SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

ECONOMIC BURDEN OF HYPERTENSION AMONG PATIENTS ATTENDING NSAWAM- GOVERNMENT HOSPITAL IN THE NSAWAM- ADOAGYIRI MUNICIPALITY, EASTERN REGION, GHANA.

BY

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DECLARATION

I, Samuel Offei, hereby declare that except for reference made to other people's work which have been duly acknowledged, this study is the result of my own search undertaken under supervision and has neither in whole or in part presented elsewhere by anyone for a degree.

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Samuel Offei

(Student)

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Date

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Professor Moses Aikins

(Supervisor)

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Date

DEDICATION

This academic work is dedicated to my lovely father Mr. Erasmus Ofei for his immense spiritual, emotional and financial supports offered to me by "squeezing water out of stone" to bring me this far in my academic pursuit. The advice he gave "The world is moving very fast so, you have to run as fast as you can to reach where you are" enabled me saw the need to further my education so as, to be able to explore opportunities in life which may come in future.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immuno Deficiency Syndrome
AU	African Union
COI	Cost of Illness
CVD	Cardiovascular Disease
DALYs	Disability Adjusted Life Years
EU	European Union
GHS	Ghana Health Service
HIV	Human Immune Virus
KRW	Southern Korea Won
LMICs	Low and Middle Income Countries
NHIS	National Health Insurance Scheme
OPD	Out Patients Department
OOP	Out of Pocket Payment
SSA	South Saharan Africa
STATA	Statistical Analysis Software
WHO	World Health Organization

ABSTRACT

Background: Hypertension is a chronic asymptomatic disease condition which affect every part of the world and has no respect for age and often, increases with age. The Objective of this study was to estimate the economic burden of hypertension among patients attending Nsawam Government Hospital in the Nsawam- Adoagyiri Municipality of the Eastern Region, Ghana.

Method

A descriptive cross sectional Cost of Illness (COI) survey which relied on quantitative data was conducted among 202 patients who have been diagnosed as hypertensive and thus, are receiving medical care at Nsawam Government Hospital from 29th May 2018 to 13th June, 2018. Data on socio-demographic characteristics, direct cost, indirect cost and the intangible cost which patients incurred as a result of seeking medical care were collected and analyzed.

Results:

A total of 202 hypertensives were interviewed. Their mean age was 59 years.

The total monthly treatment cost was GHS29,302.55 (US$6,356.30) with the direct cost accounting for almost 70% of the total cost of managing hypertension accompanied by a moderate intangible cost as reported by most of the patients.

Conclusion

Hypertension pose a considerable economic burden and a reduction in the income of the patients, impacting negatively on their welfare which often render them into financial distress in an attempt to seek for treatment.

CHAPTER ONE

INTRODUCTION

1.0 Background

Non communicable diseases are medical conditions which by their definition are non-contagious but often chronic in nature and as a result sufferers have to live with it throughout the rest of their lifetime (Ajayi et al., 2017). The notable non communicable diseases include; cardiovascular disease, cancers, chronic respiratory disease and diabetes contributing to a high global death (Goma et al., 2011). Globally, non communicable diseases are responsible for almost 36 million deaths out of the 57 million deaths in 2008 of which about half (48%) were linked to cardiovascular disease of which hypertension is a known risk factor (Kibret & Mesfin, 2015). The prevalence of non communicable diseases in low and middle income countries continue to increase which account for almost half of the recent health burden in developing nations (Joshi et al., 2014).

In Sub- Saharan Africa, history indicates that, the region was dominated by acute illness but there is a growing studies which suggest that, chronic diseases especially non communicable diseases are constantly increasing in the region. It is estimated to cause almost 46% of deaths by 2030 (Kavishe et al., 2015). Although by the twentieth century hypertension was not a common condition to be seen in Africa, current literatures indicates almost 40% of the adult population of the region have hypertension (Kibret & Mesfin, 2015). It is characterized as being asymptomatic in nature, making most people with the condition living undiagnosed and untreated accounting for increased in premature and sudden death (Kotwani et al., 2013). Report from the World Health Organization states hypertension as the third cause of death accounting for almost one in eight deaths globally (Mengist, 2014). It is however suggested that, by 2020 non communicable disease

together with hypertension will outweigh communicable disease as the leading cause of death (Joshi et al., 2014). In Ethiopia, a burial surveillance indicates almost 51% of deaths were attributed to non communicable diseases out of which cardiovascular disease was the main cause contributing to 24% of deaths and hypertension accounting for about 12% of the cardiovascular deaths (Kibret & Mesfin, 2015). Nevertheless, the consequence of the burden of hypertension constitute a bigger health challenge in Africa with almost 70% of the people affected living in low and middle income countries which evidence suggest, the mean age for cardiovascular disease higher than any part of the globe (Yan et al., 2015) which Ghana is of no exception. Hypertension contributes to heart disease, kidney failure, stroke and other mortalities (Katalambula et al., 2017)

It is therefore, important to control the condition but studies indicates, awareness, treatment and control of hypertension largely depends on the level of income of the individual (Hughes, Aboyade, Clark, & Puoane, 2013) making the cost of managing the condition a burden for both the individual and society as a whole (Katalambula et al,2017).

This study therefore, seeks to estimate the economic burden of hypertension among patients attending Nsawam Government Hospital in the Nsawam- Adoagyiri Municipality of Ghana.

1.1 Problem Statement

Globally, hypertension is the most common diagnosed disease. It is an established fact that, it has a causal linkage with cardiovascular disease and thus, can never be neglected (Suhil, Azmi, Hassali, Izham, & Ibrahim, 2010). A report from the World Health Organization indicates the major cause of death globally with hypertension been ranked as the third for Disability and Adjusted Life Years (Chockalingam, Campbell, & George

Fodor, 2006). Worldwide, the incidence of non communicable disease is constantly increasing and Ghana for that matter has started counting high patterns and trends especially for hypertension and diabetes (Opare et al., 2013).

Hypertension, once very uncommon health problem in West Africa is now a major public health threat affecting the region and Sub- Saharan Africa as a whole (Iwelunmor et al., 2014).

In many parts of the African region, disability and deaths as an outcome from conditions such as hypertension, diabetes and stroke have increase over the last 20 years distressing both the urban and rural, rich and poor and that of the young and old (Aikins, Boynton, & Atanga, 2010).

Hypertension poses a huge health threat to individuals living in Sub- Saharan Africa as it is being reported that, across the region hypertension is the leading cause of mortality and morbidity and thus, posing the tendency to increase in epidemics of non communicable diseases (Obinna, Ikechukwu & Ekwunife, 2011). Elsewhere in Africa, it is positively associated with high morbidity and mortality as it puts a huge financial burden on the health system by consuming much of the scarce resources allocated to the health sector (Celestine et al., 2017).

The African continent faces a serious but neglected widespread of chronic condition (Aikins et al., 2010). In Ghana, earlier surveys reveals that, hypertension prevalence is almost about 4.5% among rural inhabitants and about 8% -13% in the urban residents (Cappuccio et al., 2004).

Over the years, there has been an increase in chronic ailments especially hypertension and diabetes as reported from the Eastern Region of Ghana (Opare et al., 2013) as studies

conducted from health facilities in the region indicates, the prevalence of the condition rising from 5.1% in 2006 to 8.5% in 2010 (Opare et al., 2013).

Though from the ten years report of the Ministry of Health- Ghana reveals that, hypertension is the second cause of death among individuals aged 45 years and above who visit various health facilities Out Patient's Department in the country (Lamptey et al., 2017) regardless of the current prevalence which is still thought to be high as it ranges between 24 to 28% among males and 20 to 32% among females which thus, makes it a major health problem in Ghana its risk factors such as high salt intake, excessive alcohol intake, family history and body mass index are well established (Lamptey et al., 2017) as it is responsible for premature deaths in Ghana (Buabeng & Plange-rhule, 2004).and direct medical cost being the main cost driver (Damien, Lanham, Parthasarathy, & Shah, 2016).

Nevertheless, hypertension treatment has a suggested goal for patients with uncomplicated blood pressure of an normal systolic less 140mm Hg and a diastolic also less than 90mm Hg whereas, patients with comorbid conditions, the goal is blood pressure less than 130/80mm Hg (Dolor et al., 2009).

In contrast, most people with the condition could avert the direct cost associated with hypertension by changing lifestyle habits which include; reducing dietary sodium intake, decreasing body weight, avoiding smoking and reducing alcohol intake (Ratajczak, 2012) as it makes people with the condition often running into poverty since they are unable to afford buying drugs to manage their health condition (Krishna, 2007). Further, patients diagnosed as hypertensive need one or more antihypertensive medication to help achieve optimum blood pressure and this has directed to an increase in the cost of managing hypertension in the Ghanaian context (I. Kretchy, Owusu-daaku, & Danquah, 2013).

Imperatively, available data at the health information department at the Nsawam Government hospital reveals that, as at the year ending for 2016, the hospital recorded a total of 5,123 cases of hypertension. However, this figure dropped to 2,326 cases as at the end of 2017 and recorded a total of 942 cases of hypertension as at the end of the first quarter for the year 2018 thus, worth worrying.

It is in light of this, that this study seeks to determine the economic burden of hypertension among patients attending Nsawam Government Hospital to help reveal the gravity of the disease condition and its accompanying cost burden namely; direct cost, indirect cost and intangible cost which its victims go through as in their quest to seek for treatment in managing their disease condition.

1.2.0 Research Objectives

1.2.1 General Objective

The general objective of this study was to estimate the economic burden of hypertension among patients attending Nsawam Government Hospital.

1.2.2 Specific Objectives

The specific objectives of this study were;

1. To determine the direct cost of hypertension management to patients.
2. To determine the indirect cost of hypertension management to patients.
3. To determine the intangible cost of hypertension management to patients.

1.3 Research Questions

This study seeks to answer the following questions

1. What is the direct cost of hypertension management to patients?

2. What is the indirect cost of hypertension management to patients?

3. What is the intangible cost of hypertension management to patients?

1.4 Justification

Hypertension is among the leading cause of disability and deaths globally, hence, there is the need to estimate the economic burden of the disease condition on the individual receiving treatment and the nation as a whole since understanding the economic burden will enable both the individuals, households and the government as a whole to prepare and plan financially towards the unforeseen health condition which has no respect for age and social status.

However, treatment of hypertension is often associated with cost. These cost include, direct cost (medical and non- medical cost), indirect cost which comprise of income lost and loss of productivity as a result of patient absenting himself or herself from work and the intangible cost such as physical pain, anxiety, depression and loss of social life.

Further to that, the economic impact of the disease is often felt directly by the individual and the healthcare system through the high costs sustained in treating the complications and indirectly through loss of family income due to disability and death of its younger household grownups (Kayima et al., 2015).

That notwithstanding, there is limited studies especially in Sub- Saharan Africa on the economic burden of hypertension, Ghana is of no exception.

This study is therefore, carried out to determine the economic burden of hypertension among patients attending Nsawam Government Hospital. This will contribute to the growth and development of the scientific knowledge and also help inform policy by providing relevant suggestions to all stakeholders concerned.

