | 57 (56.4) | |
| Gender | | |
| Female | 45 (52.3) | 0.011 |
| Male | 14 (29.2) | |
| Ethnicity | | |
| Ibo | 58 (50) | 0.001 |
| Hausa | 0 (0) | |
| Other ² | 1 (6.7) | |
| Religion | | |
| Christianity | 59 (44.4) | --- ² |
| Islam | 0 (0) | |
| Highest educational level | | |
| None or pre-school | 15 (62.5) | 0.013 |
| Primary | 19 (59.4) | |
| Secondary | 14 (31.8) | |
| Tertiary | 11 (32.4) | |
| Village | | |
| Idinisagba | 17 (37.8) | <0.001 |
| Umuodafe | 24 (35.8) | |
| Ogboli | 18 (81.8) | |

1: Fisher's exact test; 2: Not applicable, as only one individual in Islam category

Table 4 – Bivariate and multivariable logistic regression analysis of factors associated with hypertension

| Factor | Bivariate | | Multivariable | |
|--------------------------------|------------------------|---------|------------------------------|------------------|
| | OR (95% CI) | p-value | OR (95% CI) | p-value |
| Demographic | | | | |
| Age | 1.78 (1.43,2.22) | <0.001 | 2.03 (1.34, 3.06) | 0.001 |
| Male gender | 0.38 (0.18,0.8) | 0.011 | 0.63 (0.19, 2.02) | 0.435 |
| Ibo ethnicity vs Hausa/other | 17.00 (2.19,131.97) | 0.007 | 19.17 (0.87, 424.17) | 0.062 |
| Education | | | | |
| None or primary | 1 | | 1 | |
| Secondary or tertiary | 0.31 (0.15,0.63) | 0.001 | 0.94 (0.28, 3.24) | 0.928 |
| Married | 20.08 (4.56,88.48) | <0.001 | --- ¹ | --- ¹ |
| Risk factors | | | | |
| Parents hypertensive | 0.84 (0.39,1.8) | 0.652 | --- | --- |
| Family history of hypertension | 1.04 (0.9,1.21) | 0.596 | --- | --- |
| BMI category | | | | |
| Normal (18.5-24.9) | 1 | | 1 | |
| Underweight (<18.5) | 2.10 (0.48,9.27) | 0.327 | 0.67 (0.07, 6.13) | 0.724 |
| Overweight (25.0-29.9) | 2.00 (0.89,4.50) | 0.094 | 4.25 (1.22, 14.83) | 0.023 |
| Obese (≥30.0) | 3.93 (1.43,10.81) | 0.008 | 8.17 (1.99, 33.5) | 0.004 |
| Abdominal circumference | 1.06 (1.03,1.09) | <0.001 | --- ² | --- ² |
| High salt intake | 1.59 (0.79,3.20) | 0.193 | 3.43 (1.03, 11.47) | 0.045 |
| High alcohol intake | 1.10 (0.55,2.21) | 0.782 | --- | --- |
| High cholesterol/fatty diet | 1.78 (0.88,3.63) | 0.111 | 1.6 (0.54, 4.75) | 0.396 |
| Poor physical activity | 1.14 (0.55,2.39) | 0.72 | --- | --- |
| Smoking | 0.74 (0.37,1.50) | 0.406 | --- | --- |
| Stress | 1.24 (0.59,2.59) | 0.576 | --- | --- |
| Noise | 1.23 (0.61,2.48) | 0.554 | --- | --- |
| Village | | | | |
| Idinisagba | 1 | | 1 | |
| Umuodafe | 0.92 (0.42,2.01) | 0.833 | 2.36 (0.74, 7.55) | 0.146 |
| Ogboli | 7.41 (2.15,25.61) | 0.002 | 110.5 (8.74, 1397.41) | <0.001 |

1: Removed from the final multivariable model due to high variance inflation factor (VIF) i.e. >20 ; 2: Removed from the final multivariable model due to high correlation (co-linearity) with BMI (Pearson correlation coefficient=0.724,p-value<0.05)

Table 5 – Reported barriers for management of Hypertension

| Barrier | Yes/N | % |
|--|---------------|--------------|
| Lack of funds | 98/134 | 73.13 |
| Non-availability of health care centres | 30/134 | 22.39 |
| Non accessibility of health care centre | 48/134 | 35.82 |
| Transport shortage within the community | 19/134 | 14.18 |
| Staff shortage in health care centres | 31/134 | 23.13 |
| Communication breakdown/gap | 38/134 | 28.36 |
| No social workers in clinics | 20/134 | 14.93 |
| Drug shortage in clinics | 79/134 | 58.96 |
| Equipment shortage in clinics | 90/134 | 67.16 |
| Late treatment supply | 51/134 | 38.06 |
| BP machines not in good working condition | 22/134 | 16.42 |
| Consultation room shortage in clinics | 20/134 | 14.93 |
| Stationary shortage in clinics | 18/134 | 13.43 |
| No proper patient health education in clinics | 80/134 | 59.7 |

Table 6 – Differences in reported barriers for management of HT by HT status

| Barrier | Bivariate regressions OR (95% CI) | p-value |
|---|--|------------------|
| Lack of funds | 0.62 (0.29, 1.33) | 0.218 |
| Non-availability of health care centres | 0.24 (0.09, 0.64) | 0.004 |
| Non accessibility of health care centre | 1.12 (0.55, 2.28) | 0.753 |
| Transport shortage within the community | 0.29 (0.09, 0.93) | 0.037 |
| Staff shortage in health care centres | 0.63 (0.27, 1.45) | 0.276 |
| Communication breakdown/gap | 0.77 (0.36, 1.66) | 0.504 |
| No social workers in clinics | 0.64 (0.24, 1.73) | 0.380 |
| Drug shortage in clinics | 0.71 (0.35, 1.41) | 0.325 |
| Equipment shortage in clinics | 5.88 (2.46, 14.08) | <0.001 |
| Late treatment supply | 0.64 (0.31, 1.3) | 0.217 |
| BP machines not in good working condition | 0.42 (0.15, 1.14) | 0.090 |
| Consultation room shortage in clinics | 0.49 (0.18, 1.37) | 0.176 |
| Stationary shortage in clinics | 0.21 (0.06, 0.78) | 0.019 |
| No proper patient health education in clinics | 1.25 (0.62, 2.52) | 0.529 |

Chapter 4

Influence of Cultural and Traditional Practices on the Management and Prevention of Hypertension in Some Rural Settlements in Delta State, Nigeria

CardioVascular Journal of Africa

INFLUENCE OF CULTURAL AND TRADITIONAL PRACTICES ON THE MANAGEMENT AND PREVENTION OF HYPERTENSION IN SOME RURAL SETTLEMENTS IN DELTA STATE, NIGERIA

--Manuscript Draft--

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| Abstract: | This article describes the experiences of rural settlements in Delta State, Nigeria in terms of their cultural practices and the influence on the management of hypertension. An ethnographic study was conducted utilizing in-depth interview method. Ten hypertensive patients with blood pressure readings $\geq 140/90$ mmHg who had used traditional practices for management of hypertension were purposively selected. The traditional and cultural practices identified include medicinal plants, sacrifices, scarification and tribal wars. Anti-hypertensive drugs were used alongside with traditional practices and where these traditional practices fail, local diets served as remedy. These cultural practices, like the local diet "palm kernel soup" (a high cholesterol diet) predispose them to risk factors of certain diseases and also promote their health like the medicinal plants. Models of community based management of high blood pressure in rural settings is highly recommended. This will help retain and preserve their relevant culture values and also maintain their wellbeing. |
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Influence of Cultural and Traditional Practices on the Management and Prevention of Hypertension in Some Rural Settlements in Delta State, Nigeria

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Abstract

This article describes the experiences of rural settlements in Delta State, Nigeria in terms of their cultural practices and the influence on the management of hypertension. An ethnographic study was conducted utilizing in-depth interview method. Ten hypertensive patients with blood pressure readings $\geq 140/90$ mmHg who had used traditional practices for management of hypertension were purposively selected. The traditional and cultural practices identified include medicinal plants, sacrifices, scarification and tribal marks. Anti-hypertensive drugs were used alongside with traditional practices and where these traditional practices fail, local diets served as remedy. These cultural practices, like the local diet “palm kernel soup” (a high cholesterol diet) predispose them to risk factors of certain diseases and also promote their health like the medicinal plants. Models of community based management of high blood pressure in rural settings is highly recommended. This will help retain and preserve their relevant culture values and also maintain their wellbeing.

Keywords: Hypertension, Tradition, Culture, Management, Rural community, Nigeria

Introduction

Hypertension, also known as high blood pressure, is one of the most common non-communicable diseases, affecting a high percentage of adults. Nigeria is one of the most populous countries in West Africa, with inhabitants from a range of different ethnic groups and cultural practices, with the largest groups being the Igbos, the Yorubas and the Hausa. Along with these dominant groups there are also numerous minor ethnic groups (over 250) with their own traditional and cultural practices (Ojua, Ishor, & Ndom, 2013). These cultural and traditional practices include medicational therapy practices (with use of plants and minerals) and non-medicational therapy practices (sacrifices, rituals, acupuncture, manual and spiritual therapies) (WHO, 2002). These cultural and traditional practices cut across people of different socio-demographic characteristics, creating significant differences among them, and are also passed on from one generation to another.

Most Nigerians, especially those living in rural communities, do not have access to western medicine, and it is estimated that about 75 per cent of the population still prefer to solve their health problems consulting traditional healers (Adesina, 2007). Where access to western medicine exists, the high cost of imported materials and ingredients used for producing them poses a considerable challenge. Also, many rural communities have great confidence in the effectiveness of traditional medicine and faith in the wisdom of their forefathers and ancestors. This reflects their embrace of social, cultural and religious characteristics which western medicine seems to neglect. Recent reports in developing countries have shown that more people prefer to use traditional medicine. Studies have also shown that 70% to 80% of Africans seek help from traditional healers before thinking of

western medicine (WHO, 2002, as cited by Lotika, Mabuza, & Okonta, 2013). In Nigeria, a study by Olateju (2005) showed clearly that Africans believe firmly in traditional medicine, and that among the Nigeria population western medical practice is seen as unable to cover all their medical needs. Likewise in South Africa, it has been noted that traditional healers play a significant cultural and spiritual role in the health of the populace and are consulted first in up to 80% of cases, especially in rural areas where there is a scarcity of Western medical provision (Lotika, et al., 2013). In Ghana, West Africa, an average was reported of one traditional medicine practitioner for 400 people, compared to one medical doctor for 12,000 people (Abel & Busia, 2005). In South Africa, approximately 80% of the population use traditional medicine (SATMERG, 2012).

It is therefore important to have an idea of the various traditional and cultural practices peculiar to a rural community because the practices a community adopts fulfil specific purposes for them (Idehen & Oshodin, 2007). This study describes the experiences of a typical rural community in Delta State Nigeria in terms of their various traditional and cultural practices and the influence these have on the management and prevention of high blood pressure in the community.

Ethical considerations

Ethical approval for this study was granted by the Humanities & Social Sciences Research Ethics Committee of the University of KwaZulu-Natal, Durban, South Africa (protocol reference number: HSS/0525/013D). Gate-keeper's permission was also obtained from the ruler of Ibusa community (the Obuzor of Ibusa).

Method: Design and setting

The study employed an ethnographic design. An ethnographic study was conducted in Ibusa community in Oshimili North Local Government Area of Delta State, Nigeria. The study was in three phases: (i) a quantitative epidemiological survey aimed at establishing the prevalence of hypertension in the rural community, (ii) a qualitative in-depth interviews, and (iii) development of guidelines for management of hypertension. This article/paper reports on the individual in-depth interview method.

Delta State is one of the six states in the oil-rich South-South region of Nigeria and is made up of 25 local government areas (LGAs), 10 being urban and 15 rural. Oshimili North Local Government area is one of the 15 rural LGAs. Ibusa community is one of the communities located in Oshimili North Local Government Area and is made up of ten villages with an overall population of 20,166 (Nigeria National Population Commission, 2009). Each of the villages has at least a primary school but only four have a secondary school situated in the village. There are three primary health care centres (two are functional), one general hospital and one maternal and child health centre serving the ten villages in this community. There are no facilities for pipe-borne water, though some villages have functional boreholes. The villages are linked by untarred roads and the residents are predominantly farmers and hunters.

Method: Sampling and procedure

Ethnographic research makes use of qualitative enquiry to describe and interpret cultural behaviour with the intention of learning more from the members of a group about their worldviews of the phenomena of interest (Polit & Hungler, 1999). Ethnographic design uses triangulation to ensure validity and reliability of the research design in both qualitative and quantitative approaches used during data collection. It is triangulate in the sense that the

qualitative data collected makes the quantitative data valid and reliable because the same persons that participated in the quantitative phase are also participants in the qualitative phase. The ethnographic data was validated through the different data sources (history taking during the epidemiological survey, the key-informant interviews and the Nominal Group Technique meeting). This data-source triangulation is used in mixed-method research studies where qualitative and quantitative methods are used together (Burns, 2009; Morse, 1996). Ten known hypertensive patients were purposively selected who had blood pressure readings of $\geq 140/90$ mmHg observed on three separate occasions from a previous survey conducted in the same community, and who had also confirmed their use of traditional practices in the management of high blood pressure. The inclusion criteria were: adult male or female 18 years and above, observed blood pressure readings $\geq 140/90$ mmHg, mental stability, not pregnant, no target organ damage or co-morbid condition, willingness to participate and ability to communicate, current resident of Ibusa community and confirmed use of traditional practices for the management of high blood pressure. Mental stability here means clear connection between mind and response during interview (Lotika, et al., 2013). Target organ damage and co-morbid condition were identified during history taking, and the key informants were fully aware of their hypertensive and co-morbid conditions. The language spoken in Ibusa is Igbo. The major exploratory questions asked from which the themes emerged were:

1. Please can you mention the various traditional and cultural practices that have been used to prevent, treat or cure the various diseases (hypertension inclusive) in your community
2. The issue of violation of a taboo, insult of an ancestor/spirit and forceful acquisition of assets (like plots of land) is a popular lifestyle behaviour in the community that attracts a penalty called (Obimapu/Nkuso), which means “high blood pressure”. In view of this, what

has been the treatment for this disease and how has it helped in the prevention and management of hypertension?

3. Has there been case(s) where these traditional and cultural practices failed to do its work and what were the remedies to that?

4. Are there any other means you use concurrently with the traditional and cultural practices for the prevention and treatment of hypertension?

The exploratory questions were translated into the local language (Igbo). This is desirable especially for those who are not able to understand English. In addition, there are concepts and constructs that cannot be comprehended by the Ibo speaker if left in the original language of their formulation, that is, English. The questions translated into Igbo were:

1. Biko kwuo ụzọ ọdinala dị icheiche e sirila gbochie maọbụ gwọọ ọjịa ga maọbụ gwọọ ụmụ obere ahụ ọnwụnwụ n'obodo gị dika ọbara mgbali elu

2. Ihe gbasara imerụ ala, asọpụrughị mmụọ ndị nna nna anyị ha iweghara akụ na ụba n'ike (dika ala) nke na-emerị mgbe niile n'obodo. ntaramaahụhụ ọ na-ebute bụ 'obimmapụ' nke bụ ọbara mgbali elu. n'ihі nke a, kedụ ụzọ e si agwọ ọjịa a. kedụ ụzọ o sirila nye aka igbochi nakwa ibelata ọbara mgbali elu?

3. O nweela ebe maọbụ mgbe ụzọ ọdinaala ndị a agwotalighị ọjịa a, keduzi ihe e mere maka nke a?

4. O nwere ụzọ ọzọ ijikọtara ya na usoro ọdinala were gbochie ma gwọọ ọjịa ọbara mgbali elu n'obodo unu?

All participants were asked the same exploratory questions. As observed by Streubert and Carpenter (1995), there are three central characteristics of ethnographic research: the

researcher as an instrument, the researcher as a fieldworker, and the cyclic nature of data collection and analysis. The authors emphasise that studying a culture requires an intimacy with the participants who are part of the culture, and that doing such allows the investigator the opportunity to become the conduit of information shared by the group. In addition, the investigator as a fieldworker is expected to be in the place where the culture of interest is. The interviews were conducted in the participants' homes by the principal researcher, who speaks and understands the local language. The researcher thus becomes an instrument, identifying, interpreting and analysing the culture under study through observation and recording of cultural data. As well as being a participant observer who provides the opportunity to gather information in the outsider's view (the "etic" view), the researcher also needs to access the "emic" view of the culture under study through collection and review of relevant historical records, journals and artefacts that give further information in addition to the language, beliefs and experiences provided about the phenomenon of interest (Streubert & Carpenter, 1995). The principal researcher took field notes and had the opportunity to see and observe some of the traditional practices the participants were using – in particular the medication therapy (native medicine). The interviews were audio-taped and translated verbatim by the principal researcher. The representative of the study community who speaks the same language helped in double checking the verbatim translations; he also explained and interpreted the meanings of some idiomatic expressions used by some of the participants. This ensured the trustworthiness of the information.

Following Streubert and Carpenter (1995), emphasis was placed on 'what was seen' (looking and observation) and 'what was heard' (listening), accompanied by questioning for clarification and supporting artefacts. Anecdotal notes and observations were recorded in field notes, noting the date, time, place and verbatim recordings of communications. This was

in compliance with the three principles of documentation of observations in ethnographic study noted by Spradley (1980) – the language identification principle, the verbatim principle and the concrete principle – thereby identifying the words and language of the persons making remarks or speaking rather than recording situations only in the observer’s language, and enabling recordings of native expressions and documentation of what is seen and heard without interpretation to avoid limiting access to valuable cultural insights.

Data were gathered in a cyclic manner allowing for regular interaction and frequent revisit back to the informants to get clarifications even about data already collected, answering questions that may lead to other questions as necessary. A colleague of mine working towards a PhD in same discipline participated in the data coding (an independent coder) and in some analysis procedures. Each participant was given feedback on his or her transcription to ensure correctness of captured information, thereby ensuring its trustworthiness. Direct quotations from the informants were used that summarise or illustrate the concept or theme being described. The principal researcher translated the transcriptions back into English and read the translated interviews several times to establish good understanding. According to Lacey and Luff (2007), the principal researcher needs to undergo five stages for the data analysis, using framework analysis which shares some of the features of qualitative analysis and of what is often called ‘thematic analysis’:

- **Familiarization:** Whole or partial transcription and reading of the data.
- **Identifying a thematic framework:** This is the initial coding framework which is developed both from *a priori* issues and from issues emerging from the familiarization stage. This thematic framework was developed and refined during subsequent stages.
- **Indexing:** Applying the thematic framework to the data using numerical or textual codes to identify specific pieces of data which correspond to differing themes (more

commonly referred to as **coding** in other qualitative analysis approaches). Numerical categories ranging from 1 to 10 were used for the coding process.

- **Charting:** Using headings from the thematic framework to create charts of the data so that it can be easily read across the whole dataset. Charts can be either *thematic* for each theme across all respondents (cases) or *by case* for each respondent across all themes. In the chart boxes, I inserted line and page references to relevant passages in the transcripts. I also included some text (e.g., key words or shortened quotations) as a reminder of what was being referred to.
- **Mapping and Interpretation:** This means searching for patterns, associations, concepts and explanations in the data, aided by visual displays and plots. At this stage, concepts were defined, the range and nature of phenomena were mapped, typologies were created, associations within the data were found, and explanations were provided and strategies developed (Lacey & Luff, 2007). The areas the analyst chooses to focus on will depend both on the themes that have emerged from the data and the original research question(s).

