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ECONOMIC COST AND COPING MECHANISMS FOR PROSTATE CANCER TREATMENT AMONG PATIENTS IN TWO SELECTED HOSPITALS IN ACCRA, GHANA

BY

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DECLARATION

I, Geoffrey Chizoba Madiebo Olivia declare that apart from references to other works that I have duly acknowledged, this report is a product of my own original work conducted under the supervision of Dr. Patricia Akweongo. I further declare that no part or whole of this dissertation has ever been submitted for the award of any academic credit at this University or any University in the world.

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DEDICATION

I dedicate this research report to my beloved family; Mrs Madiebo's family for their support and encouragement.

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ABSTRACT

Background: Prostate cancer is the second most frequent type of cancer among men and the rate is known to have increased about five times over the last 30 years. It was the sixth leading cause of cancer deaths among men, with over 1.1 million cases and 300,000 deaths estimated in 2012. Cost of cancer care is gradually increasing and it poses a significant financial burden to patients, even to those with health insurance. Currently the proportion of household cost incurred in managing prostate cancer in Ghana and the coping strategies households use to mitigate against cost of care is still unclear. This study sought to estimate the direct and indirect cost of Prostate Cancer among patients seeking treatment. The coping mechanism adopted by families to deal with the financial cost of Prostate Cancer treatment was also explored.

Methodology: This was a descriptive cross-sectional study design. The study employed a quantitative technique to estimate the economic cost using the cost of illness approach. A total of 137 prostate cancer patients participated in the study. Data were collected using a structured questionnaire. All analyses were performed using STATA 15 IC (Statacorp, College Station, Texas).

Results: The total estimated cost of prostate cancer both direct and indirect per month was GHS 226,779.1 (USD 43,631.2) with an average cost of GHS 1,655 (USD 316.5). The direct cost accounted for 95.4% of the total cost while the indirect cost accounted for 4.6%. The financial coping strategies used by patients to cope with the cost of prostate cancer included using savings (42.3%), borrowing money (9.6%), selling properties (9.5%), among others.

Conclusion: Prostate cancer management poses an economic burden to patients and their households and might serve as a barrier to access to the needed prostate cancer treatment services. Policies and programs are needed to tackle the economic burden associated with treatment of the disease.

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COI	Cost-of-illness
DALYs	Disability Adjusted Life Years
EBRT	External Beam Radiation Therapy
GHS	Ghana Health Service
GSS	Ghana Statistical Services
IHME	Institute of Health Metric and Evaluation
MoH	Ministry of Health
NHIS	National Health Insurance Scheme
PSA	Prostate-Specific Antigen
RP	Radical Prostatectomy
SSA	Sub-Saharan Africa
SSNIT	Social Security and National Insurance Trust
TNM	Tumor-node metastasis
USD	United States Dollar
WHO	World Health Organization

CHAPTER 1

1.0 INTRODUCTION

This chapter presents an overview of the study. This chapter is made of six sections. First of all is the background information of the study. The chapter then moves on to talk about the problem statement. The justification is then captured in section three. Section four talks about the objectives of the study as well as the research questions. The fifth section then focuses on the conceptual framework of the study. Finally, the last section presents an outline of the proposal.

1.1 Background

The global burden of cancer is enormous and increased to 18.1 million new cases in 2018 with 9.6 million deaths worldwide and it is estimated that one in 5 men and one in 6 women develop cancer in their lifetime (World Health Organisation, 2018). The World Health Organization (WHO) estimated that cancer is the first or second leading cause of death before the age of 70 in 91 countries with increasing incidence and mortality worldwide (Bray et al., 2018). There are different types of cancer some of which include lung cancer, breast cancer, prostate cancer, colon cancer, stomach cancer, liver cancer, among others (Bray et al., 2018). Cancer inflicts economic burden on society. The management and prevention of cancer comes along with major health-care cost (Luengo-Fernandez, Leal, Gray, & Sullivan, 2013).

In the USA, breast cancer for example is estimated to account for a substantive proportion of the healthcare budget which is about 1% of the total budget (Daroudi et al., 2015). The direct cost of cancer treatment is gradually increasing over time and it is in that light that Kim, Seo, Kim, Lee, & Jung, (2015) reported that the direct cost incurred for breast cancer in the year 2010 was 1.4 times greater (USD 399.2 million) than the cost in 2007 (USD 278.7) while direct non-medical costs increased from USD 50.69 million in 2007 to USD 75.83 million in 2010,

indicating a 49.6% increase. In the case of the indirect cost which encompasses loss in productivity as a result of the disease which affects not just the patient alone but caregivers and other people of concern, it was found to cost about USD16,442.30 for 56 patients (Gómez-Rico, Altagracia-martínez, Kravzov-jinich, Hinojosa-cruz, & Rubio-poo, 2009).

The second most frequent type of cancer in men is prostate cancer (World Health Organisation, 2018) and the rate is known to have increased about five times over the last 30 years, according to Czerw, Religioni, Deptala, & Fronczak, (2017) and was the sixth leading cause of cancer deaths among men, with over 1.1 million cases and 300,000 deaths estimated in 2012 (Adeloye et al., 2016). In 2018, the rate increased to about 1.3 million new cases with 359,000 deaths (Bray et al., 2018). About 42% of Prostate Cancer diagnosed cases occur in men over the ages of 50 years old and the most of them are often seen after 60 years old (Yousefi et al., 2017). Prostate cancer incidence is high in countries like Australia, New Zealand, North America, and the western and northern Europe and this could possibly be due to the frequent use of prostate-specific antigen (PSA) screening and biopsies in the regions (Asamoah et al., 2018).

The commonest cancer that has been reported among men in West Africa is prostate cancer and is near uniformly fatal, though at a lower incidence compared with western populations (Asamoah et al., 2018). The incidence of prostate cancer keeps on rising yearly and this is possibly due to the early detection using the prostate-specific antigen (PSA) blood test, increased awareness creation, increased lifespan and some environmental factors. With the ageing of the Ghanaian population, the burden of prostate cancer is likely to increase and this is associated with serious public health and economic implications. In Ghana, a total of 1,378,185 men are 50 years and above (GSS Ghana Statistical Service, 2013) and can be at a risk of prostate cancer, knowing that majority of prostate cancer cases are seen in men beyond 50 years (Yousefi et al., 2017).

In Sub-Saharan Africa (SSA) alone, Institute of Health Metric and Evaluation (IHME) estimated that Disability Adjusted Life Years (DALYs) from prostate cancer increased from 100,200 in 1990 to 219,700 in 2010 (Adeloye et al., 2016). Prostate Cancer treatment option include expectant management, external beam radiotherapy, brachytherapy and prostatectomy (Jung et al., 2013).

In Prostate cancer treatment, majority of the expenses are incurred in the first 6 months of treatment and it can be around $5000 per person and it includes medication cost, non-medical cost (travel, meals, etc.) and productivity loss (Gordon et al., 2017;Jayadevappa et al., 2010).

Economic burden relates to the loss of economic resources and opportunities due to disease (Drummond, Sculpher, Claxton, Stoddart, & Torrance, 2010). The economic burden of chronic diseases is enormous and prostate cancer is not an exception along with the physical, psychological and social pain it causes (Fattore et al., 2012).

The economic burden of prostate cancer involves the out of pocket money for medical cost, the effect on one's employment status and the financial burden on the caregiver. As the treatment of cancer lasts for a period of time, unexpected charges and cost may as well arise (Gordon et al., 2017). Most economic cost studies focus on the direct medical cost of prostate cancer. Nevertheless, it is estimated that more than 60% of the total cost of prostate cancer is accounted for by indirect cost which is as a result of loss of productivity, caregivers' resources spent and premature death (Jayadevappa et al., 2010).

The economic burden of prostate cancer is better understood when the direct cost resulting from the medical care and the indirect cost resulting from the loss of economic resources and opportunities associated with the disease; both perspectives are considered and are calculated (Daroudi et al., 2015). Households facing unpredicted illness that lowers their health status are often affected by both the payments for medical treatment and the income loss from an inability

to work. Also barriers to access to prostate cancer services, one of which is financial, needs to be assessed to help improve access to the needed care(Asamoah et al., 2018).

Majority of the literature available on prostate cancer and other cancers also in general focus on psychological coping mechanisms adopted by patients and caregivers in general. Some have reportedly been using behavioural disengagement, self-distraction and less positive social interaction support which are associated with poorer psychological adjustment (Mosher, Ott, Hanna, Jalal, & Champion, 2015). Others on the other hand will also definitely adhere to positive coping strategies like acceptance, humour, etc as a means of dealing with their distress. However, little has been done when it comes to investigating how patients and families cope with the economic burden of prostate cancer knowing for a fact that it is a chronic disease and not covered by National Health Insurance Scheme (NHIS) in Ghana (NHIS, 2018).

1.2 Problem statement

Prostate cancer, which is known to be the second most common type of carcinoma in men has increased enormously over the last 30 years. In 2009 alone, there were estimated 185 new prostate cancer cases diagnosed at the Korle Bu teaching hospital with an estimated 37 deaths (MoH, 2012). Prostate cancer may pose a significant burden on an individual's personal, work-life and economic situation and despite the growing body of evidence centred on prostate cancer diagnoses and treatment, there is still not clarity about the economic burden of those directly affected by prostate cancer. The average out-of-pocket expenditure on treatment prostate cancer for 15 months in Australia is reported to be AU$ 11, 077 even though it is covered by health insurance (Gordon et al., 2017). This translates into a monthly expenditure of AU$ 738.5. Cost of cancer care is gradually increasing and it poses a significant financial burden to patients, even to those with insurance. In Pennsylvania, a study reported that 25% of prostate cancer patients with insurance and seeking treatment used all or most of their

savings to deal with the disease while 33% were unable to pay cost associated with the treatment (Jung et al., 2013).

According to the poverty trend report in Ghana by Ghana Statistical Service, (2018), the proportion of Ghanaians living in poverty is 23.4%, that is living below the poverty line of GH¢ 1,314. Also, it was indicated that the proportion of Ghanaians in extreme poverty (that is living below a poverty line of GH¢ 792.2 per adult equivalent per year) is 8.2% with an estimate that 2.4 million people cannot afford the minimum required calories of 2,900 per adult equivalent per day even if they were to spend all their household expenditures on food. Moreover, it was indicated that families in which the family head is not working due to sickness or some other factor are shown to be poorer. The report further indicated that less than half (40.0% in urban areas and 31.0% in rural areas) of people who were sick were able to consult a doctor (GSS, 2018). This means that the larger proportion of those sick people could not access the needed health service and this could be attributed to the cost involved in the provision of the health services. Prostate cancer, however is not a disease that affect only the rich but can affect any man regardless of your economic class (Yousefi et al., 2017).

One in four families in developing countries in Africa resort to borrowing or selling assets, or both to fund for healthcare charges with higher rates of borrowing and selling used as coping strategies to the financial shock of medical bills in developing world as reported by national studies(Kruk, Goldmann, & Galea, 2009). Treatment of prostate cancer in Ghana is not covered under the National Health Insurance Scheme and as a result, patients cater for the cost themselves. Studies have shown that direct cost and out-of-pocket cost for health service further impoverish the poor and, on some occasions, exclude them from seeking health care. The lack of financial protection certainly leads to a reduction in quality of care, not seeking treatment and long-term poverty (Ewelukwa, Onoka, & Onwujekwe, 2013).

This study therefore sought to estimate the economic cost of prostate cancer and the coping strategies patients and households adopted in paying their treatment cost.

1.3 Justification

Prostate cancer is not covered by the National Health Insurance Scheme in Ghana. In a developing country like Ghana, cost involved in healthcare can be a barrier to access to the needed healthcare. Thus, the findings resulting from this study contributed to the current debate on including cancers like Prostate cancer in the National Health Insurance Scheme. The study established what proportion of household income and expenditure is spent by households on prostate cancers and this informed how many households may sink into poverty due to prostate cancers. It also may be used to inform policy makers how to plan and implement social support and equitable and sustainable health policies for cancer treatment.