1.5 Narrative On the Conceptual Framework

Hypertension is a debilitating disease which has no respect for age hence often called the "silent killer" as most patient with the condition do not exhibit clinical sign and symptoms of the condition. It thus, require managing the disease condition but the management is often associated with costs. Figure 1 above depicts the relationship between hypertension management and its associated cost burden it poses to the patient living with the condition. This framework is based on the Cost of Illness (COI) concept. The direct cost is made up of two components namely; medical and non-medical cost. The medical cost includes the expenses on medical goods and services like consultation, medicine and diagnostic tests as a result of hypertension. Non medical direct cost includes, cost of travel to and from hospital, cost of food and other miscellaneous cost. Again, patients suffer indirect cost in the form of productivity lost as a result of patients' absenteeism, sick leave and time spent by the patients and their family members in seeking for medical care. Moreover, patients with the condition face physical pain, anxiety, depression and loss of social life all of which constitute intangible cost. The pain and suffering reduces the patient quality of life hence, summing all these costs will help to estimate the economic burden of hypertension management.

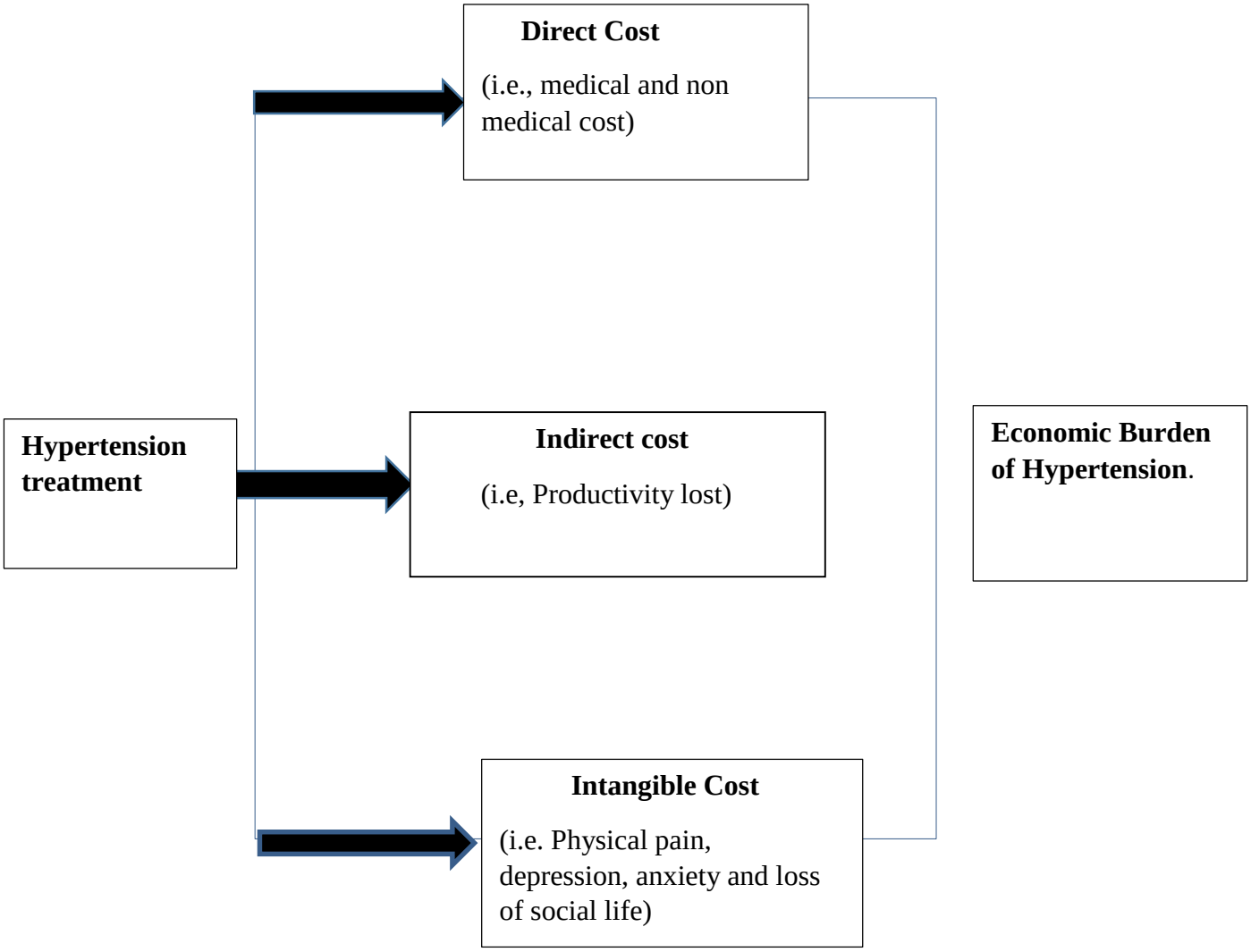

Figure 1 Conceptual framework of economic burden of hypertension

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter highlights the definition, epidemiology and mortalities associated with hypertension. Then to the concept of cost of illness and finally to economic burden of hypertension.

2.1 Epidemiology of Hypertension

Hypertension is a blood pressure of 140/90 mm Hg (millimeters of mercury) when taken at least on two different readings (Abdullahi & Amzat, 2011). Similarly, hypertension is a medical condition where arteries or veins in the blood is high and above 140 mm Hg for systolic blood pressure and equal or above 90 mm Hg for diastolic blood pressure (Kibret & Mesfin, 2015).

Arguably, hypertension is a disruption in the hemodynamic functions in which there is a constant abnormal increase of the systolic blood pressure be it systolic or diastolic over its normal level of 140/90mmHg (Ekwunife, Okafor, Ezenduka, & Udeogaranya, 2013).

Most often, individuals with the condition do not exhibit any clinical signs and symptoms during the onset of the condition particularly those living in poor communities where there is limited resources for the screening and detection of non communicable disease (Katalambula et al., 2017). Epidemiological transition which explains the change in morbidity and mortality as a result of changes in demography which occurs in all part of the world. At the beginning of the period, society was dominated by agricultural activities.

It was characterized by the age of pestilence and famine with life expectancy being 40 years. Tuberculosis, cholera, plaque and the likes were responsible for infectious disease pandemic (Blacher, Levy, Mourad, Safar, & Bakris, 2016). The second phase of the epidemiological transition occurred in the 20th century where life expectancy increase to 50 years, deaths at this period shifted from infectious disease to chronic degenerative disease (Blacher, Levy, Mourad, Safar, & Bakris, 2016). Unfortunately, developing countries are undergoing epidemiological transition with the emergence of non communicable disease which hypertension is a potential risk factor (Blacher et al., 2016). Ghana is of no exception.

Currently, a lot of hypertensive individuals are thought to be living in developing countries which stand at 75million for those living in Sub- Saharan Africa and the figure is likely to increase to 125.5 million by the year 2025 (Pires, Sebastião, Langa, & Nery, 2013).

Hypertension more often exist with other chronic conditions such as diabetes, obesity and dyslipidemia with about less than 20% cases of high blood pressure occurring without one or more risk factors of the disease condition (Daniel A. Belletti, 2010).

Due to the rise of urbanization, it has necessitated a drastic changes in social and economic spheres of Sub Saharan Africa which has contributed to a rise in non communicable diseases including hypertension (Kotwani et al., 2013).

However, high blood pressure is among the leading cause of death and disability accounting for almost 13.5% of global premature deaths and 6% of disability (Scholze et al., 2010) and about half of all cases of ischemic heart diseases and stroke can be linked to high blood pressure (Scholze et al., 2010).

Now, almost 80 million adults are hypertensive in Africa and the number is expected to increase to 150 million by 2025 (Angaw, Dadi, & Alene, 2015). Nevertheless, the

continuous increase in the burden of hypertension in Africa is linked to population growth, migration and unhealthy lifestyle (Yan et al., 2015). Hypertension like other non communicable diseases is made up of modifiable and non modifiable risk factors (Goma et al., 2011). Modifiable risk factors are those factors which can be changed as a result in the changes in the needs and wants of the individual and typical examples include; lack of physical exercise, tobacco use, alcohol consumption, stress and others whereas the non modifiable risk factors are those factors which cannot be changed and typical example include; family history of hypertension, race and it likes.

Even though as at the year 2008, about 17 million deaths occurred globally from cardiovascular diseases which almost 80% happened in low and middle income countries representing almost 7 million life loss yearly and 57 million disability adjusted life years (Pires et al., 2013).

Nevertheless, between 2003 to 2004, over one third of the adult population of the United States were thought to be suffering from hypertension (Daniel A. Belletti, 2010).

Likewise there is a rise in the number of hypertension cases in Sub- Saharan Africa which Nigeria is of no exception (Ekwunife et al., 2013)

Historically, Sub- Saharan Africa was dominated by acute illness as the major health problem in the region however, there is a growing studies which indicates there is a growing burden of non communicable diseases which claims almost 46% of deaths as reported in 2008 and the figure is projected to increase 28% by 2030 (Joshi et al., 2014). Current literature indicates, the prevalence of the condition ranges within 25% to 35% among the adult population and increases with age (Joshi et al., 2014). Hypertension affect about 22% of people aged 18 years and above accounting for 9.4 million deaths yearly around the world. It constitutes almost 45% of deaths due to heart disease and 51% of

deaths as a result of stroke which consume approximately 10% of the healthcare expenditure (Abebe, Berhane, Worku, & Getachew, 2015).

Hypertension is estimated to affect nearly 800 million individuals globally (Hughes, Aboyade, Clark, & Puoane, 2013). Also, it affects approximately 40% of the global adult population aged 25 years and above which is more than 1 billion individuals affected throughout the globe accounting for almost 9.4 million deaths yearly and 7% of disability adjusted life years lost (Padwal, Bienek, & Mcalister, 2016). It is a major risk factor for cardiovascular diseases accounting for about 52.5% of all stroke cases in Africa as opposed to 38.8% in the developed world (Bosu, Aheto, Zucchelli, &Reilly, 2017).

Evidence from the Africa Union suggest, that hypertension is one of the greatest health issue after HIV/AIDS in the Africa region (Yan et al., 2015). Despite it health impact, the number of people with under control hypertension in countries such as Ecuador is as low as 0.3% with the prevalence estimated to increase more than 500 million by 2025 (Tibazarwa & Damasceno, 2014).

For some years now, the number of Ghanaians with hypertension has been on the rise (Buabeng & Plange-rhule, 2004) as studies prove to bear that, as at the year 2002, the prevalence of the disease being estimated to be around 35% among persons aged 40 to 55 years and 40% among individuals who are above 55 years of age (Buabeng & Plange-rhule, 2004).

Hypertension affects about 25% of urban dwellers and 20% of Ghanaians living in rural areas with its worldwide prevalence being 26% is also likely to increase to 29% by 2025 (I. A. Kretchy, Owusu-daaku, & Danquah, 2014).

Findings from Ezzati et al (2002) indicates, hypertension is the most important cause of morbidity and mortality and is a huge health threat to developing countries than to

developed nations. It is estimated that, the number of hypertensive individuals as at the year 2000 was 972 million with 333 million living in developed countries whereas 639 million living in developing countries which is further predicted to increase from 24% which is about 413 million in developed countries to 80% which is almost 1.15 billion living in developing countries (Kearney et al, 2005) though hypertension, diabetes, ischemic heart disease are of paramount interest but epidemiological data on the conditions are few (Kavishe et al., 2015). Elsewhere in Nigeria, the prevalence of the condition may be associated to urbanization, adoption of western lifestyle and eating of junk food in the cities (Agaba et al, 2009).

A rise in blood pressure increases the possibility of developing conditions such as coronary heart disease and stroke (Ekwunife et al., 2013)

Hypertension is reported to contribute to organ damage which is a major morbidity and mortality issue (Joshi et al., 2014) and also increases the development of chronic kidney disease with individuals with uncontrolled hypertension having two to three times the occurrence of myocardial infarction and stroke (Tedla et al., 2011).