These stages were undertaken in a linear fashion and therefore all data were collected before analysis began. In this study, the themes emerged from areas of the data which answered the original research questions.

Results

Ten participants, two males and eight females, were interviewed. All the participants were residents of Ibusa community in Oshimili North LGA in Delta State. Their ages ranged from 46 to 79 years and the majority (80%) were unemployed. Formulated themes for data obtained during interviews with the ten participants were as follows:

- Theme 1: Identified traditional and cultural practices and their functions
- Theme 2: Other means used alongside the traditional and cultural practices
- Theme 3: Remedies employed on failure of the traditional and cultural practices to do its work, based on the hypertensive patients' experiences

Theme one: Identified traditional and cultural practices and functions

According to participants' discussions, two major categories emerged from the data related to identified traditional and cultural practices and functions. Each category was outlined and discussed separately.

Category one: Medication therapies used for hypertension management

The medication therapies that emerged were subcategorized as follows:

Medicinal plants/ herbs from stems and roots of specific plants including dry roots

These medicinal plants/antihypertensive herbs, chiefly the African *Rauwolfia*, are used for cardiovascular diseases like hypertension and stroke. The dried roots soaked in local gin with added spices help in alleviating headache as experienced by hypertensive patients.

'The dry roots are super, God created these plants for some purpose in life, there are wonders in herbs [mkpologwu]'. (P1, Female, 78)

'Indeed the medication from leaves is worth it'. (P8, Female, 49)

Herbal preparations (in powdered form = palm frond + “nzu” + “uziza”)

The ingredients mentioned above for this herbal preparation are ground together, exposed to heat to char them, and then dissolved in water or local gin before consumption; the “uziza” is an ingredient which helps to loosen blood which is believed to be thick, related to hypertension.

'The native chalk [nzu] when mixed with the hot spice is fantastic, I feel light weighted after taking the medication'. (P8, Female, 49)

'The hot spice must be added in the preparation , it dissolves accumulated thickening'. (P3, Female, 60)

Herbal preparations (in form of pomade and ointment)

This is a ground herbal medicine prepared mostly in a medium of palm kernel oil [*ude-aku*] and salt. It is used for rubbing affected parts of the body as in stroke.

‘When it was prescribed for me, I was concerned (complaint) about my body, I was also watching my complexion’. (P5, Male, 49)

‘Anything that palm oil is added, automatically becomes cleansed’. (P5, Female, 72)

Herbal preparations (in form of drinks) and water from sacred stream

This is mixed with the dry herbal medicine before drinking. Water from a sacred stream can be prescribed for consumption when the patient feels hot (excessive sweating) and for tiredness. It also helps to cool the body and relax the nerves.

‘If I take the English water (bottled water) which my children bought, I have watery stool, I prefer natural [oshimili] water’. (P1, Female, 78)

‘The stream is nearer, I fetch once a day as prescribed and it looks pure.’ (P8, Female, 49)

‘I do not know how it works, my sweating a lot has reduced, it helps’. (P9, Male, 46)

Herbal preparations (in form of bathing soap called “Nsha nkota”)

This herbal preparation is pounded with the native soap (*Nsha nkota*) and is used for bathing; such soaps are mostly used for skin diseases, though they can be prescribed for a hypertensive patient if the high blood pressure is attributed to ‘matched poison’.

‘It cleanses away all my body spots, even the ones herbs cannot cure’. (P1, Female, 78)

Concoctions and decoctions (“ogwụ nkwu”)

This is mostly prepared in liquid forms and are used for dizziness and blurred vision as experienced by hypertensive patients.

‘This native medicine [ogwụ nkwu] is what I always use whenever I feel dizzy, indicating that my blood pressure was high’. (P2, Female, 57)

‘It calms my nerves, makes me feel sleepy, when I wake, I am better’. (P4, Female, 60)

‘I was asked to take it at night, (complaint), they said it works better that time’. (P9, Male, 46)

Category two: Non-medication therapies for hypertension management

The non-medication therapies that emerged were subcategorized into the following:

Ancestral powers of healing

Participants gave acknowledgement to the presence of ancestors throughout their lives whether they were healthy or sick, and emphasized that for things to go normally, proper communication with the ancestors must be maintained. In this study, they also reported that there must be peace between them and the ancestors because threatening the relationship might bring ill health and in some cases prevent and inhibit healing. In order to resolve problems with the ancestors, ceremonial sacrifices involving animals may be done and specific people are invited to witness the ceremony. The participants also stressed the need for every event that occurred in the family to be reported to ancestors. They believe the ancestors serve as a witness and judge and oversee every human action and movements.

‘When we do things in absence of no one, we think we are safe, really our ancestors (gods) are seeing us, and can strike when we least expected’. (P6, Female, 79)

‘I normally take my native medications at night, it is believed it works better at night when our ancestors are most awake’. (P1, Female, 78)

Open confession in an oracle/shrine and Sacrifices (with animal and animal parts)

This cultural practice takes place after identification of the offender in a crime. Most times, the offender will not want to perform such a cultural practice and will be ostracized from the community and left to suffer the consequences (any form of ill health) of his/her act. From the discussions with the participants, the belief emerged that high blood pressure (“*Obimapu/Nkuso*”) is a penalty after violation of a taboo, insult of an ancestor/spirit or forceful acquisition of assets (like plots of land), and that it can be treated through sacrifices as directed by the mouthpiece of the gods. After the sacrifices are performed it is believed that the patient will be free, and that failure to do as directed by the gods may cause the patient to lose his/her life. In most cases, cultural beliefs and values relating to hypertension as a disease and its management are considered to be beyond human control.

‘The truth is that is (complaint) that only men are allowed to visit the shrine, anyway a woman is only seen but not heard in a community’. (P5, Male, 49)

‘One does not know when the gods are angry, well as a man, I always give to the gods their sacrifices from time to time’. (P9, Male, 46)

‘All I know is that a woman is not seen in a shrine often, she only goes to market to buy items needed’. (P2, Female, 57)

‘Going to the shrine can be scaring, the gods if not attended to rightly, may reject some sacrifices’. (P3, Female, 75)

‘I like going to the shrine only when I want to witness vindication of an offence’. (P4, Female, 60)

‘Severe punishments for desecrating [alù] a land can be very expensive and shameful’. (P6, Female, 79)

*Oath taking (“*inwu iyi*”) and bond affirmation (“*igba ndu*”)*

These practices are mostly used for vindication and performed in front of a shrine or oracle. In seeking to exonerate someone from a particular crime which may cause ill health such as *Obimapu/Nkuso*, if the person had actually committed the crime, the oath-taking will strike

back at the person involved, thereby exposing the offender. These cultural practices are mostly used in cases where high blood pressure is seen as a penalty after violation of taboo, insult of an ancestor/spirit or forceful acquisition of assets (like plots of land).

'All I know is that a clear mind fears no accusation but oath taking proves everything'. (P4, Female, 60)

'If you take a bond, you must drink some concoctions, that is the rule'. (P9, Male, 46)

Scarification and tribal marks especially on the face ("igba-ochi")

This is the cutting of tribal marks with charred herbal products rubbed into the bleeding marks to effect healing, especially on the face. Participants described this cultural practice as yielding positive results because it is undertaken according to specific indications. In this rural setting, it is regarded as very good for management of high blood pressure resulting from a curse having been placed on a family lineage. As testified by a participant, her headache and dizziness subsided after the scarification and tribal marks. This cultural practice helps where curses cannot be reversed especially when the person who placed the curse is no more alive.

'Sometimes, I do not like to do it because it leaves a distinct feature about me'. (P7, Female, 65)

'Tribal marks [igba-ochi] was the only thing I think has survived me till today'. (P6, Female, 79)

Theme 2: Other means used alongside with the traditional and cultural practices

Because the participants also use other means alongside the traditional and cultural practices it is not always possible to isolate the actual influence of these cultural and traditional practices on the management of high blood pressure. Four categories emerged from data which related to other items used concurrently with the traditional and cultural practices.

Category one: Use of anti-hypertensive drugs for hypertension management

Some participants agreed with the fact that they used some anti-hypertensive drugs concurrently with the traditional and cultural practices. On observation, these drugs were diuretics and anxiolytics. Examples of each are normoretic and lexotan respectively. These drugs are taken either by prescription, self-medication and advice from friends and relatives. They prefer taking these anti-hypertensive drugs at day time and the native medicine at night.

‘There is no harm in trying the two because I believe they cannot mix (drug interaction) in the body’. (P4, Female, 60)

‘I normally take the English one (Western medicine) in the morning, native at night’. (P1, Female, 78)

‘The English medicine (anti-hypertensive drug) makes me urinate too much and I do not take it always’. (P2, Female, 57)

‘I like taking the anti-hypertensive drug given to me by a medical (from hospital) because it relaxes my body’. (P9, Male, 46)

‘My son in abroad [obodo-oyibo] told me it stops fast heart beat, I am still trying it’. (P7, Female, 65)

‘My sister is the one that brings it (anti-hypertensive drug) for me, she has a chemist shop, so is not fake’. (P8, Female, 49)

Category two: Drugs bought from chemist shops

High blood pressure is also managed by the use of drugs bought from chemist shops. Chemist shops, also known as patent medicine sellers or vendors (PMV), are the easiest and cheapest source in most rural settings for obtaining medications. These drugs which were originally meant to be sold over the counter and are non-prescription medications now require prescriptions for multiple disease (Osamor, 2011).

‘This chemist shop near me is well known in the community, I buy from him because he knows all the drugs for various illnesses’. (P2, Female, 57)

'At least you do not have to stand (like in hospital) on the line (queue) for it, saves my leg pain'. (P5, Female, 72)

Category three: Lifestyle modification for hypertension management

Some participants also used lifestyle modification alongside the traditional and cultural practices. Excessive salt intake is a common practice in most riverine areas in Nigeria, with salting and smoking commonly being used as methods for preserving the fish which is available there. Those who have become aware that increased salt intake is a major risk factor now prefer to consume fresh fish which has not undergone any preservation method. In this study community, another traditional food which is widely enjoyed and cannot easily be eliminated is palm-kernel soup.

'Fresh fish [azụ-mmili] gives me better taste in my soup'. (P1, Female, 78)

'If you cook any type of vegetable soup[ọha] or ugba, the spicy salt [ogili] is always the soup herb'. (P8, Female, 49)

'The beauty of palm kernel soup [ose-akwụ] does not need much vegetable [kpa-akwukwọ]'. (P2, Female, 57)

Category four: Supplements

Out of the ten participants, only one reported that he takes some supplements because of the side effects of the herbal preparation he was taking. He explained that it was the herbal doctor who prescribed and gave him the supplement.

'I was asked by my doctor (herbal doctor) to take supplements because the herbal medicine is said to have side effect'. (P9, Male, 46)

Treatment Feedback

Some of the participants testified that their symptoms subsided following the use of these traditional and cultural practices, and there were also some who explained that after they have

taken the medication they are expected to report back the results to the native doctor/healer for further instructions. There were also cases where these traditional and cultural practices failed and the participants claimed they sought other remedies.

Theme 3: Remedies employed on failure of the traditional and cultural practices to do its work based on the hypertensive patients' experiences

Category one: Therapeutic occultism, including prophesy and revelations from chief priest of a deity

This type of traditional practice is the first line of treatment for any form of disease or illness in most rural settings. It is consultation of the chief priest of a god in regard to the patient's condition to discover the cause(s) of the disease and which type of traditional or cultural practice will be best suited for treatment. As described by the participants, the activities of therapeutic occultism include prayers, reciting and singing of incantations, making invocations and preparing fetish materials to appease an unknown god or deity. Practitioners of therapeutic occultism include diviners or fortune tellers who use supernatural or mysterious forces and perform a miscellany of cryptic practices and gestures (such as casting down of magic stones, cowries, coins, kola-nut seeds, or divining rods and reading messages in a pool or glass of water) to treat various diseases. With their ability to deal with the unseen and the supernatural, they are usually held in high esteem by community members. These practitioners of therapeutic occultism are believed to have extrasensory perception, being able to see beyond the ordinary man, receive telepathic messages, consult oracles and spirit guides, and succeed where other traditional and cultural practices as well as western medicine fail. Participants also reported that they are expected to pay some specific amount before receiving the services of a therapeutic occultist.

'Though is expensive but life [ndu] and truth are in prophesy and revelations [afa]'. (P3, Female, 75)

'The power of a prophet to see far lies in his destiny [akalaka]'. (P9, Male, 46)

'Kola-nut seeds is very essential in every therapeutic occult activity because it ushers wellness'. (P3, Female, 57)

Category two: Prayers and spiritualist churches

Another important remedy employed by these hypertensive patients is prayers in visits to spiritualist churches where the prayers are recommended by the pastors who are the overseers of the church. Participants expressed the belief that life without ill health occurs when there is a good relationship and constant peace between man and his environment (signifying God, the ancestors and other unknown deities). When the traditional cultural practices fail, the patients go elsewhere and seek remedies to their problems through prayers which also play a significant role in their religious and social life. These acts of prayers are to be encountered in various religious beliefs and doctrines including both the African traditional religion and the Christian and Islamic religions. This supports the saying in Igbo language that *'onye kwe, chi ya ekwe'*, which translates as *One's faith is God's command*.

'I just started attending church regularly now at by-pass area, this anointing oil is working for me'. (P6, Female, 79)

'My dear (talking to the interviewer), is the faith I have in God's miracle that will save me not those activities at odd places'. (P6, Male, 49)

Category three: Living a virtuous life

According to Igbo culture, good health is primarily and most easily acquired through morality: living a virtuous life without any form of crime or immoral act. Participants reported that maintaining virtue is a primary necessity of life. They also described how some traditional healers and native doctors emphasise the issue of living a virtuous life as a tool for promoting healing of diseases or ailments.

'If you keep your hands clean (free from any form of evil), no form of evil shall befall you in life'. (P2, Female, 75)

'I believe my virtuous life is what is sustaining me today'. (P6, Female, 79)

'My native doctor made it emphatically clear that I should keep my hands clean, the herbal preparation he gave me will not work if I have a hand in that case'. (P4, Female, 60)

Category four: Use of local diet/food

Some local diets available in that community were also used as remedies. These include soups prepared without any vegetable like *azu igwe* soup, which is traditionally believed to cure any form of illness; other soups are *alulu-isi* soup, *ose akwu* soup (also known as “palm kernel soup”) and *agbonogba* soup (slimy like in nature). The problematic aspect of these foodstuffs is that they lack the nutritive qualities of certain recommended diets and food for hypertensive patients (especially fruits and vegetables), and this makes the patient more prone to poor control and management of their hypertension, thereby leading to complications.

'When all other means fail, is good to fall back on our local diet especially palm kernel soup[ose akwu] because palm oil is a neutralizer'. (P4, Female, 72)

Category five: Use of alcohol (non-refined local gin)

Delta State is a riverine area and people from riverine areas tend to consume alcohol in great quantities. In consequence, some study participants continue to be predisposed to this risk factor. An additional control problem in this regard is that participants who take herbal concoctions or preparations (dry and powdered), prefer to dissolve them in alcohol rather than in water. One of the participants indicated that he takes the local gin unrefined, which portends a major risk factor for high blood pressure.

'Alcohol does not affect me as long as I eat food before drinking'. (P9, 46)

Discussion

Nowadays, in search of permanent cure for chronic conditions like hypertension, people often choose to explore a variety of available treatments and sources of help. For example, when an individual falls sick, he/she may consider visiting a hospital (government-owned or private), consulting chemist shops (patent medicine sellers), consulting traditional or native doctors/healers or even prefer to do nothing at all and allow nature to take its course. In Nigeria and other developing countries in Africa, studies have shown that people seek help from traditional healers before thinking of western medicine (WHO, 2002, as cited by Lotika, et al., 2013). In this study, the traditional and cultural practices identified for the management of high blood pressure were categorised into medication and non-medication therapies, reflecting the symptom management. The symptoms in question include headaches, tiredness, excessive sweating, and dizziness and blurred vision. The medication therapies, mostly herbal preparations such as the dried roots soaked in local gin, herbal preparations dissolved in water from a sacred stream, and various concoctions and decoctions (“*ogwu nkwu*”), were used for headache, tiredness and blurred vision, respectively. There were also some few non-medication therapies – such as sacrifices (with animals and animal parts), invoking ancestral powers of healing, and scarification and tribal marks – that serve the same purpose as the medication therapies. Similarly, in a study conducted among Shangaan patients in Limpopo Province in South Africa, liquid herbal medicines were used for tiredness and excessive sweating, and dried roots of herbal medicine for headache; “*Baso*” for dizziness and scarification, also known as “*Ku Lumeka*”, was reported to be very good for high blood pressure (Risenga, Botha, & Tjallinks, 2007). The Shangaans also believe in ancestral powers of healing as cultural care for hypertensive patients (Risenga, et al., 2007). Among the Akan tribes of Ghana in West Africa, medicinal plants such as *Tetrapleura tetraptera*, *Alstonia boonei*, *Anthocleista nobilis* and *Uapaca guineensis*, prepared in form of decoctions, were

widely used for the management of high blood pressure (Abel & Busia, 2005). Likewise, the Akan tribes also used certain non-medication therapies such as recourse to spiritualists or diviners (fetish priests and priestesses), shrine devotees and faith healers who use prayers, bible and holy water for healing purposes (Abel & Busia, 2005). Contrastingly, they also use Coca-Cola for dissolving herbal mixtures and also have certain dietary recommendations for patients with hypertension (no cooking with salt, no fatty foods and no Coca-Cola except with herbal mixtures).

Results from this study showed the use of various other means alongside with the traditional and cultural practices. Included among these auxiliary means were anti-hypertensive drugs prescribed by an orthodox doctor, drugs bought from chemist shops (patent medicine sellers), lifestyle modification and supplements. Similarly, in a recent study conducted in Gauteng Province in South Africa, it was reported that hypertensive patients also use traditional and western medicine concurrently for the management of hypertension (Lotika, et al., 2013). In South West Nigeria, specifically the Idikan community in Ibadan, patients who visited the hospital for health care also used the traditional medicine and patent medicine vendors for the management and prevention of high blood pressure (Osamor, 2011).

As regards the remedies employed on failure of the traditional and cultural practices, therapeutic occultism, such as casting of magic stones, cowries, coins, kola-nut seeds, divining rods or reading of messages in a pool or glass of water, served as one of the remedies. Correspondingly, Risenga, et al. (2007) identified instances of therapeutic occultism, such as casting of bones for interpretation, as sources for diagnostic assistance, while scarification (“*Ku lumeka*”) and steam inhalation (“*phungula*”) served as the associated remedies.

Limitations

Given the study design and sampling strategy, one should (in relation to external validity) be cautious when generalizing these findings to other settings in Delta State. The findings are therefore transferable only to other settings with similar population/behavioural/economical characteristics. However, other rural settings within Delta State are likely to be similar to those in the current study and hence should increase the external validity. Additional studies should be conducted in other settings within Delta State and elsewhere in Nigeria to replicate/validate these findings.