1.4 Objectives of the Study

1.4.1 General objective

The general objective of the study is to estimate the economic cost and coping mechanisms for Prostate Cancer

1.4.2 Specific objectives

1. To estimate the direct cost of Prostate Cancer
2. To estimate the indirect cost of Prostate Cancer
3. To determine the coping mechanism for Prostate Cancer treatment

1.5 Research Questions

1. What is the direct cost of prostate cancer treatment?
2. What is the indirect cost of prostate cancer?

3. What coping mechanisms are used by patients and their families

1.6 Outline of the dissertation

This dissertation is made of six chapters. Chapter one presents the background, the problem statement, justification, objectives, and research questions. The chapter two presents related literature on the key concepts underlying the topic under review and conceptual framework underlying the study. The chapter three presents the methodology that would be used in the study. The chapter four presents results. The chapter five presents discussion. The chapter six presents conclusion and recommendation.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter presents detail insights into previous studies that have been conducted on prostate cancer, the economic cost of living with it and how various families cope with the shock of living with prostate cancer. The chapter informs the study and also provides information for examining the findings of the study in relation to other studies in the literature. The chapter constitutes seven sections. They include the aetiology and prevalence of prostate cancer, the cost of illness approach, direct cost of prostate cancer, indirect cost of prostate cancer, coping mechanisms for prostate cancer, prostate cancer financing mechanism in Ghana and lastly, the summary of the chapter.

2.1 Aetiology and prevalence of prostate cancer

Prostate cancer, the second leading cause of malignant death in men is on the rise in some parts of the world and a study conducted by Alvarez et al., (2018) reported that the incidence in Songkhla, Thailand has increased in the past decade from 2.5 in 1990 to 8.87 in 2013 per 100,000 person-years and further projected that the incidence will increase by two folds (to 16.4) in the next decade (by 2030). Similarly, the mortality rate had increased significantly from 0.8 in 1990 to 4.93 in 2013 deaths per 100,000 person-years and also projected that it may increase to 11 deaths by 2030 (Alvarez et al., 2018). It was indicated that the increase could be as a result of change in socio-demographic characteristics and lifestyle of the Thai populace. Nevertheless, it could also be due to a robust system that identifies prostate cancer cases and records data on it and awareness creation on it that results in people reporting to the health

facility to seek treatment when they see symptoms of the disease (Asamoah et al., 2018;Bray et al., 2018)

Known risk factors of prostate cancer has been categorized into two; major risk factors and risk factors with less clear effect. The major risk factors include drinking and smoking, lack of fresh fruits and vegetables in diet, geography, and family history of prostate cancer, genetic changes, race/ethnicity and one's occupation (Grönberg, 2004;Yousefi et al., 2017;American Cancer Society, 2018). Excessive use of micronutrients, oestrogens, obesity, sexual activity and sexually transmitted infections, vasectomy, prostatitis and long survival age are known to be risk factors with less clear effect (Grönberg, 2004;Yousefi et al., 2017). Poor diet, less physical activity, environmental factors, higher body mass index, smoking, reduced lycopene intake have been reported to be the predictors of prostate cancer in men(Alvarez et al., 2018).

Globally, Bray et al., (2018) reported the incidence of prostate cancer has risen to 1.3 million new cases in 2018 with 359,000 deaths making it the second most frequent cancer and fifth leading cause of all cancer deaths in men. They further indicated that it is highly diagnosed among men in the America, Northern and Western Europe, Australia/New Zealand and Sub-Saharan Africa. In USA, the American Cancer Society reported that in the year 2018, 164,690 new prostate cancer cases were recorded with 29,430 deaths (American Cancer Society, 2018). Incidence rate of prostate cancer in Africa varies across countries and a systematic review conducted by Adeloye et al., (2016) reported the overall pooled incidence of Prostate cancer in Africa to be 21.95 /100,000 population, with a median incidence of 19.47/100,000 population. In a report by Ministry of Health (MoH), Ghana (2012), it was reported that the incidence of prostate cancer is 200 per 100,000 persons and the reported risk factors were diet and physical activity, low fruit and vegetable intake, obesity, smoking and alcohol, occupational and environmental exposures (chemical and biological agents), other infections, among others.

2.1.1 Diagnosis

Prostate Cancer diagnosis can be made 5 to 10 years before the development of symptoms in this current Prostate-specific antigen era with patients usually asymptomatic or show symptoms of urinary voiding related to Prostate Cancer (Castillejos-molina & Gabilondo-navarro, 2016). In prostate cancer diagnosis, pushing, frequency, decreased urinary stream, urgency and vesical tenesmus are usually involved with advanced symptoms being bone pain, renal failure, haematuria, pathological bone fractures, physical exhaustion and weight loss (Welch & Albertsen, 2009;Heidenreich et al., 2014;Castillejos-molina & Gabilondo-navarro, 2016) . Prostate-specific antigen levels and digital rectal exam are mainly used to diagnose Prostate Cancer (Heidenreich et al., 2014). Other factors such as ejaculation, trauma (e.g. rectal, transurethral catheter placement), inflammation and infection (acute prostatitis) as well as prostatic hyperplasia can increase Prostate-specific antigen levels in the absence of Prostate Cancer (Castillejos-molina & Gabilondo-navarro, 2016).

2.1.2 Prostate biopsy

Prostate biopsy, a current standard for the diagnosis of prostate cancer has two main criteria for consideration: a suspicious digital rectal exam and Prostate-specific antigen result higher than 4 ng/ml obtained under suitable conditions and confirmed with two measurements at least three weeks apart (Heidenreich et al., 2014;Castillejos-molina & Gabilondo-navarro, 2016). Attention is given to the size of the prostate and the amount of Prostate-specific antigen. A small prostate with high Prostate-specific antigen for example is an indication of high possibility of Prostate Cancer. Informing patients about all the processes involved and the risks involved in treatment of Prostate Cancer is mostly necessary (Castillejos-molina & Gabilondo-navarro, 2016).

2.1.3Staging

The stage of the disease is very important and plays a vital role at the prognosis stage and therapeutic stage. The Tumor-node metastasis (TNM) scale is commonly used to classify clinical and pathological stages (Edge & Compton, 2010) and it evaluates Prostate-specific antigen levels, Gleason biopsy level and digital rectal exam categorise patients into 3 main groups (Edge & Compton, 2010;Heidenreich et al., 2014;Castillejos-molina & Gabilondo-navarro, 2016). The first is the low risk group (Gleason £ 6, PSA < 10 ng/mL and a stage of T1-T2a) with 83% 10-year survival rate. The next group is the intermediate risk (Gleason 7, PSA 10-20 ng/mL and T2b stage) with 46% 10-year survival rate. The third group is the high risk (Gleason 8-10, PSA > 20 ng/ml and a stage greater than T2c) with 26% 10-year survival rate (Castillejos-molina & Gabilondo-navarro, 2016). Figure 2 shows the various stages of prostate cancer.

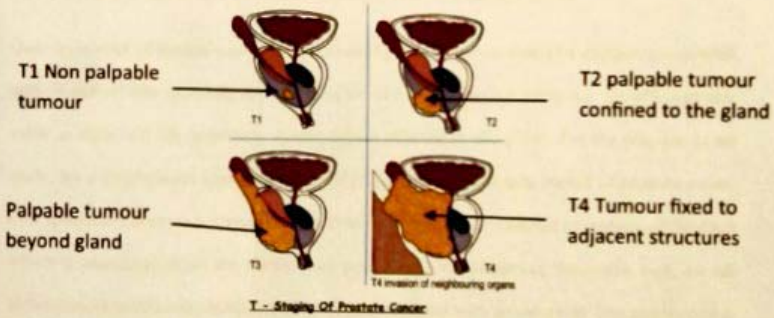

Figure 1: T-staging of Prostate Cancer

Source : (Yeboah et al., 2016).

2.1.4 Treatment

Prostate Cancer is a slowly developing disease and patients usually present it together with other diseases like hypertension, diabetes, and other non-communicable diseases. Various

treatment modalities exist, some common ones in Ghana include, radical prostatectomy, external beam radiotherapy, brachytherapy , neoadjuvant androgen deprivation therapy, neoadjuvant hormonal therapy, hormonal therapy, bilateral orchidectomy hormone therapy (Yeboah et al., 2016; Mayer-Foulkes, 2011; Nikolic, Stanciole, & Zaydman, 2011).

2.2 Cost of illness approach

Economists are consistently raising concern about Non- communicable diseases of which prostate cancer is part that it will result in long-term macroeconomic impacts on important areas like labour supply, Gross Domestic product and capital accumulation with developing countries set to experience the most severe consequences (Mayer-Foulkes, 2011; Nikolic, Stanciole, & Zaydman, 2011). Prostate cancer, as well as other non- communicable diseases have reduced the quality and quantity of labour force and human capital due to labour units lost as a result of mortality and cost of treatment (Mayer-Foulkes, 2011).

Quite a number of methods exists in determining the economic cost of a disease, some which include cost-of-illness (COI) approach, value of lost output: the economic growth approach, value of statistical life approach, among others (Bloom et al., 2011). For the purpose of this study, the cost-of-illness approach was used to capture the economic impact of prostate cancer. COI approach views cost of prostate cancer as the total cost of different categories of the direct which is concerned about the visible cost associated with diagnosis, treatment, care, etc and indirect costs which constitutes invisible costs associated with productivity loss and income as a result of disability or death (Bloom et al., 2011).

Cost-of-illness approach aims to evaluate the economic burden imposed by an illness on a society with regards to the consumption of healthcare resources and production losses (Tarricone, 2005). The cost-of-illness is better estimated by identifying the cost-generating components and monetary values which are opportunity costs attributed to them (Tarricone,

2005). Direct costs and indirect costs are the cost categories that are valued to determine the total economic cost of the illness.

By the use of economic theory, cost reflects the opportunity cost of administering a treatment and the valuation of healthcare resource use is better understood by using costs than charges because charges encompasses mark-ups and profit margins set by institutions for healthcare services provided (Sanyal, Aprikian, Chevalier, Cury, & Dragomir, 2013). It is in the light of this that this study focused on cost but not charges.

2.3 Direct cost of prostate cancer

The concept of direct cost represents the value of all goods and services as well as resources that are spent in the process of seeking healthcare, dealing with the side effects of treatment or other consequences of healthcare that may arise (Fryback & Craig, 2004). The out-of-pocket cost which is the direct non-medical care cost has to do with the costs that patients bear and pay for in the cause of his prostate cancer treatment and are usually not reimbursed (Jayadevappa et al., 2010).

Many people in developing countries have to pay for the total cost involved in seeking healthcare services due to the unavailability of publicly financed health services and this impoverish some families and also exclude some from seeking healthcare (Leive & Xu, 2008). Paying for healthcare services individually is required due to the fact that some diseases are not covered by pre-payment mechanisms like social health insurance (Leive & Xu, 2008; Ezeoke, Onwujekwe, & Uzochukwu, 2012)

In a study conducted by Jayadevappa et al.,(2010) in USA to analyse the out of pocket and indirect cost of prostate cancer patients on either radical prostatectomy (RP) or external beam radiation therapy (EBRT) using longitudinal methods, it was found out that at baseline, no difference existed across the two treatment groups. In 3 months' time, the expenses on out-of-

pocket increased for the Radical Prostatectomy group and decreased afterwards. Those in the EBRT therapy group reported increased out-of-pocket expenses at 3 months and remained unchanged over the 24-month follow-up period. Out-of-pocket expenses was higher in the RP group than the EBRT group at 6-months follow up. The mean medication costs for RP and EBRT group was $137 as against $57.2 at 3-month follow-up, at 6-month follow-up.

