University of Ghana http://ugspace.ug.edu.gh

QUALITY OF LIFE AND LIFESTYLE CHOICES OF BREAST CANCER PATIENTS AT THE SWEDEN GHANA MEDICAL CENTRE

ANNA MARIA ANIM - SAMPONG

(10515989)

THIS DISSERTATION IS SUBMITTED

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE

AWARD OF MASTER OF PUBLIC HEALTH DEGREE

OCTOBER 2020

University of Ghana http://ugspace.ug.edu.gh

DECLARATION

I, **ANNA MARIA ANIM-SAMPONG,** do hereby declare that this dissertation being submitted in partial fulfilment of the requirements for the masters degree in Public Health is the result of my own independent research project or investigation and that, except where otherwise stated, other sources are acknowledged with explicit references and are included in the reference list. This work has not been previously accepted in substance for any degree, and neither is it being concurrently submitted in candidature for any degree.

I hereby give permission for the Department of Health Policy Planning and Management to seek dissemination and/or publication of this dissertation in any appropriate format, and that authorship in such circumstances shall be jointly held between my project supervisor and I.

Signed ……………… Date ....19th November, 2020

ANNA MARIA ANIM - SAMPONG (10515989)

Signed ………..…… …………… Date …19th November, 2020

DR. GENEVIEVE ARYEETEY

University of Ghana http://ugspace.ug.edu.gh

DEDICATION

This work is dedicated to my parents - Dr. S. Anim-Sampong and Mrs. J. Anim-Sampong, and my brother Mr. Stefan Daniel Anim-Sampong. You have always inspired me to pursue my dreams and to strive for greater heights. Without your love, consistent encouragement and support, this project would not have been made possible.

University of Ghana http://ugspace.ug.edu.gh

ACKNOWLEDGEMENT

I am truly grateful to the Almighty God for bringing me this far. His great grace and mercy have been constant and never failing.

I again acknowledge with immense gratitude the relentless efforts, excellent supervision and contributions of Dr. Genevieve Aryeetey (Lecturers, School of Public Health, University of Ghana) towards this research work. I also acknowledge the kind support, assistance, and contribution of Dr. S. Anim-Sampong towards this work.

I further wish to express my deepest appreciation to all participants who consented to participating in this study, as well as the staff of the Sweden Ghana Medical Centre for the help and assistance *given throughout the period of my data collection.

Finally, to all who contributed towards the success of this project in one way or the other, I say, “Many thanks, and God bless you!”

University of Ghana http://ugspace.ug.edu.gh

TABLE OF CONTENTS

University of Ghana http://ugspace.ug.edu.gh

University of Ghana http://ugspace.ug.edu.gh

University of Ghana http://ugspace.ug.edu.gh

University of Ghana http://ugspace.ug.edu.gh

ABBREVIATIONS

ACS	–	American Cancer Society
BCS	–	Breast conserving surgery
BIG	–	Breast International Group (BIG)
EWB	–	Emotional well-being
FWB	–	Functional well-being
GHS	–	Ghana Health Service
NCF	–	National Breast Cancer Foundation
PI	–	Principal Investigator
PWB	–	Personal well-being
SGMC	–	Sweden Ghana Medical Centre
SWB	–	Social well-being
QoL	–	Quality of Life
WHO	–	World Health Organization

University of Ghana http://ugspace.ug.edu.gh

LIST OF TABLES

University of Ghana http://ugspace.ug.edu.gh

LIST OF FIGURES

University of Ghana http://ugspace.ug.edu.gh

ABSTRACT

Background: Breast cancer usually occurs in women, even though it can occur in men as well. The disease as well as the type of treatment patients with breast cancer receive can affect their quality of life and lifestyle choices. Although there are quite a number of research works in breast cancer, there is no available documentation of the quality of life and lifestyle choices of breast cancer patients in Ghana.

Aim: The study aimed at assessing the quality of life (QoL) and lifestyle choices of patients with breast cancer at the Sweden Ghana Medical Centre.

Methods: 80 patients with breast cancer who reported to the Sweden Ghana Medical Centre for chemotherapy and radiotherapy treatment in August 2020, were considered in this study. A quantitative descriptive cross-sectional design was employed in this study. The Functional Assessment Cancer Therapy-Breast (FACT-B) instrument version 4 tool and a researcher-made questionnaire were used for data collection over a one-month period August 2020. The data collected was analyzed with STATA version 16.

Results: The overall QoL score for the population was about 43% and suggestive of moderate to low QoL in the various functional roles in the patients. Patients who received curative radiotherapy and surgery enjoyed the highest QoL scores as measured by their Emotional Wellbeing (EWB) (62.4 ± 5.4%, p=0.000) and Functional wellbeing (FWB) (62.5 ± 7.5%, p=0.006). Relationships which were statistically significant were established between the QoL domains and the treatment options (p=0.000). Functional well-being domain scores were significantly higher for the three surgical procedures (p=0.027). The highest median scores ≥ 60.0% were recorded for the healthy lifestyles of the patients for all variables, except in partial mastectomy where a lower median score of 52.5% was found. There were no significant relationship between their healthy lifestyles choices and the independent variables. Statistically significant (p=0.001) median scores for diet lifestyle choices was found across the age groups,

University of Ghana http://ugspace.ug.edu.gh

but none in the other variables. The median score in the patients' personal appearance and social lifestyles were low, except for curative radiotherapy treatment and lumpectomy treatment regimens and surgery where their personal appearance lifestyles were significantly high ($p < 0.001$). A statistically insignificant difference in the marital status of the patients ($p=0.136$) was found. An expected outcome of such low scores is an adverse impact on marital relationships with their husbands due to mastectomy.

Conclusion: The versatile FACT-B Version 4 QoL tool and lifestyle choices tool employing five QoL domain subscales and four lifestyle dimensions has been used to evaluate the QoL and lifestyle choices of patients with breast cancer who reported for treatment at the Sweden Ghana Medical Centre. The assessments were done using the mean and median inter-quartile ranges of the measured scores. Functional well-being (FWB) was the most enjoyed QoL by the breast cancer patients across the independent variables. Relationships which were statistically significant were established between the QoL domains and the treatment options ($p=0.000$).

Keywords: Breast cancer, quality of life, lifestyle choices, chemotherapy, radiotherapy, breast prostheses, mastectomy, domain scores, interquartile range.

University of Ghana http://ugspace.ug.edu.gh

CHAPTER ONE

INTRODUCTION

1.1 Background

Breast cancer is the most frequently occurring type of cancer in women, and the second most frequently occurring type of cancer worldwide (World Health Organization, 2012, Anim-Sampong *et al.*, 2020). This disease has the tendency of affecting both females and males, but it is more prevalent among females (American Cancer Society, 2016). It results from the proliferation of cells in the breast which become a tumor and is visible on radiographs, and/or can be detected as a lump (American Cancer Society, 2016). Most breast cancers originate from the part of the breast tissue that consists of glands which produce milk and the ducts through which these glands connect to the nipples (American Cancer Society, 2016).

The World Health Organization (WHO) estimated in 2012 that about 1.67 million incidences of breast cancer were reported throughout the world, forming approximately 25% of every case of cancer and a mortality of 522,000 cases, ranking it as the fifth cause of death (WHO, 2012) In Ghana, the works of Ohene-Yeboah and Adjei (2012), Ghartey *et al.*, (2016), Opoku *et al.*, (2012) and Quayson *et al.*, (2014) among many others have provided some information about breast cancer. However, their researches were limited to certain geographical regions, and hence not representative of the whole country. Ghartey *et al.*, (2016) stated a breast cancer incidence of 0.76% and proposed the need for breast cancer awareness and screening for women in Ghana.

University of Ghana http://ugspace.ug.edu.gh

Although early detection for any disease condition is vital in its treatment process, the modes of disclosing patients' conditions following diagnoses can however, be devastating and could trigger negative responses.

Several treatment options are available for breast cancer. The combinations of these approaches exist and are referred to as multimodal treatment regimens. The breast conserving surgeries (BCS) including lumpectomy, partial mastectomy, and mastectomy are some of the several breast cancer treatment options utilized worldwide (Takuwa, Tsuji and Yotsumoto, 2017). Lumpectomy is a type of breast surgery which tumors or abnormal cells and some of the normal healthy tissue and lymph nodes surrounding it (called surgical margin) are removed (Mayo Clinic, 2018). In partial mastectomy, a larger portion of the breast is removed compared to lumpectomy in order to eliminate the cancer. Mastectomy, other the hand, is the taking away of one breast or both, through surgical means (Zurrida *et al.,* 2011). However, this and other treatment modalities for breast cancer are associated with several issues which act as additional stressors in affected patients. The loss of symbols of femininity could result in depression, anxiety, loss of self-confidence, pain which could be chronic or persistent, issues in their relationships, affected quality of life (QoL), and impacts on lifestyle choices. As a result, several breast cancer patients are stigmatized. Acknowledging these impacts could help provide a psychological report. Although there are quite a number of research works in breast cancer, a search through literature reveals that there is either limited or no available documentation of the QoL and lifestyle choices of female breast cancer patients in Ghana. This study may build on existent knowledge on the QoL and lifestyle choices of breast cancer patients in Ghana and establish a basis to compare with other international studies.

1.2 Problem Statement

Mastectomy and other BCS options result in loss of self-esteem, body image and feminine identity among breast cancer patients. The QoL after BCS and mastectomy is a compromised

University of Ghana http://ugspace.ug.edu.gh

challenge, and such patients experience negative psychosocial issues such as fright, pain, mild to high levels of apprehension. Furthermore, the lack of adequate and requisite scientific and technical solutions to these problems further exacerbates the challenges. Anecdotal evidence suggests that the impact of on the QoL and lifestyle choices of breast cancer survivors following BCS and mastectomy in Ghana have not been explicitly addressed, and hence a wide knowledge gap is opened for study.

1.3 Significance of Study

The impact and treatment of breast cancer on affected patients can be very dire. In particular, their QoL is degraded and their lifestyle choices are affected as well. This study is important as it assesses the various ways in which the QoL patients with breast cancer is affected, and also give information regarding the extent to which the affected QoL has impacted their lifestyle choices. It will also serve as a baseline data needed for future references.

Breast cancer may also affect women's identity and functional abilities. In particular, it is known that women play important functional roles in the family. Thus, the development of breast cancer in women adversely impacts their functional roles, which directly affects her family and other persons socially connected to them. Hence, studying the QoL in breast cancer patients is vital.

1.4 Objectives

General Objective The general objective is to determine the QoL and lifestyle choices of breast cancer patients at the Sweden Ghana Medical Centre (SGMC).

Specific Objectives: The specific objectives for this study are:

- To measure the QoL of breast cancer patients at SGMC
- To assess the lifestyle choices of breast cancer patients at SGMC

University of Ghana http://ugspace.ug.edu.gh

- To find the association between the QoL and lifestyle choices of breast cancer patients at SGMC.

1.5 Conceptual Framework

The conceptual framework for QoL and lifestyle choices of breast cancer patients is presented in Fig.1.1. The framework addresses issues such as patients demographics, clinical factors, and lifestyle choices. Any or a combination of these could impact patients‘ QoL or lifestyle choices.

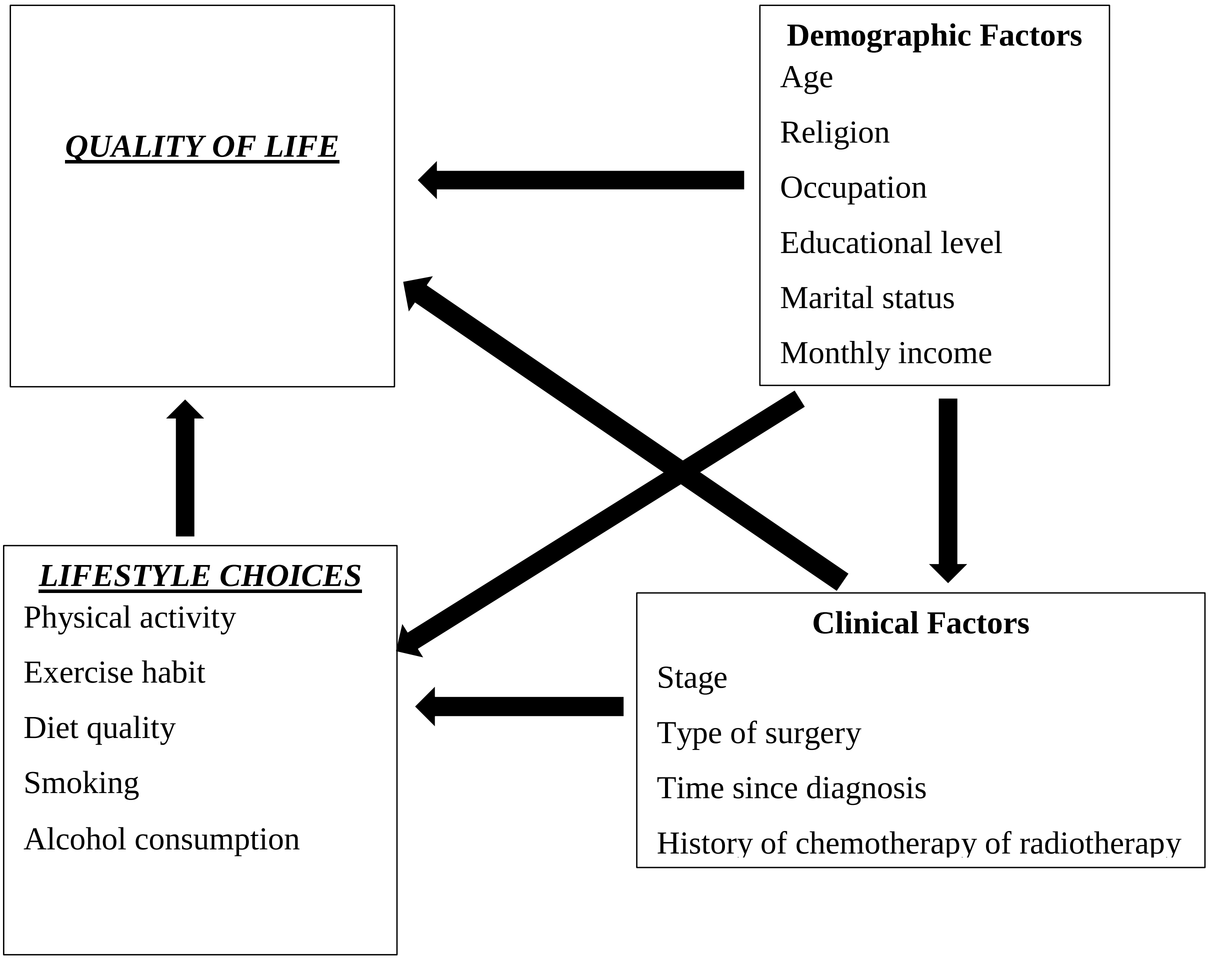

Fig. 1.1: Conceptual framework for QoL and lifestyle choices of breast cancer patients

University of Ghana http://ugspace.ug.edu.gh

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The Chapter reviews the literature on anatomy of the female breast, breast cancer, its incidence and prevalence as well as its risk factors, the types of surgical and multimodal breast cancer treatment regimens. The QoL and lifestyle choices of breast cancer patients, and the association between QoL and lifestyle choices of breast cancer patients are also reviewed.