2.2 The Concept of Cost of Illness

Cost of illness studies are studies that measure the cost of a disease (Costa et al., 2012). Cost of illness also called burden of disease has been growing since the International Codification of Disease framework in the mid-1960s (WHO, 2009). For example, other studies on cost of illness have been conducted in various settings where they were able to quantify health loss caused by disease among the population and thus, introduced the concept burden of disease (Wouter & Lieven, 2010).

While some cost of illness studies were piloted and published before the mid-1960s, it was until the period that, the health economist known as Rice first suggested out in great details

the methodology for costing illness (Tarricone, 2006), though received criticism by other writers in other parts of the world, but she finally was able to achieve her objective (Shielll et al, 1987).

Years thereafter, other scholars provided rules for those who anticipate to commence cost of illness studies (Tarricone, 2006)

As a universal rule of economic efficiency, it suggest that, no programme should be acknowledged unless it benefits surpasses the cost and where more than one programme compete for resource allocation thus, the programme with the disposable benefit should be given urgency (Shielll et al, 1987) .

Cost of illness studies have been widely argued and its worth as a decision making tool has been examined by many health economists (Tarricone, 2006) but is part of the shared economic evaluation of healthcare as reported in Italy and other foreign countries and is often used by organisations such as World Bank, WHO and the US National Institute of Health (Tarricone, 2006).

Cost of illness studies are useful in the role it played in contributing to public policy formulation and setting of healthcare importance as it serves as an crucial component in evaluating alternative healthcare demands on scarce resources and in its inquisitiveness in aggregating of disease burden (Shielll et al., 1987).

Worldwide, disease costs US$ 604 billion as at 2011 of which 84% were made up of the informal and the formal cost (Costa et al., 2012).

The total cost of treating hypertension and its associated complications are estimated from US$ 15.0 billion to US$ 60 billion (Balu & Iii, 2018). Further to that, a survey conducted to estimate the expense made on hypertension treatment found complications of cardiovascular disease accounting for almost US$ 30 billion and other mortalities

accounting for US$ 57.0 billion. Divala et al, (2016) reported that, hypertension is the most expensive health condition to manage due to population ageing.

Wouter & Lieven, (2010) indicated the distinction between direct and indirect cost of illness. Direct cost are those cost incurred directly as a result of a disease or an illness which may include; cost of treatment, rehabilitation, amount paid in the management and prevention of a disease, education and investing in medical services., divided direct cost into direct medical cost and direct non medical cost. Direct medical cost are those cost incurred as a result of purchasing drugs, admission fee and others whereas the direct non medical cost are those cost.

Indirect cost are those cost incurred as a result of loss of productivity and cost incurred as a result of death and a third category of cost known as the intangible cost which are those cost incurred as a result of loss of quality of life for both the patient and his family as a whole (Wouter & Lieven, 2010). In 2010, the direct and indirect medical cost of cardiovascular disease which hypertension has an association was estimated at US$273billion and US$172billion respectively in the United States (Song et al., 2015).

In the Ghanaian setting, the National Health Insurance Scheme caters for a chunk of the direct medical cost of health conditions including hypertension treatment. That notwithstanding, victims who are diagnosed as hypertensive are times asked to pay for some antihypertensive drugs which the National Health Insurance does not cover and even when it cover, there are times in which patients are prescribed with the drugs and are being asked to go and buy them at the Over the Counter Pharmacy shops because, there is shortage or the drug is not available at the hospital. It therefore become imperative to conduct a Cost of illness study which will help provide necessary suggestions that will go

a long way to inform policy with respect to resource allocation and also help sensitize the citizenry on the gravity of the disease condition.

2.3 Direct Cost

It is being reported that in Brazil, treatment of hypertension and its associated complications was estimated at US$ 37.2 billion in 2003 (Dib, Riera, & Ferraz, 2010) out of which direct costs include hospital costs (US$ 5.1 billion), nursing home costs (US$ 3.6 billion), expenses for doctors and other healthcare professionals cost almost US$ 9.2 billion, home health care costs US$ 1.5 billion whereas anti-hypertensive medication costs US$ 17.8 billion. However, cost of antihypertensive drugs represent almost 47.8% of the estimated direct total expenses for health care in the United States in 2003, which is projected to increase to about 14.8% over the next years (Dib et al., 2010). In contrast, payment for unforeseen health events exceeded 40% of the household nonfood expenditure (Le, Zhankun, Jun, & Keying, 2012). Suhil et al (2010), evidence from Malaysia indicates an estimated RM 145 million is spent on antihypertensive drugs with about 37,580 cases being reported in government health facilities accounting for almost RM110 million which are related to hypertension. Hypertension, a major risk factor of cardiovascular disease, the direct medical cost accounted for almost 17% of overall health expenditure in the United States of America (Song et al., 2015).

In 2010, hypertension in association with cardiovascular diseases accounted for about $273 billion of the direct medical cost (Song et al., 2015). Recent studies shows that most of the total costs of mild hypertension treatment which is a form of hypertension in Poland is the direct medical cost (Ratajczak, 2012). Medical cost of treating hypertension and its related morbidities serves as one of the largest component of the health insurance reimbursement in Philippine (Sam & Geroy, 2012). It is reported that, in the United States

medical cost as a result of hypertension was predicted at RMB19.1billion/US$3.06billion which accounted for almost 47.7% of the total medical cost of treatment of stroke and coronary heart diseases (Wang et al, 2014).

Studies from Italy indicates the major component of hypertension treatment was antihypertensive drugs which is almost 42.7% of the total healthcare cost followed by hospital admission which was almost 28.4% of the healthcare cost (Ratajczak, 2012). Reports from the Brazilian healthcare system indicates drugs as the component consuming much of the resources allocated to the healthcare delivery service which accounted for about 32.73% in 2002 to 52.3% in 2005 (Ratajczak, 2012).

Findings from Ratajczak (2012) again indicates that, the cost of treating hypertension using the first-line agents of the five recommended classes of antihypertensive agents namely; chlorthalidone, propranolol, amlodipine, enalapril and losartan proves that prophylaxis accounted for almost 24 - 77% of the total direct healthcare cost.

In contrast, the price of medication in Phillipine is very expensive as compared to other developed and developing nations (Sam & Geroy, 2012).

Publication in Brazil indicates the monthly cost of medication for hypertension treatment was estimated at 87.10 USD when using one drug but the figure was estimated to 159.00 USD when treating with two drugs (Ratajczak, 2012).

A survey conducted on the reimbursement of claims indicates that, about US$49.3 million was spent between the period of 2003 to 2006 among 167,666 patients for hospitalization as a result of hypertension and its related diseases (Sam & Geroy, 2012).

In southern part of Korea, studies indicates that between 2005 to 2009, hypertension medications increase by 64.3% from US $1.4 billion to US$ 2.3 billion. Again, medical

expenditure to treat the primary form of hypertension and other hypertensive conditions was estimated at 2.5 trillion KRW (Min et al., 2014).

Thus, by far an average of about US$544 is spent on preventing one hospitalization bill of hypertension treatment which may have been used to pay for anti- hypertensive medication for those involved for a year (Sam & Geroy, 2012).

Likewise, in the year 2007, the global health expenditure to treat and prevent diabetes which has an association with hypertension with its complications was estimated at US$ 232 billion. However, depending on the available treatment, the direct cost of the diabetes which is seen to have an association with hypertension constitute almost 2.5% to 15.0% of the annual healthcare budget (Ng, Paul, Sim, Ko, & Lee, 2015).

2.4 Indirect Cost

Hypertension reduces the individual ability to engage in productive activities as reported that in 2003, an estimated indirect costs due to loss of productivity as a result of hypertension in the United States estimated at US$ 7.0 billion (Dib et al., 2010). It is projected that by 2030, the indirect cost associated with cardiovascular diseases which has hypertension as a risk factor will increase to US$276 billion (Song et al., 2015).

Other studies suggest that, the indirect cost associated with the treatment of hypertension are higher among males than females (Alefan, Ibrahim, Razak, & Ayub, 2009), who are usually the bread winners of the family. Deaths and impairments from cardiovascular disease which hypertension is an established risk factor encourages low productivity hence, affecting the standard of living of households (Calcagno et al., 2016). It reduces the number of hours spent at work and being involved in home productivity activity among women with breast cancer which hypertension is known to have an association with (Ekwueme, Trogdon, Khavjou, & Guy, 2016).

Diabetes which hypertension is a known to have a close association with, is likely to be a common disease in all parts of the world and thus, is likely to become a global health epidemic hence, the ability to do work among such individuals is an important question with respect to work absenteeism (Krstović-spremo et al, 2014). Again the authors suggested, employees with such disease condition are likely to stop work and hence, likely to become unemployed which can then translate into reducing the income earning and savings, low self-esteem for such individuals (Krstović-spremo et al., 2014). In addition, for employers too, low productivity as a result of work absenteeism and early retirement becomes an important economic problem (Krstović-spremo et al., 2014). It hinted that, the common cause of work absenteeism included; disease, injury at work, injury outside work, care for a family member or other reasons permitted by law (Krstović-spremo et al., 2014).

On the average, almost 5% of the total lab our force employed absent themselves from work every day though, the average number of sick days per employee in the European Union is estimated at 4.6 days per year (Krstović-spremo et al., 2014).

Hypertension together with other known risk factors for cardiovascular diseases and diabetes which pose a serious burden on the nations productivity through absenteeism (Dall et al., 2009). Further, absenteeism is projected to contribute to annual productivity loss by 0.2% to 1.5% per worker with workers having hypertension constituting 0.9% (Dall et al., 2009). The same authors indicated that, presenteeism which is a reduction of productivity whiles being at work has got several reasons such as job repetition, loss of concentration and fatique (Dall et al., 2009). It again suggested that, comorbidities of obesity which has an association with hypertension can lead to back pain, arthritis and diabetes which can prevent the individual the likelihood of not working (Dall et al., 2009). Although almost 65% of people living with hypertension are treated with medications and about 57% of hypertensive have had their blood pressure being controlled (Wagner, Lau,

Frech- tamas, & Gupta, 2012). Uncontrolled blood pressure and other cardiometabolic risk factors are linked with reduced work productivity, poor quality of life and increase medical cost (Wagner et al., 2012).

In the same way, obesity which also has an association with hypertension often leads to permanent work loss which may include; disability, pension and untimely death (Goettler, Grosse, & Sonntag, 2017). It stated further that, obesity which has hypertension as a complication is often linked to temporary work loss such as sick leave and reduced productivity while being active on the job (Goettler et al., 2017). Nevertheless, productivity loss has been on the agenda of policy makers many years ago (Ying Chu Ng, Philip Jacobs, 2001).

2.5 Intangible Cost

As the individual is unable to perform daily duties expected of him or her including the ability to care for himself or herself it tends to a psychological situation which can eventually leads to isolation (Tagoe, 2012). It is reported that, anger and anxiety are the most common psychological problems faced by individuals as a result of hypertension and can even interrupt in the control of the heart beat (Bajkó et al., 2012), when anger not expressed in a healthy manner can lead to a lot of disease conditions such as hypertension, coronary arteries, cancer and the likes (Tel, 2013). Studies suggest that, people who have cardiovascular disease which hypertension is a known risk factor experience low quality of life more especially, when they do not have health insurance hence, affecting the number of hours spend at work (Calcagno et al., 2016).

Findings from (Scuteri et al., 2011) indicate depressive symptoms as a risk factor for the development of cardiovascular disease which hypertension is a known risk factor among older persons and a prognostic factor in people who already having cardiovascular disease.