Conclusion and recommendation

The traditional and cultural practices of any community not only have an impact on the health of its members, but also affect all that concerns their life and existence. The traditional and cultural practices adopted by hypertensive patients in Ibusa community has an influence on the management and prevention of their hypertension, since some of these practices, such as local foodstuffs and dietary preferences (especially the palm kernel soup, which is a high cholesterol item), may either predispose them to risk factors of certain diseases or promote their health (as do the medicinal plants and some herbal preparations). A key finding in this study, similar to some findings from other developing countries in Africa, is the concurrent use of traditional and Western medicine. On the other hand, hypertension care is mostly hospital/clinic-based care, and easy access to this is yet to be established in most rural settings . Further studies on the sociological aspects of hypertension are recommended to identify reasons for the concurrent use of traditional and Western medicine in relation to developing models of community based management of high blood pressure in the rural settings. This will help retain and preserve relevant cultural values and serve maintain community wellbeing.

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Chapter 5

Development of Guidelines for Management of Hypertension in Rural Areas in Delta State, Nigeria

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Development of Guidelines for Management of Hypertension in Rural Areas in Delta State, Nigeria
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| Abstract: | Hypertension (high blood pressure) is presently one of the most important risk factors for the development of cardiovascular diseases. Several developed and developing nations including Nigeria have adopted various initiatives to prevent and/or manage hypertension. This article entails the development of guidelines using an integrated approach through a "System Support Strategy", combining appropriate and effective clinical care with community action in rural settings in Delta State Nigeria. Using the Nominal Group Technique meeting, a group of experts (6 key stakeholders) knowledgeable in the field were brought together to harmonize their ideas and experiences within a period of three days. The meeting resumed by 9am and ended 3pm daily. Each round (stages and duration) addressing a question lasted 1hr 45minutes. Major concepts addressed include optimal diagnosis and appropriate medical evaluation for high blood pressure, principles of blood pressure measurement and different steps in blood pressure measurement. Others are management options (routine baseline investigations, pharmacological and non-pharmacological measures) and prevention of high blood pressure as well as community screening programs. This simple guideline will not only serve as a vade mecum but will also have a strong impact on the health, quality of life and mortality rate among rural communities in Nigeria. |
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Development of Guidelines for Management of Hypertension in Rural Areas in Delta State, Nigeria

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Abstract

Hypertension (high blood pressure) is presently one of the most important risk factors for the development of cardiovascular diseases. Several developed and developing nations including Nigeria have adopted various initiatives to prevent and/or manage hypertension. This article entails the development of guidelines using an integrated approach through a “System Support Strategy”, combining appropriate and effective clinical care with community action in rural settings in Delta State Nigeria. Using the Nominal Group Technique meeting, a group of experts (6 key stakeholders) knowledgeable in the field were brought together to harmonize their ideas and experiences within a period of three days. The meeting resumed by 9am and ended 3pm daily. Each round (stages and duration) addressing a question lasted 1hr 45minutes. Major concepts addressed include optimal diagnosis and appropriate medical evaluation for high blood pressure, principles of blood pressure measurement and different steps in blood pressure measurement. Others are management options (routine baseline investigations, pharmacological and non-pharmacological measures) and prevention of high

blood pressure as well as community screening programmes. This simple guideline will not only serve as a *vade mecum* but will also have a strong impact on the health, quality of life and mortality rate among rural communities in Nigeria.

Outcomes: Extensive data from population based studies in rural settings have shown the benefit of hypertension management. The target blood pressure (BP) for antihypertensive management is systolic <140 mmHg and diastolic <90 mmHg (Adebayo, et al., 2013) with minimal or no drug side effects.

Benefits: Benefits of management include reduced complications like stroke, cardiac failure and other heart diseases.

Recommendations: The correct blood pressure measurement procedure is described and recommendations for antihypertensive therapy are stipulated. Lifestyle modification in line with the HEDWAS regime (Health education, Exercise, Diet, Weight control and maintenance, Alcohol reduction, Salt reduction, Smoking cessation) are necessary in the management of every patient. Major criteria and considerations for drug therapy are listed. First line drugs for the treatment of high blood pressure include diuretics, calcium channel blockers (e.g., nifedipine and amlodipine) and angiotensin converting enzyme inhibitors. The diuretics are of three types, the loop, thiazide- based agents and the K- sparing. The thiazide based type of diuretics are mainly prescribed as first line drugs.

Validity: The guideline was developed by academics in Delta State University Abraka, Nigeria who are also qualified and registered health care professionals in Nigeria and a representative of the study community.

Introduction

This work entails the development of guidelines on screening programmes, standard of assessment, management and review of patients with high blood pressure, using an integrated approach through a “System Support Strategy”, combining appropriate and effective clinical care with community action. This took into account the facilities, the social and environmental factors and other issues that influence the development of high blood pressure in rural settings in Delta State Nigeria. The developed guidelines included the following indicators: promoting appropriate care, reducing inappropriate or harmful care, reducing variations in delivery of care, improving access to care, improving the knowledge base across disciplines, educating and empowering clinicians and patients, facilitating coordination and continuity of care and facilitating ethical care (Rosenfeld & Shiffman, 2009).

Hypertension is a global health challenge affecting a high proportion of adults. Nigeria is one of the countries in sub-Saharan Africa known to have structured programmes for hypertension by way of issuing guidelines for the prevention, control and management of the condition (Onwubere, 2005). The guidelines outlined here are the first set of guidelines developed for use by community members, non-trained health workers (such as Community Health Officers and Community Health Extension Workers) and students during clinical exposure in specific rural settings in Delta State, Nigeria.

Hypertension, also known as high blood pressure, simply means the sustained elevation of blood pressure of an individual above the normal level for the age, gender and race of the individual. High blood pressure is often called a ‘silent killer’ because it may not present with symptoms until complications set in. In Nigeria, its prevalence is on the increase, which is likely attributable to the adoption of Western lifestyles. There are usually urban/rural and male/female dichotomies. The prevalence in rural areas was reported to be

13.5%–46.4% in both genders, 14.7%–49.5% in men and 14.3%–68.8% in women (Ogah, et al., 2012). In Abia, an Ibo community in Nigeria, the prevalence of hypertension was also high in both rural and urban settings (Ogah, et al., 2013).

In a recently concluded epidemiological survey conducted by the researcher in a rural community in Delta State, Nigeria (yet to be published), the prevalence of hypertension was 44%. Based on this epidemiological survey and another qualitative study on the cultural practices used for hypertension management in the same community, the community made a request for simple guidelines to help them identify and manage hypertension in the community. This led to the researcher conducting a Nominal Group Technique meeting with a group of experts knowledgeable in the field to develop these simple guidelines for use by the community members, non-trained health workers (Community Health Officers and Community Health Extension Workers) and students during clinical exposure in the rural setting. This pointed to the need to develop and promote evidence-based, accessible and comprehensive guidelines for the management of hypertension at rural settings by trained and non-trained health care professionals in Nigeria.

Objectives and methodology

The objective of this guideline is to develop a simple, comprehensive and practical format or approach for diagnosing, managing and reviewing of patients with hypertension in the rural, resource-limited communities of Delta State, Nigeria. This was achieved by means of integrated and collaborative approach involving experts knowledgeable in the field coupled with community action. A group of key stakeholders were brought together to harmonize their ideas and experiences. The data from the quantitative and qualitative studies conducted in this same rural community were used in the development of the guidelines in the course of tackling the topics and questions addressed during the meeting.

Nominal Group Technique (NGT) is a structured variation of small-group discussion aimed at reaching consensus (Andre, 1975; Tague, 2004). The NGT meeting included the following key stakeholders and participants: the researcher/moderator (an academic and health care professional), four other academics from the College of Health Sciences, Delta State University, Abraka, Nigeria who are also health care professionals (including one academic who is also a medical practitioner in primary health care and family medicine) and a senior nursing officer for primary health care services who is also a local government health staff member and a representative of the study community. The stakeholders were purposively selected from lecturers in the College of Health Sciences who were also health care professionals, the researcher included.

The NGT meeting was originally stipulated for five days, later reduced to three days because some of the key stakeholders had other important commitments after the third day. An invitation for the NGT meeting was forwarded to the key stakeholders three weeks prior to the scheduled date to obtain their consent and facilitate their preparation. The first day took the form of a session lasting for about seven hours to accommodate the introduction and explanation time, with intervals for tea break and lunch. Each round addressing a topic lasted for an hour and 45 minutes. Topics 1,2,3 and 4 were addressed on the first day, topics 5 and 6 on the second day and topics 7, 8 and 9 on the third and last day (Table 1).

The current effort (development of this guideline) identified and explained the aspects, procedures and activities which are feasible in rural settings, taking account of the available facilities and resources (human and material). Emphasis was also placed on diet as a lifestyle modification, with indication of some recommended diets. Other unfeasible aspects were also identified with recommendations for referrals or modification to suit the rural setting, thereby making the guidelines specific to rural communities in Delta State Nigeria.

Stages and duration of the guideline development

The researcher/moderator followed the stages listed below in the NGT meeting.

1. *Introduction and explanation:* The moderator welcomed the participants (the six persons listed above) and explained to them the purpose and procedure of the meeting.
2. *Silent generation of ideas:* The moderator provided each participant with a sheet listing the questions to be addressed and asked them to write down all ideas that came to mind when considering the questions. During this stage the moderator asked participants not to consult or discuss their ideas with others. Time allocated for this stage was approximately 10 minutes.
3. *Sharing ideas:* The moderator invited participants to share the ideas they had generated. She recorded each idea on a flip chart using the words spoken by the participant. The round-robin process continued until all ideas were presented. There was no debate about items at this stage and participants were encouraged to write down any new ideas that arose from what others shared. This process ensured that all participants got an opportunity to make an equal contribution, and provided a written record of all ideas generated by the group. Time allocated for this stage was 30 minutes.
4. *Group discussion:* Participants were invited to seek verbal explanation or further details about any of the ideas that colleagues had produced that were not clear to them. The moderator's task was to ensure that each person contributed and that discussion of all ideas was thorough without spending too long on a single idea. The researcher ensured that the process was as neutral as possible, avoiding judgment and

criticism. The group suggested new items for discussion and combined items into categories but no ideas were eliminated. Time allocated for this stage was 45 minutes.

5. *Voting and ranking*: This involved prioritizing the recorded ideas in relation to the original questions. Following the voting and ranking process, immediate results in response to the questions were available to participants so that the meeting concluded having reached specific outcomes. Time allocated for this stage was 20 minutes.

Strength of the current guidelines

The current initiative (development of these guidelines) identified and explained the aspects, procedures and activities which are feasible in rural settings, taking account of the available facilities and resources (human and material) . These procedures and/or activities were either modified to suit the setting or recommended for referral. Procedures and activities which were not feasible included blood pressure measurement and assessment, physical examination (examination of the cardiovascular system for heart size, enlarged heart, optic fundi and the nervous system for evidence of hypertensive retinopathy) and routine baseline investigations (serum urea, creatine and electrolytes for assessment of kidney function, lipid profile for assessment of cholesterol levels, echocardiogram and chest X-Ray for assessment of heart enlargement). Others were pharmacological and non-pharmacological (lifestyle modification) measures for high blood pressure control. All these have been captured further in relation to each procedure and activity, thereby making the guidelines specific to rural communities in Delta State Nigeria.

Table 1: Summary table of all topics in the guideline

| |
|--|
| 1. Introduction |
| 2. Objectives and Methodology |
| 3. Diagnosis of High Blood Pressure 4. Optimal diagnosis of high blood pressure 5. Appropriate medical evaluation for high blood pressure: 5.1 History Taking 5.2 Physical examination 5.3 Investigation |
| 6. Blood Pressure Measurement 6.1 Principles for blood pressure measurement 6.2 Different steps in blood pressure measurement: 6.2.1 Explanation 6.2.2 Posture of patient and position of arm 6.2.3 Position of manometer 6.2.4 Inflation of the cuff and reading of systolic and diastolic blood pressure |
| 7. Management Options for High Blood Pressure 7.1 Routine baseline investigation(s) in the management of high blood pressure 7.2 Non-pharmacological measures for high blood pressure control 7.2.1 Life style modification (using the HEDWAS mnemonic) and Control of stress 7.2.2 Pharmacological measures for high blood pressure treatment |
| 8. Prevention of High Blood Pressure and Review of Patients 8.1 Preventive measures for high blood pressure vis-a-vis, primary (including screening programmes), secondary and tertiary measures. 8.2 Review of Patients |
| 9. Conclusion |

Diagnosis of high blood pressure

This will be discussed in relation to optimal diagnosis of high blood pressure and appropriate medical evaluation for high blood pressure.

Optimal diagnosis of high blood pressure

An adult individual with blood pressure of $\geq 120/80$ mmHg on three different occasions, with at least 30 minutes interval, is considered to be hypertensive (Nigerian Hypertension Society, 2005). An isolated systolic elevation of ≥ 150 mmHg or diastolic of ≥ 100 mmHg may need only a single reading to make a diagnosis (Salako, 2009).

Blood Pressure Measurement

Blood pressure measurement will be addressed by first highlighting the basic principles for this measurement, followed by discussion of the different steps in blood pressure measurement: explanation, posture of patient and position of arm, position of manometer and inflation of the cuff, and reading of systolic and diastolic blood pressure. This could involve an element of skill, especially for nurses who are the most readily available health care providers at rural settings (Ofili, 2012). These details have also been substantiated by various West African College of Physicians update courses on hypertension (Salako, 2009).

Principles for blood pressure measurement

These recommendations apply to all validated devices both in clinic and in self-blood pressure monitoring (SBPM)

- Blood pressure is measured using the appropriate cuff size.
- The patient should not have smoked or taken food or coffee for 30 minutes before blood pressure measurement.
- The patient should be comfortable, with no pains or full bladder.
- Blood pressure should be rechecked in 2 weeks if mild, moderate and in target organ damage.
- The blood pressure measurement device and its attachments (tubing, cuff, and valve) must be serviced and calibrated at least once each year.

Table 2: Blood pressure measurement and assessment

| | Steps in blood pressure measurement and assessment |
|-----------|--|
| 1. | PREPARATION OF THE PATIENT |
| A. | Explanation: |
| i. | Briefly explain the procedure to the patient. |
| ii. | Explain that cuff will get tighter around the arms. |
| iii. | Explain need for more than a reading. |
| B. | Posture of patient and position of arm: |
| i. | Patient to relax for at least 5 minutes before measuring BP. |
| ii. | Let patient sit with back supported and feet on the floor. |
| iii. | Measure BP in standing position for the elderly. |
| iv. | Position arm horizontally and supported with the antecubital fossa at heart level. |
| v. | Remove tight or restrictive clothing from the arm. |
| vi. | Use an appropriate BP cuff size for the patient. |
| vii. | Use a large bladder for fat arms. |
| viii. | Place cuff bladder 80% around arm with centre over brachial artery. |
| ix. | Place cuff with the tubing pointing to the shoulder. |
| x. | Place lower edge of the bladder 2 – 3cm above the point of maximal pulsation of the brachial artery. |
| C. | Position of manometer: |
| i. | Position manometer vertically. |
| ii. | Position manometer not more than 1m from observer. |
| iii. | Position manometer at eye level of observer. |
| D. | Inflation of the cuff and reading of systolic and diastolic blood pressure: |
| i. | Palpate the radial or brachial pulse of the subject. |
| ii. | Rapidly inflates cuff to 30mmHg above where the pulsation disappears. |
| iii. | Place stethoscope over brachial artery with no pressure. |
| iv. | Deflate cuff gradually at a rate of 2 – 3mmHg per second. |
| 2. | HISTORY TAKING |
| a. | Family history of hypertension and other diseases. |
| b. | Duration and previous levels of high blood pressure. |
| c. | History of drugs used. |
| d. | Any other associated illness/disease. |
| e. | Secondary causes of hypertension. |
| f. | Lifestyle factors |
| g. | Personal, psychosocial and environmental factors |
| h. | History of diabetes |
| 3. | PHYSICAL EXAMINATION |
| a. | Note signs and symptoms of oedema (swollen legs) and previous strokes |
| b. | Measure height. |
| c. | Measure body weight. |
| d. | Determine body mass index (BMI). |

| | |
|-----------|--|
| e. | Examine the apex beat and shift of apex beat (normal is at 5th intercostals space mid clavicular line) |
| f. | Examine the lungs for wheezes and crackles. |
| g. | Examine the abdomen for bruits and other masses |
| h. | Measure blood pressure and check pulse (arterial wall palpation) |
| i. | Check for hyperactive precordium |
| 4. | INVESTIGATION |
| a. | Perform urine dipstick analysis for protein and check for frothy urine. |
| b. | Perform urine dipstick analysis for blood. |
| c. | Perform urine dipstick analysis for glucose. |

Note: Based on the researcher's assessment of the health care facilities available in the rural community, examination of the cardiovascular system for heart size, enlarged heart, optic fundi and the nervous system for evidence of hypertensive retinopathy which are still important aspects of physical examination should be done by specialists which may not be available at the rural settings. The patient needs to be referred to a higher level of health care.

Management Options for High Blood Pressure

Routine baseline investigation(s) in the management of high blood pressure

- Urinalysis: Check for frothy urine (mass of small bubbles)
- Perform urine dipstick analysis for protein
- Perform urine dipstick analysis for blood
- Perform urine dipstick analysis for glucose.

Note: Based on the researcher's assessment of the health care facilities available in the rural community, other important routine baseline investigations like serum urea, creatine and electrolytes (for assessment of kidney function), lipid profile (for assessment of cholesterol levels), echocardiogram and chest X-Ray (for assessment of heart enlargement) may not be feasible at the rural settings where high-technology facilities or equipment are not available. Patients who may need these investigations should be referred to a higher level of health care.

Non-pharmacological measures for high blood pressure control (life style modification and elimination of stressors/predisposing factors).

Life style modification (using the HEDWAS mnemonic) and control of stress.

Health education: Hypertensive patients need to be educated on the status and progress of their condition. The idea of health education is to empower individuals to participate actively and ensure the quality of the management of their hypertension. Effective, honest and open two-way communication between the health care provider and the patient is critical to the prevention and management of chronic life-long conditions like hypertension. Acquisition of communication and counselling skills by health care professionals is essential, preferably in the language of the study population (Igbo language).

Education on traditional and cultural practices: The qualitative study identified some traditional and cultural practices used for hypertension management in the community – in particular, traditional palm kernel soup (which is very high in cholesterol), use of alcohol as part of a traditional medicinal practice, and spiritual practices. It is recommended that training for health workers should give attention to such factors, particularly in relation to dietary advice, although some of these practices such as the spiritual practices may be difficult to address during health education because of their sensitive nature. Some traditional practices like the use of medicinal/herbal plants may not be suitable to discuss with the patients as there are no documented studies on their use and effect in the rural community.

Exercise: Regular exercise/physical activity is essential and helps to prevent and control high blood pressure, lose weight or maintain ideal weight, manage diabetes by reducing insulin resistance, manage stress, improve lipid profile, decrease blood clotting, increase fibrinolytic activity, help in smoking cessation, improve blood cholesterol levels and increase energy to carry out daily activities. Exercise should be **regular** (moderate exercise for at least 30 minutes per day, on most days of the week, is recommended) and **aerobic** (activities such as cycling or brisk walking) depending on the ability and strength of the patient. According to *Nurses Hypertension Association Guideline, 2004*, contra-indications to exercise are:

unstable angina, resting blood pressure BP >180/110mmHg, symptomatic orthostatic BP drop of >20mmHg, certain heart conditions, resting tachycardia >120bpm, acute illness, uncontrolled diabetes and recent embolism or surgical procedure.

Note: Any patient who has a history of coronary heart disease (CHD) should be considered for an exercise tolerance test prior to taking up increased physical activity programmes.