2.2 Anatomy of the female breast

The breast consists of tissues, and ducts which affect the lactation functions of the breast. They are held in position by a framework of fibres called Cooper's ligaments (Zucca-Matthes, Urban, & Vallejo, 2016). Other key structures of the breast include the skin, fascial layer, fibroglandular tissue, lymphatics and neurovascular structures as shown in Fig. 2.1.

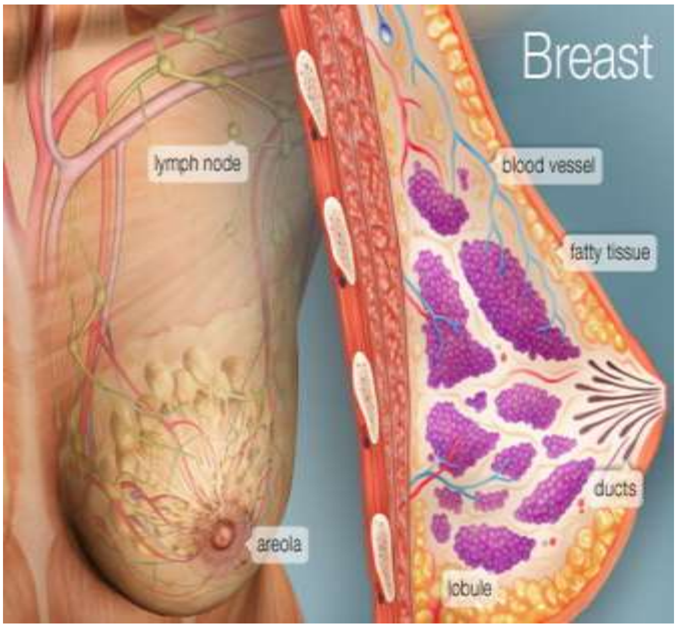

Fig. 2.1: Anatomy of the breast

University of Ghana http://ugspace.ug.edu.gh

Beginning from the anterior portion of the second rib, the breast extends down to the sixth or seventh rib (Bontrager & Lampignano, 2014). The breast develops in the fourth week of embryonic life unto early childhood, and continues in puberty due to effects of hormonal changes. The roundly-shaped areola (pigmented region) varies in size, lying slightly below the centre of each breast and surrounds the nipple, and is normally found at the level of the fourth rib (Bontrager & Lampignano, 2014; Zucca-Matthes *et al.*, 2016). The areola bears large sebaceous glands called Montgomery glands that project unto the surface and produce sebum to prevent cracking of the skin of the nipples (Marieb & Hoehn, 2013). The function of the Montgomery glands is essential in reducing irritation during breastfeeding (Moore, Dalley & Agur, 2014). The lobules (located within the lobes) contain glandular alveoli responsible for milk production in lactating mothers (Marieb & Hoehn, 2013; Bontrager & Lampignano, 2014; Moore *et al*., 2014).).

According to Wood, Cameron, and Fitzgerald (2008), breast shape and size are predisposed to hormonal changes and medical conditions. The breast tissue extends into the axilla as the axillary prolongation and is also a common site for cancer occurrence (Bontrager & Lampignano, 2014).

2.3 Breast cancer definition

Breast cancer is a non-invasive cancer commonly found in females and is second to cancer of the lung in terms of giving rise to cancer mortality (American Cancer Society, 2012). Most breast cancers are malignant, originating from the part of the breast that made up of glands that produce milk and ducts (Sharma *et al*, 2010). An invasive tumor is a cluster of abnormal cells that may invade or develop into nearby tissues or spread to remote body regions (American Cancer Society, 2012). The lobules are a common site for the initiation of cancer formations in the breast (American Cancer Society, 2016). According to the American Centre for Disease

University of Ghana http://ugspace.ug.edu.gh

Control (CDC), breast cancer symptoms usually show in several ways. These include areas of thickened tissue or growth in the breast or armpit, reddened skin of the breast, unusual nipple discharges, retracted nipple, unusual skin changes on breast and/or nipple(s), breast size changes, and unusual pain in breast or armpit (CDC, 2020).

Classification of cancer of the breast is normally centered on the histological presentation of tumor's tissues. According to Giordano and Hortobagyi (2003), a different approach to breast cancer classification is inflammatory breast cancer (IBC), a type of invasive cancer in the ducts differentiated from the other types of breast cancer by the swollen and reddened presentation of the diseased breast. Wambani *et al.,* (2011) categorized breast cancer into two stages; the pre-invasive stage with the abnormal cells constricted within ducts, and the invasive stage with cancerous growth spreading to surrounding lymph nodes and tissues. Breast cancer usually occurs in females, even though it can occur in males as well (American Cancer Society, 2015).

2.3.1 Etiology and risk factors of breast cancer

The etiology or establishment of the cause or origin of breast cancer has not been explained by any single reason. According to Iles and Dickinson (2017), the cause of cancer of the breast can be included in the most complex of cancer types, given life-long exposures to diverse internally and externally influenced factors, and the interaction of factors of heredity. Ho *et al.,* (2016) has also reported that exogenous hormone exposure may play a significant risk in the cause of cancer of the breast. The multifactorial nature of the etiology of this disease of the breast has been affirmed who further reported that being exposed to the hormone estrogen in the womb was a main predisposing factor for the onset of breast cancer later in adult life (Ho *et al.*, 2016). There is increasing proof that being exposed to agents that are hormonally active could affect the development of the mammary glands and increase the risk of breast cancer occurence (Doherty *et al.*, 2010; Watkins *et al.*, 2014).

University of Ghana http://ugspace.ug.edu.gh

Breast cancer is connected with the mix of factors including factors that are hereditary, ecological and hormonal (American Cancer Society, 2012). Age, as well as gender, are some of the most vital predisposing factors of cancer of the breast. In particular, the American Cancer Society (2012) reported that about 5% of every case of breast cancer happens in females who are below age 40, while a higher proportion (over 80%) occurred among those aged 50 or more years. Most breast cancers are not inherited. Alterations that are genetic other than alterations that are inherited come about due to aging have also been identified as a possible cause of breast cancer (Son et al., 2012).

A risk factor is an attitude, state or determinant that predisposes one to an ailment; breast cancer in this case. Over the years, some factors that may result in the occurrence of breast cancer have been proposed. In particular, it is reported in the literature that the disease is associated with three major factors: exposure to ionizing radiation, presence of exogenous ovarian hormones and the chronic use of alcoholic beverages, while other studies have suggested diet as a major role in the occurrence of breast cancers (Willett, 1989). Notwithstanding these, other factors like age, history of family, early onset of menstruation, late onset of menopause, postmenopausal obesity, breastfeeding, and the use of oestrogen and progestin menopausal hormones have been proposed (American Cancer Society, 2012). The American Cancer Society (2012) has also reported that breast cancer can develop in females with none of the afore-mentioned predisposing factors.

2.3.2 Incidence and prevalence of breast cancer

The occurrence of cancer of the breast has been widely reported in literature. Cardoso *et al.,* (2012) and Bray *et al.,* (2012) reported that cancer of the breast is the most frequently occurring cancer in females in almost all countries, which explains the approximately 1.7 million new cases diagnosed in 2012 globally. Breast cancer frequently affects women who are 40 years

University of Ghana http://ugspace.ug.edu.gh

and over, although there has been an observation in the increase in its occurrence in women less than 40 years old (Pollán, 2010). Other studies have reported increased incidence of cancer of the breast in most nations, and associated the condition mostly with females aged 50 years and older, although the incidence in younger women is also increasing (Parkin *et al.*, 2014). The WHO (2015) reported annual increments of 1.67 million incidences of confirmed cases of cancer of the breast cancer all over the world. The rise in the number of breast cancer cases present in a population at a given time has been caused lifestyle modernism (Glass *et al.*, 2007).

Thakkar, McCarthy & Villano (2014) also concluded that the incidence rate of the disease rises with advancing age. Previous analysis of the disease pattern revealed that breast cancer is more widespread among white ladies who are 40 years and above, than women of other races of the same age grouping (Desantis *et al.*, 2014). Studies conducted in the USA showed that Alaskan Native American Indian, Asian Indian or Pakistani, Black, Filipino, Hawaiian, Puerto Rican, Samoan and Mexican women had a 1.3 to 7.1 greater risk of developing stage four cancers as against non-Hispanic white ladies (Ooi *et al.*, 2011). The incidence in Middle Africa is 27 per 100,000, compared to 92 per 100,000 in Northern America (WHO, 2012).

Breast cancer is also the most frequently occurring cause of cancer mortality in women (American Cancer Society 2015). Statistically, Cardoso *et al.*, (2012) also established breast cancer mortalities of 269,000 (12.7% of total) in developing countries, and 189,000 (15.5% of total) in developed countries respectively. Thus, most of the breast cancer incidences and mortalities happen in countries that are developing as compared with developed countries. Akarolo-Anthony *et al.*, (2010) explained that even though breast cancer is a very important predicament to attend to, there is limited research on it in Africa. They further explained that the little information that may be present is usually generated from small clinical studies, which is biased and thus not adequate to propagate a general understanding of breast cancer in Africa.

University of Ghana http://ugspace.ug.edu.gh

2.4 Breast cancer treatment regimens

A number of breast cancer treatment options are utilized worldwide. The primary breast cancer treatments consist of surgery (lumpectomy, partial mastectomy and mastectomy), radiation therapy, endocrine or hormonal therapy, chemotherapy and targeted therapy (Takuwa, Tsuji and Yotsumoto, 2017). In general, the goal of cancer categorization is to settle for the best option for treatment.

2.4.1 Surgery

The most common type of treatment for breast cancer is surgery. In surgery, tumors are removed as well as some surrounding tissue. The main options for surgical treatment are partial mastectomy, radical mastectomy, reconstruction and lumpectomy.

2.4.1.1 Lumpectomy

Lumpectomy is a type of breast surgery in which tumors or abnormal cells and some of the surrounding normal healthy tissue and lymph nodes (called surgical margin) are removed (Mayo Clinic, 2018). Normally, the amount of tissue removed is small and is dependent on the size and location of the tumor. The procedure thus, seeks to take out the least amount of breast tissue, and is therefore the least invasive BCS as the rest of the breast is preserved. According to Mayo Clinic (2018), the lumpectomy is helpful in the diagnoses of cancer or curation in the early stages of breast cancer.

Tralongo *et al.*, (2019) have reported better outcomes of survival for patients with breast cancer in the past years, and hence the QoL of breast cancer patients post-surgery has consequently assumed increased importance. In a meta-analysis study which compared QoL in patients with breast cancer who underwent mastectomy to those who underwent BCS, Ng *et al.*, (2019) reported that BCS was preferred over mastectomy because it led to more preferred outcomes.

University of Ghana http://ugspace.ug.edu.gh

2.4.1.2 Partial Mastectomy

Partial mastectomy involves the removal of a greater part of the breast as compared with lumpectomy in order to get rid of the cancer. Occasionally, partial mastectomy may require the removal of some lining over the chest muscles as well.

2.4.1.3 Mastectomy

Mastectomy is the process of taking out one or both breasts through surgical means (Zurrida *et al.*, 2011). Mastectomy could be modified radical, which involves the taking out of the whole breast tissue together with the axillary contents, or radical, in which the complete breast, pectoralis major muscles, pectoralis minor muscles, and axillary lymph nodes, behind the breast are taken out (Habermann *et al*, 2010). Other types of mastectomy include extended radical mastectomy, nipple-sharing or subcutaneous mastectomy and skin-sparing mastectomy (Sacchini *et al.*, 2006).

Generally, the presence of this disease in women can predispose them to undergo mastectomy in one or both breasts for curative and/or preventive purposes. The mastectomy treatment option of breast cancer shows tangible changes on the body of the patient which affects her appearance, self-confidence, body image and sexual identity resulting in low-esteem in marriage. Some identified psychosocial factors which impact on female breast cancer patients include depression, anxiety, self-image, coping strategies in relationships, QoL, and social support. Khatcheressian and Brown (2017) have affirmed this and reported that women with breast cancer who have had mastectomy are affected by a number of common psychosocial issues such as the mode of cancer diagnosis and the impact of the mastectomy treatment on the patients' femininity. The image of such patients as seen by their spouse and children is another commonly demonstrated psychosocial issue.