It is estimated that, the number of people suffering from depression will increase among people found of having chronic diseases which hypertension is such a disease. People with hypertension stands between 37% - 46% of developing depression as compared with people without hypertension (Scuteri et al., 2011).

Hypertensive patients often experience emotional distress which usually surges their possibility of developing psychological health disorders such as anxiety and depression (I. A. Kretchy et al., 2014).

Survey found a positive association between hypertension and anxiety disorders do not continue after adjustment (Grimsrud et al., 2009). The authors again, indicates depression as more common among individuals with hypertension (Grimsrud et al., 2009).

Notwithstanding, depression is often seen to be common among individuals with chronic health conditions such as hypertension and the likes (Egede & S, 2007)

Similarly, depressive patients stand the possibility of being hypertensive compared with the general populace (Scuteri et al., 2011). Data, studied from a survey among seventeen (17) countries by the World Mental Health indicates that, non-comorbidity, anxiety disorder and comorbid depression anxiety individuals are likely to be hypertensive (Grimsrud et al., 2009).

However, hypertension and depression increase the possibility of developing cardiovascular disease. Likewise, depression, hypertension is often associated with brain abnormalities (Scuteri et al., 2011).

Arguably, almost 9.9 million people representing about 5% of the United States adult populace is thought to be affected by depression (Egede & S, 2007) which is also has an association with hypertension (Gangwisch et al., 2009).

A nationwide study carried out in the year 2001 suggest that, about 9% of Koreans are depressed (Ee, 2010). Depression has an association with work absenteeism, productivity loss and has the tendency to increase the use of healthcare resources (Egede & S, 2007).

Nevertheless, the gravity of depression on performance of work is higher than that of hypertension, diabetes, arthritis and the likes (Ee, 2010)

2.6 Economic Burden of Disease

Economics a science concern of using scarce resources to achieve optimum satisfaction. Relating the concept of economics to healthcare is important in a number of ways;

In line with disease, estimating morbidity and mortality are also important considerations needed in making inference with respect to disease burden among the population but focusing on the morbidity and mortality alone does not provide a true picture on the impact of ill health among the populace. Interesting to note, economic burden are of great concern as an unexpected increase in the healthcare spending, income lost and low productivity often lead to poverty (WHO, 2009). Further to that, poor health affect the attainment of higher education, does not encourage people to save, reduces domestic and foreign investment which all in a way contribute to a reduction in the growth of the economy (WHO, 2009).

According to Agenor and Montiel (1996) private consumption forms the largest part of the aggregate demand hence, any factor that is or likely to affect the aggregate consumption will have a great implication on the growth of the economy. As the prevalence of diseases in developing countries continues to be on the rise where resources are limited, it will compel households, firms and government to adopt alternative means to bear the associated healthcare burden. Evidence suggest, improved health outcome have a considerable

consequence on the economic growth by contributing to increase in production (WHO, 2009).

WHO (2009) establishes the indirect means through which ill health can affect adversely on the economic development and growth of a growth. First, increase in production costs and absenteeism of employees often compel employers to hire additional workers to work at their various establishment of which all this new employees are required to be given in service training to enable them effectively at their respective duties being assigned. Again, diseases such as hypertension, HIV/AIDS and the likes often compel employees to resort to early retirement thereby, leading to a reduction in the compulsory retirement age. Further, as members of a given family who were affected by catastrophic health event have no other option than to come on retirement, this affected individuals are to be given the necessary medical care which goes a long way to increase the dependency rate in the country (WHO, 2009).

Studies from WHO (2009) indicates ill health contributes to a reduction in the human capital investment as most of the young people are likely to be engaged in the marketing of goods and services as they would be more or less compel to act as caregivers.

It is therefore necessary that, the complications of hypertension and its associated cost burden it pose to individuals cannot be underestimated. It places a lot of economic hardship on individuals and thus, affecting their quality of life. Nevertheless, most of the literatures cited were mainly studies conducted in developed countries, the study is therefore necessary as it help provides useful suggestion to policy makers and the government in Ghana and for that matter Africa as a whole on the economic burden of hypertension.

2.7 Sensitivity Analysis

Sensitivity analysis is the method of determining the robustness of an assessment by examining the extent to which results are affected by changes in key parameters (Thabane et al., 2013). Further to that, it can be seen as the analysis of data set to assess whether altering any of the key parameters can lead to a different conclusion (Thabane et al., 2013). It is necessary to assess the robustness of a study to ensure the appropriate interpretation of the results taking into accounts the parameters that have changed. Sensitivity analysis helps to identify the key parameters where uncertainty affects the outcome of the results (Toshimitsu Homma & Andrea Saltelli, 1996). There are three types of sensitivity analysis namely; one way sensitivity analysis which is conducted by changing one parameter at a time, two way sensitivity analysis which is conducted by changing more than one parameter at a time and the threshold analysis which calculates the critical values beyond which the conclusion of the analysis altered (Taylor, 2009).

2.8 Human Capital Approach

Coming from economics perspective, capital is one of the factors of production employed to produce an appreciable goods and service (Jo, 2014). It therefore suggest that, the human capital is the factor of production which can take full responsibility of all production activities and hence, makes an inference that, the human capital can help generate additional value by employing it into the process of production (Jo, 2014). The human capital approach is of the view that, human resource as a factor of production provides the skills and knowledge needed to produce an economic gain (Carolina, 2011). Also, the human capital approach measures the lost in production in terms of lost earnings (Joel E. & Segel, 2006).

Productivity losses attributed to morbidity and mortality are the market value of that individual future contribution to society if he or she had been working while being healthy hence, the human capital approach is used to assess the value of the human capital as the present value of his or her future earnings under the assumption that, future earnings are a substitute for his or her future productivity (Jo, 2014).

Although has received a lot of criticism for assigning high values to some age and sex groups in respect of their income and occupational status (Joel E.& Segel, 2006) but is often used by researchers undertaking cost of illness stidies(Jo,2014)

2.9 Likert Scale Measurement

Over years now, many techniques have been adopted in the measuring of character and personality trait but there has been problems of measuring attitudes, character and personality traits (Scales & Sullivan, 2013). In respect of this, Rensis Likert described and developed a technique for the assessment of attitudes (Croasmun, 2011)

Scale rating is a common technique often used in the social sciences with scoring of attitude (Croasmun, 2011). That notwithstanding, the Likert scale is a useful and reliable instrument for measuring self value (Croasmun, 2011). The scale provides a range of responses to a statement or a series of statements which are usually five categories but there has been a growing debate among researchers concerning the exact number of choices in a Likert scale (Croasmun, 2011). A likert scale is a psychometric scale often used in research based on survey questionnaires which captures the intensity of feelings (Barua, 2013).

However, while using a Likert scale, it is imperative that, the researcher calculate and reports and should add the scales for the analysis of the response and must not worry analyzing the individual item in the scale (Croasmun, 2011).

It is usually used in a larger population to measure what are often called summated rating scale, a common measurement used in the context of education (Harpe, 2015).

CHAPTER THREE

METHODS

3.0 Introduction

This chapter explains the methods and design used in this study. It entails the study area, study design, study variables, data collection technique, data collection tool, data entry and analysis, ethical considerations and others which were used in this study.

3.1 Study Area

The study was carried out at Nsawam Government Hospital in the Nsawam – Adoagyiri Municipality in the Eastern Region of Ghana. It is one of the municipalities in the Region and covers a land area of approximately 175 square kilometers. It is bordered to the south by Ga West Municipal of the Greater Accra Region, to the north by Akuapim South District Assembly, to the west by Suhum Municipality and Upper West Akim District. According to the 2010 Population and Housing Census, the municipality has a total population of 86,000 out of which males constitute 49.7% and females constituting 50.3%. Most of the economic and administrative activities are carried out at Nsawam. The main economic activity of the people in the municipality is bakery as it employed vast majority of the women, petty trading is also another common activity in the municipality as most people in the municipality are found to be indulged in buying and selling of items such as; food stuffs, clothes, electrical gadgets and a whole lot. It serves as the only referral health facility in the municipality for both public health facilities and private clinic in and around the municipality. It has departments such as Out Patients Department (OPD), Laboratory, Surgery, Medical, Accounts, Pharmacy, Maternity, Dental, Theatre, Public health, Hypertension clinic, Eye clinic, Diabetes clinic, Antenatal Care (ANC), Medical store and supply, General Administration, Laundry, Kitchen and Mortuary. The hospital run a 24

hours services and payment for healthcare delivery at the facility is either by a health insurance which majority of its patients have enrolled onto the National Health Insurance Scheme and direct out of pocket expenditure. Special clinics such as hypertension and the likes are mainly seen on Tuesdays and Wednesdays of every week. However, patients who visit the facility on days apart from the aforementioned days are given the necessary care but is on these days (Tuesdays and Wednesdays) where the hospital receives and attend to majority of patients with special cases. The municipality also host two reputable CHAG facilities namely Notre Dame Clinic and the Orthopedic Centre and other public health facilities such as Nsawam Health Centre, Djankrom Health Centre, Adoagyiri Health Centre and other health facilities spread throughout the municipality.

Available data retrieve from the health information system of Nsawam Government Hospital indicates that, as at the year ending for 2014, the hospital recorded a total of 5,564 cases of non communicable diseases out of which hypertension cases being 3,38 accounting for almost 60.80% of the total non communicable diseases. Again, in the year 2015, they recorded a total of 5,227 cases non communicable diseases out of which hypertension cases standing at 3,372 which is about 64.5% of the total non communicable disease. Further to that, in the year 2016, the hospital recorded a total of 8,822 cases of non communicable diseases out of which hypertension cases being 5, 123 cases accounting for approximately 58.07% of the total non communicable disease being reported at the hospital and a total of 2,326 cases of hypertension as at the end of the year 2017.

3.1.1 Inclusion Criteria

Patients aged 18 years and above attending Nsawam Government Hospital with hypertensive condition from 29th May to 13th June, 2018.

3.1.2 Exclusion Criteria

Patients who are below 18 years attending Nsawam Government hospital with hypertension, and hypertensives who were seriously ill to the extent that, they could not talk with the researcher and again, were not willing to give consent as far as this study was concerned.