For the mean non-medication cost, $256 as against $380 at 12-month follow-up, and $141 as against $380 at 24-month follow-up. Total mean out-of-pocket and indirect costs for RP group and EBRT group were $757 as against $774 at 12-month follow-up, and $458 as against $871 at 24-month follow-up. Different state of prostate cancer illness comes along with different cost. A cross-sectional study that was conducted in Helsinki area in Finland by Torvinen, Färkkilä, Roine, Sintonen, & Saarto, (2016) among prostate cancer patients to assess the costs in different state of prostate cancer treatment reported that for a six month period, the following charges were identified: mean cost for primary (localised disease) treatment state was €2750, mean cost for rehabilitation (localised disease) treatment was €1143, mean cost for remission (localised disease) treatment was €760 and mean cost for metastatic treatment state was €7423. A systematic review on the costs of different radical prostatectomy approaches reported that cost for Minimally Invasive Radical Prostatectomy cost was expensive and ranged from $5,058 to $11,806 while costs for Retropubic Radical Prostatectomy was less expensive and ranged from $4,075 to $6,269 and Robot-assisted Laparoscopic Radical Prostatectomy was found to be the most expensive among all (Bolenz et al., 2014).

In Ghana, Yeboah, (2016) reported that the cost of Benign Prostatic Hyperplasia medications ranges from GH¢ 1,200 to GH¢ 2,200 for a year and the cost of simple prostatectomy is GH¢ 4,500. He further reported that the cost for radical prostatectomy or external beam radiotherapy ranges from GH¢ 5000 to GH¢ 6000, that of brachytherapy ranges from GH¢ 3000 to GH¢

32,000, hormonal therapy ranges from GH¢ 6,400 to GH¢ 12,400 and orchidectomy costs GH¢ 2,000.

Having indicated that 8.2% of Ghanaians are extremely poor (live below a poverty line of GH¢ 792.2 per adult equivalent per year) and an estimated 2.4 million people cannot afford the minimum required calories of 2,900 per adult equivalent per day (GSS, 2018), it interests the researcher to know the cost prostate cancer patients incur in treating their disease in this study and most importantly how they cope financially with the cost of the disease especially when everything is out-of-pocket payment. According to the above assertions on the different types of treatment and the cost range, it is an undeniable fact that the cost in any of the treatment types is more than the total amount of money a person living in extreme poverty lives on in a whole year. How then will such a person cope with the cope involved in seeking treatment when he suffers from prostate cancer? This is what the researcher sought to know in this study.

2.4 Indirect cost of prostate cancer

Indirect cost on the other hand makes emphasis on the costs on productivity due to period one was absent from work or retired earlier than he would have if not for his medical condition. It also comprises of lack of productivity at work (present but not productive) and impaired leisure activity (Fryback & Craig, 2004). The indirect cost of cancer as used here focuses more on the productivity loss as a result of the prostate cancer. It talks about the number of days a respondent was absent from work as a result of the condition and how early they stopped working than they would have if not for the diagnosis. In cases where someone needs to leave their work and take up the caretaker role, the number of days the caretaker was absent from work is also taken into account when talking about the indirect cost of prostate cancer as used in this work.

In a study conducted by Fattore et al.,(2012), among stroke patients in Italy which estimated the economic burden of stroke which is also a chronic disease, it was found that the productivity cost or production losses and cost of paid care as a result of the disease was €792 and €758 respectively per patient.

Gordon et al., (2017) conducted a study on the potential side effect on prostate cancer treatment in Australia and on the impact of prostate cancer on employment, they reported that one-quarter of the participants had chosen an early retirement and stopped work because of the prostate cancer diagnosis. Those who had retired were reported to retire on an average of 4-5 years before their actual retirement age which contributes to productivity loss. Those who were still working despite the diagnosis reported a reduction in working hours and others miss work because of their medical condition.

In the study that was conducted by Jayadevappa et al.,(2010) it was further indicated that at 3-months follow up, the total mean of indirect costs for radical prostatectomy group and external beam radiation therapy group were $4,795 as against $1,478, it became 341 as against $187 at 12-month follow-up, and at 24-months follow up, it was $128 as against $210. It was further reported that the indirect costs of prostate cancer in California due to premature mortality is estimated to be $180 million, equivalent to total direct costs of prostate cancer care (Jayadevappa et al.,2010) Similarly, Luengo-fernandez, Leal, Gray, & Sullivan,(2008) in their population-based study estimated the total cost of cancer in the European Union to be about €126 billion in 2009, and out of this, European Union health-care systems incurred €51 billion. However, the non-healthcare area accounted for 60% of the economic burden of cancer, with almost €43 billion in lost of productivity attributable to early mortality.

Intangible cost of prostate cancer

Intangible, also known as psychological cost basically talks about the pain and suffering associated to a disease and its treatment and affects health and wellbeing of the individual (Gyau, 2016). Prostate cancer diagnosis can be problematic for the patient and their household as well as caregivers and usually accompanied by depression and anxiety (Gordon et al., 2017). Psychosocial needs are often influenced by family and social circumstances, for example individuals caring for young children or elderly parents may need support to care for their dependents during treatment. Regular assessment of such needs may help to ensure they are met and that people are designated to appropriate support. Access to supportive and palliative care can improve the patient's experience, but patients often report that they were unaware of the psychosocial support services available (Gyau, 2016).

A longitudinal study conducted by Grunfeld et al., (2004) to determine the intangible cost of cancer found that similar proportions of caregivers (11%) and patients (12%) were depressed. Significantly more caregivers than patients were anxious, as reflected by both mean scores (8.4 v. 7.3, $p = 0.03$) and proportion of cases (35% v. 19%, $p = 0.009$). It was further reported that caregivers' depression and perceived burden increase as patients' functional status declines and strategies are needed to help reduce the psychosocial, occupational and economic burden associated with caregiving.

In this study however, intangible cost associated with prostate cancer was not a focus. This is because the study was interested in knowing the financial cost of prostate cancer among patients in the treatment seeking process and how they cope with the cost financially.

2.5 Coping mechanism for prostate cancer treatment

Experiencing prostate cancer may come along with a significant impact on one's personal life, work and financial situation (Gordon et al., 2017). With regard to this, one most important

thing is how individuals affected cope with the disease and the financial distress it comes along with. Coping mechanism as used entails the various ways in which shocks from the payment strategies used to pay for health services are responded to by various households e.g. borrowing, selling assets, depending on donations, use of own money, payment by subsidy/deferment/exemptions, etc. (Ewelukwa et al., 2013).

Healthcare financing strategy is mostly linked with household treatment seeking pattern and the coping strategies adopted can increase a household's susceptibility to impoverishment. In this regard, the World Health Organisation (WHO) estimated that households that use more than 40% of their non-food expenditure on healthcare treatment are likely to be impoverished and usually, the poor are most likely to be affected because they spend a substantive proportion of their income as compared to the wealthy families when they seek healthcare and sometimes this leads to the inequity in access to the needed healthcare services as the poor may not be able to afford the services being provided (Ezeoke, Onwujekwe, & Uzochukwu, 2012a).

A study conducted by Leive & Xu, (2008) in Africa to explore how people in different African countries (15 countries) cope with the out-of-pocket health systems payments found that in most countries, close to 30% of all the households financed out-of-pocket health expenditure by borrowing and almost 50% of those whose relative was hospitalized in the previous year borrowed to pay. Fewer households of the richest quintile sold assets or borrowed to pay for the cost of medical services as compared to those in the lowest quintile. The study further reported that in a country like Ghana, about 40% of the households that incur high level of inpatient spending are more likely to cope with the shock by selling assets and borrowing to pay for the cost involved. Another study conducted by Etiaba, Onwujekwe, Uzochukwu, & Adjagba (2015) in South-East Nigeria to investigate households coping mechanisms for expenditure on malaria treatment found that majority (79.5 %) of the households adopt use of savings as the main payment coping strategy followed by cutting down on other expenses

(22.5) as a payment coping strategy. Those who borrowed to pay were 5.5% of the total respondents.

Kruk, Goldmann, & Galea, (2009), reported that one in four families across forty developing countries borrowed or sold properties, or both, in order to generate money to finance for their health care and this is an indication that current health care financing strategies in low- and middle-income countries fail to protect many households from potential economic hardship, especially the poor. They further indicated that at the household level, high out-of-pocket payment for healthcare services and self-reported poor health were strongly associated with hardship financing which was as expected.

Sarma & Sivadasanpillai, (2012) also analysed different coping strategies among patients in India who paid for their healthcare services out-of-pocket and found loans were the predominant coping strategy and were not confined to any particular socio-economic strata. Fourteen per cent of them had financed their treatment exclusively from savings and out of this people, 70 per cent experienced catastrophic health expenditure. They further reported that 40% of the respondents financed their treatment solely from loans while 37% used a combination of loans, savings, gifts, insurance, *etc*. Out of the 17 participants (8%) who had 62%-98% of their Out of-Pocket Expenditure covered by health insurance, 6 participants (35%) experienced catastrophic health expenditure. Among daily-wage earners, 55 per cent were non-compliant, due to unaffordability of the treatment.

2.6 Prostate cancer financing mechanism in Ghana

Health service provision is advancing in Ghana and several social policies like the National Health Insurance Scheme has been implemented which ensures that patients registered enjoy free healthcare services when needed. This to some extent has increased accessibility to health services. However, cost involved in prostate cancer treatment is not covered under the National

Health Insurance Scheme despite the public health impact of the disease. This makes it a necessity for patients who suffer from the disease to pay for the cost involved in seeking healthcare due to the disease.

Several studies that have been conducted focused on the direct cost of prostate cancer treatment and used it to estimate the burden of the disease. However, to better understand the economic burden or the economic cost of a disease, the direct cost of the disease together with the indirect cost should be estimated. Not forgetting another important factor, which is the coping skills households adopt to manage the financial shock as a result of the cost involved in seeking healthcare. These give a clear picture the effect a disease has on a population.

This study therefore examines the economic cost of living with prostate cancer and the coping strategies patients and their households adopt to cater for the cost involved in seeking healthcare.

2.7 Conceptual framework

Economic cost of living with prostate cancer can be well estimated by looking at three main factors that contribute to the cost. First of all, is the direct cost of living with the illness. The direct cost comprises of both the medical and non-medical cost incurred. This cost usually comes as a result of payment for the services rendered at the health facility. These services include; drugs, consultation fee, laboratory charges, treatment charges, etc. while non-medical cost on the other hand encompasses all the charges (transportation, feeding, among others) incurred while seeking treatment that is not directly paying for the health service. These costs include, but not limited to transportation, food, drink, among others in the treatment process. There are times that someone needs to travel to a different city to seek medical care and they may need to stay there for a number of days and may need to lodge at a place which is a non-medical cost incurred. Looking at the various processes involved in the direct cost, it is likely

to increase the total cost of living with prostate cancer especially when it is known that the disease is not covered by NHIS in Ghana and all the direct costs involved are catered for by out-of- pocket payment (Gordon et al., 2017).

The second factor is the indirect cost of prostate cancer. The main indirect cost is on the loss of productivity as a result of time the patient was absent from work and the time the person was present at work but could not work. It also includes the time caregivers, family and friends take out of work in order to be with the patient. An estimated 60% of the total cost of prostate cancer is accounted for by indirect cost which is incurred due to of loss of productivity, caregivers' resources spent and premature death due to the disease (Jayadevappa et al., 2010). The socio-demographic characteristics of the patient will also have an effect on the economic cost as experienced by the person. One's location, economic status, type of work, etc will all contribute to the cost of living with cancer. People living in areas where the services are not available but need it might travel quite a distance to a place where the service can be accessed and this will increase the cost incurred.

After knowing the economic cost of prostate cancer, the next most important thing is how families cope with the financial cost. That is, the means by which they are able to raise the needed income to deal with the financial cost of the disease. An estimated one in four families in developing countries in Africa borrow or sell assets, or both to generate funds to pay for healthcare charges (Kruk et al., 2009). This higher rate of borrowing and selling is used as coping strategies to the financial shock of medical bills in developing world as reported by national studies(Kruk et al., 2009) Figure 1 gives and overview of the various factors and their relationship with each other.