University of Ghana http://ugspace.ug.edu.gh

2.4.2 Chemotherapy

The National Breast Cancer Foundation (2019) defines chemotherapy as a type of cancer treatment that combines cytotoxic medicines to either kill the cancer cells or reduce the pace of their growth. Chemotherapy is systemic, and hence the drugs are administered orally, intravenously or through the bloodstream of patients to kill migrated malignant tumors or cancer cells from the main tumour. The three major aims of chemotherapy in cancer treatment are curative, palliative and control. The major necessitating factors for chemotherapy treatment include the size of the grade and type of tumors, type of receptors and their status. The quantity of lymph nodes, together their degree of involvement, and the probability of spreading the disease to tissue margins are other factors (National Breast Cancer Foundation, 2019). Chemotherapy is usually given alongside the other types of cancer treatment such radiotherapy, surgery, targeted and hormonal therapies.

As reported in the literature, the side effects of chemotherapy include reduction in red blood cells, changes from a different balance of cells lining the intestinal tract, diarrhea, mouth and lip sores, poor appetite, hair loss with accompanying colour and texture changes, nausea and vomiting. A very unusual side effect of chemotherapy is the onset of leukemia (cancer of the blood cells). Other side effects include irregular or complete stop of menstrual periods, infertility, issues with the kidney and consequentially bladder and urine, infection, anaemia, diarrhoea, constipation (National Breast Cancer Foundation, 2019).

Aslam *et al.*, (2014) conducted a study on the side effects associated with chemotherapy revealed that 95% of the patients experienced weakness, 90% of them experienced fatigue, and 76% of them had hair loss. Other side effects such as abdominal cramps, dry mouths, diarrhoea, mouth sores, headache, numbness, impaired memories, nausea and vomiting were reported. Nurgali, Jagoe and Abalo (2018) also revealed in a study that vomiting and nausea were some

University of Ghana http://ugspace.ug.edu.gh

of the dreaded side-effects exxperienced by chemotherapy treatment patients. They further indictaed that in as much as most patients fairly respond to medications aimed at managing acute chemotherapy-induced nausea and vomiting (CINV), a delayed phase of CINV is more ardous to control. It usually manisfests in two phases; an acute phase, and then a delayed phase which has a remarkable adverse effect on the everday life of patients (Navari and Aapro, 2016). In a study by Rapoport (2017), it was discovered that making out patients at risk of delayed CINV is quite complicated and would need assessment of demographic, personal, clinical and behavioural factors. It was also realised in the same study that CINV in its delayed phase has a remarkable adverse effect on the everday life of patients.

Nausea and vomiting as a result of chemotherapy can have a very bad effect on the QoL of such patients (Hilarius *et al.*, 2012) and potentially affect outcomes of treatment (Jordan et al., 2015). Chan and Ismail (2014) found in some research they conducted in 2014 that over two-thirds of patients after the final cycle of chemotherapy, experienced nausea and vomiting and these patients mentioned that nausea and vomiting were two of the side effects of chemotherapy they dreaded the most.

A study by Chui (2019) suggested that depression, fatigue, interruption of sleep and pain are positively associated and occur concurrently, impacting one another and reducing the QoL of patients undergoing chemotherapy treatment. Pearce *et al.*, (2017) also mentioned in their study that chemotherapy associated side effects affect the QoL, emotional and physical health of patients. Adjuvant chemotherapy minimizes the probability of a recurrence, with results that are proportionally higher in younger women but are slightly affected by grade, nodal status, or the use of adjuvant endocrine therapy (Saparano *et al.*, 2018)

University of Ghana http://ugspace.ug.edu.gh

2.4.3 Hormone therapy

Estrogen and progesterone are gland producing chemicals or hormones in the body which regulate body cycles. According the National Breast Cancer Foundation (2019), these hormones can sometimes induce cancer. Hormonal therapy (anti-hormone treatment) is therefore needed to inhibit the inception of spread of hormone induced cancers.

Hormone therapy is used only in postmenopausal women. Tamoxifen is the most common hormone therapy drug. According to the Breast International Group (BIG) 1-98 Collaborative Group, adjuvant endocrine therapy with tamoxifen significantly prolongs disease-free and overall survival in postmenopausal women with early-stage breast cancer. Winer *et al.*, (2004) earlier reported that adjuvant hormonal therapy is one of the most dramatic and important additions to the treatment of breast cancer for hormone-sensitive breast cancer with impressive reductions in recurrence and mortality. This is confirmed in the literature that adjuvant hormonal therapy for hormone-sensitive breast cancer dramatically reduces recurrence and mortality (Hershmann et al, 2010).

2.4.4 Radiotherapy

2.4.4.1 Curative radiotherapy

Radiotherapy uses high-energy radiation to kill cancer cells. Breast cancer radiation therapy may be used to destroy any remaining mutated cells that remain in the breast or armpit area after surgery. Mohan *et al.*, (2019) described radiotherapy as the major type of cancer treatment which uses radiation to interfere with the DNA of cancer cells, resulting in stunting the growth, division and eventual death of the cells. External beam radiation therapy (EBRT), also known as traditional or whole breast radiation therapy involves the use of highly focused energetic radiation to target the cancerous area for two to three minutes (National Breast Cancer Foundation, 2019). Internal beam radiotherapy (IBRT) for breast cancer treatment involves the

University of Ghana http://ugspace.ug.edu.gh

use of *partial breast radiation* where a radioactive liquid using needles, wires, or a catheter is inserted in order to target the origin or area of the cancer cells., and neighbouring tissues.

According to the Early Breast Cancer Trialists' Collaborative Group (2011), randomized trials have shown that radiotherapy for early-stage breast cancer can reduce the rates of recurrence and death from breast cancer. The decision to treat a tumor with radiotherapy is based on the location of the primary tumor and whether the tumor cells are radiosensitive (Mohan *et al.,* 2019). With respect to tumor localization, radiotherapy is most effective when a tumor is contained, easily accessible and located away from major organs of the body. Generally, radiation is directed to the tumor and the immediate surrounding area to destroy the main tumor and any nearby tumor spread. Higher total doses of radiation are needed to destroy the main tumor; lower doses are given to destroy the spread of the tumor. A great percentage of breast cancer patients undergo either neoadjuvant radiotherapy (prior to surgery) or adjuvant radiotherapy (post surgery) treatment in order to prevent recurrence of the disease and the optimal treatment outcome (McGale *et al.,* 2014).

A drawback of the radiotherapy treatment is that it can also affect normal cells around the cancer cells. According to Mohan *et al.*, (2019), some of the observed side effects for breast cancer radiotherapy treatment include fatigue, irritated skin at the treatment site, swollen breasts, unusually heavy and discoloured breasts, lymphedema and acute radiation induced dermatitis. Wet desquamations is both painful and uncomfortable and is reported to be experienced by about 36% of patients receiving radiotherapy treatment (Suresh *et al.*, 2019). Kole *et al.*, (2017) have also stated that almost all patients who underwent radiotherapy treatment experienced some amount of acute radiation dermatitis. Effects of radiation on the skin are more complicated as the sebaceous glands and follicles of hair are sensitive to

University of Ghana http://ugspace.ug.edu.gh

comparatively low radiation doses, leading to dryness of the skin and loss of hair which induce dermatitis (Kole *et al.*, 2017).

2.4.4.2 Palliative radiation therapy

In addition to its curative purposes, Gaertner *et al.*, (2014) stated that palliative radiotherapy may also be given to relieve pain in cancer patients, especially patients with illnesses that are life-threatening. For palliative purposes, lower doses are given compared to curative treatment, usually over a shorter period of time. Davis, Bruera and Morganstern (2013) suggested that palliative care should be integrated into cancer care at the begining treatment stage as it has proven extremely helpful in improving QoL, decreasing the burden of caregivers, improved control of symptoms and probable benefits of survival. Irrespective of staging and disease prognosis, palliative care has been found to be beneficial to cancer patients (Von, 2013). Palliative treatment has been one of the first ten developing subspecialties in medicine due to increased demand (Strand et al., 2014). It is mentioned in the literature that palliative treatment is usually included in the management of late staged cancer with the aim of discussing care, transition to hospice and eventual death. Patients in the late stages of breast cancer together with their families have complicated needs to be catered for to reduce frustration and decreasing of QoL of patients as well as their families (Cherny, Paulch-Shimon and Berner-Wygoda 2018).

2.4.5 Targeted therapy

Target therapy involves the use of effective treatment methods or therapy to effectively target malignant cells without harming normal cells. Targeted therapy methods are employed in combination with chemotherapy. The targeted drugs block the growth of breast cancer cells in specific ways. In particular, during targeted therapy of breast cancer, the drug (mostly herceptin) is administered through a vein alone, or as a combination therapy with chemotherapy. Side effects that most commonly occur during the first treatment include fever

University of Ghana http://ugspace.ug.edu.gh

and chills. Other possible side effects include weakness, nausea, vomiting, diarrhea, headaches, difficulty breathing, and rashes. According to the National Breast Cancer Foundation (2019), the side effects generally become less severe after the first treatment. Herceptin also may cause heart damage, heart failure, and serious breathing problems.

2.4.6 Combination (Multimodal) treatments

Combination or multimodal treatments refer to the use of two or more kinds of therapies. Combining two or more types of treatments such as surgery, radiotherapy, and chemotherapy in sequence, at the same time, or in various modes may be more effective than a single treatment option. Under certain conditions, combination therapy can achieve a greater likelihood of cure than a single approach, with less damage to vital organs and tissues (Ginsburg *et al.*, 2020).

Due to recent advances in the treatment of early-stage breast cancer, many patients receive lumpectomy followed by radiation therapy rather than mastectomy (removal of the entire breast.

As reported in the literature, combination treatments are performed for several reasons including higher effectiveness of one treatment mode at a certain stage of cancer than another, enhancement of one treatment option by the other, and the fact that one treatment alone may not affect the tumor (Ginsburg *et al.*, 2020). To enhance the effectiveness of radiation therapy, some chemotherapy drugs are used to make certain kinds of cancer cells more susceptible to the radiation dose. Radiation therapy is generally most effective at the edges (margins) of a tumor but not as effective in the center of a tumor. Surgery can remove the tumor, but it may be unable to eliminate all cancer cells surrounding it without cutting out too much normal tissue Therefore, the two treatments can be combined to work together, filling in the gaps of each

University of Ghana http://ugspace.ug.edu.gh

other. Since it is uncommon for cancer to be treated by only one method, combination treatments present a promising outlook for cancer treatment (Mohan *et al.,* 2019).

Breast cancer treatment with a curative intent usually results in desired outcomes if it is given over a specific time period. The success of the treatment outcome, according to Ginsburg *et al.,* (2020) is dependent on how the case is handled after the diagnosis. Curative treatment for breast cancer is given thorugh different modalities such as radiotherapy, surgery and chemotherapy, alongside treatment to manage side-effects of treatment and pain related to cancer for stage I through stage III of the disease (Cardoso *et al.,* 2013).

2.5 Quality of life (QoL) of breast cancer patients

Quality of life is a subjective term which defines the degree to which an individual is healthy, comfortable, and able to participate in or enjoy life events. Quality of life as defined by the WHO is an individual's perception about their position in life in the context of value and cultural systems in which they live and in relation to their goals, expectations, standards, and concerns. It has been reported in literature that breast cancer impacts negatively on the QoL and lifestyle choices of affected patients. According to Kyei *et al.,* (2014), measuring QoL in breast cancer has been the focus of clinical practice in recent decades which is important in assessing treatment outcomes. This could be due to increasing number of breast cancer patients.

Breast cancer is associated with quite a number of tangible presentations with the ability to decrease the QoL and affect the total wellbeing of a patient (Thrift-Perry *et al.,* 2018). A study by Sharma and Purkayastha (2017) revealed that breast cancer patients aged 30 to 39 years portrayed particularly worse QoL outcomes compared with much older breast cancer patients in the areas of physical functioning, social functioning and future perspective. Their work revealed that younger breast cancer patients felt more socially restricted, especially during adjuvant mastectomy, compared to older patients. In a similar study, Bantema-Joppe *et al.,*

University of Ghana http://ugspace.ug.edu.gh

(2015) reported that over a duration of time, role development, emotional, and cognitive functioning were as worse in much older breast cancer patients compared to younger patients. Basu *et al.,* (2016) observed that long-term breast cancer survivors diagnosed after age 65 years portrayed particularly worse outcomes in the physical domain, while those diagnosis at a much earlier age portrayed worse outcomes in the social, emotional and body image perception QoL domains, and concluded that age is a vital component in assessing QoL. In particular, Basu and Basu (2016) also noted that, similar to other findings, patients' social and physical functions decreased during chemotherapy, while the reasonably good scores for QoL obtained during radiotherapy suggested that patients tolerated radiotherapy quite well.

In a South Korean study on breast cancer survivors, Shin *et al.,* (2017) found that levels of physical activity after diagnosis of breast cancer were related to QoL. The study observed variations in menopausal status at the time of diagnosis, staging of the disease, body mass index (BMI), time gone after surgery and age at the time of diagnosis. The study also revealed that the increased physical activity after the time of diagnosis related with decreased scores of fatigue and pain, and increased scores of sexual functioning. According to Shin *et al.,(*2017), other studies, consistent with theirs revealed that bodily exercise was associated with improved QoL.