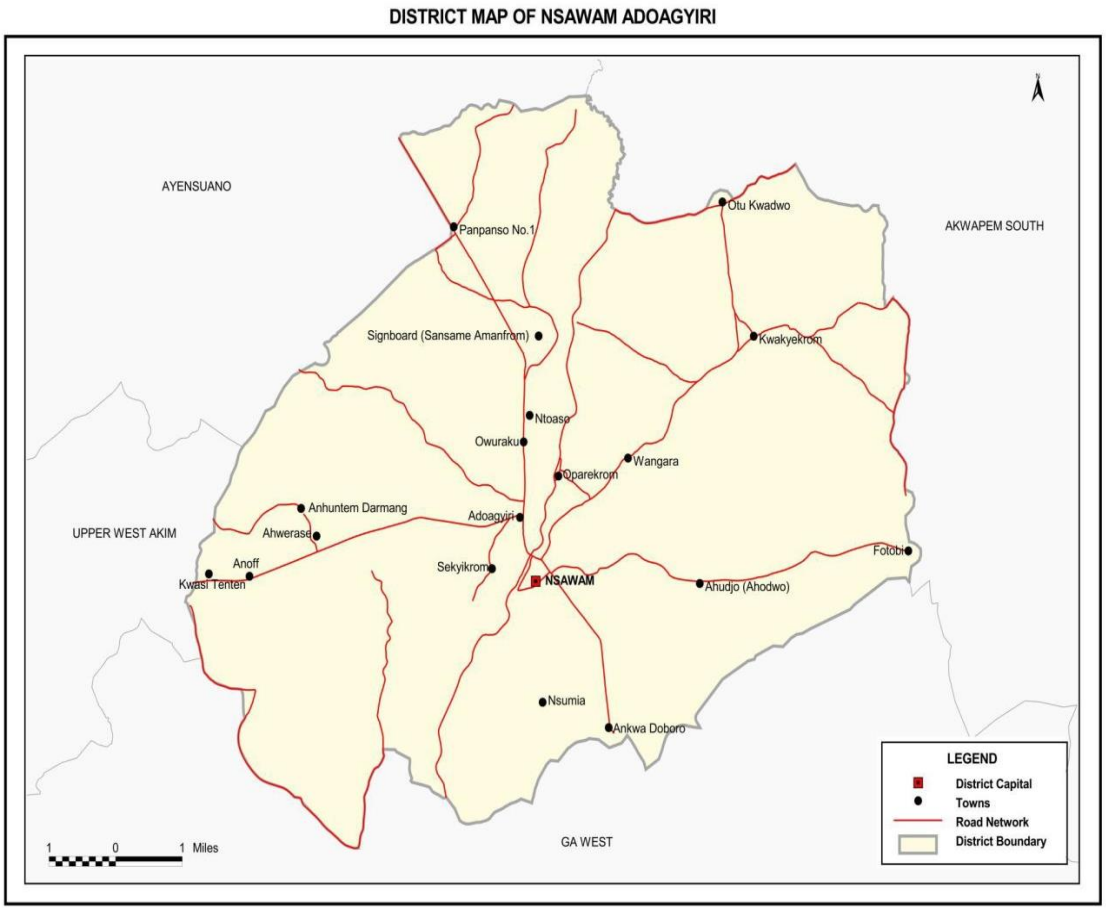

Figure 2 Map of Nsawam – Adoagyiri Municipal Assembly

3.2 Study Design

A descriptive Cross- sectional and Cost of Illness (COI) quantitative approach was used to solicit for information among individuals who have been diagnosed as hypertensive and are were receiving treatment at Nsawam Government Hospital from 29th May

2018 to 13th June, 2018. A systematic random sampling was used to recruit the study participants with a sample size of 202. Patient(s) were require to picked a card(s) numbered from 1 to 100, those who picked a prime number say 1, 3, 5 and others were selected randomly at the hypertensive which run every Tuesday and Wednesday at the hospital. That notwithstanding, patient who picked a prime number but were unwilling to participate in the study was replaced by a patient who picked an even number say 2, 4 and others and meet the inclusion criteria of the study at the period of conducting this study.

3.3 Sample Size

The proportion of the population studied was termed as the sample size. This was calculated using (Yamane, 1967) formula for known population with an assumption of 95% level of confidence.

The Yamane formula is given by:

$$n = \frac{N}{1+N(e^2)}$$

n = minimum sample size

N= population size

e= acceptable margin of error at 95% confidence interval

Substituting, $N = \frac{342}{1+342 \times (0.05 \times 0.05)}$

184.4 approximately 184

This number will be increased to 202 to make up for possible 10% non- response rate.

3.4 Study Variable

The dependent variable was, the economic burden of hypertension was composed of the summation of the direct cost, indirect cost and the intangible cost. However, the independent variables are those variable which could be manipulated and is also made up of the direct cost burden, indirect cost burden and the intangible cost burden. Table 1 depicts the various independent variables; direct cost burden, indirect cost burden and the intangible cost burden which were being incurred by individuals diagnosed as hypertensive which in one way or the other affect their households and family as a whole.

Table 1 Study Variables

TYPE OF COST	CATEGORY OF COST	DESCRIPTION OF COST
Direct cost	Medical cost	Cost of drugs Cost of consultation Cost of other treatment
	Non medical	Cost of travel Cost of food and drinks Other miscellaneous cost
Indirect cost	Productivity lost	Productivity lost as a result of absent from work
Intangible cost	Intangible costs	Pain Anxiety Depression Loss of social life

3.5 Quality Control

3.5.1 Training of Research Assistants

Four (4) research assistants were engaged in this study. They were required to have a minimum qualification of diploma. They were trained intensively for three (3) days on how to administer the questionnaire for quantitative data collection as well as the ethical guidelines involved in this study. Their training was focused on understanding the objectives of the study, the tool for data collection and evaluating the capacity of the research assistants with regards to their competence on the task assigned to them.

3.5.2 Pilot Study

To assess the comprehensiveness of the questionnaires, twenty copies were printed and administered at Notre Dame Clinic, Adoagyiri since the people in this community exhibit similar characteristics as the study site.

3.5.2.1 Supervising and Editing of Completed Questionnaire

The research assistants worked in collaboration with the study participant as far as data collection was concerned. They ensured that, any error made by study participant(s) with regards to the questionnaire was sorted out completely. However, after the research

assistants have submitted the questionnaires, the researcher checked carefully for any error before entering the data.

3.6 Data Collection Technique

A face to face interview was used to gather data from the respondents. Respondent(s) who cannot read were have the questionnaire read to them in a local dialect and their response(s) interpreted by the research assistant(s) with supervision of the Principal investigator.

3.7 Data Collection Tool

A structured questionnaire was used for data collection. Information collected include; demographic characteristics of respondents, data on cost burden of the disease condition which involved; the direct medical cost burden which was comprised of cost of drugs, cost of treatment and others. Direct non medical cost burden which was also composed of cost of travel and food. The indirect cost burden which was loss of productivity and data on the intangible cost burden which was on pain, depression, anxiety and loss of social life. Using the Likert scores on a scale of one to five, the study participants were made to assess their intangible cost burden. Table 2 shows summary of data collection tool and technique that was used in this study.

Table 2 Summary of Data Collection tool and data collection technique

Number	Specific objective	Variable	Data collection technique	Source of Data	Data collection tool
1	Determine the direct Cost burden of hypertension management	Direct Medical cost and direct non medical cost.	Face to face Interview	Nsawam Government Hospital	Structured questionnaire.
2	Determine the indirect cost burden of hypertension management	Loss of productivity	Face to face Interview	Nsawam Government Hospital	Structured questionnaire
3	Determine the intangible cost burden of hypertension management	Pain, anxiety, depression, and loss of social life.	Face to face Interview	Nsawam Government Hospital	Structured questionnaire

3.8 Data Entry

The questionnaires were coded and double entered into Microsoft Word 2013. Direct medical cost burden, direct non medical cost burden and intangible cost burden which was faced by hypertensive patients were estimated using the Microsoft Excel Version 2013 and STATA Version 15.

3.9 Data Analysis

3.9.1 Background Characteristics of Study Participants

The background characteristics of the study participants was obtained by cross tabulating sex with the above variables; age, educational status and marital status using STATA Version 15.

3.9.2 Estimation of Direct Cost

This was made up of the medical cost burden and non -medical cost burden. From the questionnaire, the medical cost includes; consultation fees, cost of drugs and cost of other treatment. The cost of consultation, medicines both those received from the hospital and those that were bought over the counter shops and diagnostics as a result of hypertension were enquired from the patients verbally or checked from the folders of the patient. All these were computed separately for patients with or without National Health Insurance Scheme and the average cost of visit where applicable was estimated and reported.

The non- medical cost also includes, cost of transport which covered the cost of conveying the patient(s) to and from the hospital for regular review. Tickets receipts and fares paid per visit was enquired from the patient(s) or caretaker(s) and total cost calculated. Food and consumable cost were estimated by estimating the cost of food, drinks as well as other consumables the patient(s) used during the period of attending at the hospital. The cost of each item or food which were used by the patients(s) was asked and total summed up.

The total direct cost was ascertained by summing all the components of the medical and non- medical cost expenses.

Table shows 3 the estimation approach for the direct medical and non- medical cost of this study.

Table 3 Estimation approach for direct medical and non medical cost

Type of cost	Category of cost	Cost estimation approach
Medical	Direct cost	Summation cost of consultation, drugs and diagnostic test(s) as a result of hypertension treatment.
Total medical cost	Direct cost	Summation of total cost of consultation, drugs and diagnostic test(s) as a result of hypertension treatment.
Non medical cost	Direct cost	Cost of food, drinks/ water, travel and others which the patient(s) and their accompanying caretaker incurred to and from the hospital during the period of seeking treatment.
Total non medical cost	Direct cost	Summation of all cost of travel, food/water and others which the patient(s) and their accompanying caretaker incurred during the period of seeking treatment.
Total direct cost	Direct	Summation of all estimated direct medical and non medical cost faced by the patient(s) and their accompanying caretaker as a result of seeking treatment.

3.9.3 Estimation of Indirect Cost

Indirect cost was calculated using the Human Capital Method which was used to ascertain the value of human capital as the present value of the patient's future earnings. This was obtained by multiplying the daily minimum wage rate by the number of days of workdays lost for the patients as well as his/ her caretaker(s). The productivity lost was therefore, valued using the 2018 national minimum wage in the country that is, GHS9.68 per day.

Table 4 Estimation of indirect cost

Number	Category	Cost estimation approach
1	Days lost to work by patient(s)	Summing the number of days employ patient(s) lost to work within the last 1 month.
2	Days lost to caregiver(s) who accompany the patient(s) to the hospital.	Summation of days lost to work, farm, school and others as a result of hospital visit within the last 1month.
3	Productivity lost due to travelling time.	Summation of total number of hours spent by the patient(s) as well as the caretaker(s) to seek treatment within the last one month.
4	Productivity lost due to waiting time.	Summation of the total number of hours spend by the patient(s) as well as the caretaker(s) as waiting to seek treatment within the last one month.
5	Total indirect cost	Overall summation of the valued productivity days lost by the employed participant(s) multiplied by the daily minimum wage.

3.9.4 Determination of Intangible Costs

The intangible cost to patient(s) was described using a Likert scale to score the domains of intangible cost burden. A five dimension Likert scale was used where patient(s) were asked to rate statement under each dimension as (1)' Not at all' (2) 'A little' (3)' Moderately' (4) 'Quite a bit' (5) 'Extremely' in respect of pain, anxiety, depression and loss of social life. The score of each domain of the intangible cost burden was used descriptively for patient(s). The mean of the responses for each dimension and their individual item under them was estimated for patient**(s).**

Table 5 Estimation of intangible cost

No	Domain	Scale	Score range
1	Frequent headache	1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	Score range is estimated by multiplying the number of question under this domain by the number of dimension.
2	General body pains	1. Not at all 2. A little 3. Moderately 4. Quite a bit **5.** Extremely	Score range is estimated by multiplying the number of questions under this domain by the number of dimension.
3	Worry in taking medications.	1. Not at all 2. A little 3. Moderately 4. Quite a bit **5.** Extremely	Score range is estimated by multiplying the number of question under this domain by the number of dimension**.**
4	Feel disturbed checking your blood pressure	1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	Score range is estimated by multiplying the number of question under this domain by the number of dimension
5	Fear of disease progression.	1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	Score range is estimated by multiplying the number of question under this domain by the number of dimension

6	Disturbed for changing your diet	1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	Score range is estimated by multiplying the number of question under this domain by the number of dimension
7	Feel depressed	1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	Score range is estimated by multiplying the number of question under this domain by the number of dimension
8	Easily becoming tired.	1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	Score range is estimated by multiplying the number of question under this domain by the number of dimension.
9	Loss of social Life	1. Not at all 2. A little 3. Moderately 4. Quite a bit **5.** Extremely	Score range is estimated by multiplying the number of question under this domain by the number of dimension.
Total			Summation of total score(s)
Range			Lowest- Highest range

Composite intangible Score

The composite score were obtained by summing up the dimensions in each domain and multiplying each by the number of question(s).