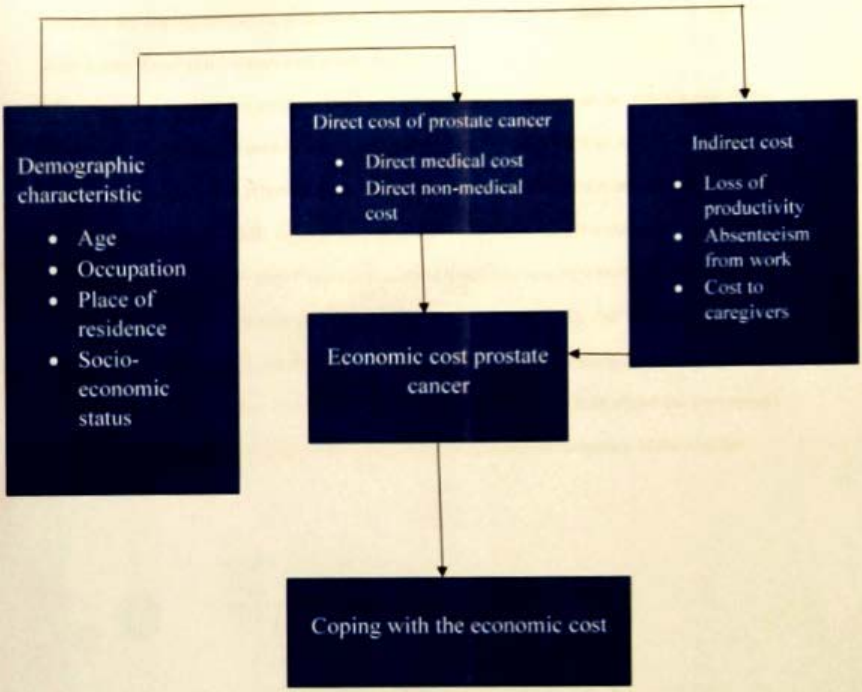

Figure 2:Conceptual framework on economic cost of prostate cancer and coping strategies

Source: Researcher's own conception

2.8 Conclusion

From the literature reviewed, it can be seen that prostate cancer comes along with cost which needs to be catered for by out-of-pocket payment. There have been some studies on cost involved in prostate cancer treatment but there is limited literature on how patients and their families cope financially with the treatment of prostate cancer. This study therefore sought to

examine the coping strategies patients and their families adopt in addition to what has been done on the direct and indirect cost of the disease.

This chapter examined the existing literature on the subject matter. In the section one of the chapter, the aetiology and prevalence of prostate cancer was presented as well as its diagnosis, prostate biopsy and other relevant information. The second section then presented the cost of illness approach to the study. Again, the third section then presented the direct cost of prostate cancer. The fourth section moved on to talk about the indirect cost of prostate cancer. The fifth section presented the evidence on financial coping mechanisms for out-of-pocket payment diseases and for that matter, prostate cancer. Moreover, the sixth section then captured prostate cancer financing mechanism in Ghana. The seventh section then talked about the conceptual framework of the study and lastly, the eighth section captured the summary of the chapter.

CHAPTER THREE

METHODS

3.0 Introduction

This section provides a detail description of the methods to be used for this study. The subtopics discussed include the philosophical perspective of the study, the research design, study area, study variables, study population, sample size, sampling procedure, data collection techniques and tools, quality control, pre-data collection stage, data processing and analysis, estimation of direct, indirect, intangible cost and statistical methods, ethical considerations, descriptions of subjects, potential risks and benefits and data usage and storage.

3.1 Philosophical perspective

Research philosophy refers to the way researchers develop knowledge especially in relation to how data should be collected, analysed and applied (Bajpai, 2011). Saunders, Lewis, & Thornhill, (2012) indicated that different types of research purposes, objectives and questions are linked with several research philosophies. They indicated that research philosophy should be the first consideration when conducting a research. According to Collins, (2010) positivism, interpretivism, pragmatism and realism are the various types of research philosophies. Positivism will therefore be used in this study. Positivism is as a philosophy that relies on the application of quantitative, deductive and objective ways to research (Novikov & Novikov 2013). Cresswell (2012) emphasises that positivist research depends on statistical analysis that is based on quantifiable data. Therefore, positivist research is more conducive for quantitative research hence its use in this study.

3.2 Study design

Descriptive cross-sectional study design was adopted for this research. The study employed quantitative technique for data collection. The descriptive data was used to estimate the economic cost and to determine the coping mechanisms of men who were seeking treatment at the selected health facilities adopt to deal with the cost involved. The study population was prostate cancer patients at the selected facilities and data was gathered between the period of May to July 2019.

3.3 Study area

The study was conducted in Accra Metropolis in the Greater Accra Region of Ghana which is the country's national capital. According to the 2010 population and housing census, there was an estimated 1,665,086 people living in the metropolis representing 42% of the region's total population (Ghana Statistical Service, 2014).

Geography and Demography

The Metropolis is comprised of diverse ethnic groups as people from different parts of the country come there for diverse reasons. Majority (51.9%) of the population are females and the rest (48.1%) are males (Ghana Statistical Service, 2014). It occupies a total land surface of 139.674 km^2. It shares border with Ga West Municipal to the north, La Dadekotopon to the east, Ga South Municipal to the west and the Gulf of Guinea to the south. Many educational facilities are situated in the region ranging from crèche to tertiary level.

Economy

The Accra Metropolitan Area is considered the economic hub of the Greater Accra region and the rest of Ghana (Ghana Statistical Service, 2014) and it is mainly due to availability of a lot of oil companies, manufacturing industries, telecommunication, education, tourism, financial institutions, health institutions, education and other important business entities. The numerous

business entities and organisations provide a range of employment opportunities for the residents of the region. A report by the Ghana Statistical Services indicates that the residents engage in occupations that fall under tertiary, secondary and primary sectors of the economy. The residents engage in employments such as construction, farming, fishing, manufacturing, services, among others. Due to the presence of these companies and job opportunities in the Metropolis, people are constantly migrating into the Metropolis (Ghana Statistical Service, 2014).

Health Provision and Personnel

Pehr, (2010) indicated that, there are 201 Community Health personnel, 283 clinics, 6 district hospitals, 28 health centres, 76 hospitals, 85 midwife/maternity hospitals, 13 polyclinics and 2 psychiatric hospitals situated in the Greater Accra Region of which Accra Metropolitan Assembly is the capital. Moreover, hospital beds that serve the health needs of the residents are about 1687 (Ghana Health Services, 2017). Additionally, there are about 1316 doctors. Also, there are 1882 community health nurses, 2288 enrolled nurses, 1135 midwives, 1259 medical officers, 184 pharmacist and 3243 registered general nurses; which makes a total of 9991 medical personnel. Specialists are also available in the Metropolis and for that matter the region who attend to special medical cases.

Study sites

Figure 3 shows a geographical map of the Accra Metropolitan Assembly.

Figure 3: Geographical map of Accra Metropolis

Source: 2010 Population and housing census.

Health facilities to be used

The study was conducted at two health facilities in Accra in the Greater Accra Region and samples was drawn from each facility. The health facilities used were Ridge Hospital and SSNIT hospital. These facilities were selected because they are facilities in the metropolis that actively treat prostate cancer patients.

Ridge hospital which is regarded as the main central healthcare facility in the Accra city has a 600-bed capacity and contains enhanced medical specialities some of which include imaging, maternity, day care, surgery, laboratory, among others. The hospital has a general out-patient department, accident and emergency department, diagnostic-imaging department, pharmacy/dispensary department, laboratory medicine, surgery department, among others. Various specialists are there including urologist.

The Social Security and National Insurance Trust hospital, also known as Trust hospital was first established as a non-for-profit health facility to provide healthcare for SSNIT staff and their dependents and was later upgraded to a full-fledged hospital to provide services to the general public. Services provided there include antenatal care, asthma clinic, cardiology, orthopaedics, imagery, laboratory, general surgery, neurosurgery, paediatrics, pharmacy, physician specialist, urology, among others. The Trust hospital is located at Angola Street Osu, Accra.

3.4 Study population

The study population were prostate cancer patients who were seeking care at the selected health facilities.

3.4.1 Inclusion and exclusion criteria

Inclusion criteria

Men of all ages with prostate cancer who were seeking care at the selected health facilities and were willing to participate in the study were included.

Exclusion criteria

All men with prostate cancer who were very sick and could not communicate and those who would not agree to participate were excluded from the study. First timers or those newly diagnosed were also excluded from the study.

3.5 Study variables

A study variable is defined as a characteristic that has quality or quantity and varies (Redman & Mory, 2009). The variables of the study were mainly continuous variables. Description of the various variables that were measured are indicated in Table 1 below. It also describes the components of the cost incurred in seeking treatment for Prostate cancer.

Table 1:Description of Study Variables

Variable	Categorization	Description	Scale of measurement
Socio-demographics	Socio-demographic characteristics of respondents	• Age • Highest education • Marital status • Socio-economic status (economic quintiles) • Occupation • Place of residence	Nominal and ordinal
Direct cost	Direct medical cost Direct non-medical cost	• Cost of drugs • Consultation fee • Laboratory fee • Cost of treatment • Travel cost • Food and other expenses	Ratio
Indirect cost	Productivity cost	• Absenteeism from work • number of hours present but couldn't work • Early retirement due to disease	Ratio
Coping strategies	Coping with the financial cost	• Paying from own saving • Paying with loan • Social support • Selling properties to pay • Availability of financial credit • Remittances from family and relatives	Nominal

3.6 Sample size

From previous research done on "Equity in Ghanaian Breast Cancer Treatment Outcomes" in the Komfo Anokye Teaching Hospital of Ashanti region in Ghana, the mean household expenditure on breast cancer care was GHS231 (SD= GHS127.5) (Niens *et al.*, 2014). With this study's outcome of interest being continuous variable, the sample size is calculated using the formula $n = \frac{\left(Z_{1-\frac{\alpha}{2}}\right)^2 \sigma^2}{e^2}$

At 95% confidence interval, $Z_{1-\frac{\alpha}{2}} = 1.96$

Standard deviation of the mean= GHS127.5

Error margin $e = 10\% \, of \, the \, mean \, cost = 23.1$

Substituting it in the formula, n=116

Based on a study conducted by Gyau, (2016) on Economic Burden of breast cancer in women in Ghana, a 10% non-response rate was adopted. Hence, 10% non-response rate =12

Therefore, n=116+12= 128

3.7 Sampling technique

A list of all Prostate cancer patients seeking care at the selected health facilities were obtained and their folder retrieved from the records department. Men who sought treatment for prostate cancer in May to July 2019 and were willing to partake in the study were eligible for selection. The number of prostate cancer attendances in each facility were obtained and used to divide the samples among facilities. Simple random sampling was used to select participants who were booked for treatment on clinic days within the period of data collection.

3.8 Data collection technique and tools

A quantitative data collection approach was used. Face to face interviews was done using structured questionnaires to collect data. The questionnaire had both open and closed ended questions covering relevant information on patients' demographic information, employment status, and occupation. Another aspect the questionnaire tackled was the cost incurred by patients as a result of the surgery done, therapy sessions, stage of diagnosis and duration of treatment and their time lost in a month to seek treatment (direct and indirect costs). The last section of the questionnaire was on the various means they coped financially and gather data on household expenditure to measure further socio-economic status.

3.9 Quality control

Several mechanisms were put in place to ensure and guarantee data accuracy and quality devoid of biases. These included training of research assistants, pre-testing of questionnaires and supervision of data entry and processing.

Pre-testing of questionnaire

The questionnaires were pre-tested by the investigator and with two research assistants before the actual administration was done. Pre-testing included men with Prostate cancer and their household members who accompanied them to a health facility outside the two selected facilities for the main study. All necessary corrections including clarity of questions, responses and vagueness of the tools as a result of the pre-testing were duly corrected.

Training of Research Assistants

Six research assistants who are knowledgeable in Prostate cancer and are fluent in Ga, Twi, Ewe and English were recruited and trained for the study. The training involved the explanation of questionnaires, ethics, how to seek informed consent from participants and how to administer the questionnaire to the participants who consented to participate in the study. They were also monitored on daily basis.

Data entry and processing

Data collected were validated, serialized and coded. Microsoft Excel 2016 database was used to enter data from each respondent and appropriate label name were assigned to each variable. Data were cross-checked for errors on hard copies to ensure correct entry of the variables. Completed questionnaires were entered daily after which data was cleaned.