A study conducted by Dirksen and Epstein (2007) suggested that insomnia is a major issue for cancer patients. Their estimated prevalence 30-73% revealed that cancer patients experienced difficulties in sleeping further mentioned that breast cancer survivors were prone to having sleep disturbances. In the literature, a large number of breast cancer survivors have reported difficulties in sleeping at the time of diagnoses, and during and after treatment (Carpenter *et al.*, 2004)

University of Ghana http://ugspace.ug.edu.gh

2.6 Lifestyle choices of breast cancer patients

Lifestyle has been defined in several ways. It relates to the interests, view, ideas, behaviours, way of living and behaviours of an individual, or group of people. Lifestyle can therefore be described as a combination of intangible factors such as matters relating to psychological aspects such as personal values, preferences, and outlooks. Lifestyle can also be a combination of tangible factors which relate demographic variables which are normally independent. According Ryan (2018), a lifestyle is a way of living or doing things, including decision making.

A lifestyle choice is therefore a voluntary and cognizant decision to accomplish or execute activities that have the propensity to induce, or increase, or decrease the risk of an existing injury or disease condition. Several factors which affect lifestyles choices of breast cancer patients can present positive or negative impacts on the survivability of breast cancer. Adoption of healthy lifestyle behaviours has shown promising effectiveness in reducing the high morbidity burden of cancer survivors. There is reported evidence that physical exercise during adjuvant treatment for breast cancer probably improves physical fitness, while promoting healthy lifestyle behaviours among many breast cancer survivors in the United States has been critical to their well-being, QoL, and motivated changes in lifestyle choices (O’Neill et al., 2013). For this reason, breast cancer patients are motivated to attempt changes in lifestyle choices.

There are now lifestyle guidelines for cancer survivors advocating smoking cessation, moderate alcohol consumption if any, and healthy balanced diets, daily physical activities, and maintenance of a healthy weight. In a study by Spei *et al.,* (2017), it was found that the greatest amount of physical activity spent on recreation relatively reduced all-causes and breast cancer mortality. In the literature, reports of the effects of food regimen and nutrition picks on tumour

University of Ghana http://ugspace.ug.edu.gh

advancement or otherwise, probability of a relapse, and general endurance in persons who underwent cancer treatment have been made. In particular, DeNysschen *et al.,* (2014) have stated that a relapse of breast cancer can be affected by lifestyle modifications, especially food and physical workout.

In reporting about diet, exercise, and complementary therapies after cancer treatment, Jones and Demark-Wahnefried (2006) indicated that many cancer fighters were greatly inspired to hunt for information about lifestyle choices regarding food, bodily activity and the use of food supplements to increase their treatment response, speed up the recovery process, lessen their possibility of a tumour reappearance, and increase their overall QoL. Another study reported by Pierce *et al.,* (2007) found that breast cancer survivors who consumed healthy diets and performed weekly physical activity equivalent to 30 minutes of walking at a moderate pace, 6 days/week, had a higher 10-year survival rate than those who did not adhere to these lifestyle practices.

Similarly, Kwan et al., (2009) reported a 43% decline in general mortality was seen in a study of survivors of breast cancer in association with a dietary arrangement characterized by the high consumption of vegetables and whole grains. Survivors of breast cancer survivors who confirmed taking in at minimum 5 servings of fruits and vegetables daily, and engaging themselves in bodily activity weekly, equal to 30 minutes of walking for 6 days every week were seen to have a greater rate of survival, even though a substantial survival benefit was not seen for either of these behaviours only.

Again, owing to the fact that women usually gain weight after being diagnosed with breast cancer, weight control should also be given attention (Vance *et al.,* 2011). Other studies have suggested that diets for breast cancer survivors should emphasize vegetable, fruit, whole grain, fiber, and low fat dairy intake while lowering saturated fat content of the diet as a strategy to

University of Ghana http://ugspace.ug.edu.gh

promote health and prevent disease (Pierce *et a l.,* 2007). According to Lahart *et al.,* (2018) changes in diet and exercise can remarkably improve the overall health of patients, while increased physical activity leads to significantly minor to reasonable advancements in QoL emotive function, apparent bodily function, apprehension, and cardiorespiratory health.

2.7 Improving the quality of life and lifestyle choices of breast cancer patients

2.7.1 Breast prostheses

Breast prosthesis is an artificial form of breast used to substitute the natural breast after a complete or partial mastectomy has been done to provide better symmetry, a more natural look and shape to the body as well as improve posture of the body (Jetha, Gul & Lalani, 2017). Available literature concerning breast prostheses from some countries suggests that breast prostheses come in different types, sizes, shapes and colours. The decision to use breast prostheses is very personal and varies from individual to individual based on feelings, age, QoL, and lifestyle, among certain other factors. Some women resort to the use of breast prosthesis pending decisions for breast reconstruction surgery or not. Others also use breast prosthesis instead of breast reconstruction. However, some women opt not to use breast prosthesis or have reconstructive surgery (Anim-Sampong, 2018). According to Fouladi (2013), patients who underwent mastectomy and consented to participate in a study used breast prostheses, jelly brassieres, special coverings and breast reconstruction surgeries. According to Roberts *et al.,* (2003), the provision of an appropriate breast prosthesis to affected breast cancer patients improved their QoL, body image, appearance, and femininity.

Other studies have also confirmed that the use of breast prostheses alleviated stress and improved the self-esteem of women who underwent mastectomy (Gallagher *et al.,* 2010). Borghesan *et al.,* (2014) discovered that about 56% of post-mastectomy breast cancer patients were content with breast prostheses. However, some complained about its displacement during

University of Ghana http://ugspace.ug.edu.gh

activity, pain and uneasiness at the site where the surgery was done. In a related study conducted in Pakistan on the experiences of women with body prostheses, Jetha, Gul, and Lalani (2017) stated that 15 women from 35 to 61 years (mean age: 45 years) who went through mastectomy saw their breasts as a symbol of womanly distinctiveness and thus, resorted to the use of breast prostheses.

Employing the use of mix methodology, Kubon *et al.*, (2012) compared the preference of custom-made breast prostheses and temporary breast prostheses among post-mastectomy women in Canada. Whereas the quantitative part of the study revealed no difference between custom-made breast prostheses over temporary breast prostheses, the qualitative part of the study showed more contentment with custom-made breast prostheses. Studies have shown that breast prostheses help to alleviate stress and improve the self-esteem of women after they have been through a mastectomy (Gallagher *et al.*, 2010). In investigating the use of breast prostheses in India, Ramu *et al.*, (2015) found that high level of education, young age and living in the urban part of the country contributed to higher usage of breast prostheses. Ramu *et al.*, (2015) further stated that many post-mastectomy patients who used breast prostheses confirmed improvement in the quality, comfort, size, shape and cost of breast prostheses.

On the other hand, Gallagher *et al.*, (2009) argued that the cost of breast prostheses is a primary challenge for women who resorted to using them. In the same wise, in Canada, Fitch *et al.*, (2012) also suggested that the cost and care of breast prostheses was the major worry of those who used them. Other concerns of the women included inadequate information on breast prostheses, absence of privacy, time for fitting the breast prostheses and certain traits of the fitters such as their gender and character.

In Ghana, it was also observed that most post-mastectomy breast cancer patients knew very little or nothing about breast prostheses and the few who knew about it could not readily or

University of Ghana http://ugspace.ug.edu.gh

always afford them. Some women resort to fixing foams or pieces of fabric in their brassieres in place of actual breast prostheses.

2.7.2 Support groups

The Cambridge English dictionary defines a support group as, "*A group of people who have had similar experiences, especially difficult ones, and who provide help to each other*". Thus, support groups are a great form of help for women after mastectomy (American Cancer Society, 2012). Till (2003) indicated in his study that literature on the evaluations of community-based cancer support groups revealed that they rendered a good number of benefits, and that it is more practicable to expect an impact of such interventions on psychosocial functioning and/or health-related QoL than on just survival. More popular online support groups are peer-moderated, rather than professionally moderated (Till, 2003).

A study undertaken by Adorna, Morari-Cassol, & Ferraz (2015) revealed that, by the kind courtesy or assistance of support groups, women who have had mastectomy have opportunities to identify with themselves, share experiences, reduce tensions, have a better understanding of what they are facing, be updated with information concerning their situation, make good friends, raise their self-esteem and improve their QoL.

2.7.3 Support from loved ones

Neto *et al.*, (2017) suggested that good support provided by relatives and close friends of women who underwent mastectomy is key to improving their QoL. Family seems to be the main source of support for women during neo-adjuvant and adjuvant oncological treatment as they provide direct care and indirect support to affected relatives with regards to their emotional well-being and with daily activities. This is because the affected women are physically and psychologically incapable after mastectomy (Almeida *et al.*, 2015). In such situations, the

University of Ghana http://ugspace.ug.edu.gh

family presence, support and care provide means to significantly deal with associated stress and reduce the physical and emotional pains of affected women.

2.7.4 The role of health care professionals

Koçan & Gürsory (2016) indicated in their study that patients need medical, social, and psychological support throughout the process of treatment for breast cancer as well as after completion of treatment for breast cancer. Consequently, the multidisciplinary team must work with human values, break down the mechanized and routinized care, provide an innovative and transformative habitude of the professional relationship with the patient, and give the women with mastectomy holistic care (Nasciemento *et al.*, 2014). Solidarity to women in preoperative mastectomy requires teamwork, as a united staff, and not as a group that performs its functions individually (Nasciemento et al., 2014).

Koçan & Gürsory (2016) suggested in their study that nurses make available to patients all the necessary information and support both prior to and after the surgery, and teach effective coping skills to aid them go through the difficult health challenge they are faced with. They recommended skilled professionals to deal with the psychological aspects of the issues faced by such patients due to the sensitive nature of their condition. The Koçan & Gürsory (2016) study has also suggested discussion of the options for reconstruction with patients who are to undergo mastectomy either before the surgery or afterwards (Koçan & Gürsory, 2016).

2.8 Conclusion to the review

This review presents literature breast cancer, its incidence and prevalence, as well as risk factors. Again, lumpectomy and mastectomy which are surgery treatment options for breast cancer, as well as the emotional, psychological and social impact on affected patients are presented in this chapter. Other treatment options – chemotherapy and radiotherapy are also presented in this chapter together with the treatment intents for cancer treatment – curation and

University of Ghana http://ugspace.ug.edu.gh

palliation. Finally, the Chapter also comprises of the QoL and lifestyle choices of breast cancer patients, and the association between both. There is presently no published data to elucidate the QoL and lifestyle choices of breast cancer patients at the SGMC Cancer Centre. This study is being undertaken to assess the QoL and lifestyle choices of breast cancer patients at the SGMC Cancer Centre in Accra, and further provide information about the extent to which the affected QoL has an impact on their lifestyle choices. It will also serve as a baseline data needed for future references.

University of Ghana http://ugspace.ug.edu.gh

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In this Chapter, the study design and reasons for its adoption in this study are presented. The study site, sample population, sample size, and sampling methods are also discussed. Again, other aspects including the inclusion and exclusion criteria, data collection procedure, data analysis and ethical considerations are also presented in detail.

3.2 Study design

A quantitative descriptive cross-sectional study design was employed for this study. The choice of this study design was particularly helpful in finding association between QoL and lifestyle choices and independent demographic variables and various cancer treatment regimens for breast cancer patients.

3.3 Study site

This study was carried out at SGMC in Accra. The Centre is a modern out-patient clinic for effective cancer treatment. The study site was chosen because many breast cancer patients are referred there for treatment from many hospitals throughout Ghana and in the West African sub-region. The Centre began operating in November 2011 and is owned by Global Medical Investments Ltd. It is a joint Swedfund and Elekta company established to provide cancer clinics in developing countries.

3.4 Study population

The study population consisted of breast cancer patients who reported to the Centre in the month of August, 2020 for adjuvant multimodal cancer treatment including curative chemotherapy, radiotherapy and palliative regimens

University of Ghana http://ugspace.ug.edu.gh

3.5 Sampling method

The total enumeration method was employed taking into consideration the records of the study site for the last five months prior to data collection. It showed a reduction in the number of patients reporting to SGMC for treatment and monthly review due to the coronavirus pandemic.

3.6 Sampling size

In accordance with the requirements of the academic programme, the study period was limited to only one month. Using the total enumeration method, 80 breast cancer patients reported to SGMC during the study period of August, 2020 for treatment and/or review. All the patients consented to participate in the study. Hence, a sample size of 80 was obtained. Per available records at the Centre, the average number of breast cancer patients presenting for treatment and/or review from March to July was 85. Hence, a sample size of 80 patients for the limited month of August is within 94.1% of the recorded monthly average.

3.7 Inclusion and exclusion criteria

3.7.1 Inclusion criteria

Consenting breast cancer patients of the study population reporting to SGMC for review and/or adjuvant multimodal cancer treatment including curative chemotherapy, radiotherapy and palliative regimens in August 2020, were included in the study.

3.7.2 Exclusion criteria

Patients within the study population who declined consent to were excluded from the study.

3.8 Data collection

3.8.1 Data collection tool

The data collection tool consisted of three parts; the first for socio-demographic and clinicopathological characteristics extracted after reviewing the patients’ medical records. The

University of Ghana http://ugspace.ug.edu.gh

second part was the Functional Assessment of Cancer Therapy-Breast version 4 questionnaire (FACT-B V4). The 3-sectioned questionnaire comprised close ended questions, and addressed indices or factors such as patient demographics (age, ethnicity and marital status), factors that have impacts on their QoL, as well as factors that affect their lifestyle choices.

The QoL instrument FACT-B+4 tool specifically contains 37 questions defined under 5 dimensions or subscales: physical well-being (PWB), social/family well-being (SWB), emotional well-being (EWB), functional well-being (FWB), and additional concerns about breast cancer (ACBC). The values for each question ranged from 0 to 4, and final scores are anchored on a scale of 0 to 148 (highest QoL) as presented in Table 3.1.