The composite scores was then re- classified into Low, Moderate and High intangible cost with the corresponding ranges using the descriptive statistics tertile approach. Table 6 above depict the composite intangible cost burden.

Table 6 Composite intangible score ranges

No	Dimension	Range
1	Low	9- 21
2	Moderate	22- 34
3	High	35- 45
Total	202	

Sensitivity Analysis

To ascertain the robustness of the study results, a sensitivity analysis was conducted on the disposable income (wage) and cost of antihypertensive drugs due to uncertainty in the values given by the study participants. The cost of drugs and the disposable income of the respondents were varied separately by increasing it by 5%, 7% and 10% which was used by the researcher. Also, a multi- variation was done by varying the cost of drugs and the disposable income by an increase of 5%, 7% and 10% respectively.

3.10 Ethical Considerations

3.10.1 Ethical Clearance

Ethical approval for the research was obtained from the Ghana Health Service Ethical Review Committee (Ethical Approval ID- **GHS-ERC: 030/02/18**) prior to the beginning of this study. An introductory letter was also collected from the department of health Policy, planning and management, School of Public Health to seek permission and approval from the Medical Director of Nsawam Government Hospital.

Further, informed consent was sought from patients diagnosed as hypertensive and were seeking treatment at the Nsawam Government Hospital who were willing to partake in this study.

3.10.2 Purpose of The Study

The purpose of this study was to estimate the economic burden of hypertension among patients attending Nsawam Government Hospital.

3.10.3 Potential Risk

This research will not pose any risk to either the study participants or the study area.

3.10.4 Potential Benefits

The study was to serve the interest of the people of Nsawam Adoagyiri Municipality and Ghana as a whole as it will help provide useful suggestions to policy makers on the cost burden of hypertension treatment to the individual and the need to allocate the necessary resources to help combat the disease and it associated costs.

3.10.5 Privacy

Respondent(s) response(s) as well as their identity were not disclosed to any third party.

3.10.6 Confidentiality

Response(s) given by respondents together with their names were coded and stored electronically with a password which was not disclosed to anyone.

3.10.7 Consenting Process

An introduction was done to mention the name of the researcher and the research assistant(s) to the participant(s) and the purpose of the study made known to them before they were allowed to participate in this study.

3.10.8 Voluntary Withdrawal

Written informed consent was given to study participant(s) before data was to be collected from them. Participation in this study was voluntary and participants who wished to opt out of this study could do so at their own discretion.

3.10.9 Compensation

Participant(s) of this study were not compensated.

3.10.10 Data Usage and Storage

Data files will be password protected. Hardcopies and electronic data were to be stored securely in a locked file cabinets without the names of participants and access however, was limited to the Principal Investigator and the supervisor.

3.10.11 Conflict of Interest

There was no conflict of interest as far as this study is concern.

3.11 Limitations of the Study

The valued productivity days lost as a result of presenteeism at work were not costed for the indirect cost which thus, makes the indirect cost reported in this study likely to be under estimated. Again, the intangible cost component which was a mix of pain, anxiety, depression and loss of social life were difficult to cost. However, this cost component were only described which there makes the total cost burden reported herein likely to be underestimated.

CHAPTER FOUR

4.0 Results

This chapter present the results of the study. It has been divided into section such as; demographic characteristics of the study participants, health status of the study participants, direct medical cost, indirect cost, total cost and intangible cost of hypertension management.

4.1 Background characteristics of study participants

Table 7 depicts the socio- demographic background characteristics of the study participants. The mean age for the study participants was 59years (95% CI: 57.82- 60.97) and majority 54% (109) were persons aged 60 years and above and the least 0.5% (1) being persons aged 20 to 29 years. In addition, females constitute the highest proportion of 73.8% (149) whereas, the males also accounted for 26.2% (53) of the patients being studied. Majority of the respondents 39.6% (80) had no formal education with the least 4.9% (10) were persons who had primary education. About 99.5% (201) were insured whereas, 0.5% (1) was uninsured.

In addition, majority 58% (117) of the respondents were married whereas, 15.8% (32) were not married. Majority of the patients 56.4% (114) were employed whereas, 31.7% (64) were not employed. For those employed, 94.7% (108) were informal sector employees whiles 5.3% (6) were formal sector employees with a mean monthly income of GHS288.66 (95%CI 254.66- 322.66). Majority of the respondents 70.3% (97) earned less GHS500 (US$108.4) whereas, about 3.6% (5) earn above GHS1,000 (US$216.92) a month. There was statistical significance in employment status and hypertension management.

The results is shown in Table 7.

Table 7 Socio demographic characteristics

Age group	Number	Percentage(%)
20- 29	1	0.5
30- 39	10	5.0
40- 49	24	11.9
50- 59	58	28.7
60 and above	109	54.0
Mean	59 (95% CI: 57.82- 60.97)	
Sex		
Male	53	26.2
Female	149	73.8
Level of education		
No education	80	39.6
Primary	10	4.9
Junior High School	25	12.4
SHS/ Vocational/ Technical	73	36.1
Tertiary	14	7.0
Marital Status		
Married	117	58.0
Not married	32	15.8
Widow/ widower	53	26.2
Employment Status		
Employed	114	56.4
Unemployed	64	31.7

Pensioner	24	11.9
Sector of working		
Formal	6	5.3
Informal	108	94.7
Monthly Income (GHS)		
<500	97	70.3
500-1,000	36	26.1
1,000 and above	5	3.6
Mean income(GHS) 288.66 (95% CI: 254.66- 322.66)		
Total monthly income(GHS) 58,310 (95% CI: 52,616.83- 64,003.17)		
Insurance Status		
Insured	201	99.5
Uninsured	1	0.5
Total	**202**	**100**

4.2 Health status of study participants

Duration of hypertension

Out of the total (202) patients who were interviewed for this study, the mean duration for which patients were being diagnosed and lived as hypertensive was 5 years. Majority 56.4% (114) were patients who had been diagnosed as hypertensive less 5 years, 39.6% (80) were persons who had been diagnosed as hypertensive from the past 5 – 19 years and 4% (8) where individuals who had been diagnosed as hypertensive from the past 20 – 34 years.

4.3 Direct Cost

The direct cost was made up of direct medical and non medical cost which the patients incurred in the course of seeking treatment. The direct medical cost burden was made up of cost of consultation, drugs and diagnostic test(s) as a result of hypertension while the direct non medical was also made up of cost of transportation, food, drink and water used by both the patient(s) and their accompanying caretaker during the period of seeking treatment. Again, the total direct cost for a monthy hospital visitation was estimated at GHS20,580.87 (US$4,464.40) with direct medical cost accounting for almost 82.4% with an estimated cost of GHS16,952.57 with a mean cost of GHS83.92 (95% CI: 74.69-93.07) whereas, direct non medical cost burden accounted for about 17.6% at an estimated cost of GHS3,628.30 (US$787.05) with a mean cost of GHS18.58 (95% CI: 16.16- 19.76). That notwithstanding, cost of drugs for a monthly hospital visitation was estimated at GHS9,613.18 with a mean cost of GHS47.59 (95% CI: 45.28- 49.88) the highest percentage of the direct medical cost responsible for approximately 46.7% of the total direct cost for a monthly hospital visitation. The results is shown in Table 8.

Table 8 Direct Cost

Cost Item	Cost(GHS)	Mean (GHS)	(95%CI)	Cost profile (%)
Direct Medical Cost				
Consultation	2,065.2	10.22	10.08- 10.28	10.0
Medicines	9,612.53	47.59	45.28- 49.88	46.7
Diagnostic test	5,274.84	62.06	44.95- 79.16	25.6
Sub total	**16,952.84 (US$3,677.41)***	**83.92**	**74.69- 93.07**	**82.4**
Direct Non Medical Cost				
Transportation	2,381.80	11.91	10.45- 13.37	11.6
Food	1,064.40	5.5	5.48-5.55	5.2
Drink/ water	182.10	1.15	0.82- 1.47	0.9
Sub total	**3,628.30 (US$787.05)***	**18.58**	**16.16- 19.76**	**17.6**
Total	**20,580.87 (US$4,464.40)***	**101.84**	**92.33- 111.4**	**100**

*GHS4.61 equivalent to US$1 (Bank of Ghana interbank exchange rate July, 2018)

4.4 Indirect Cost

The indirect cost which was lost to productivity was estimated using the Human capital approach. Out of the total 7,956.9hours which was lost to productivity during a monthly hospital visitation, about 7,771.3 productivity hours was lost as a result of waiting time at the hospital by the patients and their accompanying caretaker before they were called to see

a doctor whereas, 185.6 hours was used for travelling to and from the hospital by the patients and their accompanying caretaker. The total number of days absent from work for those employed was 901 days thus, valueing of the total productive days lost was based on the minimum wage in the country that is GHS9.68 per day. In that respect, the total valued productive days lost was estimated at GHS8,721.68 (US$1,891.90). Productive days lost was done for study participants who were employed however, that of the unemployed and pensioners were not costed. The results is depicted in Table 9.

Table 9 Indirect Cost

Productivity hours lost	**Number**	**Travel time (Hours)**	**Waiting time (Hours)**	**Total hours lost**
Employment Status				
Employed	114	134	7,443.4	7,577.4
Unemployed	64	38.6	233.7	272.3
Pensioners	24	13.0	94.2	107.2
Sub total	**202**	**185.6**	**7,771.3**	**7,956.9**
Productive days lost				
Item	**Days lost**		**Valued productive days lost(GHS)**	
Absent from work	901		8,721.68	
Total	**901**		**8,721.68 (US$1,891.90)***	

***GHS4.61 is equivalent US$1 (Bank of Ghana interbank exchange rate July, 2018)**

4.5 Total Cost

Out of the total cost of a monthly hospital visitation which was estimated at GHS 29,302.55 (US$6,356.30) with a mean total cost of GHS 145.06 (US$31.47), direct cost was estimated at GHS 20,580.87 (US$4,464.40) with a mean cost of GHS 101.89 (US$22.10) representing about 70.% of the total cost whereas, the indirect cost was estimated at GHS 8,721.68 (US$1,891.90) with a mean cost of GHS 43.18 (US$9.37) representing 30% of the total cost. The results is depicted in Table 10.

Table 10 Total Cost

Cost category	Cost valued (GHS)	Mean (GHS)	Cost profile (%)
Direct total cost	20,580.87 (US$4,464.40)	101.84	70
Indirect total cost	8,721.68 (US$1,891.90)	43.18	30
Total cost	**29,302.55 (US$6,356.30)**	**145.06**	**100**

*GHS4.61 equivalent US$1 (Bank of Ghana interbank exchange rate July, 2018)

Proportion of direct and indirect cost

From the total cost which was estimated at GHS 29,302.55 (US$6,360.30) direct cost accounts for approximately 70% of the total cost while, indirect cost accounted for 30% of the total cost. The results is depicted in Figure 3.