3.10 Data processing and analysis

Each of the questionnaires that was administered to study participants were assigned a unique code. Microsoft Excel 2016 database was used to enter data from each respondent and appropriate label name was assigned to each variable. In addition, data entry was done on each day of data collection. Data was imported from excel and errors and missing values were thoroughly checked for. Data entered were scrutinised and cleaned and validated to ensure quality of data. Data from the answered questionnaires were coded and analysed based on objectives of the study. Descriptive statistics were used to analyse the data. Furthermore, tables and graphs were used to view the results comprehensively.

Total direct cost was estimated by summing up all the costs (direct medical and direct non-medical). The various elements under the direct cost include cost of drugs, consultation fee, laboratory fee, cost of treatment, travel cost, food and other expenses. They were all summed and mean direct cost was calculated out of it. The indirect cost was calculated using the human capital approach. Productivity loss was calculated using the national minimum wage of GH₵ 10.65. The indirect cost was estimated as the product of the number of days lost and the national minimum wage of GH₵10.65. The total indirect costs were summed and mean indirect cost calculated from it. In the event where a respondent was seriously ill and was unable to

participate in the study, another respondent from the sampling frame replaced him, therefore representing a 100% response rate

Sensitivity analysis is a type of analysis that determines how different values of an independent variable affect a particular dependent variable under a given set of assumptions (Kenton, 2018). In economic studies, uncertainties may arise due to the size of key inputs, lack of consensus about what value an input parameter should take, existence of sampling variability of parameters, lack of clarity on how estimates relates to different populations, etc. (Walker & Fox-rushby, 2001). Sensitivity analysis was done in order to explore the impact of uncertainty on the findings. The lack of sensitivity analysis in an economic study indicates poor quality while the presence of sensitivity analysis helps the researcher to evaluate the reliability of conclusions and also makes room for generalizability of findings to other contexts.

Sensitivity analysis was done to assess the robustness of the cost estimates. This was done by varying some of the key cost elements like cost of medication and income of patient to see if they had effect on the conclusion to be drawn from the analysis. One-way and Multi-way analysis were done by varying relevant cost elements that were selected due to uncertainty associated with them. Based on the study conducted by Gyau, (2016) on Economic Burden of breast cancer in women in Ghana, the test was done by increasing the cost elements by 3%, 5% and 7%. All analyses were performed using Stata 15 IC (Statacorp, College Station, Texas)

3.11. Ethical considerations

The ethical considerations in this study included the study approval, informed consent, privacy and confidentiality, voluntary participation and withdrawal, risks and benefits, and results dissemination. These have been explained below.

Ethical approval

Ethical clearance was obtained from the Ghana Health Service Ethics Review Committee with Ethical Review number as GHS-ERC 050/03/19. This gave the mandate to conduct the study.

Permission from the study sites

Permission was sought from the administration of the selected hospitals and upon approval, participants were selected and data was collected from participants in the selected facilities.

Informed Consent

The study purpose, various procedures involved in the study, rights of study participants, potential risks and benefits of participating in the study, and other necessary things in research were carefully explained to the participants. They were allowed to ask questions and raise concerns and all were answered and addressed to their satisfaction before they are being made to answer the questionnaire. Participants, upon agreeing to participate in the study were given written informed consent and allowed to read and sign before administering a questionnaire to them (the participants consent is shown in Appendix A).

Potential Risks and benefits

Minimal risk is involved in the study and may usually come as taking few minutes of participants' time to answer the questions, which might be a form of distress to the participants. The study findings may contribute to a robust policy on prostate cancer treatment. It will inform policy makers to plan and implement social support and equitable and sustainable health policies. All these were made known to the participants.

Privacy and confidentiality

Data obtained from study participants were kept confidential and used for academic purposes only. The results were presented and discussed without revealing the identities of the respondents and their responses.

Voluntary withdrawal

Study participants were not obliged to answer every question and were free to withdraw from the study at any time.

Data storage

Study materials, including written informed consent forms and questionnaires were locked in a secure cabinet at the completion of the study and the electronic copies were stored in a password protected database on the laptop of the principal investigator.
Study participants' information in the electronic database were only accessible to the principal investigator.

Results dissemination

The outcome of this study was made available to the study participants and the various stakeholders at the cancer treatment field and the policy makers in the country's health sector. The results will also be circulated through publications in scientific journals, presentation at conferences, workshops and symposiums.

Compensation

The participants were informed that there was no compensation given in this study as this study does not lead to any harmful effect.

CHAPTER FOUR

RESULTS

4.0 Introduction

The findings of the study based on the study objectives which seek to determine the direct cost and indirect cost of prostate cancer treatment and coping strategies adopted by patients to pay for the cost of treatment are presented in this chapter. The sections in the chapter include the socio-demographic characteristics of study participants, the direct cost of prostate cancer, the health status of the respondents, the indirect cost of prostate cancer, the sensitivity analysis and the coping strategies.

4.1 Socio-demographic characteristics

A total of 137 prostate cancer patients were sampled from two hospitals in Accra and all were interviewed, achieving a 100% response rate.

Table 1 represents the demographic characteristics of the study respondents. The mean age of the respondents was 67.6 years with a minimum age of 55 years and a maximum age of 85 years **(Table 1)**. About 46% (63) of the participants were between the ages 65 and 74 years while 15% (21) aged 75 years and above. Majority of the participants, 65% (89) were married. Majority of the survey respondents, 83.9% (115) were living with their families while only 16.1% (22) were living alone. Christians constituted 53.3 % (73) of the respondents while 29.9% (41) were Muslims. About 16.8% (23) belonged to other religions. About 46% (63) of the survey respondents attained tertiary level education. Twenty-six percent (36) of the respondents had Senior Secondary/High School or vocational educational level. The results of the study further showed that close to 60% (81) of the respondents are retired. Only 2.9% (4) of them were unemployed. A greater proportion 17.6% **(24)** were self-employed. An equal

proportion of 10.2%worked for a private sector or were self-employed (10.2%). Majority of the respondents, 81% (111) reported to have been on prostate cancer treatment for between 1 to 4 years and about 16.8% (23) reported to have been on treatment for between 4 to 8 years (Table 4.1). The average household expenditure among respondents for a month was GHS 2,450 (USD 468.50) with a minimum of GHS 658 (USD 114.30) and a maximum of GHS 9,860 (USD 1,885). This translates into a quarterly expenditure of GHS 7,350. (USD 1,405.30) with a minimum of GHS 1,974 (USD 343) and a maximum of GHS 29580 (USD 5,655). This further translates into an average yearly expenditure of GHS 29,400 (USD 5,621.40). About 59.8% (82) of the respondents' expenditure was above the average monthly expenditure. The average monthly income of the respondents was GHS 4,500 (USD 860.40). About 24.5% (13) of the participants fell into the lowest wealth quintile while 18.8 % (10) fall into the highest wealth quintile. More than half (58.5%) of them earned above the average monthly income. Table 2 gives an overview of the socio-demographic characteristics of the survey respondents.

Table 2: Socio-Demographic characteristics of participants

Characteristic	Number	Percentage
Age in years		
55-64	53	38.7
65-74	63	46
75 and above	21	15.3
Mean age = 67.6	Min= 55 max= 85	
Marital status		
Married	89	65.0
Divorced	19	13.8
Widowed	26	19.0
Co-habiting	1	0.7
Single	2	1.5
Living status		
Living with family	115	83.9
Living alone	22	16.1
Religion		
Christian	73	53.3
Muslim	41	29.9
Other	23	16.8
Educational level		
No formal education	2	1.5
Primary level	8	5.8
Middle/JHS/JSS	28	20.4
SSS/SHS/Tech/Vocational	36	26.3
Tertiary	63	46.0
Employment status		
Self-employed	24	17.6
Private sector	14	10.2
Public sector	14	10.2
Unemployed	4	2.9
Retired	81	59.1
Income quintile		
GHS ~~1,000~~ 1,000 – 3,500	13	24.5
GHS 4,000 – 4,400	9	17.0
GHS 4,500 – 6,000	18	34.0
GHS 7, 000 – 8,000	3	5.7
GHS ~~9,000 and~~9,000 and above	10	18.8
Median = GHS 4,500	Min= 1,000 Max= 34,000	

Expenditure quintile		
GHS 598 – 1,675	28	20.4
GHS 1,690 – 2,210	27	19.8
GHS 2,237 – 2,577	28	20.4
GHS 2,600 – 2,925	28	20.4
GHS 2,928 and above	26	19.0
Median = 2,450	Min=598 Max=9,860	
Number of years on prostate cancer treatment		
1 to 4	111	81.0
5 to 8	23	16.8
9 and above	3	2.2
Mean=3.2	Min= 1 Max=12	

US$1.00 equivalent to GHS 5.23 (Bank of Ghana average monthly interbank exchange rate, July 2019)

4.2 Health status of Respondents

Given that most participants had been on treatment between 1 and 4 years (81%), the findings of the study showed that the participants were diagnosed of prostate cancer at various clinical stages. Most of them, 43.8 % (60) were diagnosed at clinical stage 3. About 29.9% (41) were diagnosed at clinical stage 2. Those that were diagnosed at late stage were 13.9% (19) and 12.4% (17) at clinical stages 4 and 1 respectively. Figure 4 shows the clinical stages of the disease among the respondents.

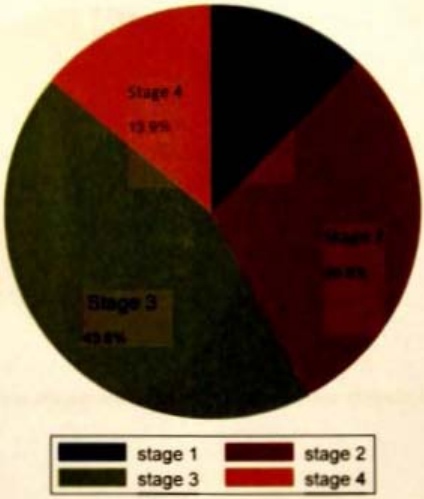

Figure 4: Clinical stage of Prostate cancer among Respondents

The findings of the study further showed that 36.5% (50) of the survey respondents were suffering from other chronic diseases. Among those who reported to be suffering from other chronic diseases, 52% (26) were found to be suffering from diabetes while the remaining reported to be suffering from hypertension. Twelve percent (6) reported suffering from both diabetes and hypertension which is a triple burden.

Figure 5 shows the proportion of the respondents who were found to be suffering from other chronic diseases.

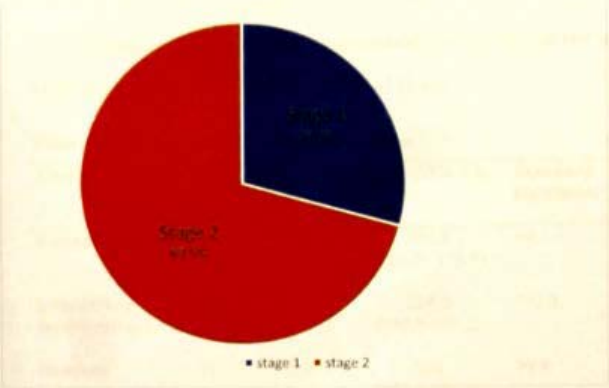

Figure 5: Proportion of respondents suffering from other chronic diseases aside Prostate Cancer

4.3 Direct Cost

The average household expenditure for respondents was reported as with a minimum of GHS 1,974 (USD 343.0) and a maximum of GHS 29,580 (USD 5,655.80) quarterly. Thus, in calculating the costs of prostate cancer care, the direct cost was made up of two cost components namely direct medical and direct non-medical cost components incurred by prostate cancer respondents every 3 months for treatment and further translated into a monthly cost.

4.3.1 Direct medical cost

The cost elements that made up the direct medical cost were consultation, laboratory, imaging, hospitalization, surgery, drugs and other costs incurred by respondents. Table 3 presents the direct medical cost incurred by prostate cancer patients every 3 months. The estimated total direct medical cost was GHS 643,804 (USD 123,098.30) with a mean cost of GHS 4,633.60 (USD 886) (95% CI 3206.4, 6060.80) and the standard deviation of 8,447.30. The direct medical cost translates into a mean monthly cost of GHS 1,544.50 (USD 295.30). The cost

variable that made the largest of the direct medical cost was surgical cost with a cost profile of 44.9% followed by drugs with a cost profile of 38.4%.