Table 3.1: Dimensional scores of FACT-B V4 tool

No	Dimension	No. of items	Score range per question	Score
1	PWB	7	0 – 4	28
2	SWB	7	0 – 4	28
3	EWB	6	0 – 4	24
4	FWB	7	0 – 4	28
5	ACBC	10	0 – 4	40
			Total	148

The final scores were calculated by adding up the scores from the various subscales. In this study, the closer the dimensional score is to the total score (148), the better the QoL of the breast cancer patients.

The third part was the section on lifestyle choices created by the researcher. This tool specifically contains 21 questions defined under 4 dimensions or subscales: health lifestyle, diet lifestyle, physical appearance and social lifestyle. The values for each question ranged

University of Ghana http://ugspace.ug.edu.gh

from 0 to 4, and final scores are anchored on a scale of 0 to 84 (highest lifestyle) as presented in Table 3.2.

Table 3.2: Dimensional scores of lifestyle choices

No	Dimension	No. of items	Score range per question	Score
1	Health	5	0 – 4	20
2	Diet	5	0 – 4	20
3	Physical Appearance	6	0 – 4	24
4	Social Life	5	0 – 4	20
			Total	84

The final scores were calculated by adding up the scores from the various subscales. In this study, the closer the dimensional score is to the total score (84), the better the lifestyle choices of the breast cancer patients.

3.8.2 Validity and reliability of the questionnaire

As reported by Kimberlin & Winterstein (2008), the validity of a data collection tool is largely dependent on the ability of the tool to accurately measure what it was intended to. Two persons including a public health expert of the University of Ghana School of Public Health, and a radiation oncologist at SGMC assessed the questionnaires to ensure the validity of the questions. A scale of 1-3 was used to score each question. Questions which scored 1.5 or less were considered irrelevant and removed from the questionnaire. Cronbach's alpha was then used in determining the reliability of the questionnaire. In particular, Cronbach's alpha is a coefficient of reliability (or consistency) and measure of internal consistency. It establishes

University of Ghana http://ugspace.ug.edu.gh

close relationships between a set of items in a group, and is expressed as a function of the number of test items and the average inter-correlation among the items via the formula

$$\alpha = \frac{N\bar{c}}{\bar{v}(N-1)\bar{c}} \qquad (3.1)$$

where α is Cronbach's coefficient coefficient of reliability, N is number of items, $\bar{c}$ is the average inter-item covariance among the items average covariance between item-pairs, and $\bar{\upsilon}$ is the average variance. In particular, the value of Cronbach's alpha is strongly influenced by the number of items, and the average inter-item covariance among the items average covariance between item-pairs if all factors are held constant. Pre-testing was also used to assess the reliability and validity of the questionnaire.

3.8.3 Procedure and data collection

The entire research work and procedure was explained to the study population of patients who reported to the Centre, and who could ask questions for any further clarifications. Consenting participants were then given information letters and consent forms to explain what was required of them in the research study by the researcher. The first aspect of the data collection data consisted of extracted socio-demographic and clinicopathological characteristics after reviewing the patients' medical records. The QoL FACT-B V4 data collection tool and lifestyle choices questionnaire were employed in the second and third parts using its semi-structured questionnaires. The questionnaires were available in English but were however, translated to the relevant local languages of patients who requested them.

3.8.4 Data collection precautionary measures during covid-19 pandemic

There were no physical contacts with the patients during data collection. The QoL FACT-B V4 questionnaires were administered to the patients through a link via email, whatsapp and telegram depending on patients preferences. The consenting patients filled and submited via

University of Ghana http://ugspace.ug.edu.gh

their preferred means. Also, assistance was provided to patients who requested it in order to complete their questionnaires. This was done over phone calls where the questions were read out and explained to them. Their answers were then indicated on their questionnaires as provided by the principal investigator.

3.8.5 Data management plan

The collected data was recorded and saved on a computer and secured with a password known only to the investigator. Hard copies of the work will be printed and safely kept as back-up.

3.9 Data analysis

Data collected was analyzed using STATA version 16. Descriptive statistics in the form of frequency distributions, bar charts and percentages were used to present the data, by using Microsoft Excel 2013 version 15 spreadsheets. This provided results in the form of charts, graphs and tables for easy interpretation. Descriptive continuous variables were reported as means with standard deviations, or median with inter-quartile range if not normally distributed. Multiple regression modelling was used to determine the factors (demographic, clinical and lifestyle choices) associated with QoL and lifestyle choices among the breast cancer patients. A *p*-value less than 0.05 was reported as significant.

3.10 Ethical considerations

Ethical clearance and permission to conduct the study were provided by the Ghana Health Service Ethics Review Committee, and the Ethical and Protocol Review Committee of SGMC respectively. Informed consent was sought from participants included in the study. No participant was coaxed into participation. Assurance was given to participants concerning the confidentiality and anonymity of information they give towards the study. Consent forms were available in English and translated into local dialects as and when necessary. Participants were

University of Ghana http://ugspace.ug.edu.gh

given the freewill to decline their involvement at any stage during data collection. Also, patients were assured of the fact that there will be no harm caused in the course of the study.

Participant consent: Every respondent was approached to express consent prior to participation. Before participants received the questionnaire, they were each given a consent form to read and sign. For individuals who could not read, the purpose of the study was explained to them and if they accepted to partake, the questions were read too them to answer.

Confidentiality: All respondents were given assurance that any information they provide will strictly be used solely for academic purposes and their confidentiality was therefore, assured.

Risk and Benefit: Respondents were assured that the research presented no risk or cost except their time that they used in filling the questionnaire.

Compensation: Respondents were compensated with airtime and internet bundle worth GH₵10.00 each ~~to compensate~~ for their spent time in answering or filling the questionnaires, as well spent in receiving and submitting via email, WhatsApp or Telegram. Each questionnaire was filled within 10 -15 minutes.

Conflict of interest: There was no conflict of interest in doing this study and presentation.

University of Ghana http://ugspace.ug.edu.gh

CHAPTER FOUR

RESULTS

4.1 Introduction

The findings of the study on the QoL and lifestyle choices of breast cancer patients presenting for treatment and clinical reviews at the SGMC are presented in this Chapter. The results include patient demographics, QoL and assessments of patients' lifestyle choices, and the association between them. The STATA version 16 software and Microsoft Excel 2013 were used for descriptive and inferential analysis of the data.

4.2 Demographics

The demographics of the participants are presented in Table 4.1. The ages ranged from 21 years to over 70 years. The mean age of the population was 48.4 years (SD= 13.5). The most prevalent age groups were 50-59 years (*N*=29, 36.3%) and 40-49 (*N*=27, 33.8%), while the least prevalent age group was 20-29 years (*N*=4, 5.0%).

There were more married (*N*=60, 75.0%) than unmarried women (*N*=20, 25.0%) among the population. The small population of Nigerians (*N*=6, 7.5%) was based upon recommendations and referrals from Nigerian hospitals. Most of the participants hailed from Ghana (*N*=74, 92.5%). Some of the Ghanaian participants hailed from different geographical regions of the country. Hence, for purposes of convenience, their hometowns were categorized into 10 geographical regions. Majority of the participants hailed from the Central (*N*=12, 15.0%), Western (*N*=11, 13.8%), Volta (*N*=11, 15.0%) and Eastern (*N*=10, 12.5%) Regions, while the minority hailed from the Upper East (*N*=2, 2.5%), and Upper West (*N*=1, 1.3%) Regions respectively.

University of Ghana http://ugspace.ug.edu.gh

Table 4.1: Age, marital and ethnicity

Demographics			*N*	Percent, %
Age (years)		20 – 29	4	5.0
		30 – 39	10	12.5
		40 – 49	27	33.8
		50 – 59	29	36.3
		60 +	10	12.5
		Mean (±SD)	48.4 ± 13.5	
Marital status		Married	60	75.0
		Unmarried	20	25.0
Country of origin	Ghana	Ashanti	4	5.0
		Brong-Ahafo	6	7.5
		Central	12	15.0
		Eastern	10	12.5
		Greater Accra	9	11.3
		Northern	8	10.0
		Upper East	2	2.5
		Upper West	1	1.3
		Volta	11	13.8
		Western	11	13.8
		Total	74	92.5
	Nigeria		6	7.5

Participants from the Greater Accra (*N*=9, 11.3%) and Northern (*N*=8, 10.0%) Regions constituted about 21.3% of the sample population.

4.3 Treatment regimens

Combination or multimodal treatments refer to the use of two or more kinds of cancer therapies. Since one treatment alone cannot cure or control cancer, multomodal treatments provide patients with better survival opportunities and enhance longer living. Multimodal cancer treatments use different kinds of therapies in sequence, at the same time, or in different formats. In this study, three multimodal adjuvant breast cancer treatment regimens or modalities

University of Ghana http://ugspace.ug.edu.gh

including curative chemotherapy, radiotherapy and surgery (Cur CRS), curative radiotherapy and surgery (Cur RS), and palliative chemotherapy and radiotherapy (Pa CR) were provided to the participants as shown in Table 4.2. Most 69 (*N*=75, 93.7%) had undergone multimodal adjuvant curative chemotherapy, radiotherapy and surgery, and curative radiotherapy and surgery, while only 5 (6.3%) presented for neoadjuvant palliative chemotherapy and radiotherapy.

Table 4.2: Treatment regimens

Treatment and Surgery			***N***	**Percent, %**
Treatment	Adjuvant	Cur CRS	69	86.2
		Cur RS	6	7.5
	Neoadjuvant	Pa CR	5	6.3
		Total	80	100.0
Surgery (*N*=75)	Breast conserving	Lumpectomy	7	9.3
		Partial mastectomy	6	8.0
	Non-breast conserving	Mastectomy	62	82.7
		Total	75	100.0

Mastectomy (*N*=62, 82.7%) was the most common surgical procedure. The BCS were comparable (lumpectomy: *N*=7, 9.3%; partial mastectomy: *N*=6, 8.0%).

4.4 Quality of life (QoL)

The QoL of the breast cancer patients was determined using five QoL FACT-B+4 dimensions. The QoL scores were defined at the mean value of the inter-quartile range which occurs at the 50th percentile as shown in Fig. 4.1. Generally, mastectomy and other treatment regimens negatively impact the psychological and emotional health of breast cancer patients to a large extent. The highest domain scores were demonstrated in the EWB (46.4%) and FWB (50.0%) subscales, while the lowest scores were recorded in the ACBC (32.5%) and SWB (40.0%) subscales.

University of Ghana http://ugspace.ug.edu.gh

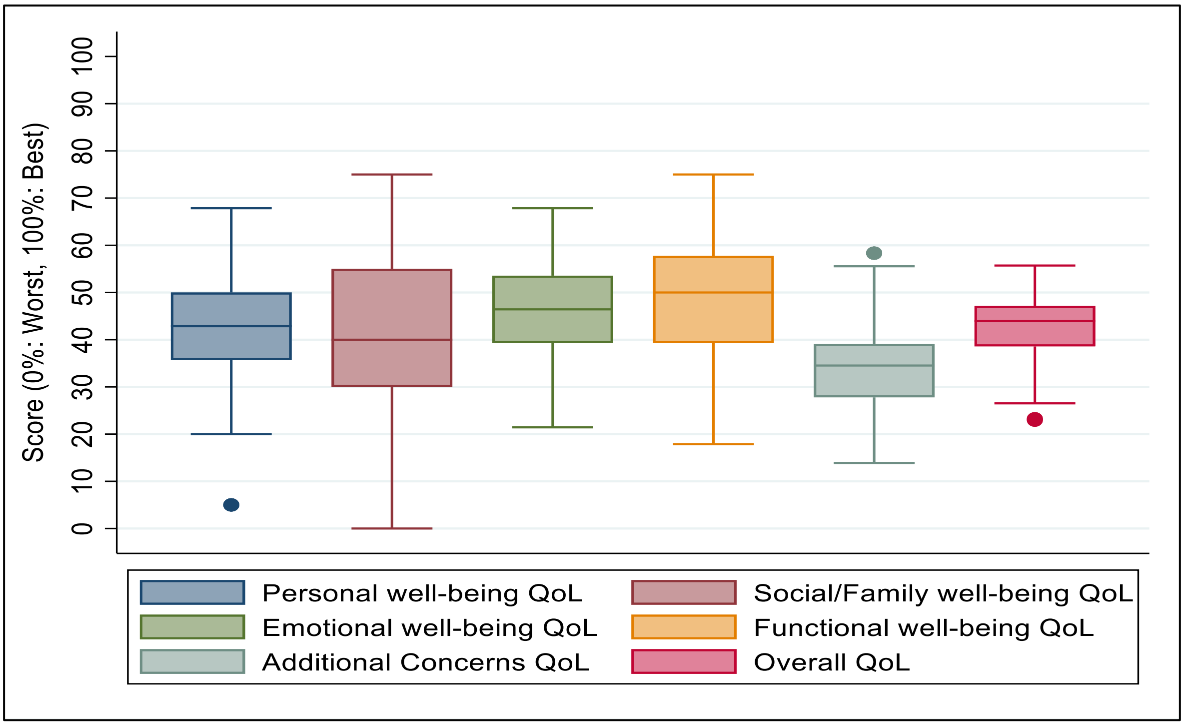

Fig. 4.1: FACT-B QoL of breast cancer patients

Another impact of cancer treatment regimens on breast cancer patients is decreased physical ability. The results show a 43% QoL score for patients' PWB which is comparable to the overall average of 43.9%.