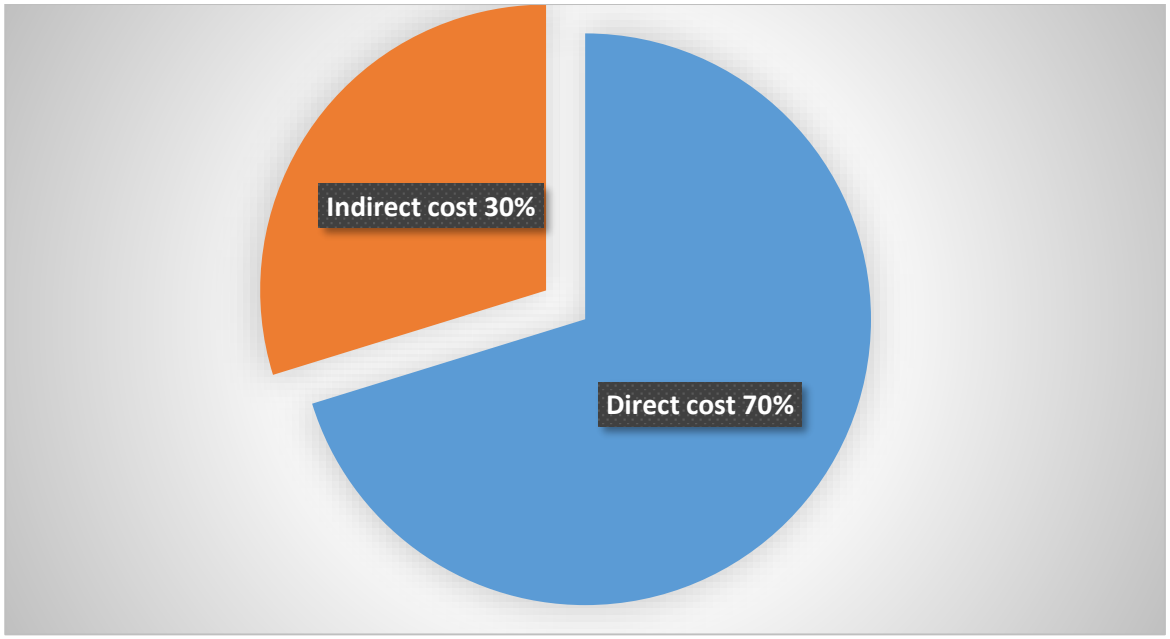

Figure 3 Proportion of direct and indirect cost

4.6 Sensitivity Analysis

To determine the robustness of the study results, a one way and two way sensitivity analysis were conducted on the cost of medicine and the monthly income of the respondents by changing the various cost components by an increasing them by 5%, 7% and 10% individually. In addition, an increase of the medicine cost component by 5%, 7% and 10% resulted in a percentage increase of 1.6%, 7% and 10% in the total cost burden whereas, an increase of the income component by 5%, 7% and 10% also lead to an increase of 10%,14% and 20% respectively in the total cost burden. That notwithstanding, an increase of the cost of medicine and income component by 5%, 7% and 10% also contributed to a percentage change of 11.6%, 16.2% and 23.2% respectively in the total cost burden. This indicates that, cost estimate for income and medicines are sensitive to changes. The results is depicted in Table 11.

Table 11 Sensitivity Analysis for Hypertension Treatment

Scenario	Cost component	% change in parameter	Total cost		% change in total cost
Base scenario			GHS	US$	
		0	29,302.55	6,356.30	00
One Way Sensitivity Analysis	Medicine	5	29,783.18	6,460.56	1.6
		7	31,353.73	6,801.24	7.0
		10	32,232.81	7,011.67	10.0
One Way Sensitivity Analysis	Income	5	32,218.05	6,988.73	10.0
		7	33,384.25	7,241.70	14.0
		10	35,133.55	7,621.16	20.0
Two Way Sensitivity Analysis	Medicine and income	5	32,698.68	7,092.99	11.6
		7	34,057.13	7,387.66	16.2
		10	36,094.80	7,829.67	23.2

4.7 Average Intangible Cost Domains

As depicted in figure 4, the patients had a high intangible cost score for experiencing regular body pains, frequent headache and easily becoming tired as a result of engaging in physical activities such as walking and engaging in daily household chores as against a low intangible cost score for feeling disturbed to check blood pressure, worrying in taking antihypertensive drugs on a regular basis and changing diet as a result of being hypertensive. The results is shown in Figure 4.

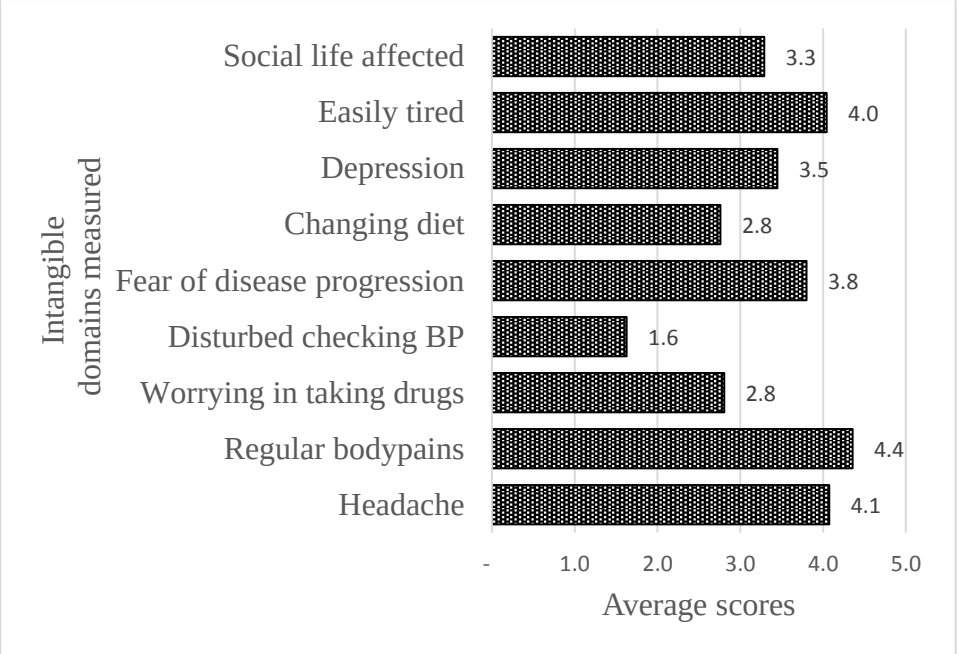

Figure 4 Average intangible domains

4.8 Composite intangible cost

Overall, as observed from figure 5, majority 55% (111) had a moderate intangible cost burden followed by 31% (62) who had a high intangible cost whereas, 14% (29) had a low intangible cost. The results is indicated in figure 5.

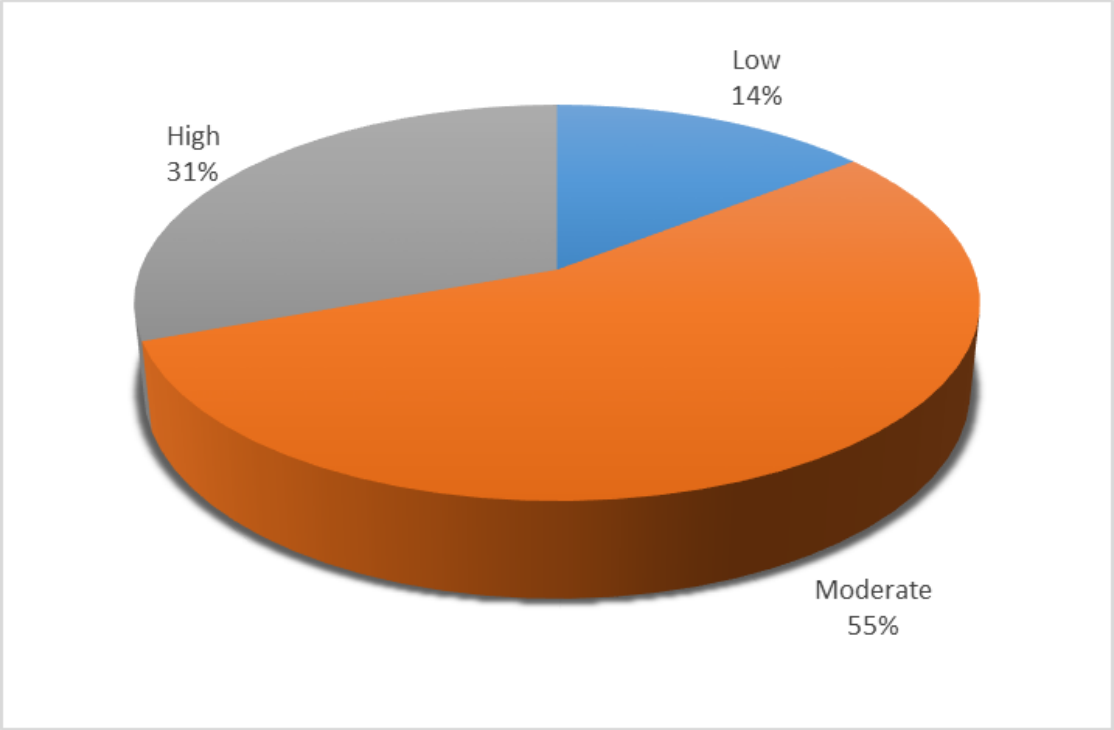

Figure 5 Composite Intangible Cost

CHAPTER FIVE

5.0 Discussion

This part highlight the discussions of this study. It is based on the objectives of this study as it relates to other published findings on the economic burden of hypertension.

Overall, patients aged less 40 years constitute about 5.4% (11), 40.6% (82) were patients aged from (40- 59) years whereas, approximately about 54% (109) were patients aged 60years and above. That notwithstanding, the mean age of this study was 59 years (95% CI: 57.8-61.0) thus, hypertension in this study was prevalent in persons aged 59 years and above. This is similar to findings by Divala et al. (2016) who hinted that, hypertension increases with age and as suggested by Buabeng & Plange- rhule (2004), who also noted that, about 40% of the Ghanaian populace aged 55 years and above are hypertensive.

Again, the mean monthly income from this study was GHS288.66 (95% CI: 254.66-322.66) and with a mean treatment cost of GHS145.06 per a monthly hospital visitation, and with a vast majority 94.7% (108) of the study participants being informal sector employees whom majority 70.3% (97) earned less GHS500 as against 3.6% (5) who earned GHS1,000 and above, it therefore suggest that, most of this study participants earned a scanty income, thus, treatment of disease condition becomes a burden to them. This agrees with a study by Hughes, Aboyade, Clark & Puoane (2013) who noted that, it is important to control hypertension but, the treatment and control of the disease condition largely depends on the income of the individual.

Direct cost

The total direct cost was estimated at GHS 20,580.87 (US$4,467.21) with a chunk of the direct cost component (46.7%), being attributed to medication which was estimated at GHS 9,612.53 (US$2,086.46) with a mean cost of GHS47.59 (95% CI: 45.28- 49.88) out of the total direct cost. This supports a study conducted in Italy by Ratajczak (2012), who suggested that, for the treatment of hypertension using the recommended antihypertensive prophylaxis for first line treatment, it accounts for almost 24- 77% of total direct cost. Similar view was made by Dib et al. (2010) who hinted that, in the United States, the cost of antihypertensive drugs represents almost 47.8% of the estimated direct total expenses for healthcare.

Again, the medical cost in this study was estimated at GHS16,952.57 (US$3,679.66) with a mean cost of GHS83.92 (95% CI: 74.69- 93.07), with almost 99.5% (201) of the respondents being subscribers of the National Health Insurance Scheme, it therefore suggest that, it will placed a burden on the National Health Insurance Scheme in reimbursing the hospital. This agrees with a study conducted by Sam & Geroy (2012) who noted that, in the Philippine, medical cost of hypertension and related morbidities serves as one of the largest component of health insurance reimbursement.

Indirect cost

The total productive days employed patients absent themselves from work was 901days with total indirect cost burden being estimated at GHS 8,721.68 (US$1,893.09) representing about 30% of the total cost burden borne by the patients and their accompanying caretaker to and from the hospital to seek treatment.