Table 3: Direct medical cost of prostate cancer

Cost variable	N	Cost (GHS)	Mean (95% CI)	Standard Deviation	Cost Profile (%)	Min –Max Cost (GHS)	
Consultation	83	11,970	144.2 (134.5 - 153.9)	44.5	1.9	50	165
Laboratory investigations	63	33,014	524.0 (389.9-658.2)	532.8	5.2	40	2000
Imaging	34	5,440	160 (134.6-185.4)	72.9	0.9	80	360
Hospitalization	38	55,230	1,453.4 (1119.8-1787.0)	1,014.9	8.7	240	4200
Cost of Surgery	22	285,320	12,969.1 (6647.2-19291.0)	14,258.7	44.9	600	48000
Drugs	137	243,530	1,777.6 (1663.7-1891.5)	647.1	38.4	100	5000
Total	137	634,804	4,633.6 (3206.4-6060.8)	8447.3	100	1130	57145

US$1.00 equivalent to GHS 5.23 (Bank of Ghana average monthly interbank exchange rate, July 2019)

4.3.2 Direct non-medical

The direct non-medical cost was made up of charges on transportation, food and drink that prostate cancer patients incur when coming for their review every 3 months. The total direct non-medical cost was GHS 14,201 (USD 2,715.30) with a mean cost GHS 103.70 (USD 19.80). This translates into a monthly mean cost of GHS 34.60 (USD 6.60). The bulk of the cost under this component was on transportation which had a cost profile of 72.7% followed by food with a cost profile of 21.9%. The cost on drink was the least with a cost profile of 5.4%. Table 4 presents the direct non-medical cost of prostate cancer.

Table 4: Direct non-medical cost of Prostate cancer

Cost variable	N	Cost (GHS)	Mean (95% CI)	Standard Deviation	Cost Profile (%)	Min –Max Cost (GHS)
Transportation	137	10,322	75.3 (59.0-91.7)	96.5	72.7	10 700
Food	78	3,110	39.9 (33.1-46.6)	29.9	21.9	10 170
Drink	109	769	7.1 (6.0-8.1)	5.7	5.4	1 30
Total	137	14,201	103.7 (83.2-124.1)	121.1	100	20 900

US$1.00 equivalent to GHS 5.23 (Bank of Ghana average monthly interbank exchange rate, July 2019)

4.3.3 Total direct cost of Prostate Cancer

The total direct cost of prostate cancer comprised the direct medical plus the direct non-medical costs. The total direct cost of prostate cancer for a three-month period was GHS 649,005 (USD 124, 092.70) with a mean cost of GHS 4,737.30 (USD 905.80). This translates into a monthly mean cost of GHS 1,579.10 (USD 301.90). The direct medical cost made up the bulk of the direct cost with a total cost of GHS 643,804 (USD 123,098.30), a mean of GHS 4,633.60 (USD 886) for the three-month period and a cost profile of 97.8%. The direct non-medical cost had a cost profile of 2.2% with a total cost of GHS 14,201 (USD 2,715.30) and a mean cost of GHS 103.70 (USD 19.80) for the three-month period. Table 5 presents the total direct cost of prostate cancer.

Table 5: Total direct cost of prostate cancer

Cost variable	N	Cost (GHS)	Mean (95% CI)	Standard Deviation	Cost Profile (%)	Min –Max Cost (GHS)
Direct medical						
Consultation	83	11,970	144.2 (134.5 - 153.9)	44.5	1.8	50 165
Laboratory investigations	63	33,014	524.0 (389.9-658.2)	532.8	5.1	40 2000
Imaging	34	5,440	160 (134.6-185.4)	72.9	0.8	80 360
Hospitalization	38	55,230	1,453.4 (1119.8-1787.0)	1,014.9	8.5	240 4200
Cost of Surgery	22	285,320	12,969.1 (6647.2-19291.0)	14,258.7	44.0	600 48000
Drugs	137	243,530	1,777.6 (1663.7-1891.5)	647.1	37.5	100 5000
Subtotal (GHS)	137	634,804	4,633.6 (3206.4-6060.8)	8447.3	97.8	1130 57145
Direct non-medical						
Transportation	137	10,322	75.3 (59.0-91.7)	96.5	1.6	10 700
Food	78	3,110	39.9 (33.1-46.6)	29.9	0.5	10 170
Drink	109	769	7.1 (6.0-8.1)	5.7	0.1	1 30
Subtotal (GHS)	137	14,201	103.7 (83.2-124.1)	121.1	2.2	20 900
Total Direct cost	137	649,005	4,737.3 (3,305.9-6,168.7)	8,472.2	100	1,192 57,230

US$1.00 equivalent to GHS 5.23 (Bank of Ghana average monthly interbank exchange rate, July 2019)

4.4 Indirect cost incurred for Prostate Cancer

The indirect cost was estimated as productive days lost due to prostate cancer and its treatment. The cost variables under this component were number of days patients absented themselves from work due to the disease, number of days they were present at work but could not work well due to the disease, days lost due to early retirement because of the disease and days caregiver or relative absented themselves from work to escort the patient to the hospital. The total indirect cost of prostate cancer due to loss in productivity was GHS 31,332.40 (USD 5,990.90) with a mean of GHS 228.70 (USD 47.30). This translates into a monthly mean cost of GHS 76.20 (USD 15.80). Out of the total of 2,942 productive days lost, the bulk of it (2,640 days) was early retirement due to the disease and accounted for a cost of GHS 28,116 (USD 5,375.90) with a mean of GHS 4,686 (USD 896) and a cost profile of 89.7%. The cost variable with the least cost was productive days lost as a result of respondent present at work but not able work well due to the disease which had a cost profile of 0.7%. Table 6 presents the indirect cost of prostate cancer.

Table 6: Indirect cost of prostate cancer

Cost variable	N	Productive days lost		Valued productive days lost (GHS)		
		Days lost	Average days lost	Sum	Mean	Cost profile (%)
Absent from work	23	113	4.9	1,203.5	52.3	3.8
Present at work but couldn't work well	6	18	3	191.7	32	0.7
Early retirement because of disease	6	2,640	440	28,116	4,686	89.7
Care giver or relative absent from work	46	171	3.7	1,821.2	39.6	5.8
Total indirect cost	137	2,942	21.5	31,332.4	228.7	100

US$1.00 equivalent to GHS 5.23 (Bank of Ghana average monthly interbank exchange rate, July 2019)

4.5 Total cost of prostate cancer

The total cost of prostate cancer treatment was made up the direct cost and indirect cost of prostate cancer. The total cost was GHS 680,337.40 (USD 130,083.60) with a mean cost of GHS 4,966 (USD 949.50). This translates into a mean cost of GHS 1,655 (USD 316.50). The direct cost made up bulk of the prostate cancer cost with a total cost of GHS 649,005 (USD 124,092.70), a mean of GHS 4,737.30 (USD 905.80) and a cost profile of 95.4%. The indirect cost had a cost profile of 4.6% with a total cost of GHS 31,332.40 (USD 5,990.90) and a mean of GHS 228.70 (USD 47.30). Table 7 presents the total cost of prostate cancer treatment.

Table 7: Total cost prostate cancer

Cost variable	N	Cost (GHS)	Mean cost	Cost Profile (%)
Direct medical				
Consultation	83	11,970	144.2	1.8
Laboratory investigation	63	33,014	524.0	4.9
Imaging	34	5,440	160	0.8
Hospitalization	38	55,230	1,453.4	8.1
Cost of Surgery	22	285,320	12,969.1	41.9
Drugs	137	243,530	1,777.6	35.8
Subtotal (GHS)	**137**	**634,804**	**4,633.6**	**93.3**
Direct non-medical				
Transportation	137	10,322	75.3	1.5
Food	78	3,110	39.9	0.5
Drink	109	769	7.1	0.1
Subtotal (GHS)	**137**	**14,201**	**103.7**	**2.1**
Total Direct cost	**137**	**649,005**	**4,737.3**	**95.4**
Indirect cost				
Time lost due to absenteeism from work	23	1,203.5	52.3	0.2
Time lost due to Present at work but could not work well	6	191.7	32	0.0
Time lost due to Early retirement because of disease	6	28,116	4686	4.1
Time lost due to Care giver or relative absent from work	46	1,821.2	39.6	0.3
Total indirect cost	**137**	**31,332.4**	**228.7**	**4.6**
Total cost (GHS)	**137**	**680,337.4**	**4,966**	**100**

4.6 Sensitivity analysis

The sensitivity analysis was done to quantify the uncertainties and robustness of the cost estimates. The test was performed on drugs and wage rates. This is mainly due to the uncertainties in the respondents' estimated cost values. Univariate (One-way) and Multivariate (Two-way) sensitivity analysis was employed. The One-way sensitivity analysis was first employed by varying the cost variables (drugs and wage rate) individually by 3%, 5% and 7%. The choice of range was borrowed from a study conducted by Gyau, (2016) on Economic burden of prostate cancer.

The One-way analysis conducted by varying the cost of drugs by 3%, 5% and 7% resulted in an increment of total cost of prostate cancer management by 1.1%, 1.8% and 2.5% respectively. When the same analysis was performed using the wage rate, it resulted in an increment of total cost of prostate cancer by 0.1%, 0.2% and 0.3% respectively which is lower than what the cost of drugs resulted in (Table 8)

The sensitivity analysis further showed that varying the cost of drugs by 3%, 5% and 7% resulted in an increment of direct cost by 0.04%, 0.08% and 0.11 % respectively while the indirect cost on the other hand reduced by the same cost rates and variation rates. The same analysis performed on wage rate resulted in an increment of the indirect cost by 0.14%, 0.22% and 0.31% respectively while the direct cost also reduced by the same cost rate and cost variations. This sensitivity analysis therefore indicates that, if cost of prostate cancer drugs increases by 3% (GHS 7,305), it will result in an increment in the cost incurred by prostate cancer patients and vice versa. Also, an increment in the loss in productivity by 3% (GHS 940) will also result in an increment in the cost of prostate cancer treatment and vice versa.

The Two-way analysis performed on both the cost of drugs and wage rate by varying them by 3%, 5% and 7% resulted in an increment of the total cost of treatment by 1.2%, 2.0% and 2.8%

respectively. The same variations also resulted in a percentage fall in direct cost in proportions to total treatment cost and a percentage rise in indirect cost in proportions to total treatment cost.

The results of the sensitivity analysis showed that the cost estimates in the study were sensitive to changes in cost of drugs and wage rates. Nevertheless, the changes in the cost estimates were not so large and this is an indication that the findings of this study are reliable and therefore can be used for decision making (Table 8).

Table 8: Sensitivity Analysis of Total Cost of Prostate Cancer

Scenario	Cost component	Percent Change in Parameter	Total cost (GHS)	Percent Change in Total Cost	Proportion of total cost		Change in proportion of cost (%)	
					Direct	Indirect	Direct	Indirect
Base scenario		0	680,337.40	0.0	95.40	4.60	0	0
Variation (One-way Sensitivity Analysis)	Drugs	3 5 7	687,643.30 692,513.90 697,384.50	1.1 1.8 2.5	95.44 95.48 95.51	4.56 4.52 4.49	0.04 0.08 0.11	-0.04 -0.08 -0.11
Variation (One-way Sensitivity Analysis)	Wage	3 5 7	681,277.40 681,904.00 682,530.70	0.1 0.2 0.3	95.26 95.18 95.09	4.74 4.82 4.91	-0.14 -0.22 -0.31	0.14 0.22 0.31
Multi-Variate (Two-way Sensitivity Analysis)	Drugs and Wage	3 5 7	688,583.30 694,080.50 699,577.80	1.2 2.0 2.8	95.31 95.26 95.21	4.69 4.74 4.79	-0.09 -0.14 -0.19	0.09 0.14 0.19

4.7 Coping strategies for financial cost among Prostate Cancer Patients

The findings of the study further showed that prostate cancer patients adopted diverse strategies to cope with the financial cost involved in the treatment or management of prostate cancer. These strategies included use of savings to finance healthcare 58 (42.3%), cutting down on

relevant expenses to be able to finance healthcare 23 (16.8%), relying on donations from family and friends to finance healthcare 48 (35%), among others. About 9.5% (13) respondents reported to have sold their property to generate money to finance their healthcare. About 46.7 % (64) indicated that they relied on their employer to finance their healthcare. Over 50% (71) of them, reported that their healthcare cost is subsidized by their employer. Table 9 presents the coping strategies adopted by prostate cancer patients to finance their healthcare cost.