Diet: Dietary Approach to Stop Hypertension (DASH diet) is recommended. This is chiefly diets low in fat, sugar and rich in fruits and vegetables. (U.S. Department of Health and Human Services, et al., 2004). If your blood potassium is too low, blood pressure may increase. Including potassium- rich foods in your diet may help in managing high blood pressure. High-potassium foods include bananas, dried fruits, skim milk and potatoes. If you take a diuretic (“water pill”) to control your blood pressure, it is important to have your care provider check your blood potassium level during your regular check-ups. You may need to take a potassium supplement to keep your blood potassium within the normal range. Including potassium-rich foods (e.g., banana and plantain) in your diet is also necessary.

Emphasis has to be placed on diet as a lifestyle modification in this rural setting. The most common local diet in most rural settings in Delta State is *ofe akwu* (palm kernel soup), which is a high cholesterol foodstuff. This is taken with *eba* (pounded yam), *fufu* (boiled yam), potatoes, boiled plantain or rice. We recommend an alternative soup prepared with more vegetables which can be taken with any of the above mentioned foods; these vegetables (commonly and readily available in the community) are spinach (popularly known as “green”), *ugu*, *onugbu*, *oha* and *utazizi*. Another common dietary item is boiled yam with palm oil mixed with salt. We recommend that boiled yam be taken with vegetable soup or stew if desired. Low-salt diets will be discussed in detail in relation to salt reduction as a lifestyle modification. The diets and overall management of hypertensive patients with co-

morbid conditions need to be carefully planned, depending on the type of co-morbid condition. Table 3 below shows a list of appropriate diets for hypertensive patients with co-morbid conditions.

Table 3: Appropriate diets for hypertensive patients with co-morbid conditions

| Cardiac conditions | Renal conditions | Hormonal conditions (e.g. diabetes) |
|--|---|--|
| <ul style="list-style-type: none"> ▫ Low salt diet ▫ Low fat/cholesterol diet (non-fried foods) ▫ Vegetables (<i>onugbu</i>, <i>ugu</i> and <i>pha</i>) | <ul style="list-style-type: none"> ▫ Low salt diet ▫ Low potassium diet (indomie noodles, water melon, rice and cooked vegetable) ▫ Low protein diet (parboiled rice, yam flour, <i>gari/eba</i>) ▫ Low phosphorus diet (spinach, mustard leaves, lettuce, boiled yam, apple, lime and lemon) ▫ Moderate calorie diet (pounded yam, cassava flour/<i>fufu</i>) | <ul style="list-style-type: none"> ▫ Low salt diet ▫ Low sugar (boiled unripe plantain) ▫ High roughage diet (<i>onugbu</i>, <i>ugu</i>, <i>pha</i>) ▫ Low calorie diet (<i>amala</i>) |

Note: Local foods have been referred to for relevance. Some medical conditions such as kidney disease may require reduced potassium in the diet, in which case the patient needs to be referred to a registered dietician who can give more information about foods rich in potassium.

Weight control and maintenance: Being overweight is very closely connected to high blood pressure, especially if your body mass index (weight in kilograms divided by your height in meters squared) is 25 or greater. Excess body fat (for example a waist measurement of 35 inches or greater in women or 40 inches or greater in men) is also related to high blood pressure, diabetes, increased blood lipid levels, and coronary heart disease.

Some recommended weight loss tips:

- Choose foods low in saturated fat, cholesterol, trans fat (partially hydrogenated fats) and refined sugar.
- Eat at least five servings of fruits and vegetables each day. One serving is equivalent to one orange or apple or mango or banana, or three tablespoons of cooked vegetables (e.g., *ugu*, *onugbu*, *oha*, *utazizi*). Try to avoid juice and canned fruit, which are generally high in sugar and may add more calories.
- Watch your food portion sizes. One quarter of your plate should comprise a palm-size portion of lean protein such as chicken breast, another quarter should comprise a fist-size portion of unrefined grain such as brown rice, and one-half of your plate should be filled with a variety of vegetables.
- Do not skip meals. Eating three meals a day plus snacks is essential in weight management. Remember to snack on fresh fruit.
- Make sure you take enough fibre; about 25 to 30 grams of fibre are recommended each day. To help you boost your fibre intake, choose whole-grain, high-fibre breads and cereals. Choose whole-wheat rice instead of white rice and include more dried beans (like soya) in your meals. Fibre helps fill you up faster, which can help you to curb hunger and eat less. Most importantly, soluble fibre can help lower your cholesterol.
- Exercise daily. Participate in physical activity daily as recommended by your physician or exercise physiologist.
- Eat the majority of your calories in the first half of your day. Enjoy portion-controlled snacks during the day to control hunger at night.
- Drink plenty of water. Take at least 6 to 8 glasses of fluid each day. Water helps keep you adequately hydrated and often helps prevent overeating.
- Set realistic goals. Weight loss should be gradual.

Note: Patients may also be referred to registered dieticians who can help them evaluate their current eating habits and plan strategies to help them lose weight.

Alcohol reduction: Drinking too much alcohol can increase your blood pressure and make it more difficult to treat high blood pressure. If you have high blood pressure, it is recommended that you cut down if you drink excessively. The recommended alcohol intake for men is 20–30g/day (2 drinks) and 10–20g (1 drink) for women.

Salt reduction: Reducing the amount of sodium (salt) in the diet can help lower blood pressure especially for hypertensive patients. Sodium is found in table salt and some of the foods we eat, most commonly, preserved and canned foods. Salt intake of <100mmol/day is highly recommended (Josephs, 2009). In rural settings in Delta State, salt reduction strategy can be achieved by using some of the commonly eaten local foods. We recommend the following: boiled yam should be prepared with salt to taste; sprinkle some salt on the fish for preservation; use more herbs and spices instead of salt to flavour foods and be careful of the use of *ogilisi* which serves as soup flavour and is also salty; avoid processed foods (canned foods, cheeses and canned meats); foods preserved by salting and smoking should be avoided. Fresh types of these can be taken.

Note: Patients may also be referred to registered dieticians who can help them evaluate their current food choices and help them select foods lower in sodium.

Smoking cessation: If you smoke, please “Quit”. Smoking and tobacco use are significant risk factors for a variety of chronic disorders including heart and blood vessel disease.

Tips on how to stop smoking:

- Make a list of all the reasons you want to quit smoking. Read over the list every day, before and after you quit.
- Make a list of activities you can do instead of smoking.
- Stop smoking in certain situations before actually quitting.
- Pick a date for quitting and stick to it.

- Get a friend who is doing the same to help you quit, and ask your family and friends for support .

Control of stress and anger

It is known that sudden stress can cause an acute rise in blood pressure; one example of this is the marked increase in systolic blood pressure that can be caused by the act of taking blood pressure. Chronic stress is suspected to be one of the risk factors for hypertension. During periods of stress or anger, blood pressure rises. If the stress and anger persists over time, high blood pressure can occur. However, the role of chronic stress has been difficult to assess, partly because stress means different things to different people and because stress has not always been easy to measure. Stress and anger are also related to heart disease.

Tips to control stress and anger:

- Manage your time.
- Set realistic goals for what you can accomplish each day within your strength and capability.
- Take time each day to relax.
- Learn relaxation techniques. Relaxation therapies can reduce blood pressure and people may wish to try them.
- Always try to avoid the scene of anger. This may serve as a way of removing the stressors/stress agents.

Pharmacological measures for high blood pressure treatment

This is a very delicate aspect of management and caution should therefore be taken in relation to the type of drugs prescribed (their class) and the side effects. These drugs are best obtained from health centres, registered patent medicine vendors and pharmaceutical shops within the community. Anti-hypertensive drugs are best given based on the different classes, individual

peculiarities and type commonly available in the locality. Considerations for drug therapy include efficacy, individualizing therapy, age, race and “patient-friendly” regimens (Olaniyan, 2008). The basic first-line drugs for the treatment of high blood pressure are:

1. Diuretics: There are three types: loop diuretics, thiazide-based agents and K-sparing diuretics. The thiazide-based diuretics are mainly prescribed as first-line drugs.
2. Calcium channel blockers (e.g., Nifedipine and Amlodipine).
3. Angiotensin converting enzyme inhibitors.

Other anti-hypertensive drugs include: beta blockers, central acting drugs (e.g Aldomet), vasodilators, angiotensin II receptors blockers (ARB), anxiolytics (diazepam and Lexotan), antithrombotics - ASA (Vasoprin and heparin).

In this rural setting, the most available, affordable and accessible drugs are the **diuretics, calcium channel blockers** and the **central acting drugs**. Diuretics and calcium channel blockers are mostly prescribed because of their efficacy among the blacks – especially diuretics and “patient-friendly” regimens. According to the key informants in the qualitative study which led to the developed guidelines, sharing of medicines with family members is part of their lifestyle as they believe the medicines perform the same function as long as the symptoms are similar, irrespective of the individual diagnosis. Education on the risk of sharing medicines is pertinent and should be included in the training of health workers.

Note: If blood pressure is 20/10mmHg higher than the required level, two different classes of anti-hypertensive drugs have to be used. Also, individuals who have diabetes or any kidney disease MUST be placed on angiotensin converting enzyme (ACE) inhibitors because these are renoprotective. Complicated hypertension/in association with co-morbidities should be referred early enough to specialist physicians.

Prevention of high blood pressure and review of patients

Different preventive measures for high blood pressure vis-a-vis, primary (including screening programmes), secondary and tertiary measures

Primary measures: These include regular blood pressure check, lifestyle modification and intake of supplements such as calcium, potassium (K⁺) and magnesium (Mg⁺). Lifestyle modification has been addressed in detail above (see HEDWAS). It is important that every adult male/female in the community should have a regular blood pressure check, which can be done during the periodic medical examination. Individuals **who do not have high risk factors** (the aged, family history of hypertension, obsessive, etc.) should have their blood pressure checked **at least once every 2 years**, while **those at high risk** should have their blood pressure check **at least once every year**.

Screening programmes: There are three types of screening programme: mass screening, targeted screening and opportunistic screening. A *mass screening programme* is when a health care provider enters into a community setting and screens (in blood pressure assessment) any adult male or female in the community. A *targeted screening programme* is focused on a particular category of individuals according to a particular criterion – for example those having high risk factors (like the aged or obsessed). An example of an *opportunistic screening programme* would be where a health care provider visits a friend in the community and individuals in the vicinity seize the opportunity to ask for a blood pressure check.

Secondary measures: The secondary measures for prevention of high blood pressure include prevention of complications, prompt and adequate treatment of high blood pressure, routine investigations, encouraging compliance, preventing circulation of fake drugs and educating the patients on side effects of the drugs.

Tertiary measures: These include reducing the development of complications and managing the progression of complications to prolong life.

Review of patients

In the course of screening programmes for blood pressure there may be individuals who have other diseases of interest or concern; such individuals will need further assessment or review. Review of patients is also accomplished when investigations (e.g., urinalysis, blood sugar) are done to confirm whether an individual is hypertensive. Individuals who are confirmed hypertensive may need further investigations (e.g., chest x-rays or echocardiograms) which involve high-technology equipment to monitor and prevent complications. In this case, referral process is necessary when the high-technology equipment is not available at the rural setting (Aderamo & Magaji, 2010).

Conclusion

The practice guidelines developed in this study stipulated a simple format for standard of assessment, screening programmes, management and review of patients with high blood pressure in a typical rural community in Delta State, Nigeria. Facilities available in the setting as well as the social and environmental factors influencing the development of hypertension in rural settings were considered. The blood pressure measurement procedures and the pharmacological measures for treatment of high blood pressure need to be updated from time to time as new skills in practice emerge. Non-pharmacological measures for high blood pressure control (such as the HEDWAS regime) would have a strong impact on the health, quality of life and mortality rate among rural communities in Nigeria. Community screening activities are important for population subgroups, especially those at high risk of developing cardiovascular disease and with limited access to medical care. The guidelines provide balanced information to steer clinicians, academics, students and community members, rather

than strict rules that would constrain their judgment about the management of individual patients each with their own personal, social, ethnic and cultural characteristics.

Strategic implications for implementing these guidelines

The implementation of these guidelines is an active process that will involve dissemination, community awareness and education. It will require the full collaboration and co-operation of policy makers and administrators at the local government level as well as funders. The nurses, local professional groups (community health officers and community health extension workers) and the community representatives will need to meet to discuss how to implement the guidelines in the community. One obstacle likely to be encountered will be funding. Support materials that will be needed for implementation include organising conferences and workshops and screening programmes.

Research needs

We recommend further research on special considerations for hypertension in certain populations, which would include hypertension in pregnancy, the elderly, adolescents, persons living with HIV/AIDS and people with co-morbid conditions.

Acknowledgements

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Chapter 6

Theoretical Development of Guidelines for Management and Prevention of Hypertension in a Rural Community

6.1 Introduction

The document discussed in this chapter is intended to be a quick reference guide on the management of hypertension for community members, nurses working at primary health care (PHC) level, non-trained health workers such as community health officers (CHO), community health extension workers (CHEW) and students on clinical exposure and/or community-based experience services (COBES) in rural settings, in Delta State, Nigeria. The guidelines were developed as part of a PhD study at the University of KwaZulu-Natal, School of Nursing & Public Health by Ms. Mary Ofili (MSc) in collaboration with a nominal group of academics and health care professionals employed in Delta State, Nigeria.

Members of the nominal group::

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Mr. Charles Oloriegbe

Chief Achinze

Date: 7th - 9th April 2014

6.2 Purpose and objectives of the Guidelines

The purpose of the Guidelines is to develop and promote evidence-based, accessible and comprehensive guidance for the management of hypertension at rural settings by trained and non-trained health care professionals in Nigeria. The broad objective is to develop a simple,

comprehensive and practical approach for diagnosing, managing and reviewing of patients with hypertension in the rural, low-resource communities of Delta State, Nigeria. The Guidelines have been designed to meet the following objectives:

1. Empower community members for the management and prevention of hypertension.
2. Improve community and population health.
3. Promote appropriate care.
4. Reduce inappropriate or harmful care.
5. Reduce variations in delivery of care.
6. Improve access to care.
7. Improve the knowledge base across disciplines.
8. Educate and empower clinicians and patients.
9. Facilitate coordination and continuity of care and facilitate ethical care.

6.3 Scope of the guidelines

In formulating the Guidelines, their scope has been conceived in relation to four sets of considerations: the target group for the guidelines, the disease/condition(s) included in Guidelines, the Guidelines categories and the interventions and practices considered.

6.3.1 Target group for the Guidelines

The users of these guidelines will be the community members, nurses working at primary health care (PHC) level, non-trained health workers such as community health officers (CHO), community health extension workers (CHEW) and students on clinical exposure and/or community-based experience services (COBES) in rural settings, in Delta State, Nigeria. These health workers do not do full assessments and/or individualized plans for hypertensive patients with co-morbid conditions; instead they are encouraged to do referrals for such patients. The following recipients in Nigeria will be provided with copies of these

guidelines: Ibusa community, Delta State Ministry of Health, and institutions such as Delta State University, Abraka, Nigeria.

6.3.2 Disease/condition(s) included in Guidelines

- Hypertension, also known as high blood pressure.

6.3.3 Guidelines categories

- Management of hypertension in rural settings/at rural level.
- Management of hypertension in primary health care centres.
- Management of hypertension by nurses working at primary health care level, non-trained health workers such as community health officers (CHO), community health extension workers (CHEW) and students on clinical exposure in rural settings in Delta State, Nigeria.

6.3.4 Strategies, interventions and practices considered in formulating the Guidelines

A potential objective in carrying out research is to enable the development of evidence-based guidelines for practice. This was a principal objective in the underlying research for the guidelines described here, in which the researcher investigated hypertension management in a specific rural community in response to a request by community members in Ibusa community in Delta State, Nigeria, following an epidemiological survey and a qualitative study on the cultural practices used for hypertension management in the same community. The guidelines on screening programmes, standards of assessment, management, and review of patients with high blood pressure were developed using an integrated “System Support Strategy” approach which combined appropriate and effective clinical care with community action. The interventions and practices considered were the WHO CVD-Risk Management Package for low- and medium-resource setting (2002), the Guidelines for the Management of Hypertension in Nigeria (2005), the National Institute for Clinical Excellence (NICE)

Guidelines for management of primary hypertension in adults and the Nurses Hypertension Association (NHA) guidelines, 2004.

There are many approaches worldwide for the prevention and control of hypertension, and in most of these approaches the local populations themselves have a role to play. The World Conference in 1995 has enabled the World Hypertension League (WHL) to obtain a global view of the approaches, difficulties and solutions associated with the prevention and control of hypertension which should benefit all participants and societies. A review of selected national programmes of hypertension control and cardiovascular disease prevention has shown the importance of mobilizing broad segments of society, including medical and non-medical organizations acting in partnership (Frohlich, 1995). Hypertension control programmes must include provision for evaluation of both process and outcome to establish their impact on blood pressure levels in the populations or communities for which they have been designed (Gyarfas & Strasser, 1995). Developing countries may need specific consideration in this regard and much can be achieved with modest means, if there is adequate societal support. Thus, hypertension control measures should be firmly established as a component of primary health care. Health education, lifestyle counselling and screening programmes, especially in rural settings, can be powerful support measures.

Strategies for the prevention and control of high blood pressure

Prevention and control of high blood pressure would undoubtedly have a strong impact on the health, quality of life and mortality rate among rural communities in Nigerian. It would also reduce health care expenditure needs for cardiovascular diseases.