4.4.1 Relationship between background characteristics and quality of life (QoL)

The QoL across the demographics, treatment regimens and types of surgery is presented in Table 4.3. The Kruskal-Wallis test was used for non-parametric tests, and *p*–values < 0.05 were taken as significant where comparisons were conducted. With respect to PWB, QoL was highest for the breast cancer patients aged 50 – 59 years (48.9 ± 9.6%) and over 60 years (46.3 ± 15.0%) and least for the 20 -29 years group (33.6 ± 9.7%). The results showed a significant relationship between age and PWB QoL (*p*=0.002). Similarly, the QoL for SWB was highest for the patients aged 50 – 59 years (41.0 ± 15.5%) and over 60 years (45.0± 19.7%) and least for the 20-29 years group (27.5 ± 19.4%). A *p*-value of 0.502 showed no significant relationship between the patients age and their SWB. The 20-29 years old patients enjoyed the highest QoL (48.2 ± 15.0%) with respect to their EWB. The QoL was also high for women aged 40 - 49

University of Ghana http://ugspace.ug.edu.gh

years (46.3 ± 11.2%) and 50-59 years (47.0 ± 10.9%). The QoL domain scores for the oldest group (60 -70 years) patients was however lowest at (42.9 ± 6.0%). No significant relationship (*p*=0.809) between the patients' age and their EWB existed.

The 20 - 29 years also scored the highest (56.8±8.3%) QoL domain scores for FWB. The highest (52.9 ±13.2%) QoL domain scores among the 30 – 39 years for all the five QoL subscales was recorded for their FWB. The least value was recorded among the over 60 years at 47. 9 ± 8.6%. There was no significant relationship between the parients age and their FWB (*p*=0.622). The breast cancer patients aged 40-49 years and over 60 years enjoyed the highest QoL doanin scores of 35.7 ± 10.6% and 36.3 ±5.5 % respectively in respect of ACBC. Statistically, there was no significant relationship between the parients age and ACBC (*p*=0.749). Overall, the the highest QoL domain scores were found among the those aged 50 – 59 years (43.7 ± 6.6%) and over 60 years (43.2 ±4.6%), The least QoL scores were found among the 30 – 39 years (40.4 ± 10.3%) and 20 – 29 years (40.5 ± 6.9%). The lowest QoL scores was only 8.2% shy of the highest score. In general, the was no statistical significance between the patients' age and their combined QoL FACT-B+4 dimensions (*p*=0.524).

Functional well-being was the QoL dimension most enjoyed by both married (50.3 ± 12.5%) and (47.3 ± 11.5%) breast cancer patients. The results further show that both married and unmarried worried about additional concerns of breast cancers as evidenced by the lowest QoL domain cores of 34.7 ± 9.2% and 34.4 ±11.1% respectively. In general, no statistically significant relationships were found between marital status and any of the QoL dimensions (*p*= 0.302 – 0.897). Overall, the married cancer patients marginally enjoyed higher QoL (42.4± 6.3%) compared to the unmarried patients (41.4 ± 8.7%), and there was no statistical significance (*p*=0.672) between marital status and combined QoL dimensions.

Table 4.3: QoL across background characteristics

	Mean (±SD) of QoL domain scores (% scale)					
	Personal well-being	Social/Family well-being	Emotional well-being	Functional well-being	Additional concerns	Overall
Age (years)	*p*=0.002	*p*=0.502	*p*=0.809	*p*=0.622	*p*=0.749	*p*=0.524
20-29	33.6 (±9.7)	27.5 (±19.4)	48.2 (±15.0)	56.8 (±8.3)	34.3 (±9.0)	40.5 (±6.9)
30-39	40.4 (±12.4)	35.0 (±22.7)	43.9 (±13.2)	52.9 (±13.2)	31.2 (±10.9)	40.4 (±10.3)
40-49	36.0 (±13.6)	40.4 (±19.4)	46.3 (±11.2)	48.2 (±12.7)	35.7 (±10.6)	41.1 (±6.5)
50-59	48.9 (±9.6)	41.0 (±15.5)	47.0 (±10.9)	49.2 (±13.1)	34.4 (±9.8)	43.7 (±6.6)
60-70	46.3 (±15.0)	45.0 (±19.7)	42.9 (±6.1)	47.9 (±8.6)	36.3 (±5.5)	43.2 (±4.6)
Marital status	*p*=0.783	*p*=0.652	*p*=0.302	*p*=0.349	*p*=0.897	*p*=0.672
Married	42.2 (±14.1)	39.3 (±17.5)	46.7 (±11.1)	50.3 (±12.5)	34.7 (±9.2)	42.4 (±6.3)
Unmarried	43.1 (±10.7)	41.5 (±21.5)	43.8 (±10.2)	47.3 (±11.5)	34.4 (±11.1)	41.6 (±8.7)
Treatment	*p*=0.000	*p*=0.0001	*p*=0.000	*p*=0.006	*p*=0.086	*p*=0.000
Curative chemotherapy, radiotherapy & surgery	45.6 (±10.6)	42.9 (±17.6)	46.0 (±8.8)	49.1 (±12.1)	35.6 (±9.1)	43.4 (±5.9)
Curative radiotherapy & surgery	16.7 (±9.8)	30.0 (±5.5)	62.5 (±5.4)	62.5 (±7.5)	30.4 (±8.1)	40.4 (±3.3)
Palliative chemotherapy & radiotherapy	29.0 (±7.4)	10.0 (±0.0)	25.0 (±4.4)	40.0 (±3.9)	27.1 (±14.9)	27.2 (±4.3)
Surgery type	*p*=0.0002	*p*=0.155	*p*=0.007	*p*=0.027	*p*=0.653	*p*=0.244
Lumpectomy	25.8 (±13.7)	32.9 (±8.6)	57.7 (±9.3)	61.9 (±6.6)	32.9 (±7.5)	42.2 (± 3.8)
Partial mastectomy	37.7 (±18.1)	34.2 (±17.4)	42.9 (±12.0)	50.4 (±13.1)	33.2 (±11.7)	39.6 (±7.9)
Mastectomy	45.8 (±10.9)	43.6 (±17.7)	46.6 (±8.9)	48.8 (±12.2)	35.6 (±9.1)	43.6 (± 5.7)
Total	42.4 (±13.3)	39.9 (±18.5)	45.9 (±10.9)	49.6 (±12.2)	34.7 (±9.6)	42.2 (± 6.9)

p-values from one-way Analysis of Variance (ANOVA) to compare significant differences in the mean QoL scores across the background variables

University of Ghana http://ugspace.ug.edu.gh

4.4.3 Quality of life and treatment regimens

Three treatment options were provided to the participants. Patients who received curative radiotherapy and surgery enjoyed the highest QoL scores as measured by their EWB (62.4 ± 5.4 %, p=0.000) and FWB (62.5 ± 7.5 %, p=0.006). The results show that the QoL for patients who received a combination of palliative chemotherapy and radiotherapy was lowest across all the QoL dimensions, apart from PWB. Participants treated via curative chemotherapy, radiotherapy and surgery were most satisfied with their FWB (QoL = 49.1 ± 12.1%) compared to other dimensions. Generally, the QoL for participants treated via curative chemotherapy, radiotherapy and surgery (43.4 ± 5.9 %) was higher than curative radiotherapy and surgery (40.4 ± 3.3 %). Apart from FWB (p=0.006) and ACBC (p=0.086), significant differences between the treatment options and the other QoL dimensions were found. Overall, a p-value =0.000 established statiscally significant differences between the treatment options and the combined QoL dimensions.

All the participants had undergone either BCS (lumpectomy, partial mastectomy) or mastectomy. The FWB subscale was identified as the QoL dimension most appreciated by the breast cancer patients among the three surgical procedures: lumpectomy (61.9 ± 6.6 %), mastectomy (48.8 ± 12.2%) and partial mastectomy (50.4 ± 13.1%), and a mean total of 49.6 ± 12.2%). However, no statistical significance was found between type of surgery and FWB (p=0.027). Participants who underwent lumpectomy reported the lowest QoL (25.8 ± 13.7%) in their PWB. However, statistical significance was established between the type of surgery and the patients' PWB QoL (p=0.002). The QoL was generally lowest for additional concerns of breast cancer. In particular, QoL domain scores ranged from 32.9 ±7.5 % to 35.6 ± 9.1%, with an average total of 34.7 ± 9.6%. There was no significant difference between type of surgery and ACBC (p=0.653).

University of Ghana http://ugspace.ug.edu.gh

Generally, patients who underwent mastectomy reported higher domain scores of 43.6 ± 5.7 % in the combined QoL dimensions compared to lumpectomy (42.2 ± 3.8%) and partial mastectomy (39.6 ±7.9%) respectively. No statistical significance (*p*=0.244) between types of surgery and QoL dimensions were found.

4.5 Lifestyle choices

The lifestyle choices of the 80 breast cancer patients surveyed in this study. The lifestyle choices of the participants were classified into four groups: health lifestyle, diet lifestyle, personal appearance lifestyle and social lifestyle. The overall lifestyle choice was classified as a combination of these groups. The lifestyle scores were similarly defined at the mean value of the inter-quartile range which occurs at the 50th percentile as presented in Fig. 4.2.

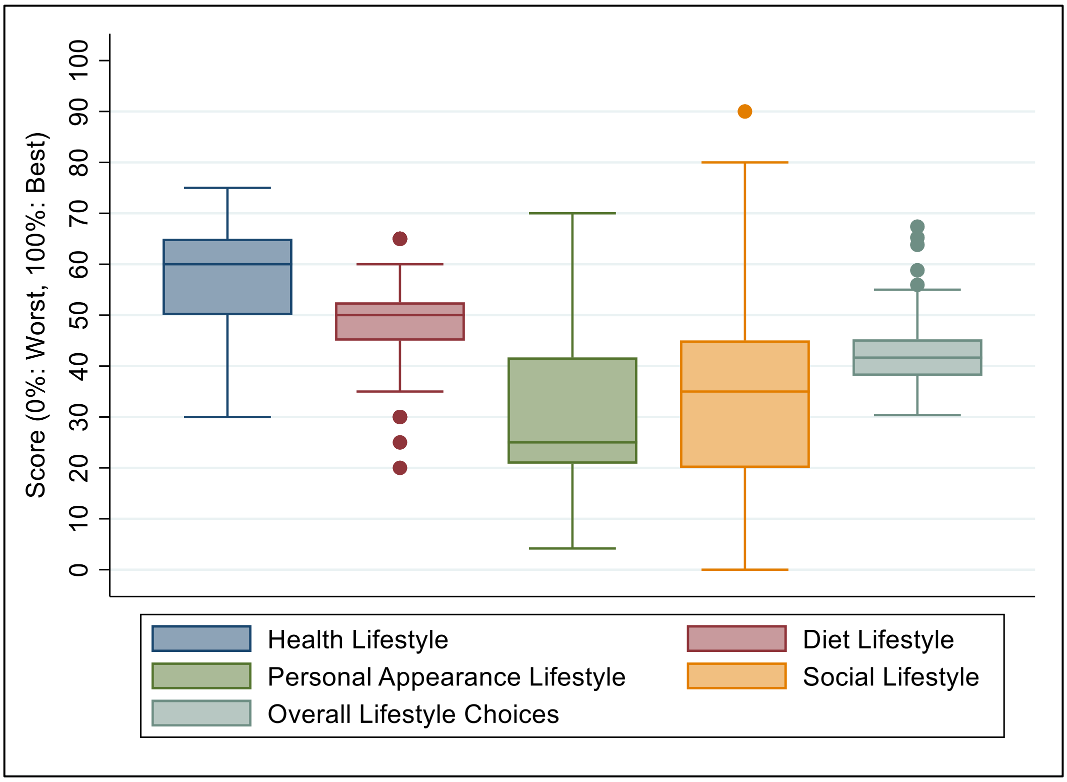

Fig. 4.2: FACT-B lifestyle choices of breast cancer patients

From the plot of Fig. 4.2, healthy lifestyle was the most rated (60.0%) choice of the breast cancer patients. Their ratings of dietary lifestyle was considered moderate at 50.0%. Partial

University of Ghana http://ugspace.ug.edu.gh

mastectomy in women involves the removal of a larger portion of the breast in order to eliminate the cancer, while total mastectomy requires the complete removal of one or both breast. These surgical procedures result in changes in their physical appearances. In this study, the personal appearance lifestyle choices of the breast cancer patients was the least rated (25.0%). This implies that the patients paid less attention to their personal appearances. The results show that their overall lifestyle choices rated over 41.7% was higher than their mean social lifestyle scores.

The lifestyle choices across the demographic and treatment options are presented in Table 4.4. The median (IQR) of lifestyle choices scores (% scale) are presented for each category. The results demonstrate that healthy lifestyle choices was most liked by the participants. The scores ranged from 55.0 ± 12.5% for the 20-29 years group, to 65.0 ±15.0% among the 60 – 70 year olds. However, there was no significant relationship between age and healthy lifestyle choices. The ratings of the median lifestyle choices were generally higher for diet (range: 42.5 ± 15.0% - 65.0±15.0%) than personal or physical appearance (range: 20.8±8.3% - 45.8 ±20.0%). Statistical significance was established between age and diet lifestyle choices (*p*=0.001), and between age and physical lifestyle choices (*p*=0.002). The lowest median lifestyle choice score (15.0 ± 15.0%) was reported among the over 60 years patients in respect of their social lifestyle. Unsurprisingly, the highest (52.5 ± 27.5%) social lifestyle median score was observed among patients aged 20 – 29 years. The results indicated a significant relationship (*p*=0.001) between age and social lifestyle choices of the breast cancer patients. Overall, the median lifestyle choices was highest among the 20-29 year group (46.4 ± 14.6%) and over 60 year group (45.2 ± 3.6%). Patients aged 30 – 39 years and 50 – 59 years has the lowest median scores of 40.5 ± 6.0%. No statistical significance (*p*=0.074) was found between age and the combined lifestyle choices.