Table 9: Financial Coping strategies among Prostate Cancer Patients

Coping Strategy	Number	Percentage
Savings		
used Saving	58	42.3
No Savings	79	57.7
Cut down relevant expenses		
Cut down expenses	23	16.8
did not cut down on expenses	114	83.2
Borrow money or take loan		
Borrow money	13	9.6
Do not borrow	123	90.4
Donation from family and friends		
Donations	48	35.0
No donations	89	65.0
Sell properties		
Sell	13	9.5
Do not sell	124	90.5
Rely on employer		
Rely on employer	64	46.7
Do not rely on employer	73	53.3
Payment subsidized by employer		
subsidized	71	51.8
Not subsidized	66	48.2
Defer payment		
Defers	15	11.0
Never deferred	122	89.0

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter discusses the results of the study based on the study objectives. The specific objectives of the study were to determine the direct cost of prostate cancer, to determine the indirect cost of prostate cancer and lastly to determine the financial coping strategies among prostate cancer patients. The results of the study show that the direct cost of prostate cancer is GHS 649,005 (USD 124, 092.70) with a mean cost of GHS 4,737.30 (USD 905.80) quarterly. This translates into a monthly mean cost of GHS 1,579.10 (USD 301.90). The indirect cost of prostate cancer in this study is GHS 31,332.40 (USD 5,990.90) with a mean of GHS 228.70 (USD 47.30) quarterly. This translates into a monthly mean cost of GHS 76.20 (USD 15.80). Patients use various financial coping strategies some of which include using savings to pay for treatment cost (42.3%), borrowing money to pay for treatment cost (9.6%), selling properties to get money to pay for treatment cost (9.5%), among others.

The findings of this study indicate that prostate cancer is more prevalent among those retired (67.6 years). The findings of this study on the age is similar to another study that was conducted in Hong Kong by Chan et al., (2017) who reported that the mean age of the prostate cancer patients was 71.0 (range, 54-90). Majority of the participants in this study are therefore outside the economically productive age bracket as they have almost 8 years post-retired. The average monthly income of the respondents is GHS 4,500 (USD 860.40) with a mean household expenditure of GHS 2,450 (USD 468.50). The income and household expenditure of study participants could possibly be an indication that majority of the study participants fall in the high wealth quintile while others are in the low wealth quintile. Also, the high cost of prostate cancer treatment per month (GHS 1,655) could be a clear indication that some Ghanaians might

not be able to afford prostate cancer treatment given that, estimates from the poverty trend report in Ghana by Ghana Statistical Service, (2018), shows that the proportion of Ghanaians living in poverty is 23.4%, that is living below the poverty line of GH¢ 1,314. Also, the proportion of Ghanaians in extreme poverty (that is living below a poverty line of GH¢ 792.20 per adult equivalent per year) is 8.2% with an estimate that 2.4 million people cannot afford the minimum required calories of 2,900 per adult equivalent per day even if they were to spend all their household expenditures on food.

The finding of the study further shows that 36.5% of the study participants are also suffering from other chronic diseases which were diabetes (52%) and hypertension (48%). The existence of other chronic diseases among the prostate cancer patients in this study is consistent with other findings by other studies which also reported other chronic diseases like diabetes and hypertension among cancer patients (Yeboah et al., 2016; Mayer-Foulkes, 2011; Nikolic, Stanciole, & Zaydman, 2011). The presence of comorbidities among some participants did not lead to higher expenditure in this study. The plausible explanation is because respondents were not asked on how much they spend on the other chronic diseases monthly.

5.2 Direct cost of prostate cancer treatment

The findings of the study shows that the direct cost of prostate cancer treatment has direct medical and direct non-medical cost components. The direct medical cost has components such as cosultation, hospitalization, laboratories, imaging, surgical costs and medication. This finding is similar to the findings by Sanyal, Aprikian, Chevalier, Cury, & Dragomir, (2013) who also reported similar direct cost components. Another study conducted by Kitazawa, Matsumoto, Fujita, Seto, & Hanaoka, (2015) to determine the cost of illness of prostate cancer in Japan also reported direct cost components such as hospitalization, medication cost, laboratory tests, imaging, surgical costs, among others which is similar to the finding of this

study. The direct cost of prostate cancer treatment is GHS 649,005 (USD 124, 092.70) with a mean cost of GHS 4,737.30 (USD 905.80) quarterly in this study. The cost found in this study is similar to what Roehrborn & Black, (2011) found in their study. They reported that the mean direct cost of prostate cancer management in United Kingdom for three months was USD 895.80 (GHS 4,685.10). However, they reported that the mean direct cost of prostate cancer management in USA for three months was GHS 18,175.60 (USD 3,475.30) which was higher than the findings of this study. The mean direct non-medical cost of prostate cancer is found to be GHS 103.70 (USD 19.80) in this study which is lower than the mean direct non-medical cost that Jayadevappa et al.,(2010) found in their study in United States of America to be GHS3,394.30 (USD 649). The difference in geographical location could possible account for the difference in direct non-medical costs in the two studies.

Another study conducted by Gyau, (2016) on Economic Burden of breast cancer in women in Ghana found that the mean direct cost of breast cancer treatment was GHS 646.90 per month which is lower than what was found in this study. The difference could be due to some costs components under breast cancer treatment being subsidized by the National Health Insurance Scheme in Ghana whereas prostate cancer is not.

The findings of this study further shows that the highest cost component is the surgical cost which has a total cost of GHS 285,320 (USD 54,554.50) and a mean of GHS 12,696.10 (USD 2,427.60) which is lower than the mean cost found by Sanyal et al., (2013) to be GHS 26,756.70 (USD 5,116) in USA. The difference in the surgical cost in the two studies could be due to the technological advancement in USA which might result in higher cost than what is in Ghana. The cost of medication for a three-month period for this study formed a substantial portion (37.5%) of the total direct cost of prostate cancer management with a total cost of GHS 243,532 (USD 46,564.40) and a mean of GHS 1,777.60 (USD 339.90). This finding was however lower than what was reported by Becerra et al., (2016) who found that the cost of medication in

prostate cancer management for a three-month period in USA was GHS 6,299 (USD 1,204.40). The difference in cost of medication could be as a result of the type of medications used by the patients in the different countries. Some of the medications for treating prostate cancer in Ghana are Zoladex which ranges from GHS 1,400 (USD 267.70) to GHS 1,800 (344.20) and Stilbesterol Which costs GHS 600 (114.70). However, in the USA, some of the drugs for treating prostate cancer are Xtandi which costs USD 9,362.90 (USD 48,968) and Xgeva which costs 2,268.90 (GHS 11,866.30).

5.3 Indirect cost of prostate cancer treatment

The indirect cost which is loss in productivity on the part of patients and caregivers due to prostate cancer is also estimated in this study. The findings of this study show that the indirect cost of prostate cancer management due to loss in productivity is GHS 31,332.40 (USD 5,990.90) with a mean of GHS 228.70 (USD 47.30). The mean indirect cost of prostate cancer treatment was found to be GHS 25,077.90 (USD 4,795) in a study conducted in USA by Jayadevappa et al.,(2010) which was higher than what is reported in this study. Another study conducted by Becerra et al., (2016) also reported in their systematic review of literature that the mean indirect cost of prostate cancer was EUR 12,465 which was also higher than what is found in this study. The difference in the indirect cost in the studies could be as a result of the different wage rates that was used to calculate the indirect costs.

5.4 Total cost of prostate cancer treatment

The findings of the study further show that the overall total cost of prostate cancer is very expensive in relation to income knowing that participants spend 36.8% of their monthly income on prostate cancer treatment and can be burdensome to some patients and their households. The estimated total cost for prostate cancer treatment for three months is found to be GHS

680,337.40 (USD 130,083.60) in this study with a mean cost of GHS 4,966 (USD 949.50) quarterly. The bulk of the treatment cost (95.4%) is accounted for by the direct cost and the remainder (4.6%) being the indirect cost. The cost profile for the direct cost in this study (95.4%) is higher than what was found by Kitazawa, Matsumoto, Fujita, Seto, & Hanaoka,(2015) to be around 75% in Japan. In that study, the indirect cost had a cost profile of 25% which is higher than the indirect cost profile of 4.6% that is found in this study. The difference in the cost profiles could be due to the calculation for the indirect costs where Kitazawa et al., (2015) calculated their indirect cost by adding mortality costs and morbidity costs. However, contradictory to the findings of this study, a systematic review by Becerra et al., (2016) indicated that some studies reported higher indirect cost of prostate cancer than direct cost. For instance, they reported that one study had an indirect cost of EUR 12,465 which was higher than the direct cost of EUR 3,863 found. Also, another study conducted by Jayadevappa et al., (2010) in USA reported that more than 60% of the total cost of prostate cancer is accounted for by indirect cost which is as a result of loss of productivity, caregivers' resources spent and premature death.

The findings of the study further indicate that prostate cancer patients use a substantial proportion (36.8%) of their monthly income to pay for the cost involved in prostate cancer treatment. A further 37.4% accounted for household expenditure. This means that 74.2% of respondent's monthly income is spent on prostate cancer treatment and their household expenditure. The proportion of the monthly income used for prostate cancer treatment could be an indication that prostate cancer poses an economic burden to patients as well as their households which could impoverish them. The World Health Organisation (WHO) estimated that households that use more than 40% of their non-food expenditure on healthcare treatment are likely to be impoverished (Ezeoke, Onwujekwe, & Uzochukwu, 2012). In this study, the mean monthly expenditure on food only is GHS 1,861 (USD 355.80). The remaining amount

out of the mean monthly income is GHS 2,638.70 (504.50) and prostate cancer patients spend 62.7% of this on prostate cancer treatment which could be catastrophic health expenditure as it is more than the 40% threshold.

Estimates from the poverty trend report in Ghana by Ghana Statistical Service, (2018), shows that the proportion of Ghanaians living in poverty is 23.4%, that is living below the poverty line of GH¢ 1,314. Also, the proportion of Ghanaians in extreme poverty (that is living below a poverty line of GH¢ 792.20 per adult equivalent per year) is 8.2% with an estimate that 2.4 million people cannot afford the minimum required calories of 2,900 per adult equivalent per day even if they were to spend all their household expenditures on food. This assertion could be an indication that some Ghanaians might not be able to access prostate cancer treatment due to cost serving as a barrier.

5.5 Coping strategies for treatment cost

The findings of this study show that prostate cancer patients use various means to cope with the financial cost involved in prostate cancer treatment. This study found that 42.3% of the respondents reported to use their savings to pay for the cost of prostate cancer treatment. This is however larger than what was reported by Jung et al., (2013) that in Pennsylvania, 25% of prostate cancer patients with insurance and seeking treatment used all or most of their savings to deal with the disease. The difference in the percentage could be due to the availability of prostate cancer treatment insurance for the patients in Pennsylvania whereas those in Ghana do not have. Another study conducted by Arnold et al., (2016) to assess the coping strategies for diabetes and tuberculosis in Kyrgyzstan found that 208 (67.3%) of the participants used their savings or income to pay for the cost involved in treatment.

The findings of this study further show that 9.6% and 9.5% of the respondents resorted to taking loan or borrowing money and selling properties respectively to generate money to pay for the

financial shock of cost involved in prostate cancer treatment. This finding was however lower than what was found by Kruk, Goldmann, & Galea, (2009). They found that one in four (25%) families in developing countries in Africa resort to borrowing or selling assets, or both to fund for healthcare charges with higher rates of borrowing and selling used as coping strategies to the financial shock of medical bills.