Programme strategies

Achievement of the short- and long-term programme outcomes will require the development and implementation of strategies involving both the health sector and other developmental sectors. These strategies will need to address behavioural and environmental factors associated with high blood pressure prevention and control in order to achieve three sub goals: prevention, early detection and control of hypertension. Three principal strategies are involved: Community Health Promotion Strategy, Health Services System Strategy and System Support Strategy. All three embrace a common concept: adoption by the population of healthy lifestyles and behaviours through health education, exercise, diet, weight control and maintenance, alcohol reduction, pharmacological measures, salt reduction and smoking cessation. Research has shown that a combination of strategies is more effective than a single approach. The guidelines therefore recommend a combination of strategies (see Figure 1) to be known as the HEDWAPS approach, which includes:

HHealth education

EExercise

DDiet

WWeight control and maintenance

AAlcohol reduction

PPharmacological measures

SSalt reduction & Smoking cessation

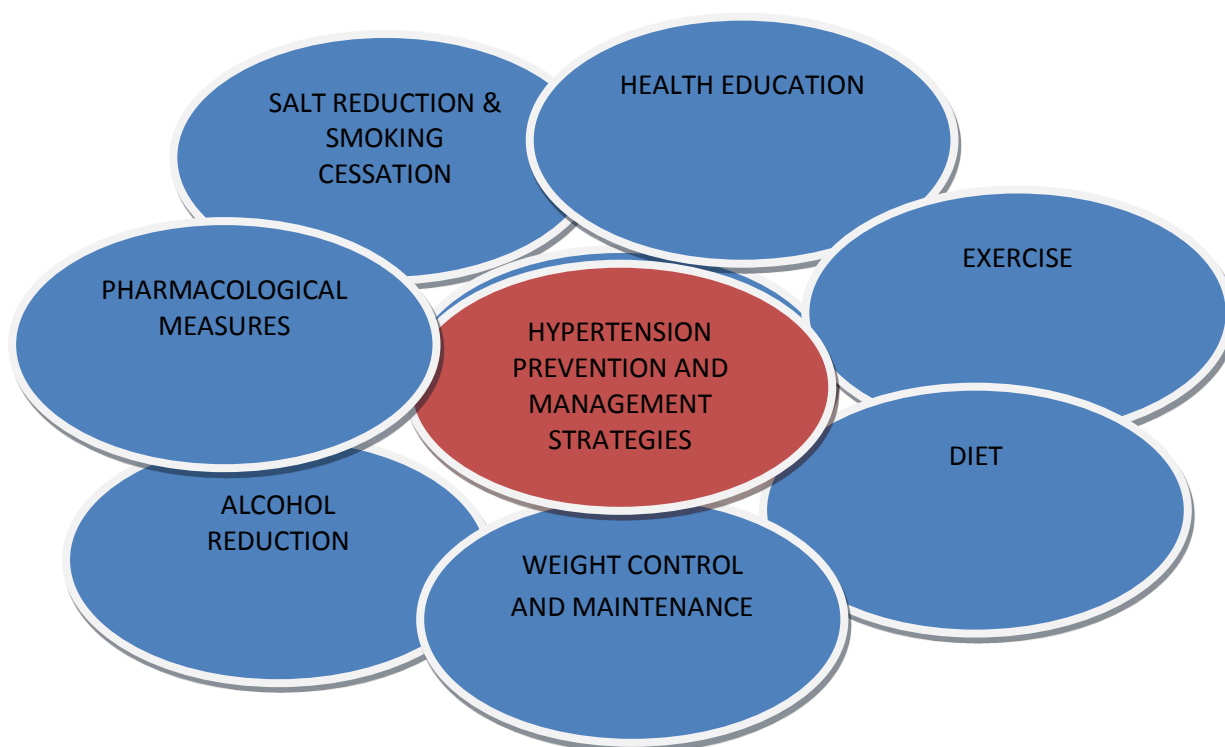


Figure 1: Strategies of the HEDWAPS Approach

6.4 Expected outcomes

It is expected that if the eight combined strategies (Health education; Exercise; Diet; Weight control and maintenance; Alcohol reduction; Pharmacological measures; Salt reduction and smoking cessation) are successfully implemented in the community, the following changes will be achieved:

1. Awareness of early detection of hypertension and control measures.
2. Learning amongst community members, non-trained health workers and students.
3. Knowledge acquisition by health care professionals, non-trained health workers and students.
4. Constructive attitudes and behaviours existing among the community members.
5. Enhanced practice skills and techniques for non-trained health workers and students.
6. Normative or policy changes and social or environmental changes in the community.
7. Adoption of positive and active engagement in life by the community members.

8. Adoption of health-directed behaviours by the community members.
9. Ability of community members to do self-monitoring of their blood pressure.
10. Enhanced and balanced emotional wellbeing for community members.
11. Reduced target blood pressure (systolic <140 mmHg and diastolic <90 mmHg) with minimal or no drug side effects.

6.5 Essentials of the Guidelines

The success of these guidelines will depend on the following factors:

1. Willingness and preparedness of the community members to participate in screening programmes.
2. Availability of necessary materials, equipment and resources for effective and proper health education
3. Adequate staffing and collaboration between the staff and community members.
4. Availability of health care institutions and specialists in case of referrals.
5. Sufficient funding.
6. Correct timing of programme-related activities.
7. Socio-economic factors and social norms and conditions.
8. Political stability in the community.

6.6 Context of the Guidelines

Context refers to the environment in which the developed guidelines will work successfully.

These guidelines was developed in a rural setting in Delta State, Nigeria, where resources (human and material) are scarce and health care facilities and personnel are limited. This means that the guidelines are suitable for use within the Nigeria Health Care System. They have been developed to fit in with the Local Government Health Care System, which the Nigerian Government has deemed to be most suitable for primary health care. Other contextual factors include collaboration between community members and trained and non-trained health workers working at the rural level, willingness and preparedness of the community members to participate in screening programmes, existence of structures and

services, the low-resource setting (where about 80% of the population depend on the government for development), and relationship of trust between community members and those who will implement the guideline.

6.7 Principal concepts in the three hypertension prevention and management strategies

The three strategies are all linked to hypertension prevention and management and for optimal results they should be implemented in combination.

Community Health Promotion

- Advocate for *healthy public policy* in both the health and non-health sectors to support healthy lifestyles.
- Encourage *community action* for adoption of healthy lifestyles and regular assessment of blood pressure.
- Create *supportive environments* in schools, the workplace and the community for adoption of healthy lifestyles and regular assessment of blood pressure.
- Provide *information and education* on adoption of healthy lifestyles, regular assessment of blood pressure, and appropriate taking of prescribed medication.
- Involve *the non-health sector* in creating healthy policies, programmes and services to support healthy lifestyles and high blood pressure detection and control.

Health Services System

- *Provide education* about healthy lifestyle and high blood pressure prevention and screening, using a variety of methods, as part of primary care for everyone of all ages.
- *Screen* all adults (over age 20) for high blood pressure at least once every two years (or more often if indicated) in the primary care setting, or in the workplace or community if part of an organized programme of follow-up.

- For individuals with a high blood pressure reading at the time of screening, ***repeat assessment*** over a three to six month period to make the diagnosis of high blood pressure.
- Search for ***underlying medical causes*** of high blood pressure according to clinical practice guidelines.
- Provide intensive lifestyle education for individuals with high blood pressure as an essential part of high blood pressure management control.
- Recommend ***addition of medication*** to control high blood pressure according to clinical practice guidelines.
- Encourage the individual with high blood pressure and his/her family to be ***active*** participants in their management plan, and provide monitoring and follow-up to support health behaviour changes and appropriate taking of medications.
- Organize ***delivery of health services*** to ensure they are accessible, effective and efficient, including use of interdisciplinary teams for service delivery, a primary care team as first response, and specialist assistance as needed.

System Support Strategy

- Advocate for sufficient ***resources*** to implement the high blood pressure prevention and control initiative.
- Develop and provide ***education resources*** on healthy behaviours and prevention and treatment of high blood pressure for individuals, families and health service providers.
- Develop and disseminate ***clinical practice guidelines*** to health care providers including undergraduate and postgraduate students and practicing professionals.
- Conduct ***surveillance, research and programme evaluation*** to provide the evidence base for the high blood pressure prevention and control programme.
- Maintain or develop ***coalitions or networks*** at the local/regional, provincial/territorial, and national levels to facilitate effective planning, collaboration and communication, and use of resources within the health and non-health sectors.

6.8 Concepts in the combined HEDWAPS approach

The combined elements that constitute the HEDWAPS approach are all linked to hypertension prevention and management and should be implemented in combination for optimal results.

Health education: Hypertensive patients need to be educated on the status and progress of their condition. The idea of health education is to empower individuals to participate actively and ensure the quality of the management of their hypertension. Effective, honest and open two-way communication between the health care provider and the patient is critical to the prevention and management of chronic life-long conditions like hypertension. Acquisition of communication and counselling skills by health care professionals is essential, preferably in the language of the study population (Igbo language).

Exercise: Regular exercise/physical activity is essential and helps in preventing and controlling high blood pressure, losing weight or maintaining ideal weight, managing diabetes, managing stress, improving blood cholesterol levels and increasing energy to carry out daily activities. Exercise should be *regular* (moderate exercise is recommended for at least 30 minutes per day, on most days of the week) and *aerobic* (activities such as brisk walking or cycling).

Note: Any patient who has a history of coronary heart disease (CHD) should be considered for an exercise tolerance test prior to taking up increased physical activity programmes.

Diet: The Dietary Approach to Stop Hypertension (DASH diet) is recommended. This is principally a diet that is low in fat and sugar and rich in fruits and vegetables. (U.S. Department of Health and Human Services, et al., 2004). If your blood potassium is too low, blood pressure may increase. Including potassium-rich foods in your diet may help manage

high blood pressure. High-potassium foods include, bananas, dried fruits, skim milk and potatoes. If you take a diuretic (“water pill”) to control your blood pressure, it is important to have your care provider check your blood potassium level during your regular check-ups. You may need to take a potassium supplement to keep your blood potassium within the normal range. Including potassium-rich foods in your diet is also necessary.

It is important to emphasise diet as a lifestyle modification in this rural setting. The most common local diet in most rural settings in Delta State is *ofe akwu*, also known as palm kernel soup, which is a high cholesterol diet. This is taken with *eba* (pounded yam), *fufu* (boiled yam), potatoes, boiled plantain or rice. We recommend an alternative soup prepared with more vegetables which can be taken with any of the above mentioned foods. Vegetables commonly and readily available in the community include spinach popularly known as “green”, *ugu*, *onugbu*, *oha* and *utaziji*. Another common diet is boiled yam with palm oil mixed with salt. We recommend that boiled yam be taken with vegetable soup or stew if desired. Low-salt diets will be discussed in detail under salt reduction as a lifestyle modification.

Note: Local foods have been referred to for relevance. Some medical conditions such as kidney disease may require low amount of potassium in the diet. The patient needs to be referred to a registered dietician who can give more information about foods rich in potassium.

Weight control and maintenance: Being overweight is very closely connected to high blood pressure, especially if your body mass index (weight in kilograms divided by your height in meters squared) is 25 or greater. Excess body fat (for example a waist measurement of 35 inches or greater in women or 40 inches or greater in men) is also related to high blood pressure, diabetes, increased blood lipid levels, and coronary heart disease.

Some recommended weight loss tips:

- Choose foods low in saturated fat, cholesterol, trans fat (partially hydrogenated fats) and refined sugar.
- Eat at least five servings of fruits and vegetables each day. One serving is equivalent to one orange or apple or mango or banana or three tablespoons of cooked vegetables (e.g., *ugu*, *onugbu*, *oha*, *utazizi*). Try to avoid juice and canned fruit which are generally high in sugar and may add more calories.
- Watch your food portion sizes. One quarter of your plate should comprise a palm-size portion of lean protein such as chicken breast, another quarter should comprise a fist-size portion of unrefined grain such as brown rice, and one-half of your plate should be filled with a variety of vegetables.
- Do not skip meals. Eating three meals a day plus snacks is essential in weight management. Remember to snack on fresh fruit.
- Make sure you take enough fibre; about 25 to 30 grams of fibre are recommended each day. To help you boost your fibre intake, choose whole-grain, high-fibre breads and cereals. Choose whole-wheat rice instead of white rice and include more dried beans (like soya) in your meals. Fibre helps fill you up faster which can help you to eat less and curb hunger. Most importantly, soluble fibre can help lower your cholesterol.
- Exercise daily. Participate in physical activity daily as recommended by your physician or exercise physiologist.
- Eat the majority of your calories in the first half of your day. Enjoy portion-controlled snacks during the day to control hunger at night.
- Drink plenty of water. Take at least 6 to 8 glasses of fluid each day. Water helps keep you adequately hydrated and often helps prevent overeating.
- Set realistic goals. Weight loss should be gradual.

Note: Patients may also be referred to registered dietitians who can help them evaluate their current eating habits and plan strategies to help them lose weight.

Alcohol reduction: Drinking too much alcohol can increase your blood pressure and make it more difficult to treat high blood pressure. If you have high blood pressure, it is

recommended that you cut down if you drink excessively. The recommended alcohol intake for men is 20–30g/day (2 drinks) and 10–20g (1 drink) for women.

Pharmacological measures for high blood pressure treatment: This is a very delicate aspect of management approach, so caution should be taken in terms of type of drugs prescribed (class) and the side effects. Anti-hypertensive drugs are best given based on the different classes, individual peculiarities and types that are common within the locality for easy reach. Considerations for drug therapy include efficacy, individualizing therapy, age, race and “patient friendly” regimens (Olaniyan, 2008). Basically, the first-line drugs for the treatment of high blood pressure are:

- Diuretics: These are of three types: loop diuretics, thiazide-based agents, and K-sparing diuretics. The thiazide-based diuretics are mainly prescribed as first-line drugs.
- Calcium channel blockers (e.g., Nifedipine and Amlodipine)
- Angiotensin-converting enzyme inhibitors

Other anti-hypertensive drugs include: beta blockers, central acting drugs (e.g Aldomet), vasodilators, angiotensin II receptor blockers (ARB), anxiolytics (diazepam and lexotan), and antithrombotics (ASA, Vasoprin and heparin).

In this rural setting, the most available, affordable and accessible drugs are the **diuretics**, the **calcium channel blockers** and the **central acting drugs**. Diuretics and calcium channel blockers are mostly prescribed because of their efficacy among the blacks, especially diuretics and “patient friendly” regimens.

Note: If blood pressure is 20/10mmHg higher than the required level, two different classes of anti-hypertensive drugs have to be used. Also, individuals having diabetes or any kidney disease MUST be placed on angiotensin-converting enzyme (ACE) inhibitors because these are renoprotective. Complicated

hypertension/in association with co-morbidities should be referred sufficiently early to specialist physicians.

Salt reduction: Reducing the amount of sodium (salt) in the diet can help lower blood pressure, especially for hypertensive patients. Sodium is found in table salt and some of the foods we eat – most commonly preserved and canned foods. Salt intake of <100mmol/day is highly recommended (Josephs, 2009). In rural settings in Delta State, salt reduction strategy can be achieved through some of the local foods that are commonly eaten take. We recommend the following: prepare boiled yam with a small quantity of salt; in preserving fish use a small quantity of salt; use more herbs and spices instead of salt to flavour foods; be careful in the use of *ogilisi*, which serves as soup flavour and is also salty; avoid processed foods (canned foods, cheeses and canned meats) and foods preserved by salting and smoking – preferably use fresh foods.

Note: Patients may also be referred to registered dieticians who can help them evaluate their current food choices and help them select foods lower in sodium.

Smoking cessation: If you smoke, please **Quit!** – Smoking and tobacco use are significant risk factors for a variety of chronic disorders, including heart and blood vessel disease.

Tips on how to stop smoking:

- Make a list of all the reasons you want to quit smoking. Read over the list every day, before and after you quit.
- Make a list of activities you can do instead of smoking.
- Stop smoking in certain situations before actually quitting.
- Pick a date for quitting and stick to it.
- Get a friend who is doing the same to help you quit, and ask your family and friends for support.

6.9 Enabling hypertension management strategies through HBM/SCT theories

Theories and models for preventive programmes explain hypertension-related behaviours in terms of individual psychological processes, social relationships, and structural factors. Understanding of cognitive-attitudinal and affective-motivational constructs that underpin individual behaviour change has been helpful in guiding the development of intervention programmes (Ralph, Richard, & Michelle, 2002) – as in the case of the guidelines for prevention and control of high blood pressure in a rural community that are being proposed in this study. Bandura (2001) notes, on the other hand, that in psychosocial theories (health belief model, social cognitive/learning theory, theory of reasoned action, stages of change model) of behavioural risks and individual behavioural change where the emphasis is on predictions for risky behaviour, behavioural change and maintenance of safe behaviour, less attention is given to the interaction of social, cultural and environmental issues as they influence individual behaviours.

The concepts directing the guidelines development were in line with the theoretical models used in this study – the health belief model (HBM) and social cognitive theory (SCT) – which acknowledge the need to change risk-producing situation and social relations, and with the central core of action targeted on risk reduction skills imparted through a combined process of instruction, modelling, practice and feedback (Irwin, Victor, & Marshall, 1988). Following these models, intervention tended to focus on changing individuals' personal beliefs about hypertension with the notion that the individual would change unhealthy behaviours to developing hypertension when the individual weighs the benefits against the costs and barriers to change (Ralph, et al., 2002). An individual's behaviour is a function of that individual's social-demographic characteristics, knowledge and attitude and the individual must embrace six identified beliefs to be able to change risk behaviours like

smoking, alcohol consumption etc.: The individual must (i) recognise susceptibility to the disease, (ii) recognise the seriousness of hypertension, (iii) recognise how it would affect his/her life, (iv) recognise the effectiveness of expected change in behaviour, and (v) recognise the benefits of preventive actions against hypertension through the adoption of good lifestyle and healthy behaviours (regular blood pressure check, smoking cessation, regular exercise, moderation of alcohol consumption, low salt and cholesterol diets) and (vi) recognise obstacles to their adoption of the required precautions, such as a dislike for necessary dietary controls, especially in the case of individuals in a low-resource setting.

The guidelines thus have a combination of hypertension management control strategies that include Health education, Exercise, Diet, Weight control and maintenance, Alcohol reduction, Pharmacological measures, Salt reduction and Smoking cessation (HEDWAPS), as seen in figure 2.

Behaviour is regulated by its consequences (i.e. what reinforces it), but only insofar as those consequences are interpreted and understood by the individual. Thus, for example, in prevention and management of high blood pressure, individuals who value the perceived effects of changed lifestyles (incentives) will attempt to change if they believe that

- their current lifestyles pose threats to any personally valued outcomes, such as health or appearance (environmental cues)
- that particular behavioural changes will reduce the threats (outcome expectations)
- that they are personally capable of adopting the new behaviours (efficacy expectations).

Programmes derived from these models for hypertension risk factor behavioural change emphasize information giving (health education and counselling), attitudinal change to enhance motivation, and reinforcement of risk-factor reduction skills and self-efficacy

(Ralph, et al., 2002). Figure 2 shows the factors for enabling hypertension prevention and management through health belief model and social cognitive theories in the shape of a flow diagram.

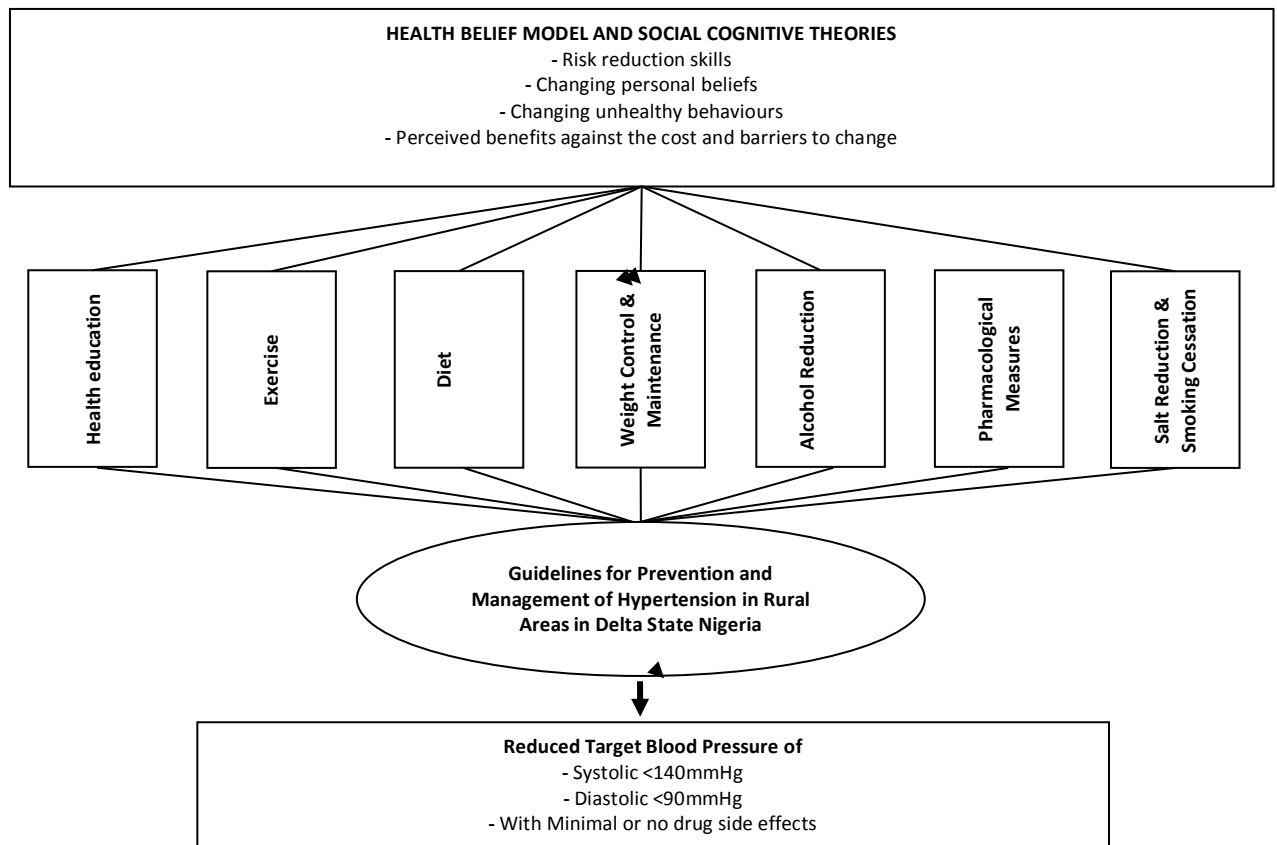


Figure2. Enabling hypertension prevention and management through health belief model and social cognitive theories.