In addition, from table 9, out of the total estimated 7,956.9hours which was lost to productivity, 97.7% (7,771.3) hours was lost as a result of waiting time at the Out Patients Department by the patients and their accompanying caretaker before they were called to see a doctor and 2.3% (185.6) hours was lost as a result of travelling to and from the hospital by the patients and their accompanying caretaker. This agrees with findings by Dib et al. (2009) who hinted that, hypertension together with other known risk factors for cardiovascular diseases pose a serious burden on the nation productivity through absenteeism. Similar view was made by Krstović-spremo et al, (2014) who noted that, for employers, low productivity as a result of absenteeism and early retirement can have a negative repercussion on the economic growth. Likewise findings by Ekwueme, Trogdon, Khaviou & Guy (2016) observed that, it reduces the number of hours spent at work as acknowledge by WHO (2009), who indicated that, absenteeism of employees often compel employees to hire additional staff which this staff are required to be given in- service training to enable them become effective hence, leading to an increase in production cost and further hinted that, disease such as hypertension, HIV/AIDS and others force employees to retire early thus, leading to a reduction in the compulsory retirement age.

Further, from this study, almost 56.4% (114) were informal sector employees, who were earning a mean monthly income of GHS288.66 (US$62.62). This support a study by Krstović-spremo et al, (2014) which noted that, an employee with hypertensive condition are likely to stop work and hence, become unemployed which can translate into reducing the income earnings and savings of such affected persons.

Total Cost

The total cost was estimated at GHS29,302.55 (US$6,360.30), the direct cost forms a major cost profile (70%) which was estimated at GHS20,580.87 (US$4,467.21) as against the indirect cost which accounted for about 30% of the total cost burden. This agrees with a study conducted by Song et al.(2015), who suggested that in the United States of America, the direct medical cost account for a significant portion of the total cost of treating cardiovascular disease which hypertension has an association with the direct cost estimated at US$273billion as against US$172billion as the indirect medical cost.

Again, the total cost estimated in this study was estimated at GHS 29,302.55 (US$6,360.30). This goes contrary to a study by Balu and Iii (2018), who found that, the total cost of treating hypertension and its related complications to be estimated at US$ 15.0 billion to US$ 60.00 billion in the United States of America. This findings may be as a result of the contextual differences with respect to the setting in which the study was being carried out.

Intangible cost

The patients had a high intangible cost score for easily becoming tired for engaging in physical activities such as walking and engaging in daily household chores This relate to similar findings by Tagoe (2012) who established that, as an individual is unable to perform daily duties of him or her including the ability to care for himself or herself, it tends to a psychological situation which leads to isolation.

Above all, almost 99.5% of the patients had a health insurance which relived them from a bit of being downhearted as in where to go and solicit for financial assistance for the treatment of their disease condition, the overall intangible burden was moderate. This corroborate with a study by Calcagno et al.(2016) who observed that, people experience low quality of life when they do not have a health insurance.

The main constraints of this study was it inability to quantify the productivity lost due to presenteeism and premature deaths which were not acknowledged in the estimation of the indirect cost burden. It therefore suggest that, the indirect cost reported in this study are likely to be underestimated.

However, this study has help made a significant contribution to help cost the economic burden of hypertension which is forefront challenge to the health system of Ghana and other low and middle income countries.

It therefore suggest that, using this study to make an inference in the broader domain should be done with optimum caution.

CHAPTER SIX

6.0 Conclusions and Recommendations

This section reviews the importance and repercussion of the study and suggest feasible recommendations which intend to inform policy and other relevant stakeholders on the economic burden of hypertension and hence, the need to fight against the menace at Nsawam Municipality and Ghana as a whole.

6.1 Conclusion

Generally, hypertension increases with age and is very common among the elderly posing an enormous economic burden to patients with direct cost accounting for majority of the total treatment cost. Also, most patients reported moderate intangible cost associated with hypertension.

6.2 Recommendations

Based on the findings of this study, the following suggestions are therefore recommended;

1. Due to the high medical cost of managing hypertension, the National Health Insurance Scheme should consider if possible to absorb all the medical cost involved in the management of hypertension so as to help defray the high cost from the patients.
2. The management of the hospital should improve on its manual records system to help reduce long waiting hours.
3. The hypertension patient cost estimate could be used by Ghana Health Service to obtain a holistic overview of hypertension treatment cost to inform service delivery and hypertension advocacy.

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APPENDICES

APPENDIX A: INFORMATION SHEET.

This form was given to all the study participants to enable them abreast themselves with the objectives of this study before deciding to participate or not to participate in this study.

RESEARCH TITLE: **Economic Burden of Hypertension among Patients attending Nsawam Government Hospital in the Eastern Region.**

This research work was conducted by Offei Samuel, a student at the department of Health Policy, Planning and Management, School of Public Health, University of Ghana as part of the requirement for the award of Master of Public Health Degree.

This study seeks to determine the cost incurred by individuals who have been diagnosed hypertensive and are seeking treatment. A structured close – ended questions covering the objectives of the study was used for data collection. For participants who were enrolled on the National Health Insurance Scheme, the amount of money spent on medication, consultation and others were obtained from the hospital records. I expected to interview 202 hypertensive who were made up of those with or without complication(s) attending the hospital.

Information collected from participants were coded, no Name(s) were to be recorded. The study participants were at liberty to withdraw themselves from this study at their own free will. There was no risk, loss of benefits and others if a participant decides to withdraw from this study.

If you have any suggestions regarding this study, please do not hesitate to contact Offei Samuel on 0242646043 or Prof. Moses Aikins, School of Public Health, University of Ghana.

APPENDIX B: CONSENT FORM

Statement of person obtaining informed consent:

I have fully explained the research to ……. and have given enough information about this study including the risk and benefits to enable the participant(s) make an informed decision to participant or not.

DATE …… NAME …….

Statement of person giving consent:

I have read the information on the study have had it translated to a language I understand.

I have also talked to the interviewer to my fullest satisfaction. I have understood that participation in this study is not compulsory and thus, I can choose to withdraw from this study at my own wish without the need to explain myself.

I have received a copy of the information sheet and consent form to keep for myself.

NAME ……..

DATE…….

SIGNATURE/THUMBPRINT ……

Statement of person witnessing consent:

(**Witness Name**) do certified that, the information given to (**Name of Participant**) in the local dialect, is true from what I had from the study participation sheet attached.

WITNESS SIGNATURE/ THUMBPRINT ……

APPENDIX C: QUESTIONNAIRE

TOPIC**: ECONOMIC BURDEN OF HYPERTENSION AMONG PATIENTS ATTENDING NSAWAM GOVERNMENT HOSPITAL.**

Dear Respondent,

This is a study carried out in the Nsawam- Adoagyiri Municipality of Eastern Region. I will therefore like to take a few minutes of your precious time to answer these questions. You are assured that, answers you give will be kept confidential and your name(s) will not be mentioned in my research report, Thank you.

Question Number	Questions	Response(s)
	Respondent ID	
SECTION A	**SOCIO- DEMOGRAPHIC INFORMATION**	
1	What is your sex? 1. Male 2. Female	
2	What is your age as at last birthday?	
3	What is your highest level of education? 1. No education 2. Primary 3. Junior High School 4. Senior High/ Vocational/ Technical School 5. Tertiary	
4	What is your marital status? 1. Married 2. Not married 3. Widow 4. Widower	
5	What is your employment status? 1. Employed 2. Unemployed 3. Pensioner	

	4. Student	
6	If unemployed, why are you not working? 1. Unable to work due to illness 2. If other, please specify ……	⌊__⌋
7	If unemployed, have you been looking for job in the last 6 months? 1. Yes 2. No	⌊__⌋
8	If employed, in which of the sectors are you employed? 1. Formal sector 2. Informal sector	⌊__⌋
9	If employed, what is your average monthly disposable income?	**GHS** ⌊__⌋
10	For how long have you been diagnosed as hypertensive?	⌊__⌋ Month(s)
11	What is your insurance status? 1. Insured 2. Uninsured	⌊__⌋
12	Who pays for your hypertension treatment? 1. Myself 2. Relative 3. Employer 4. National Health Insurance 5. Private Health Insurance 6. If other please specify ……	⌊__⌋
SECTION B: DIRECT COST BURDEN INFORMATION		
13	How much did you spend/ pay during your last hospital visit in the past 2 months on?	**GHS**
	(a) Consultation	
	(b) Medicines/drugs	

	(c) Diagnostic test(s) as a result of hypertension	
14	How much did you spend/ pay for yourself and accompanying caretaker to the hospital on?	**GHS**
	(a) Travel	
	(b)Food	
	(c) Drinks/ water	
15	Do you rely on financial help from other source(s) for treatment apart from your disposable income? A. Yes B. No	|__|
16	If yes to Question 14, what are the source(s) A. Relative B. Friend C. Saving D. Loan E. If other, please specify ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	|__|
17	How much did you received from the identified source(s)	**GHS**
SECTION C: INDIRECT COST BURDEN INFORMATION		
18	How many days have you absent yourself from work in the last 1 month because of your illness?	|__|
19	How many minutes did you spend travelling from your house to the hospital?	|__|
20	How many minutes did you have to spend waiting before you were called to see the doctor or physician for treatment?	|__|
21	Did anyone accompany you from the house to the hospital? A. Yes B. No	|__|

22	If someone did accompany you to the hospital, what is his/ her employment status? A. Employed B. Unemployed C. Student D. Pensioner	⌊__⌋
23	Did the person who accompany you, come with you from the house and stay with you for treatment and take you back home? 1. Yes 2. No	⌊__⌋
24	If yes to Question 20, how many minutes/ hours in total did he/ she travel from and to with you to the hospital	⌊__⌋ minutes
25	If yes to Question 20, how many minutes/ hours in total did he/ she spend with you when you were receiving treatment at the hospital	⌊__⌋ minutes
26	Did someone in your household have to take care of you while ill? A. Yes B. No	⌊__⌋
27	If yes to Question 23, how many day(s) did he/ she have to take care of you?	⌊__⌋ Day(s)
28	If yes to Question 23, is he/ she employ A. Yes B. No	⌊__⌋
29	If yes to Question 25, in which of the sector? A. Formal sector B. Informal sector	⌊__⌋
SECTION D: INTANGIBLE COST BURDEN INFORMATION		
Please select the appropriate statements made below from "not at all" to "extremely" depending on how the statement/ condition applies to you.		

30	Have you been experiencing frequent headache after being diagnosed as hypertensive? 1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	⌊__⌋
31	Have you been encountering regular general body pains prior to being diagnosed as hypertensive? 1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	⌊__⌋
32	Do you worry taking two or more type of anti-hypertensive drugs on a daily basis? 1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	⌊__⌋
33	Do you feel disturbed having to check your blood pressure on a regular basis? 1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	⌊__⌋
34	Are you having fears that your hypertension condition will progress to disease(s) such as stroke and the likes? 1. Not at all 2. A little 3. Moderately	⌊__⌋

	4. Quite a bit 5. Extremely	
35	Do you feel disturbed for changing your diet as a result of being hypertensive? 1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	⌊__⌋
36	Do you feel depressed for being hypertensive? 1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	⌊__⌋
37	As a hypertensive patient, do you become tired as a result of engaging in physical activities such as walking and daily household chores? 1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	⌊__⌋
38	Has your hypertension condition affected your social life? 1. Not at all 2. A little 3. Moderately 4. Quite a bit 5. Extremely	⌊__⌋