Another study conducted by Leive & Xu, (2008) in Africa to explore how people in different African countries (15 countries) cope with the out-of-pocket health systems payments found that in most countries, close to 30% of all the households financed out-of-pocket health expenditure by borrowing which is also higher than the proportion that was found in this study. The use of these coping strategies could further impoverish prostate cancer patients and their households as it was reported by Sarma & Sivadasanpillai, (2012) that out of the 14% of participants who had financed their treatment for acute coronary syndrome exclusively from savings, 70 % experienced catastrophic health expenditure.

5.6 Limitations

1. The direct and indirect costs incurred by patients as well as productive days lost were based on recall which may be bias
2. Due to the study method (quantitative), the researcher was not able to delve into exploring the financial coping strategies reported by patients compared to if a mixed-method approach was used.
3. The study did not capture data on the intangible cost incurred by patients which also served as a limitation

A month recall period was used to minimize the bias and the analysis was robustly done to eliminate any further biases and to make this finding generalizable to the setting in which the study was conducted.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

This chapter summarizes the major findings of the study and its implications and relevance for policy. It provides recommendations that may help inform policies and programmes geared towards the improvement of management of prostate cancer and to address the economic burden to patients and households in Greater Accra region.

6.1 Conclusion

Prostate cancer is chronic disease and therefore requires patients to go through continuous management/treatment which comes with high cost.

The findings of the study indicate that the total monthly cost of the disease is high. The monthly cost of prostate cancer management per this study is GHS 226,779.10 (USD 43,631.20) with a mean cost of GHS 1,655 (USD 316.50). With an average monthly income of GHS 4,500 (USD 860.40) and patients spending an average of GHS 1,861 (USD 355.80) monthly on food only, it means prostate cancer patients spend 62.7% of their non-food expenditure on prostate cancer treatment which could be catastrophic.

Direct cost accounted for the highest proportion (95.4%) of the total cost of prostate cancer management in this study. Surgical cost and cost of drugs accounted for 41.9% and 35.8% of the total cost of prostate cancer treatment respectively. This results in 77.7% of the total cost of prostate cancer management. This is an indication that cost of surgery and cost of drugs are key factors in determining the total cost of prostate cancer management and therefore should be given the necessary attention by relevant stakeholders and government to help reduce the economic burden of prostate cancer to patients and their families.

Also, the high cost of prostate cancer treatment per month (GHS 1,655) could be a clear indication that some Ghanaians might not be able to afford prostate cancer treatment.

The indirect cost, which is cost due to loss in productivity as a result of the disease accounted for a smaller proportion (4.6%) of the total cost of prostate cancer treatment. Nevertheless, it is an important component taking into consideration the income level of participants and the fact that this is spent monthly.

The various means by which patients cope with the financial cost of prostate cancer treatment such as using savings (42.3%), bowing money (9.6%), selling properties (9.5%) could be an indication that the disease pose a burden to households and that it could impoverish households in the long term.

The study therefore concludes that prostate cancer management poses an economic burden to patients and their households and might serve as a barrier to access of the needed prostate cancer treatment services.

6.2 Recommendation

Based on the findings of the study, the researcher recommends the following;

The Ghana Health Service:

1. The cost of prostate cancer treatment monthly is high and patients use a substantive proportion of their non-food expenditure on prostate cancer treatment which is catastrophic health expenditure. This calls for necessary actions to be taken to subsidize the cost involved in prostate cancer treatment
2. The direct cost of prostate cancer account for the larger proportion of prostate cancer treatment, there is the need for policies on prostate cancer to subsidize the direct cost components of prostate cancer treatment.

3. Prostate cancer services should be decentralized to enable patients spend less on traveling costs as this will help reduce the cost involved in prostate cancer treatment
4. Almost half (43.8%) of the participants were diagnose at clinical stage three and few (12.4%) were diagnosed at clinical stage one. This calls for more education and sensitization on prostate cancer for early detection and prompt treatment as this will help reduce the cost due to loss in productivity
5. Further research should be conducted to confirm households that sink to poverty as a result of catastrophic health expenditure on prostate cancer

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APPENDICES

Appendix 1: Participant Consent form

School of Public Health

College of Health Sciences

University of Ghana

Project Title: Economic cost and coping mechanisms for prostate cancer treatment among patients Accra Metropolis

Institutional Affiliation:

School of Public Health,

Department of Health Policy and Planning Management,

University of Ghana

Legon

Background

Personal Introduction:

The principal Investigator of this study is Geoffrey Chizoba Olivia Madiebo, a Master of Public Health student and conducting a study on Economic cost and coping mechanisms for prostate cancer treatment among patients in Accra Metropolis. This research is for academic purposes and a requirement for the award of Master's Degree in Public Health. This study is being supervised by Dr. Patricia Akweongo of School of Public Health, University of Ghana, Legon.

Procedure:

Taking part in this study will take about 20 minutes of your time and we expect your honest response in answering of the questions. The questions are about you and cost incurred after prostate cancer diagnosis.

Risk and Benefits:

There may be psychological distress as a result of you talking about your experiences however, findings may inform policy makers to plan and implement social support and equitable and sustainable health policies.

Right to Refuse:

Your participation is voluntary and you can withdraw at any time without consequences. Even though we would be very grateful if you decide to partake in this study and answer all the questions sincerely, neither you nor the study will be affected if you decide not to take part in this study.

Anonymity and Confidentiality:

Your responses will be confidential and your identity will be anonymous. This will be ensured by assigning codes to the participants on the form. The questionnaire will be kept in a locked cabinet after data entry and can be accessed by only the researcher and will be destroyed when it is no longer relevant to the research. Information from this research will be used solely for this study and any publications that may result from this study.

Your rights as a Participant:

This research will be reviewed and approved by the Ghana Health Service Ethical Review Committee. If you have any questions about your right as a research participant, you can contact the Ethical Review Administrator (Ms. Hannah Frimpong) on 0507041223.

Compensation:

There will be no compensation or fee paid to participants for agreeing to participate in this study.

Before taking consent;

If you have any questions, kindly ask or for further clarifications, please don't hesitate to contact the Principal Investigator (Geoffrey Chizoba Olivia Madiebo) on;

Telephone number: 0262911835 Email: lollymadiebo@yahoo.co.uk

PARTICIPANT

The procedures, risk, benefit and details for the study title "ECONOMIC COST AND COPING MECHANISMS FOR PROSTATE CANCER TREATMENT AMONG PATIENTS IN ACCRA METROPOLIS" have been read and explained to me. My questions have been answered to my satisfaction and have the opportunity to ask further questions at any time. I understand I have the right to refuse to answer any particular questions and withdraw from the study at any time. I agree to provide information to the researcher(s) on the understanding that my name will not be used without my permission. I also agree to participate as a volunteer.

....

Date signature or thumbprint of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the procedures, benefit, details and possible risk of the study were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the study.

....

Date signature of witness

I certify that the nature and purpose, the potential benefits and possible risks associated with participating in this research have been explained to me by the above individual.

....

Date signature/ thumbprint of volunteer

INTERVIEWR'S STATEMENT:

I have explained the procedure to be followed in this study to the clients in the language that they understand best and they have agreed to participate in the study.

....

Signature Date

Appendix 2: Questionnaire form

University of Ghana

School of Public Health

Department of Health Policy and Planning Management

Economic cost and coping mechanisms of prostate cancer treatment among patients in Accra Metropolis

Questionnaire

Greetings, Geoffrey Chizoba Olivia Madiebo is my name and I am a student of School of Public health in the University of Ghana, Legon. As part of my research work, I am investigating the economic cost of and coping mechanisms for prostate cancer treatment among patients in Accra Metropolis. The findings from this study will inform policy makers to plan and implement social support and equitable and sustainable health policies in relation to prostate cancer.

We are hoping you can assist us in this effort by agreeing to participate and giving us sincere information. Participation in this study is voluntary and you can withdraw from the study at any time. Please feel free to ask any question at any time during the interview. Thank you for your cooperation.

CODE.....

PART A: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENT

1. Age at last birthday.....
2. Place of residence.....
3. Marital status: 1 Married [] 2 Divorced [] 3 Widowed [] 4 Co-habiting []
   5 Single [] 6 other (specify).....
4. Living Status: 1 live with family [] 2 live alone [] 3 other (specify).....
5. Religion: 1 Christian [] 2. Muslim [] 3. Other (specify).....
6. Highest educational level: 1 No formal education [] 2 Primary level []
   3 Middle/JHS/JSS [] 4 SSS/SHS/tech/Vocational []
   5 Tertiary []
7. What is your employment status: 1 Self Employed [] 2 Private Sector []
   3 Public Sector [] 4 Unemployed [] Other.....
8. If employed, what work do you mainly do?
   1 Health service [] 2 Trading [] 3 Security service []
   4 Business [] 5 Banking and finance []
   6 Other (specify).....
9. What is your monthly income? .....

Health seeking

10. When were you diagnosed of Prostate cancer?
    Months.....
    Years.....

11. Clinical stage of illness: (to be reviewed from respondent's folder)

1 Stage 1 [] 2 Stage 2 [] 3 Stage 3 [] 4 Stage 4 []

12. Are you suffering from any other chronic disease?

1. Yes 2. No

13. If Yes, please choose

1 Hypertension [] 2 Diabetes [] 3 HIV/AIDS [] 4 other (specify)...

14. How long have you been on Prostate cancer treatment?

Months .....

Years.....

14a. Have you been to a Prostate facility before?

1.Yes 2. No

14b. Why did you choose to come to this facilitys?

.....

.....

.....

.....

.....

PART B: DIRECT COST

15. **Medical cost**

Item	Cost
a. Registration	
b. Consultation	
c. Laboratories	

d. Imaging	
e. Days of hospitalisation	
f. Treatment type	
g. Drugs	
h. Others (specify)	

16. Non-medical cost

How much do you and your family spend in a month on these while seeking treatment?

Item	Cost
a. Travel	
b. Food	
c. Drink	
d. Others (specify)	

PART C: INDIRECT COST

17. Are you still working to earn a living? Yes.... No.....

18. How long in the last month have you absented yourself from work because of the disease? (In days).....

19. How many days did you go to work but couldn't work well because of the disease?

(In days) .....

20. If you are retired, did you go on retirement because of the disease?

1 Yes 2 No

21. If yes, at what age did you retire? .....

22. Do you have an active caretaker?

1 Yes 2 No

23. If yes, what is your relationship with the person?

1 Relative 2 Friend 3 Employee 4 Other (specify).....

24. How many hours does the person spend with you in a day?.....

25. Has a relative or friend ever taken a break from work because they needed to attend to you or escort you to the seek healthcare for the disease?

1 Yes 2 No

26. If yes, how long did they take a break from work? (in days).....

PART D: COST COPING STRATEGIES

Kindly answer the questions below by ticking the appropriate ones that apply to you

27. Do you use your savings as a source of financing the for the healthcare cost?

1 Yes 2 No

28. Have you cut down on relevant expenses so that you can finance your healthcare cost?

1 Yes 2 No

29. If yes, what have you cut down on?

30. Do you borrow money or take a loan to finance your healthcare cost?

1 Yes 2 No

31. If yes, how recent did you take a loan or credit facility?

Days.....

Months.....

How much did you take as loan?

32. Do you rely on donations from family and friends to finance your healthcare cost?

1 Yes 2 No

33. How often do you receive remittances from family and friends?.....

34. How much do you get monthly from friends and relatives?.....

35. Do you sell or have you ever sold your properties to finance your healthcare cost?

1 Yes 2 No

36. If Yes? What did you sell in your most recent illness?.....

37. Do you rely on your employer income to finance your healthcare cost?

1 Yes 2 No

38. Is your payment of health care subsidized by your employer?

1 Yes 2 No

39. Do you defer your payment of health care sometimes?

1 Yes 2 No

40. If yes, how many times in the last episode of illness did you defer payment for health care?

HOUSEHOLD CONSUMPTION		
What items did you spend your money on last month?	How much did you pay?	Total
41. Rent		
42. Food		
43. Soap		
44. Salt		
45. Clothing		
46. Shoes/sandals		
47. Kerosene/cooking gas		
48. Wood/charcoal		
49. Water		
50. Electricity		
51. Other		

THANK YOU