6.10 Conclusion

The purpose of these guidelines is to assist, guide and direct community members, non-trained health workers such as community health officers (CHO), community health extension workers (CHEW) and students on what they can do to prevent and manage hypertension in rural communities. If they are implemented appropriately, it will have a strong impact on the health, quality of life and mortality rate among rural communities in

Nigeria. Thus leading to minimal and low costs of hospitalization in the community as well as productive and healthy community.

List of Abbreviations

| | |
|-----------|---|
| HBP | high blood pressure |
| HT | Hypertension |
| CHO | community health officer |
| CHEW | community health extension worker |
| PHC | primary health care |
| NGT | nominal group technique |
| COBES | community based experience service |
| WHO | World Health Organization |
| CVD | cardiovascular disease |
| NICE | National Institute for Clinical Excellence |
| NHA | Nurses Hypertension Association |
| WHL | World Hypertension League |
| HEDWAPS | Health education, Exercise, Diet, Weight control and maintenance, Alcohol reduction, Pharmacological measures, Salt reduction and Smoking cessation |
| K-sparing | potassium sparing |
| ASA | anti-thrombotic |
| ARB | angiotensin receptor blocker |
| HBM | health belief model |
| SCT | social cognitive theory |

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Chapter 7

Discussion, Limitations, Recommendations and Conclusion

7.1 Introduction

This chapter presents a summary of the study discussion, limitations, conclusion and recommendations

7.2 Principal findings

- Hypertension prevalence in this rural community was 44%, and in one village it was significantly higher.
- Increase in age, increase in body mass index and high salt intake were established as prominent risk factors for hypertension, and lack of funds and equipment shortage in clinics were the most reported obstacles to health care.
- The cultural practices adopted by hypertensive patients in this community had an influence on the management of their hypertension, as some of these practices (such as consumption of palm kernel soup, a high cholesterol local dietary item) predisposed them to risk factors for certain diseases, while others promoted their health (such as medicinal plants and certain herbal preparations).
- Guidelines on hypertension prevention and management were developed using an integrated approach taking account of facilities, social and environmental factors and other issues that influence the development of high blood pressure in rural settings in Delta State, Nigeria, and drawing on the health belief model and social cognitive theories as a theoretical foundation.

7.3 Discussion

The overall prevalence of hypertension found in this study (44%) is comparable with studies in most rural communities in the neighbouring West African countries (Agyemang, 2006; Spencer, et al., 2005). It does, however, appear to be higher than the prevalence figures of 20.2% (Alikor, et al., 2013), 22.5% (Ogah, et al., 2013) and 26.4% (Adebayo, et al., 2013)

reported in rural communities in the Niger Delta Region and in South Eastern Nigeria (Abia State) and South Western Nigeria (Osun State) respectively. These differences may be attributable to differences in target population in the various studies, as the age cut-off (≥ 18 years) used in this study was higher than the ≥ 15 years cut-off used in the South Eastern and South Western Nigeria studies, and it has been shown that blood pressure rises steadily, irrespective of gender (Ogah, et al., 2012). Also found was notably higher risk of hypertension in Ogboli village compared to other sites. This, and the overall high prevalence, may be attributable to differing cultural behaviours, including traditional dietary items such as high cholesterol diet palm kernel soup.

In relation to other well-known risk factors for development of high blood pressure such as sex, age, BMI and certain lifestyle factors, this study found a higher prevalence of hypertension in females than in males (males 29.2%; females 52.3%), contrary to other studies, globally and within the country of study which have shown higher prevalence of hypertension in males than in females (Adebayo, et al., 2013; Agyemang, 2006; Alikor, et al., 2013). This high prevalence in females was also reported in a study in Abia State, in South-Eastern Nigeria (Ogah, et al., 2013), though an added consideration may be that in both studies more females were recruited than men. In line with previous research (Alikor, et al., 2013), our study also revealed that hypertension prevalence was significantly high in married individuals, indicating that family and family burden are significant issues in relation to blood pressure, with the higher prevalence attributable to the heightened social responsibilities and stress faced by this group of people (Alikor, et al., 2013; Erhun, et al., 2005). None of the students in this study population were hypertensive. This may be because most of them were in the younger age group (20-30 years), which is biologically less prone to hypertension.

The multivariable logistic regression also demonstrated a positive and significant association between hypertension and both increasing age and BMI status (overweight and obesity). In this study, age, BMI and high salt intake were the strongest predictors/risk factors of hypertension. This is consistent with previous studies (Adebayo, et al., 2013; Alikor, et al., 2013; Ogah, et al., 2013). Increasing age, overweight and obesity are well-known risk factors for development of high blood pressure (Adebayo, et al., 2013; Alikor, et al., 2013; Clarice, et al., 2000; David, et al., 2000; Izzo, et al., 2001; Karmal, et al., 1997; Kaufman & Barkey, 1993; Ogah, et al., 2013; Ogah, et al., 2012; Onwubere, 2005; Tesfaye, et al., 2006). The association between high salt intake and hypertension is well established. The high salt intake in this study population is probably attributable to the local diet in these communities: Delta State is a riverine area, rich in fish resources, and the main method of preservation is salting and smoking.

Another key finding in this study relates to the issue of impediments to healthcare management of hypertension. Among hypertensive patients (as distinguished from non-hypertensive patients) the most significant impediment reported was equipment shortage in clinics. In comparison, the principal obstacles to managing hypertension in local health care centres reported in studies conducted in South East Nigeria and Limpopo Province in South Africa were, respectively, financial constraints (Okwuonu, et al., 2014), and non-compliance with treatment, transport shortage, staff shortage, drug shortage and late treatment supply from hospital dispensary (Sekokotla, et al., 2003).

Those in search of permanent cure for chronic conditions such as hypertension may explore a variety of available treatment methods and sources of help. These could include visiting a hospital (government-owned or private), consulting chemist shops (i.e. patent medicine sellers), consulting traditional or native doctors/healers, or even just doing nothing

at all and allowing nature to take its course. In Nigeria and other developing countries in Africa, studies have shown that people seek help from traditional healers before thinking of western medicine (WHO [2002], as cited by Lotika, et al., 2013). In this study, the traditional and cultural practices identified for the management of high blood pressure were categorized into medication and non-medication therapies and these categories were also applied to symptom management for symptoms that included headaches, tiredness and excessive sweating, and dizziness and blurred vision. The medication therapies, mostly herbal preparations (e.g., dried roots), either soaked in local gin or dissolved in water from a sacred stream, and other concoctions and decoctions (*ogwu nkwu*) were used for headache, tiredness and blurred vision. Certain non-medication therapies such as sacrifices (with animals and animal parts), invocations of ancestral powers of healing, and scarification and tribal markings were also resorted to for the same purpose as the medication therapies. Similarly, in a study conducted among Shangaan patients in Limpopo province in South Africa, liquid herbal medicines were used for tiredness and excessive sweating, dried root were used for headache, a treatment known as *baso* was used for dizziness, and scarification (*ku lumeka*) was reported to be very good for high blood pressure (Risenga, et al., 2007). The Shangaan informants also believed in ancestral powers of healing as cultural care for hypertensive patients (Risenga, et al., 2007). Among the Akan tribes of Ghana in West Africa, medicinal plants such as *Tetrapleura tetraptera*, *Alstonia boonei*, *Anthocleista nobilis* and *Uapaca guineensis*, prepared in the form of decoctions, were widely used for the management of high blood pressure, in addition to certain non-medication therapies such as consultation of spiritualists or diviners (fetish priests and priestesses), shrine devotees, and faith healers who use prayers, bible and holy water for healing purposes (Abel & Busia, 2005). In the Akan study, Coca-Cola was used for dissolving herbal mixtures and there was also some dietary

advice for patients with hypertension (no cooking with salt, no fatty foods and no Coca-Cola except with herbal mixtures).

Results from the present study showed use of additional means, alongside the traditional and cultural practices, which included anti-hypertensive drugs prescribed by an orthodox doctor, drugs bought from chemist shops (patent medicine sellers), lifestyle modification, and supplements. Similarly, a recent study conducted in Gauteng province in South Africa also reported that hypertensive patients use traditional and western medicine concurrently for the management of hypertension (Lotika, et al., 2013). In the Idikan community in Ibadan, South West Nigeria, patients who visited the hospital for health care also used the traditional medicine and patent medicine vendors for the management and prevention of high blood pressure (Osamor, 2011).

Remedies reportedly employed when the traditional and cultural practices fail include therapeutic occultism such as casting down of magic stones, cowries, coins, kola-nut seeds, or divining rods, and reading of messages in a pool or glass of water. Risenga et al. (2007) identified instances of therapeutic occultism, such as casting of bones for interpretation, as means resorted to for diagnostic assistance, with scarification (*ku lumeka*) and steam inhalation (*phungula*) serving as associated remedies.

In the practice guidelines which constitute the third element of the study, simple formats are developed for setting assessment standards, for screening programmes, and for management and review of patients with high blood pressure in a typical rural community in Delta State, Nigeria. In the development of these guidelines, facilities available in the setting together with social and environmental factors influencing the development of hypertension in rural settings were specifically taken into account. In this respect these guidelines differ

from other currently available guidelines which are confined to more generally applicable interventions and practices in health care at large (Nigerian Hypertension Society, 2005).

7.4 Recommendations

7.4.1 Recommendations for practice

Counselling instruction and courses on lifestyle modifications for trained and non-trained health workers are recommended. This will enable the State Ministry of Health to plan and promote effective and feasible community screening programmes for the management and prevention of hypertension. This will also reduce or eliminate the cost and risk of travelling outside the community to seek health care services. Future guidelines should incorporate the needs of special-population individuals to include hypertension in pregnancy, the elderly and adolescents, hypertension in persons living with HIV/AIDS, and persons with co-morbid conditions.

7.4.2 Recommendations for education

Hypertension management guidelines need to be included in the curricula of the various training schools and in adult education programmes presently being conducted in the community. Guidelines are also needed on appropriate care and management of other chronic disease conditions associated with complications from hypertension. These should incorporate a nutritional education programme promoting low-calorie and low-salt diet, and specifically targeting higher-risk localities and ethnicity groups. Such education should also be extended to community members where suitable opportunities arise, such as community gatherings and meetings. Media opportunities such as town criers and television could also be used, in accordance with the local context where participants live. High priority should be

given to face-to-face contact with health care workers accompanied by distribution of hypertension management education and appropriate pamphlets in the local language.

7.4.3 Recommendations for further research

A range of recommendations have been included in the various research articles/manuscripts that comprise this study. In particular, however, further research on hypertension prevention and management should be undertaken, suitably funded, across a more extended community setting than just three villages for a larger sample of survey participants. What may also help would be further research involving case control studies for in-depth exploration of traditional and cultural practices influencing the prevention and management of hypertension in rural communities, the various methods adopted in these practices, and their specific positive and negative impacts on health and general wellbeing.

7.5 Study limitations

One problem that was encountered was determining the ages of some of study subjects, as some of them could not remember their dates of birth and had lost their birth certificates during the Biafra war; in these cases I used a guide sheet of important dates and historic events to estimate their ages.

In relation to the external validity of the study, one should be cautious in generalizing these findings to other settings in Delta State, given the study design and sampling strategy. The findings should be regarded as transferable only to other settings with similar demographic, behavioural and economical characteristics. However, other rural settings within Delta State are likely to be similar to those in the current study and should therefore extend the external validity. Additional studies should be conducted in other settings within Delta State and Nigeria to replicate and validate these findings.

In the development of the guidelines, the nominal group technique (NGT) meeting was originally scheduled for five days but was ultimately shortened to three days because some of the key stakeholders had further commitments. In addition, the guidelines did not cover hypertension prevention and management for special populations – which would include hypertension in pregnancy, the elderly, and adolescents, hypertension in persons living with HIV/AIDS, and people with co-morbid conditions.

7.6 Conclusion

This study investigated the blood pressure profiles of residents in Ibusa community. Traditional and cultural practices associated with hypertension prevention and management in the community were also explored. Hypertension prevalence in this rural community was 44%, and in one village it was significantly higher. Increase in age, increase in body mass

index and high salt intake were established as prominent risk factors for hypertension, and lack of funds and equipment shortage in clinics were the most reported obstacles to health care. Traditional and cultural practices associated with hypertension prevention and management in the community were also explored, using an ethnographic approach in which qualitative enquiry was complemented by quantitative data from the survey, and it was found that cultural practices adopted by hypertensive patients in this community had an influence on the management of their hypertension; some of these practices (such as consumption of palm kernel soup, a high cholesterol local dietary item) predisposed them to risk factors for certain diseases, while others promoted their health (such as medicinal plants and certain herbal preparations). Guidelines on hypertension prevention and management were developed using an integrated approach taking account of facilities, social and environmental factors and other issues that influence the development of high blood pressure in rural settings in Delta State, Nigeria, and drawing on the health belief model and social cognitive theories as a theoretical foundation.

Although there were some limitations to the study, it will hopefully meet its intended aim of helping to empower individuals to take more active responsibility for their own health issues, supported by community self-reliance and self-determination.

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Appendix 1: Questionnaire & ethics consent form / participant info (English version)

01 July 2013

UNIVERSITY OF KWAZULU-NATAL School of Nursing and Public Health

Dear Respondent,

This informed assent form has two parts:

- ☐ Information Sheet (gives you information about the study)
- ☐ Certificate of Assent (this is where you sign if you agree to participate)

You will be given a copy of the full Informed Assent Form

Part I: Information Sheet

Name of Project: PhD Research Project

Researcher: Mary Isioma Ofili (+27 838790970; +234 36719498)

Supervisor: Prof. B.P Ncama (+27 312602270)

Local research office: Govan Mbeki Building, Westville Campus, Durban, South Africa
(+27312603587)

I Mary I. Ofili, a PhD student of the School of Nursing and Public Health, University of KwaZulu-Natal, hereby invite you to participate in a research project entitled: An Ethnographic Study of Predictors of Hypertension and its Preventive Strategies in a Rural Community in Delta State Nigeria.

I am conducting a study to find out the predictors of hypertension and its preventive strategies in Ibusa community so as to develop guidelines for the prevention and management of hypertension in the community. The data collection process is expected to be concluded within four months with the following research instruments: a questionnaire made up of four sections. The first section addresses respondents' demographic variables, the second section looks at their family history of hypertension and general health care practices while the third and fourth sections identify factors associated with raised blood pressure and barriers to health care for the management of hypertension. An interview guide comprising seven questions will also be used to identify and explore the traditional and cultural practices associated with hypertension management. A survey (anthropometric measurement of blood pressure, weight, height and abdominal circumference) to determine the prevalence of hypertension in the community will also be conducted.

The observation will be used to inform the health service managers of any areas that are identified for improvement. I anticipate that this study will provide information that will assist everybody involved in the prevention and management of hypertension to improve the quality of care provided. Please be informed that participation is voluntary and your responses will be treated in a confidential manner and you are free to withdraw from the research at any time without any negative or undesirable consequences. There will be no monetary gain for participating in this research project. No personal details of yours will be published in the final report nor will any cross-references be made that can link the results of the questionnaire to you. Confidentiality and anonymity of records identifying you as a participant will be maintained by the School of Nursing and Public Health, UKZN. If you have any questions about participating in this study, please contact me or my supervisor through the phone numbers listed above. It should take you about 25 minutes to complete the questionnaire.

Sincerely



Investigator's signature

01 July 2013

UNIVERSITY OF KWAZULU-NATAL
School of Nursing and Public Health

Part 2: Certificate of Assent

Name of Project: PhD Research Project

Researcher: Mary Isioma Ofili (+27 838790970; +234 36719498)

Supervisor: Prof. B.P Ncama (+27 312602270)

Local research office: Govan Mbeki Building, Westville Campus, Durban, South Africa
(+27312603587)

I _____ (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

Signature of Participant Date

SECTION I: DEMOGRAPHIC VARIABLES

Please tick or write as appropriate.

1. Age in years (last birthday)
2. Marital status: Single () Married ()
3. What is your gender? Male () Female ()
4. Ethnicity Ibo () Yoruba () Hausa () others (specify)..... ..
5. Religion: Christianity () Islam () Traditional () others (specify).....
6. Highest level of education

SECTION II: RESPONDENTS' FAMILY HISTORY OF HYPERTENSION AND GENERAL HEALTH CARE PRACTICES.