University of Ghana http://ugspace.ug.edu.gh

Similarly, the median scores by both married and unmarried patients were highest for the health (60.0 ± 17.5%) and diet (50.0 ± 10.0%) lifestyle choices, and lowest for personal or physical appearance (25.0 ±18.8%). The overall median score for lifestyle choices was higher among married (41.7 ± 5.4%) compared to unmarried (40.5 ± 9.5%) breast cancer patients. There was no significant relationship between marital status and the combined lifestyle choices (p=0.211).

Table 4.4: Lifestyle choices across background characteristics

	Median (IQR) of lifestyle choices scores (% scale)				
	Healthy lifestyle	Diet lifestyle	Physical appearance lifestyle	Social lifestyle	Overall lifestyle choices
Age (years)	*p*=0.393	*p*=0.001	*p*=0.002	*p*=0.001	*p*=0.074
20-29	55.0 (12.5)	45.0 (27.5)	45.8 (20.0)	52.5 (27.5)	46.4 (14.6)
30-39	57.5 (15.0)	42.5 (15.0)	25.0 (12.5)	37.5 (20.0)	40.5 (6.0)
40-49	60.0 (15.0)	50.0 (10.0)	29.2 (33.3)	35.0 (20.0)	41.7 (13.1)
50-59	60.0 (10.0)	50.0 (0.0)	20.8 (8.3)	35.0 (15.0)	40.5 (6.0)
60-70	65.0 (15.0)	65.0 (15.0)	37.5 (4.2)	15.0 (15.0)	45.2 (3.6)
Marital status	*p*=0.606	*p*=0.392	*p*=0.806	*p*=0.136	*p*=0.211
Married	60.0 (15.0)	50.0 (10.0)	25.0 (18.8)	35.0 (25.0)	41.7 (5.4)
Not married	60.0 (17.5)	50.0 (7.5)	27.1 (29.2)	27.5 (20.0)	40.5 (9.5)
Treatment type	*p*=0.248	*p*=0.288	*p*<0.001	*p*<0.001	*p*<0.001
Curative chemotherapy radiotherapy & surgery	60.0 (15.0)	50.0 (10.0)	25.0 (16.7)	35.0 (25.0)	41.7 (7.1)
Curative radiotherapy & surgery	62.5 (5.0)	42.5 (15.0)	65.0 (5.0)	75.0 (15.0)	61.3 (10.2)
Palliative chemotherapy & radiotherapy	65.0 (0.0)	45.0 (5.0)	25.0 (12.5)	10.0 (10.0)	32.1 (7.1)
Surgery type	*p* = 0.543	*p* = 0.885	*p* < 0.001	*p* < 0.001	*p* < 0.001
Lumpectomy	60.0 (15.0)	50.0 (15.0)	62.5 (10.0)	70.0 (25.0)	58.8 (21.2)
Partial mastectomy	52.5 (20.0)	50.0 (20.0)	45.8 (4.2)	47.5 (10.0)	48.8 (6.0)
Mastectomy	60.0 (15.0)	50.0 (5.0)	25.0 (16.7)	35.0 (20.0)	40.5 (7.1)
Total	60.0 (15.0)	50.0 (7.5)	25.0 (20.8)	35.0 (25.0)	41.7 (7.1)

p-values from Kruskal-Wallis tests to investigate if there are significant differences in the distribution of lifestyle choice scores across the background variables.

University of Ghana http://ugspace.ug.edu.gh

The median score for health lifestyle choices recorded among patients presenting for palliative chemotherapy and radiotherapy (65.0±0.0%) was higher than those presenting for curative radiotherapy and surgery (62.5± 5.0%) and curative chemotherapy radiotherapy and surgery (60.0± 15.0%). The highest median scores for diet and social lifestyle choices were reported by patients presenting for curative chemotherapy, radiotherapy and surgery (50.0±10.0%), and curative radiotherapy and surgery (65.0±5.0%). Although the physical appearances lifestyle choices among the patients was generally lowest among the other choices, the study found that the highest median score was recorded for physical appearances lifestyle choices among patients presenting for curative radiotherapy and surgery (75.0 ±15.0%). The overall lifestyle choices was highest for curative radiotherapy and surgery treatment type (61.3 ±10.2%). No significant relationships were found between treatment types and healthy (*p*=0.248) and diet (*p*=0.288) lifestyle choices. However, the study established significant relationships between treatment types and the physical, social, and overall lifestyle choices of the patients (*p*=0.001).

In respect of the types of surgery, the median score for social lifestyle choices was the highest (70.0 ± 25.0%) and observed among patients who had lumpectomy, while the lowest score was associated with physical appearances lifestyle choices and reported among patients with mastectomy (25.0± 16.7%). The measured median scores for diet lifestyle choices were the same for the different types of surgery (50.0±5.0%), although lower than health lifestyle choices (52.5%- 60.0%). The median scores for the overall lifestyle choices of the patients was higher for those who had lumpectomy 58.8 ± 21.2% compared to partial mastectomy (48.8 ± 6.0%) and mastectomy (40.5 ± 7.1%). In general, median scores were highest for health lifestyle choices (60.0±15.0%) and lowest for physical appearances lifestyle choices (25.0 20.8%). The median score for the combined lifestyle choices was 47.1 ± 7.1%. No significant relationships between the types of surgery and health (*p*=0.543) and diet (*p*=0.885) were found.

University of Ghana http://ugspace.ug.edu.gh

However, significant relationships between treatment types of surgery and the physical, social, and overall lifestyle choices of the patients (*p*=0.001) were found.

4.6 Association between quality of life and lifestyle choices

The results of the Spearman correlations between the various QoL subscales and the lifestyle variables of the patients, and the linear regression of the QoL scores on the patients' demographics and the different treatment regimens are presented in Tables 4.5 and 4.6 respectively. In particular, the linear regression analysis was done to measure predictors' significance and to calculate the coefficient of determination. The dependent variables were QoL and lifestyle subscales and paramters, while age, marital status, treatment regimens and types of surgery constituted the independent variables.

The results show a negative significant correlation (*p*=-0.0255) between FWB and PWB subscales in the patients QoL, and between the ACBC and EWB QoL subscales (*p*=-0.0453). The overall, there were also statistically insignificant correlations between the overall QoL and any of the subscales (*p*> 0.05). The results further showed positive and statistically significant correlation between the patients dietary and healthy lifestyles (*p*=0.0144) only. There are no significant relationships between the other variables of the patients' lifestyle choices (*p*=± 0.05).

One of the key aspects of this study was to investigate any relationship between the QoL and lifestyle choices of the breast cancer patients. The results of this study showed that the dietary lifestyle of the patients was very important as evident in its median scores. A positive statistically significant correlation between the patients' dietary lifestyle and the ACBC QoL subscale (*p*=0.0452). Similarly, a positive statistically significant correlation between the patients' overall lifestyle choice and their EWB QoL (*p*=0.0038). Negative but statistically

University of Ghana http://ugspace.ug.edu.gh

significant relationships were also found between their overall QoL and physical appearance (*p*=-0.0481) and social (*p*=-0.0296) lifestyle choices.

Table 4.5: Spearman correlations of QoL and lifestyle choices scores

		QoL scores						Lifestyle choices scores			
		PWB	SWB	EWB	FWB	ACBC	Overall QoL	Healthy	Diet	Physical appearance	Social life
QoL Scores	SWB	0.3112*	1								
	EWB	0.2615*	0.1024	1							
	FWB	-0.0255	0.0665	0.3500*	1						
	ACBC	0.1226	0.085	-0.0453	0.0811	1					
	Overall QoL	0.6220*	0.5984*	0.4610*	0.5188*	0.4225*	1				
Lifestyle choice Scores	Healthy	0.1641	0.1800	0.1108	0.1782	-0.1515	0.1972	1			
	Diet	0.2037	0.2070	-0.1199	-0.0322	0.0452	0.2062	0.0144	1		
	Physical appearance	-0.3498*	-0.1485	-0.0525	0.3119*	0.2536*	-0.0481	-0.1493	0.0651	1	
	Social	-0.1297	-0.2295*	0.1837	0.1059	0.1688	-0.0296	-0.2386*	-0.1889	0.2159	1
	Overall lifestyle choice	-0.1250	-0.0503	0.0038	0.3110*	0.1927	0.0851	0.1221	0.2978*	0.7425*	0.5142*

*$p < 0.05$

Table 4.6: Linear regression of QoL % scores on demographics and treatment regimens

	Unadjusted		Adjusted Model 1		Adjusted Model 2	
	Mean difference	*p*-value	Mean difference	*p*-value	Mean difference	*p*-value
Lifestyle Choices						
Healthy	0.15 (-0.02, 0.32)	0.083	0.18 (0.03, 0.34)	0.019	0.22 (0.06, 0.39)	0.008
Diet	0.10 (-.06, 0.27)	0.219	-0.02 (-0.17, 0.14)	0.804	-0.02 (-0.18, 0.15)	0.832
Physical appearance	0.01 (-0.09, 0.11)	0.798	0.01 (-0.09, 0.12)	0.823	0.01 (-0.1, 0.13)	0.791
Social	0.02 (-0.07, 0.10)	0.660	0.05 (-0.05, 0.15)	0.352	0.05 (-0.05, 0.16)	0.330
Overall lifestyle choices	0.14 (-0.07, 0.35)	0.193	-	-	-	-
Age (years)	0.14 (-0.01, 0.28)	0.061	0.15 (0, 0.3)	0.049	0.13 (-0.04, 0.29)	0.125
Marital status						
Married	Ref		Ref		Ref	
Not married	-0.76 (-4.33, 2.80)	0.672	0.09 (-2.85, 3.03)	0.953	0.74 (-2.4, 3.87)	0.640
Treatment						
Curative chemotherapy radiotherapy & surgery	Ref		Ref		Ref	
Curative radiotherapy & surgery	-3.00 (-7.86, 1.85)	0.221	-5.19 (-12.59, 2.22)	0.167	-9.28 (-18.37, -0.18)	0.046
Palliative chemotherapy & radiotherapy	-16.22 (-21.49, -10.94)	<0.001	-16.11 (-21.62, -10.59)	0.000	NA	
Surgery type			NA			
Lumpectomy	Ref				Ref	
Mastectomy	1.42 (-3.17, 6.00)	0.540			-4.73 (-12.31, 2.86)	0.218
Partial mastectomy	-2.18 (-9.01, 3.79)	0.419			-6.14 (-13.62, 1.34)	0.106

University of Ghana http://ugspace.ug.edu.gh

Three linear regression models: unadjusted model, adjusted model 1 and adjusted model 2 were used. No statistically significant relationships were found in the unadjusted regression model (range: p=0.083 – 0.7980>0.05) of their lifestyle choices. However, significant relations were found only in the healthy lifestyle choice in the regression adjusted model 1 (p=0.019) and model 2 (p=0.008) respectively. With respect age, statistically significant relations was found only in the adjusted model 1 regression model (p=0.049), but none in the unadjusted (p=0.061) and adjusted model 2 (p= 0125) regression models. Marriage among the breast cancer patients was considered as reference in the linear regression analysis. The range of p-values for the three models (p= 0.640 -0. 9530) indicate no statistically significant relationships in their marital status.

Multimodal adjuvant curative chemotherapy radiotherapy and surgery as used as reference in the linear regression analysis of the QoL and breast cancer treatment regimens. The results showed positive statistical significance (p=0.046) in the adjusted model 2 for adjuvant curative radiotherapy and surgery, in the unadjusted model for palliative chemotherapy radiotherapy (p<0.001), and in adjusted model 2 (p=0.000) for adjuvant curative radiotherapy and surgery No statistically significant relationships were found in any of the regression models for all the surgical procedures.

University of Ghana http://ugspace.ug.edu.gh

CHAPTER FIVE

DISCUSSIONS

5.1 Introduction

The research was carried out with 74 breast cancer patients from all the 10 geographical regions in Ghana and 6 from Nigeria presenting for breast cancer treatment at SGMC in Accra. These cohort of patients voluntarily consented to participate in this study which addresses the issues of QoL and lifestyle choices of breast cancer patients. This Chapter therefore discusses the findings of the study. In particular, discussions are made of the demographic characteristics of the participants, breast cancer treatment options, QoL and lifestyle choices, and statistical associations. The conclusions, recommendations, and limitations of the study are also presented

5.2 Demographic characteristics of study participants

The mean age of the 80 breast cancer patients at presentation was 48.4 ±13.5 years (range: 29 -70 years). This is comparable with the mean age of 47.6 years (range 30-75 years) of a group of 60 participants of carcinoma breast post-modified radical mastectomy on radiotherapy in an Indian tertiary care hospital (Sharma and Purkayastha, 2017). Similarly, as reported in other studies, Chen *et al.*, (2018) stated a mean age of 48.0 ± 9.6 years among a Chinese cohort of 608 female breast cancer patients, while Safaee *et al.*, (2008) indicated a mean age of 48.27 ± 11.42 years for an Iranian population of 119 breast cancer patients. Other studies conducted in Turkey and Pakistan showed comparable mean ages of 45.9 years ± 7.3 years (range: 32 - 58 years) and 45 years (range: 35 - 61years) respectively (Koçan and Gürsoy, 2016; Jetha, et al., 2017). In a South African study, a mean age of 56 years (range: 29 – 84 years) was reported among 160 patients presenting for multimodal breast cancer treatment (Phakathi *et al.*, (2016).