1. Are you a known hypertensive patient? Yes () No ()
2. How long have you been diagnosed hypertensive?
3. Is any of your parent(s) hypertensive? Yes () No ()
4. In your family, who are those that are confirmed hypertensive? Father () Mother ()
Grand-Father () Grand-Mother () Son () Daughter ()
5. Is there a dedicated clinic you attend where you are seen by a nurse? Yes () No ()
6. Is there a dedicated clinic you attend where you are seen by a doctor? Yes () No ()
7. Does the clinic arrange for any other support group meetings for patients?
Yes () No ()
- 8a. Do you request body weight measurements when you attend clinic? Yes () No ()
- 8b. If yes, how often? (i) Monthly () (ii) Quarterly () (iii) Annually () (iv) Never ()
- 9a. Do you request urinalysis when you attend clinic ? Yes () No ()
- 9b. If yes, how often? (i) Monthly () (ii) Quarterly () (iii) Annually () (iv) Never ()
- 10a. Do you request eye examination when you attend clinic? Yes () No ()
- 10b. If yes, how often? (i) Monthly () (ii) Quarterly () (iii) Annually () (iv) Never ()
11. At each visit to the clinic, do you check your blood pressure? Yes () No ()
12. How often do you brush your teeth in a day? (i) In the morning (ii) After each meal () (iii) At night () (iv) When I feel like ()

13. How many times do you eat in a day? (i) Once daily () (ii) Twice daily () (iii) Thrice daily () (iv) Each time I feel hungry ()
- 14a. Do you take cola nut? Yes () No ()
- 14b. If yes, how many balls do you take in a day? (i) <1 ball () (ii) 1-5 balls (iii) 6-10 balls () (iv) More than 10 balls ()
- 15a. Do you take alcohol? Yes () No ()
- 15b. If yes, what type of alcohol do you take? Beer () Stout () Local gin () Others (specify).....
- 15c. How many bottle(s) do you consume in a day? (i) < 1 bottle () (ii) 1-5 bottles (iii) 6-10 bottles (iv) More than 10 bottles ()
- 15d. For how long have you been taking alcohol? (i) < 1 year () (ii) 1-5 years () (iii) 6-10 years () More than 10 years ()
- 16a. Do you smoke cigarette? Yes () No ()
- 16b. If yes, how many sticks do you take in a day? (i) < 1 stick () (ii) 1-5 sticks (iii) 6-10 sticks (iv) More than 10 sticks ()
- 16c. For how long have you been smoking? (i) < 1 year () (ii) 1-5 years () (iii) 6-10 years () More than 10 years ()
17. How many times do you bath in a day? (i) Once daily () (ii) Twice daily () (iii) Thrice daily () (iv) Each time I feel like ()
18. How many hours do you sleep in a day? (i) 1-3 hrs () (ii) 4-6 hrs (iii) 7-9 hrs () (iv) 10 hrs and above ()
19. How often do you engage in recreational /physical activity (i) Daily () (ii) Once a week () (iii) Once a month () Others (please specify)

SECTION III: FACTORS ASSOCIATED WITH RAISED BLOOD PRESSURE

20. What are those lifestyle factor(s) that are associated with high blood pressure
- (i) High salt intake Mentioned () Not mentioned ()
- (ii) High alcohol intake Mentioned () Not mentioned ()

- (iii) Overweight/Obesity Mentioned () Not mentioned ()
- (iv) High cholesterol/fatty diet Mentioned () Not mentioned ()
- (v) Poor physical activity Mentioned () Not mentioned ()
- (vi) Smoking Mentioned () Not mentioned ()
- (vii) Stress Mentioned () Not mentioned ()
- (viii) Noise Mentioned () Not mentioned ()
- (ix) Family history of hypertension Mentioned () Not mentioned ()

SECTION IV: BARRIERS TO HEALTH CARE FOR THE MANAGEMENT OF HYPERTENSION

21. What are the barriers to health care for the management of hypertension (please indicate by ticking the barrier(s) that applies to you)
- i. Lack of fund ()
 - ii. Non-availability of health care centres in the community ()
 - iii. Non accessibility to the health care centres in the community ()
 - iv. Transport shortage within the community ()
 - v. Staff shortage in health care centres ()
 - vi. Communication breakdown/gap ()
 - vii. No social workers in the clinics ()
 - viii. Drug shortage in the clinics ()
 - ix. Equipment shortage in the clinics ()
 - x. Late treatment supply from hospital dispensary ()
 - xi. Blood pressure machines not in good working condition ()
 - xii. Consultation room shortage in the clinics ()
 - xiii. Stationery shortage in the clinics ()
 - xiv. No proper patient health education in the clinics ()

Appendix 2: Questionnaire & ethics consent form / participant info (local language version)

01 July 2013

UNIVERSITY OF KWAZULU – NATAL

SCHOOL OF NURSING AND PUBLIC HEALTH

Ezigbo Ozaa,

Akwukwọ nkowa nsonye a dī n'uzọ abụọ:

Ikike Nsonye (nke a bụ ebe ị ga-ebinye aka ma ị kweta na ị ga-esonye)

A ga-enye gị akwukwọ ga-akwara gị n'uju maka nkwenye gị

Agba Nke Mbụ: Akwukwọ Nkowa

Aha nchọcha: Nchọcha maka inweta nzere Ph.D

Nwanchọcha: Mary Isioma Ofili (+27838790970; 23436719498)

Onye Mgbazi: Okammuta B. P. Ncama (+27312602270)

Obodo ụlọorụ nchọcha: Govan Mbeki Building, Westville, Durban, South Africa (+27312603587)

Mụ bụ Mary I, Ofili, nwaakwukwọ na-agu maka inweta nzere Ph.D n'ụlọ akwukwọ "School of Nursing and Public Health" nke mahadum Kwazulu-Natal, na-akpọ gị ka ị sonye na nchọcha a a kpọrọ "An Ethnographic Study of Predictors of Hypertension and its Preventive Strategies in a Rural Community in Delta State". Nke a pụtara, Amụmamụ nchọputa ụzọ digasị icheiche e si enweta ọjia ọbara mgbali elu na ụzọ digasị icheiche e si egbochi ya n'ime obodo dī na Steeti Delta nke Nigeria.

Ana m eme nchọcha a ịjī chọputa ihe ndị na-ebute ọjia ọbara mgbali elu na ụzọ a ga-esi gbochie ya n'ime obodo Ibusa; ka e were nwee ike weputa usoro a ga-egbaso were gbochie na kwa belata ọjia ọbara mgbali elu n'obodo a. A ga-emecha igba ajujū ịjī nweta ngwa ọrụ e ji ruo ọrụ a n'ime ọnwa atọ. A ga-ejikwa akorọ ngwa ndị a mee nchọcha: Akwukwọ ndeputa ajujū nke ga-adị na nkega na nkega. Nkega nke mbụ na-arụtụ aka otu ọzaa siri mata ụzọ dī icheiche e si enweta ahụ ike. Nkega nke abụọ na-arụtụ aka n'otu ọjia ọbara mgbali elu si akpa ike n'ezinaulọ ndị ọguu nakwa ụzọ e si enweta ahụike ga. Nkega nke atọ na nke anọ weputachara ihe ndị ahụ na-ebuli ọjia ọbara mgbali elu na ihe ndị na-enye aka igbochi nakwa ibelata ọjia ọbara mgbali elu. Igbedo ukwū n'ihe a hugasiri na nchọputa (ihe gbasara otu ọbara mgbali elu si aligo, weti onye, ogologo onye, na otu afọ ya siri tokopu). Ihe ndị a na-enye aka imata otu ọjia ọbara mgbali elu si amuba n'obodo. A ga-eme ka ndị na-ahụ maka ahụ ike mata maka nchọputa a. Nke a ga-enye aka ime ka ọrụ ha na-aga nke ọma otu a tūrụ anya.

A na-ele anya na ihe ọmumụ a ga-enyere mmadụ niile na-ahụ maka igbochi na ibelata ọjia ọbara mgbali elu aka ime ka ọrụ ha na-aga otu o kwesiri. Biko marakwa na isonye n'amumamụ a abughị iwu. O bụ onye o masiri, o sonye. A gaghi agbakwanu usa onye obula nyere n'anwu. I nwekwara ike ipu na nchọcha a mgbe obula. O nweghi ntaramahuhu diiri gi. O nweghi ugwo a na-

akwụ maka na i sonyere na nchọcha a. A gaghị ebiputa ihe ọbụla gbasara gị na mbiputa ikpeazụ nke nchọcha a. O nweghikwa ka a ga-esi kwuo na i kwuru nke a maọbụ nke ọzọ. Ndị School of Nursing na Public Health, UKZN na-agbasokwa usoro agbaghị azịza mmadụ na-anwụ ya na-akpoghị aha onye zara azịza ahụ mgbe ha na ahazi nchọcha ahụ. Biko, ọ bụrụ na i nwere ajujụ i ga-ajụ gbasara nsonye i sonyere n'ihe ọmụmụ a, biko mee ka m mara maọbụ i gwa onye mgbazi m site na nomba ekwentị ndị a e deputara n'elu. Ọ ga-ewe gị nkeji iri abụọ na ise iji zaa ajujụ ndị a.

Ọ bụ m,



Signechọ nwanchọcha

01 July 2013

UNIVERSITY OF KWAZULU – NATAL
SCHOOL OF NURSING AND PUBLIC HEALTH

AGBA NKE ABỤỌ: IKIKE NKWENYE

Aha nchọcha: Nchọcha maka nzere Ph.D

Nwanchọcha: Mary Isioma Ofili (+27838790970; 23436719498)

Onye Mgbazi: Okammuta B. P. Ncama (+27312602270)

Ebe nchọcha sitere: Govan Mbeki Building, Westville Campus, Durban, South Africa
(+27312603587)

Mụ bụ(aha onye nsonye) na-ekwuputa na aghọtara m ihe dị n'akwụkwọ a na ụdịrị ihe nchọcha a. M were na-ekwenye isonye na nchọcha a. Aghotakwara m na enwere m ike esonyezighi m na nchọcha a mgbe ọbụla ọ masiri m ma ọ bụrụ na m chọọ iputa na ya.

Signechọ Onyensonye

Deeti

NKEGA I: IHE NDỊ E NWERE IKE IHỤ

Biko kanye maobu deba otu o siri daba

1. Afọ ole ka i gbara (guruo ya mgbe i mere ncheta omumu gi ikpeazu)
.....
- 2a. I bu okokporo? Ee () Mba ()
- b. I nweela ezinaulo? Ee () Mba ()
3. Kedụ ihe i bu? Nwoke () nwaanyi ()
4. Kedụ agburu i sitere na ya? Igbo () Yoruba () Awusa () dee nke o bu.
5. Kedụ ekpemekpe gi? Otu Kraist () Alakuba () Omenaala () ndi ozo
(kpoo aha)
6. Kedụ ebe i gudebere akwukwo?

NKEGA II: AKUKO SITE RE N'AKA NDỊ QZAA MAKA QRIQ QBARA MGBALI ELU N'EZI NA ULQ HA NA KWA UZO E SI NWETA AHU IKE GA

1. A maara gi dika onye na-aria qria qbara mgbali elu? Ee () Mba ()
2. Kedụ mgbe e jiri nyochaputa na i na-aria qria?
3. Ndi muru gi, o nwere onye na-aria qbara mgbali elu? Ee () Mba ()
4. N'ezi na ulo unu, kedụ onye a choputarala na-aria qria qbara mgbalielu? Nna ()
Nne () Nnaochie () Nneochie () Okpara () Ada ()
5. O nwere ezigbo obere ulo ogwu i na-aga ebe onye noosu na-elekota gi? Ee ()
Mba ()
6. O nwere ezigbo obere ulo ogwu i na-aga ebe dibia Bekee na-elekota gi? Ee ()
Mba ()
7. O nwere ogbakọ ndi ulo ogwu a na-achikobara ndi qria ha iji nyere ha aka? Ee ()

Mba ()

8a. I na-achọ ka o mara ihe weti gi bụ ma i gaa ụlọ ọgwụ? Ee () Mba ()

8b. Ụsa gi bụrụ Ee, kedụ ka i si eme ya? (i) kwa ọnwa () (ii) kwa ọnwa anọ ()

(iii) kwa afọ () (iv) emebeghi m ()

9a. I na-achọ ka e lee mamiri gi ma i gaa ụlọ ọgwụ? Ee () mba ()

9b. Ụsa bụrụ ee, kedụ ka i si eme ya? (i) kwa ọnwa () (ii) kwa ọnwa anọ ()

(iii) kwa afọ () (iv) emebeghi m ()

10. I na-achọ ka e lee gi anya ma i gaa ụlọ ọgwụ? Ee () mba ()

10b. Ụsa bụrụ ee, kedụ ka i si eme ya? (i) kwa ọnwa () (ii) kwa ọnwa anọ ()

(iii) kwa afọ () (iv) emebeghi m ()

11. Mgbe ọbụla i gara ụlọ ọgwụ i na-elekwa ọbara iji mata ọnọdụ ọbara mgbali elu?

Ee () Mba ()

12. Kedụ ka i si echicha eze gi n'ụbọchị? (i) ututu () (ii) mgbe ọbụla m richara

nri () (iii) n'abalị () (iv) mgbe ọbụla masiri m ().

13. Ugboro ole ka i na-eri nri n'ụbọchị? (i) otu ugboro n'ụbọchị ()

(ii) ugboro abuo n'ụbọchị () (iii) ugboro ato n'ụbọchị () (iv) mgbe ọbụla

aguu guru m ().

14. a. I na-ata oji? Ee () mba ().

b. Azịza gi bụrụ ee, mkpuru oji ole ka i na-ata n'ụbọchị

(i) oruchahị otu () (ii) malite n'otu ruo n'ise () (iii) malite na isii ruo

n'iri () (iv) karịa iri ().

15. a. I na-anụ mmanya na-aba n'anya? Ee () mba ().

b. Ụsa gi bụrụ ee, kedụ ụdị ọbụ? (i) beer () (ii) stout () (iii) local gin () (iv) ndi

ozo (kpoo aha)

c. kalama ole ka i na-anu n'ubochi? (i) oruchahi otu kalama ()

(ii) malite na otu kalama ruo na kalama ise () (iii) malite na kalama isii ruo na kalama iri () (iv) karija kalama iri ().

d. arọ ole ka i malitere inu mmanya na-aba n'anya? (i) oruchahi otu arọ () (ii) malite na otu arọ ruo na ise (iii) malite na arọ isii ruo na iri (iv) karija arọ iri ()

16a. I na-ese siga? Ee () mba ().

16b. Usa gi buru ee, ole ka i na-ese n'ubochi? (i) oruchahi otu ()

(ii) malite na otu ruo na ise () (iii) malite na isii ruo na iri () (iv) karija iri ().

16c. arọ ole ka i malitere ise siga? (i) oruchahi otu arọ () (ii) malite na otu arọ ruo na ise (iii) malite na arọ isii ruo na iri (iv) karija arọ iri

17. Ugboro ole ka i na-asa ahụ n'ubochi? (i) otu ugboro () (ii) ugboro abuo ()

(iii) ugboro ato () (iv) mgbe obula o masiri m ().

18. Elekere ole ka i na-arahu ura n'ubochi?

(i) malite n'otu elekere ruo n'elekere ato () (ii) malite na elekere anọ ruo

n'elekere isii () (iii) malite na elekere asaa ruo n'elekere itoolu () (iv)

malite na elekere iri gawazie ().

19. Kedụ ka i si esonye n'ihe ga-emesaghari gi ahụ? (i) kwa ubochi () (ii) otu

ugboro n'izu uka () (iii) otu ugboro n'onwa () (iv) ndi ozo (biko deputa otu

i si esonye)

NKEGA III: IHE NDỊ NA-AKWALITE ỌRỊA ỌBARA MGBALI ELU

20. Kedụ ihe ndị na-akwalite ọrịa ọbara mgbali elu?
- i. Itinye oke nnu na nri. E kwuru ya () E kwughị ya ()
 - ii. Inụ oke mmanya na-aba n'anya. E kwuru ya () E kwughị ya ()
 - iii. Ida oke weti/ntokopu afọ E kwuru ya () E kwughị ya ()
 - iv. Iri ihe oke mmanụ na oke abụba dị. E kwuru ya () E kwughị ya ()
 - v. A naghị emesaghari ahụ. E kwuru ya () E kwughị ya ()
 - vi. Ise siga. E kwuru ya () E kwughị ya ()
 - vii. E ezughị ike. E kwuru ya () E kwughị ya ()
 - viii. Mkpọtụ E kwuru ya () E kwughị ya ()
 - ix. Ọrịa ọbara mgbali elu n'ezie na ụlọ E kwuru ya () E kwughị ya ()

NKEGA IV: IHE BỤ ỌGBATA UHIE NYE Ị KPACHAPỤRỤ AHỤ IKE ANYA IJI GBOCHIE MAỌBỤ BELATA ỌRỊA ỌBARA MGBALI ELU

21. **Kedụ ndị bụ Ọgbatauhie nye inwete ahụike dịka o siri metụta ibelata ọrịa ọbara mgbalielu (Biko kanye dịka ihe mgbochi a siri metụta gi)**

- i. E nweghị ego ()
- ii. E nweghị ụlọ ọgwụ na-ahụ maka ahụike n'obodo ()
- iii. E nweghị ike ibanyenwu n'ụlọ ọgwụ a dị n'obodo ()
- iv. Ụkọ ụgbọala na-ebu ndị njem n'obodo ()
- v. E nweghị ndị ọrụ zuru oke n'ụlọ ọrụ ndị a ()
- vi. E nweghị ụzọ esi ezisa ozi ()
- vii. E nweghị ndị ọrụ a zuru azu n'ụlọ ọgwụ maka ilekọta ọhaneze ()
- viii. E nweghị ọgwụ ga-ezu ndị ọrịa n'ụlọ ọgwụ ahụ ()

- ix. E nweghi ngwa oru zuru oke n'ulo ogwu ☐
- x. Ndi na-ekesa ogwu n'ulo ogwu ahụ eweputaghị ogwu e ji agwo ndi oria n'oge ☐
- xi. Igwe e ji esi obara mgbali elu anaghị aru oru nke oma ☐
- xii. E nweghi ebe ndi dibia Bekee na-anọ ahụ ndi oria n'ozuzu oke ☐
- xiii. Akoro ngwa e ji aru oru n'ulo ogwu ezughị oke ☐
- xiv. A naghị azu ndi oria n'uzo ha ga-esi mara ihe ndi ha ga-eme iji belata oria ha n'ulo ogwu ahụ ☐

Appendix 3: In-depth interviews (English version)

IN-DEPTH INDIVIDUAL INTERVIEW GUIDE

The following questions were used to identify and explore the traditional and cultural practices associated with hypertension prevention and management.

1. Please can you briefly explain your knowledge of healing and/or treatment of diseases
2. Please can you mention the various traditional and cultural practices that have been used to prevent, treat or cure hypertension and other various diseases or ailments common in your community
3. What are the factors that are associated with your raised blood pressure and what mechanisms are you employing in controlling and managing your high blood pressure based on the factors you mentioned.
4. The issue of violation of a taboo, insult of an ancestor/spirit and forceful acquisition of assets (like plots of land) is a popular lifestyle behaviour in the community that attracts a penalty called (Obimapu/Nkuso) which means high blood pressure. In view of this, what has been the treatment for this disease and how has it helped in the prevention and management of hypertension?
5. Has there been case(s) where these traditional and cultural practices have failed to do its work and what were the remedies to that?
6. Are there any other means/item you use in junction with the traditional and cultural practices for the prevention and treatment of hypertension in your community?
7. What are the barriers to the use of these traditional and cultural practices in the prevention and management of hypertension?

Appendix 4: In-depth interviews (local language version)

USORO IGBA AJUJU/USORO OTU GA-AGBASO

Usoro igba ajuju na usoro otu a ga-agbaso nke ga-agbado kwu na ntugharikota uche n'ajuju ndi a nke ga-eweputa ma choputa uzọ odinala e si egbochi na kwa belata oria obara mgbali elu.

1. Biko kwaa na nkenke ihe i maara maka ngwota oria na ogwugwo oria ga.
2. Biko kwuo uzọ odinala di icheiche e sirila gbochie maobu gwoo oria ga maobu gwoo umu obere ahụ onwunwu n'obodo gi.
3. Kedụ ihe ndi na-eme ka obara mgbali elu gi ria elu? Kedụ ihe ndi i na-eme iji gbochie nakwa belata iri elu obara gi? Gbado ukwu n'ihe ikwuorola na mbu were zaa ajuju a.
4. Ihe gbasara imeru ala, asopurughi mmuo ndi nna nna anyi ha iweghara aku na uba n'ike (dika ala) nke na-emeri mgbe niile n'obodo. Ntaramaahuhu o na-ebute bu 'obimmapu' nke bu obara mgbali elu. N'ih ihe nke a, kedụ uzọ e si agwọ oria a. Kedụ uzọ o sirila nye aka igbochi nakwa ibelata obara mgbali elu.
5. O nweela ebe maobu mgbe uzọ odinala ndi a agwotalighi oria a, keduzi ihe e mere maka nke a?
6. O nwere uzọ ozọ ijikotara ya na usoro odinala were gbochie ma gwoo oria obara mgbali elu n'obodo unu?
7. Kedụ ihe ndi na-echere usoro odinala ndi a aka mgba maka igbochi na ibelata oria obara mgbali elu?

Appendix 5 Sample in-depth interview transcript

PARTICIPANT B - FEMALE, 57

Q 1. Please can you briefly explain your knowledge of healing and/or treatment of diseases

Response - I highly regard the use of traditional practices (native medicine) for treatment of diseases. Though I visit the hospital after persuasion by my children and was given some prescriptions but I hardly adhere to the prescriptions. I believe that the native medicine is more effective because I have tried both methods.

Q2. Please can you mention the various traditional and cultural practices that have been used to prevent, treat or cure hypertension and other various diseases or ailments common in your community

Response - These include prophesy from the chief priest of a deity, sacrifices in the shrine, use of herbal leaves and stem of some specific plants, reversal of a curse and re-affirming of oaths. All these practices depend on the type of disease or illness. Well, all I know is that a woman is not seen in a shrine often, she only goes to market to buy items needed.

Q3. What are the factors that are associated with your raised blood pressure and what mechanisms are you employing in controlling and managing your high blood pressure based on the factors you mentioned?

Response - High alcohol intake (at least 2 bottles in a day) and high cholesterol diet (palm kernel soup) and high calorie diet (*fufu* - pounded cassava) are the major factors especially the soup because that is my favorite. In fact, the beauty of palm kernel soup [*ose-akwu*] does not need much vegetable [*mkpa-akwukwo*]. I control my HBP by reducing the alcohol consumption and avoiding the palm kernel soup for some time. I also take a native medicine called “*ogwu nkwa*” (a yellowish liquid concoction with some brown sediments). I do not know the ingredients used to make the concoction. This native medicine [*ogwu nkwa*] is what I always use whenever I feel dizzy, indicating that my blood pressure is high.

Q4. The issue of violation of a taboo, insult of an ancestor/spirit and forceful acquisition of assets (like plots of land) is a popular lifestyle behaviour in the community that attracts a penalty called (Obimapu/Nkuso) which means high blood pressure. In view of this, what has been the treatment for this disease and how has it helped in the prevention and management of hypertension?

Response - In some cases, the offender is subjected to do an open confession and appease of the gods and is assumed the gods will forgive the person afterwards but where the offender fails to do this, he or she may die after prolonged suffering from that illness. It is believed that “*obimapu*” also known as HBP does not kill instantly but takes time and gradually eats up the individual.

Q5. Has there been case(s) where these traditional and cultural practices have failed to do its work and what were the remedies to that?

Response - Yes, there have been cases like that and most times, I go to visit a chemist shop within the neighbourhood who sells an anti-hypertensive to me. This chemist shop near me is well known in the community, I buy from him because he knows all the drugs for various

illnesses. Before I go to the chemist, I like to consult a fortune teller to know the true cause of the hypertension. I normally go with kola-nut seeds, is very essential in every therapeutic occult activity because it ushers wellness.

Q6. Are there any other means/item you use in junction with the traditional and cultural practices for the prevention and treatment of hypertension in your community?

Response - Yes, I use anti- hypertensive drug in junction with the traditional practices. This English medicine (anti-hypertensive drug) makes me urinate too much and I do not take it always. I also eat the food prescribed for me by the chemist who I have more confidence in than going to hospital where they waste my time.

Q7. What are the barriers to the use of these traditional and cultural practices in the prevention and management of hypertension?

Response - The barriers include outcasts or ostracized individuals not been allowed to use the various traditional and cultural practices in the community, festive periods/moments prohibiting the use of some traditional/local food and diet, widespread of Christianity religion and belief.

Appendix 6: Research ethics approval



18 July 2013

Ms Mary Isidoma Ofili Z12557760
School of Nursing and Public Health
Howard College Campus

Protocol reference number: HSS/0525/013D

Project title: An ethnographic study of predictors of Hypertension and its preventive strategies in a rural community in Delta State Nigeria.

Dear Ms Ofili:

Expedited approval

This letter serves to notify you that your application in connection with the above has now been granted full approval.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach/Methods must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number. Please note: Research data should be securely stored in the school/department for a period of 5 years

Best wishes for the successful completion of your research protocol.

Yours faithfully

Professor U Bob (Chair) and Dr S Singh (Deputy Chair)

/px

cc Supervisor: Professor Busisiwe Purity Ncama
cc Academic Leader Research: Professor M Mars
cc School Administrator: Mrs Caroline Dhanraj

Humanities & Social Sciences Research Ethics Committee
Professor Urmilla Bob (Chair) and Dr Shenuka Singh (Deputy Chair)
Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban, 4000, South Africa

Telephone: +27 (0)31 260 3587/8350/4557 Facsimile: +27 (0)31 260 4609 Email: ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mchunjp@ukzn.ac.za

Website: www.ukzn.ac.za

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Appendix 7: Amendment research ethics approval

 **UNIVERSITY OF
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YAKWAZULU-NATALI

04 June 2014

Ms Mary Isioma Ofili 212557760
School of Nursing and Public Health
Howard College Campus

Protocol reference number: HSS/0525/013D
Project title: An ethnographic study of predictors of Hypertension and its preventive strategies in a rural community in Delta State Nigeria.

Dear Ms Ofili

Approval - Amendment

I wish to confirm that your application dated 21 May 2014 in connection with the above mentioned project has been approved as follows:

- Additional site (Ogboji village)


Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach/Methods must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

Please note: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

Best wishes for the successful completion of your research protocol.

Yours faithfully:



Dr Shenuka Singh (Chair)

/ms

cc: Supervisor: Professor Busisiwe Purity Ncama
cc: Academic Leader Research: Professor M Mars
cc: School Administrator: Mrs Caroline Dhanraj

Humanities & Social Sciences Research Ethics Committee
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Website: www.ukzn.ac.za

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Appendix 8: Gatekeeper's permission

Obuzor of Ibusa

HRH OBI (PROF.) L. C. NWOBOSHI

P. O. BOX 1, IBUSA OSIMILI NORTH L. G. A., DELTA STATE.
Tel: 08056653127. E-mail: louisnwboshi@yahoo.com, obizibusa@yahoo.com

19th March, 2013

*The Director
Research and Ethical Board,
University of KwaZulu-Natal,
Durban,
South Africa.*

Dear Director,

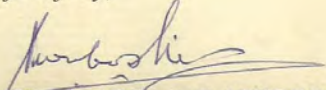
**REQUEST FOR PERMISSION AND SUPPORT TO CONDUCT A
STUDY - BY OFILI MARY ISIOMA (STUDENT NO. 212557760)**

*Your above student is welcome to carry out "An Ethnographic study on the
Predictors of Hypertension and Preventive Strategies in my Community –
Ibusa in Delta State of Nigeria.*

She will get my full support.

Thanks,

Yours faithfully,


HRH OBI (PROF.) L.C. NWOBOSHI
THE OBUZOR OF IBUSA

Appendix 9: Statistical letter of certification

Discipline of Public Health Medicine
School of Nursing and Public Health
Physical Address: 2nd Floor, George Campbell Building, Howard College Campus
Telephone: +27 (0) 31 260 4459
Email: sartorius@ukzn.ac.za
Website: pubhealth.ukzn.ac.za



UNIVERSITY OF
KWAZULU-NATAL
INYUVESI
YAKWAZULU-NATALI

2 January 2015

To whom it may concern

Re: Statistical contribution and certification (PhD Candidate Mary Isioma)

This letter serves to confirm that I assisted with and reviewed the analyses for her PhD chapter, entitled: "HYPERTENSION IN RURAL COMMUNITIES IN DELTA STATE, NIGERIA: PREVALENCE, RISK FACTORS AND BARRIERS TO HEALTH CARE".

Kind regards,

Benn

Professor Benn Sartorius, PhD
Biostatistician
Acting Head - Discipline of Public Health Medicine
School of Nursing and Public Health
College of Health Sciences
Howard College Campus
University of Kwazulu-Natal
Email: Sartorius@ukzn.ac.za
Tel(work): +27 (0) 31 260 4459
Tel (cell): +27 (0) 72 326 0595

Appendix 10: Letter re editing help



06 January 2015

To whom it may concern

This is to confirm that I provided editing assistance to Mary Isioma Ofili in the preparation of her PhD thesis, "An Ethnographic Study of Predictors of Hypertension and its Preventive Strategies in a Rural Community in Delta State, Nigeria".

The editing covered English language usage, grammar, idiom, orthography, punctuation and sentence structure for Chapters 1, 6 and 7, and I also gave some help with the MS Word formatting of the complete thesis.

I will be happy to furnish additional details if requested.

A handwritten signature in dark ink, appearing to read 'D Newmarch', with a stylized flourish at the end.

David Newmarch

DAVID NEWMARCH B A (HONS) (NATAL); M PHIL (YORK)
197 QUEEN ELIZABETH AVE, DURBAN 4001, SOUTH AFRICA
082 554 9090 (C) • 031 261 2197 (H) • DNEWMARCH@GMAIL.COM

Appendix 11: Acknowledgement of role played by student in the research study

Author contributions: Mary Ofili, the PhD student, investigator and researcher after completion of the research work, drafted the four manuscripts. The first manuscript: Ofili, M.I & Ncama, B.P (2014). Strategies for Prevention and Control of Hypertension in Nigeria Rural Communities.

Biomedical and Pharmacology Journal 7 (1) 39-45 (published). The student participated in the sequence alignment, drafted, revised and reviewed the manuscript, Ncama, BP participated in the sequence alignment, the two authors read and approved the final manuscript. The second article is titled “Hypertension in rural communities in Delta State, Nigeria: prevalence, risk factors and barriers to health care” by Ofili, MI, Ncama, BP and Sartorius, B. The student participated in the sequence alignment, drafted and revised the manuscript, Ncama, BP participated in the sequence alignment, Sartorius, B performed the statistical analysis and participated in the revision, all authors read and approved the final manuscript. The third article is titled “Influence of cultural and traditional practices on the management and prevention of hypertension in some rural settlements in Delta State, Nigeria” by Ofili, MI and Ncama, BP. The student participated in the sequence alignment, drafted and revised the manuscript, Ncama, BP participated in the sequence alignment, the two authors read and approved the final manuscript. The fourth and last article is titled “ Development of guidelines for management of hypertension in rural areas in Delta State, Nigeria” by Ofili, MI and Ncama, BP. The student participated in the sequence alignment, drafted and revised the manuscript, Ncama, B.P participated in the sequence alignment, the two authors read and approved the final manuscript.

Appendix 12: Instructions to authors- Cardiovascular Journal of Africa

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It has become necessary for the Cardiovascular Journal of Africa to charge a modest manuscripts processing fee of ZAR 400 for all articles submitted for publication.

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Appendix 13:Proof of submission of manuscripts online (Article 2

CardioVascular Journal of Africa

Hypertension in Rural Communities in Delta State, Nigeria: Prevalence, Risk Factors and Barriers to Health Care

--Manuscript Draft--

| | |
|--|--|
| Manuscript Number: | |
| Full Title: | Hypertension in Rural Communities in Delta State, Nigeria: Prevalence, Risk Factors and Barriers to Health Care |
| Article Type: | Original Article |
| Section/Category: | Clinical Section |
| Keywords: | Nigeria; Hypertension; Blood pressure; Prevalence; Rural communities; Risk factor |
| Corresponding Author: | mary ofili, msc Delta State University Abraka, Nigeria Abraka, NIGERIA |
| Corresponding Author Secondary Information: | |
| Corresponding Author's Institution: | Delta State University Abraka, Nigeria |
| Corresponding Author's Secondary Institution: | |
| First Author: | mary ofili, msc |
| First Author Secondary Information: | |
| Order of Authors: | mary ofili, msc Busisiwe Ncama, BCur, MCur, PHD Benn Sartorius, PhD |
| Order of Authors Secondary Information: | |
| Manuscript Region of Origin: | NIGERIA |
| Abstract: | Hypertension is a global health challenge affecting many adults. Hypertension prevalence is increasing rapidly in most African countries and also in rural areas. Few studies on the prevalence and risk factors of hypertension have been conducted in Nigeria and none within Delta State. We assessed the prevalence of hypertension and associated risk factors in adults in three villages in Ibusa community in Delta State, Nigeria. Homesteads were randomly selected and all consenting adults (≥18 years) were recruited into this cross sectional study (134 individuals: 48 males; 86 females). Socio-demographic data and anthropometric measurements (weight, height and abdominal circumference) were captured. Diagnosis of hypertension was based on a blood pressure (BP) threshold ≥ 140/90mmHg. Hypertension prevalence in this rural community was 44% and significantly higher in one village (Ogboli, 82%) and Ibo ethnic group (50%). Multivariable logistic regression analysis suggested increasing age, increasing body mass index and high salt intake as prominent risk factors for hypertension. Lack of funds and equipment shortage in clinics were the most reported barriers to health care. A nutritional education programme promoting low calorie and salt diet is recommended specifically targeting higher risk areas and ethnicity groups. Local barriers to accessing health care need to be addressed. |
| Suggested Reviewers: | okechukwu ogah Ministry of Health, Nnamdi Azikiwe Secretariat, Umuahia, Abia State, Nigeria osogah56156@gmail.com He has done so many research works on hypertension anthony akintomide Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria ony_akintomide@yahoo.co.uk He is knowledgeable in cardiology (hypertension) |

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Appendix 14: Proof of submission of manuscripts online (Article 3)

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INFLUENCE OF CULTURAL AND TRADITIONAL PRACTICES ON THE MANAGEMENT AND PREVENTION OF HYPERTENSION IN SOME RURAL SETTLEMENTS IN DELTA STATE, NIGERIA

--Manuscript Draft--

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| Manuscript Number: | |
| Full Title: | INFLUENCE OF CULTURAL AND TRADITIONAL PRACTICES ON THE MANAGEMENT AND PREVENTION OF HYPERTENSION IN SOME RURAL SETTLEMENTS IN DELTA STATE, NIGERIA |
| Article Type: | Original Article |
| Section/Category: | Clinical Section |
| Keywords: | Hypertension, Tradition, Culture, Management, Rural community, Nigeria |
| Corresponding Author: | mary ofili, msc Delta State University Abraka, Nigeria Abraka, NIGERIA |
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| Corresponding Author's Institution: | Delta State University Abraka, Nigeria |
| Corresponding Author's Secondary Institution: | |
| First Author: | mary ofili, msc |
| First Author Secondary Information: | |
| Order of Authors: | mary ofili, msc mary ofili, msc Busisiwe Ncama, BCur, MCur, PHD |
| Order of Authors Secondary Information: | |
| Manuscript Region of Origin: | NIGERIA |
| Abstract: | This article describes the experiences of rural settlements in Delta State, Nigeria in terms of their cultural practices and the influence on the management of hypertension. An ethnographic study was conducted utilizing in-depth interview method. Ten hypertensive patients with blood pressure readings $\geq 140/90$ mmHg who had used traditional practices for management of hypertension were purposively selected. The traditional and cultural practices identified include medicinal plants, sacrifices, scarification and tribal wars. Anti-hypertensive drugs were used alongside with traditional practices and where these traditional practices fail, local diets served as remedy. These cultural practices, like the local diet "palm kernel soup" (a high cholesterol diet) predispose them to risk factors of certain diseases and also promote their health like the medicinal plants. Models of community based management of high blood pressure in rural settings is highly recommended. This will help retain and preserve their relevant culture values and also maintain their wellbeing. |
| Suggested Reviewers: | Okechukwu Ogah Ministry of Health, Nnamdi Azikiwe Secretariat, Umuahia, Abia State, Nigeria osogah56156@gmail.com He has done so many research works on hypertension Anthony Akintomide Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria tony_akintomide@yahoo.co.uk He is knowledgeable in cardiology (hypertension) |

Appendix 15: Proof of submission of manuscripts online (Article 4)

CardioVascular Journal of Africa

Development of Guidelines for Management of Hypertension in Rural Areas in Delta State, Nigeria

--Manuscript Draft--

| | |
|--|--|
| Manuscript Number: | |
| Full Title: | Development of Guidelines for Management of Hypertension in Rural Areas in Delta State, Nigeria |
| Article Type: | Original Article |
| Section/Category: | Clinical Section |
| Keywords: | Key words: Hypertension, Management, Guidelines, Rural community, Nigeria, Nominal group technique |
| Corresponding Author: | mary ofili, msc Delta State University Abraka, Nigeria Abraka, NIGERIA |
| Corresponding Author Secondary Information: | |
| Corresponding Author's Institution: | Delta State University Abraka, Nigeria |
| Corresponding Author's Secondary Institution: | |
| First Author: | mary ofili, msc |
| First Author Secondary Information: | |
| Order of Authors: | mary ofili, msc mary ofili, msc Busisiwe Ncama |
| Order of Authors Secondary Information: | |
| Manuscript Region of Origin: | NIGERIA |
| Abstract: | Hypertension (high blood pressure) is presently one of the most important risk factors for the development of cardiovascular diseases. Several developed and developing nations including Nigeria have adopted various initiatives to prevent and/or manage hypertension. This article entails the development of guidelines using an integrated approach through a "System Support Strategy", combining appropriate and effective clinical care with community action in rural settings in Delta State Nigeria. Using the Nominal Group Technique meeting, a group of experts (6 key stakeholders) knowledgeable in the field were brought together to harmonize their ideas and experiences within a period of three days. The meeting resumed by 9am and ended 3pm daily. Each round (stages and duration) addressing a question lasted 1hr 45minutes. Major concepts addressed include optimal diagnosis and appropriate medical evaluation for high blood pressure, principles of blood pressure measurement and different steps in blood pressure measurement. Others are management options (routine baseline investigations, pharmacological and non-pharmacological measures) and prevention of high blood pressure as well as community screening programs. This simple guideline will not only serve as a vade mecum but will also have a strong impact on the health, quality of life and mortality rate among rural communities in Nigeria. |
| Suggested Reviewers: | anthony akintomide Obafemi Awolowo University tony_akintomide@yahoo.co.uk he is very good in internal medicine okechukwu ogah Ministry of Health, Nnamdi Azikiwe Secretariat, Umuahia, Abia State, Nigeria osogah56156@yahoo.com |

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- 4 iPad sale
- 5 Ninja blender
- 6 Women's yoga pants
- 7 Champagne flutes
- 8 Espresso machines
- 9 Nike Dri-Fit shirts
- 10 Toy box

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Thank you Mr mary ofili . Your payment to buy@clinicscardive.com was successful. We have sent you an order confirmation email.

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Delivery Details

Delivery Method:
Delivery Address:

Payment Details

| Description | Unit Price | Qty | Sub Total |
|---|------------|-----|--------------------------------------|
| CVJA Manuscript Submission Fee: „Hypertension in rural communities in Delta State Nigeria: prevalence, risk factors and barriers to health care | R 400.00 | 1 | R 400.00 |
| Payment Type: Credit Card | | | Subtotal: R 400.00 |
| Payment Total: R 400.00 (ZAR) | | | Tax (incl delivery): R 0.00 |
| Payment Currency: ZAR - South Africa Rand | | | Shipping and handling: R 0.00 |
| Seller Reference: 2015-01-12 14:21:32 | | | Insurance: R 0.00 |
| MonsterPay Transaction ID: 2c9c0c8a-010a-4d18-9c9a-54bbe0563bdf | | | Total: R 400.00 |

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