University of Ghana http://ugspace.ug.edu.gh

The homogeneity or heterogeneity of a study population can be expressed or defined in several ways including country of origin, ethnicity, race, and other demographic variable. These indices are dependent on the participants available at the time of the study. In this study, the population was heterogeneous in respect of country of origin and ethnicity. In particular, the participants consisted of 74 (92.5%) Ghanaians and 6 (7.5%) Nigerians. The ethnicity of the participants was diverse as they hailed from different geographical regions in Ghana and states in Nigeria respectively. The heterogeneity of the population is explained by the fact that the SGMC (study site) is a well-known cancer treatment centre in Africa. Hence, some breast cancer patients from different African countries are referred to the Centre for treatment. In a South African prospective observational study, Phakathi *et al.*, (2016) reported that the population of women undergoing treatment breast cancer treatment consisted of a heterogeneous cohort including of 82 blacks (49.4%), 65 whites (36.2%), 1 Indian (0.6%) and 12 mixed race (7.2%). This observation is consistent with this study. In other studies (Anim-Sampong *et al.*, 2020; Kyei *et al.*, 2014), homogenous populations consisting of only Ghanaians, but ethnically heterogeneous have been reported.

Racially, the participants of this study were homogenously black. Breast cancer disparities persist by race and ethnicity. According to Ooi *et al.,* (2010), black breast cancer patients fare quite poorly as they have elevated likelihoods of having all four adverse breast outcomes. This is suggestive that breast cancer disparities negatively impact black women across the breast cancer spectrum. This can be explained by indices or factors such as access to breast screening and preventive services, access to mammographic services, clinical care subsequent to breast cancer diagnosis, and long term follow-up care, and clinical management for black breast cancer survivors (Ooi *et al.*, 2010). As reported in the literature, Iqbal *et al.,* (2014) further established that the probability of mortality was significantly higher for black women

University of Ghana http://ugspace.ug.edu.gh

compared with white women with small-sized with breast cancer tumors. Patterns-of-care factors also contribute to poorer outcomes for black women. In particular, Griggs *et al.,* (2003), Li *et al.,* (2003), Gwyn et al., (2004), Smith *et al.*, (2005) and Griggs *et al.*, (2007) identified delays in treatment, underuse and misuse of treatment through non–guideline-concordant therapy as other factors that affect the care of black breast cancer women.

In a breast cancer gene mutation study consisting of a population of breast cancer women with 3.8% African ancestry and 78.3% Western European ancestry, Hall *et al.,* (2009) reported that breast cancer gene 1 (BRCA1) and gene 2 (BRCA2) mutation prevalence was 10.2% and 5.7% in the women of African ancestry, and 6.9% and 5.2% in the women of Western European ancestry respectively. This, according to Daly and Olapade (2015) is suggestive evidence of a high rate of inherited mutations in genes that might explain increased risk for young-onset aggressive breast cancers in black women.

In another comparative study of women of African American and non-Hispanic white races, Komenaka et al., (2010) stated that women of African American race with breast cancer were statistically significantly associated with breast cancer–specific mortality (African Americans: 26.0%, non-Hispanic whites: 17.5%, p = 0.028; hazard ratio [HR] of death = 1.64, 95% confidence interval [CI] = 1.06 to 2.55), assuming effects of comorbidities were accounted for. The decisions of the participants of this study to seek medical treatment and minimize breast cancer-specific mortality is therefore imperative and consistent with the literature.

Some studies on marital status and breast cancer have been done. In particular, Martinez *et al.,* (2016) reported significant heterogeneity in the association between marital status and survival across racial and ethnic and nativity groups. In this study, 75.0% of the participant were married. This is similar to Safaee *et al.,* (2008) who found that 73.9% of the breast cancer patients in their study were married. The findings of Jetha, Gul, and Lalani (2017) which

University of Ghana http://ugspace.ug.edu.gh

reported that 67% of a cohort of 15 women in a related study were married, while 20% were unmarried and 13.3% were widowed also supports the findings of this study. A population-based comparative study reported by Parikh *et al.*, (2015) showed that unmarried women were more likely to be diagnosed with later stage breast cancer disease and to die of breast cancer compared to married breast cancer patients.

5.3 Treatment regimen

This study was limited to breast cancer patients undergoing multimodal breast cancer treatment regimens or modalities (curative chemotherapy, radiotherapy and surgery, curative radiotherapy and surgery, and palliative chemotherapy and radiotherapy) at the study site. This decision is supported by Bolm *et al.*, (2018) who reported that multimodal regimens involving chemotherapy and radiotherapy in addition to surgical resection improve disease control. In this study, multimodal adjuvant chemotherapy, radiotherapy and surgery was the main treatment regimen provided to the patients. This is consistent with the literature where Ginsburg *et al.*, (2020) stated that achievement of optimal outcomes for breast cancer therapy with curative intent depends on appropriate referrals for timely and personalized multimodality treatment after the receipt of a definitive diagnosis. The provision of cancer treatment therefore requires organized, multidisciplinary and multimodal approaches including a combination of surgery, radiotherapy, chemotherapy, endocrine therapy and/or targeted therapy. These multimodal breast cancer treatment regimens whose effectiveness are constantly improving and allow for reductions in the mortality rate, as stated by Thomson et al., (2004). In a South African study, Phakathi *et al.*, (2016) stated that 153 patients (96%) out of a cohort of 160 underwent breast surgery, while adjuvant chemotherapy and radiotherapy were administered to 140 (88%) and 55 (34.4%) patients, in a multimodal breast cancer treatment regimen.

The various components of the curative chemotherapy, radiotherapy and surgery present side effects as indicated by the patients and supported by the literature. In this study, chemotherapy

University of Ghana http://ugspace.ug.edu.gh

was administered for 6-12 weeks excluding weekends using a spectrum of drugs including xeloda, paclitaxel, caelyx, fluroracil, adriamycin, cyclophosphamide, taxotere and docetaxel. This is consistent with literature where similar drugs have been mentioned for use in chemotherapy (Sparano *et al.,* 2018). The side effects of chemotherapy are strongly dependent on the type of drugs administered to the breast cancer patients. Heart problems, pulmonary problems, cognitive dysfunction with difficulties in memory, concentration and language, anxiety and finally depression are other complications of chemotherapy that adversely affect the QoL life of patients (Montazeri, 2008: Schmitz et al., 2010; Schmitz et al., 2010).

According to Shapiro et al., (2001), short-term side effects such as erythema has been observed in over 50 % of women presenting for radiotherapy treatment, while dry peeling in 6 to 10 % of cases, or wet in more than 50 % of cases more or less pronounced depending on the treatment history and present in over 50 % of women have been reported by Shapiro et al., (2001), Schmitz (2010) and Sjövall (2010). Edema of the subcutaneous fat, esophagitis following irradiation of the mammary chain, hyperpigmentation, myelosuppression, pain as well as anxiety, depression and decreased QoL have also been reported (Shapiro *et al.*, 2001; Sjövall *et al.*, 2010; Schmitz *et al.*, 2010; and Meyns *et al.*, 2006).

Long term effects of radiotherapy have been reported as rare (Schmitz *et al.,* 2010; Meyns *et al.*, (2006). However, lymphedema of the arm present in 6 to 10 % of patients after lymph node irradiation, subcutaneous fibrosis with possible telangiectasia in 10 to 50 % of cases, pulmonary disorders including pneumonia with fever, cough and breathlessness with an incidence of less than 1 %, brachial plexitisas well as heart problems such as arrhythmias, pericarditis, ischemic heart disease and myocardial infarction again present in less than 1 % of cases have been identified (Shapiro et al., 2001; Sjövall et al., 2010; Schmitz et al., 2010; and Meyns et al., 2006).

University of Ghana http://ugspace.ug.edu.gh

This study reports that about equal numbers of the participants had lumpectomy (9.3%) and partial mastectomy (8.0%) compared to mastectomy (82.7%). The preference for lumpectomy and partial mastectomy by some 17.3% of the women could be explained by the fact that, lumpectomy is a less invasive BCS which keeps most of the tissue and preserves the natural breast shape, maintains feminine identity (less change to physical bodies), less recovery time of a few weeks, and also improves QoL. Partial mastectomy also provides for maximum preservation of the breast without altering its appearance. However, Kingsmore et al., (2004) and Punglia *et al.,* (2007) have indicated that cancer cells have growth factor receptors that are compatible with growth factors in the wound environment of the breast during conservation surgeries. These cancer cells have the propensity to intraoperatively discard of and contribute to both local recurrence and distant metastases. Thus, these BCS approaches have a slightly higher risk (10.0%) of recurrent cancer, and would need further radiotherapy treatment. It has also been reported in the literature that local recurrence after BCS increases systemic disease with a probability of increased mortality (Kingsmore *et al.*, 2004; Punglia *et al.*, 2007). According to McCahill *et al.,* (2012), about 25.0% of women breast cancer patients who had breast conservation therapy required a second operation. In comparing breast cancer patients who underwent partial mastectomy (PM) with mini latissimus dorsi flap (MLDF) and subcutaneous mastectomy with implant (M + I) regarding QoL, Ozmen *et al.,* (2020) reported that the PM + mini latissimus dorsi flap MLDF procedure provided significantly superior results in terms of body image and cosmetic results with similar morbidity and oncologic outcomes. It has been stated in the literature that in randomized controlled trials, BCS including partial mastectomy plus radiation has been shown to be at least equivalent, or even superior, to mastectomy (Onitilo *et al.*, 2015). These are other probable reasons that support the low proportion of women who had lumpectomy and partial mastectomy BCS in this study.

University of Ghana http://ugspace.ug.edu.gh

Several reasons and be adduced to the choice of mastectomy by the women in this study. In particular, getting cancer cells out of the body is the most desired, common and understandable response in fighting breast cancer. This prompts some breast cancer patients with early-stage breast cancer to choose mastectomy, as it provides confidence of no return of the cancer. Another reason is that radiotherapy may not be needed after mastectomy. Another reason for the higher numbers of women who had undergone mastectomy is the possibility of recurrent cancer associated with lumpectomy which involves removal of the cancerous tissue in affected parts of the breast. On the contrary, the women who opted for mastectomy needed to cope with lower levels of QoL, high levels of stigmatization, less confidence of femininity, and hence, required to wear breast prostheses to enhance their appearances.

5.4 Quality of life

Five domain outcomes in the QoL FACT-B+4 questionnaires were used. A higher score in the domain outcomes is associated with a higher QoL, and vice versa. This study showed that, the average domain score for the SWB, EWB and PWB functional scales were ≥ 40%, and indicate moderate QoL in the patients. The average domain score for ACBC was low and suggest poor QoL in the patients. The higher score in FWB indicate better good QoL. The overall QoL score for the population was about 45% and suggestive of moderate QoL in the various functional roles in the patients. The overall highest domain score of 43.7% (moderate QoL) was found among patients aged patiens aged 50 – 59 years (p=0.524). This result is similar to the findings of Ganesh *et al.*, (2016) who determined in a recent study that patients of older-age-group had better QoL.

This study reports that the lowest QoL domain cores for SWB was observed among the youngest (20 – 29 years: 27.5%; 30 -39 years: 35.0%). This finding is supported by Sharma and Purkayastha (2017) whose study revealed that breast cancer patients aged 30 to 39 years

University of Ghana http://ugspace.ug.edu.gh

portrayed particularly worse QoL outcomes compared with much older breast cancer patients in the areas of physical functioning, social functioning and future perspective. Consistent with this results, Basu and Basu (2016) stated that breast cancer patients diagnosed at much earlier ages portrayed worse outcomes in QoL in the social, emotional and body image perception domains. Using a larger sample size of 284 patients, Imran *et al.*, (2019) similarly reported higher scores in functional scales, especially social functional (about 65.8%) which indicated better QoL in their patients.

The results of this study are further supported by Jassim and Whitford (2013) who reported highest QoL scores in social functioning among a cohort of 239 breast cancer women in a Bahrain study. The importance of social support in breast cancer patients has been stated in a Malaysian study by Ng *et al.*, (2015). The results of this study show lower QoL scores for SWB and therefore connote the need for social support for breast cancer patients. This is supported by Gao and Dizon (2013) who observed that provision of post-treatment social support to breast cancer patients was needful to abate recurrence of cancer and mortality.

Generally, FWB domain scores were higher across all the age groups, albeit statistically insignificant (p=0.622). Comparatively, FWB scores were particularly higher (higher QoL) in the younger age group. Similar findings in the literature which support this results have been reported by Khater *et al.,* (2019) and Imran *et al.,* (2019) Egyptian and Saudi Arabian studies. The FWB score was also highest (better QoL) in the married patients (p=0.349) compared to lowest QoL scores in ACBC scores (low QoL) among the unmarried patients (p=0.897).
The overall QoL was however, moderate with no significant difference between marital status and the QoL dimensions (p=0.672). This observation could be explained by the fact that patients of different marital status may produce and can be associated with different problems. In typical Ghanaian family settings, married women bear heavy functional responsibilities

University of Ghana http://ugspace.ug.edu.gh

including provision of care for children, household and performance of household chores. These responsibilities predisposes them to do more work and hence become functional. Similar results were reported by Khater *et al.,* (2019) where functional well-being score was significantly higher in married patients (*p*=0.021).

Generally, the breast cancer treatment regimens negatively impact the psychological and emotional health of women to a large extent. Emotional well-being is therefore important to assessing the QoL of breast cancer patients. This study reports that a moderate EWB functional score (≥ 40%) indicate moderate QoL in the patients. This assertion is supported by a Saudi Arabian study which confirmed the important relationship of EWB to patients' satisfaction among breast cancer patients in palliative care (Aboshaiquah *et al*, 2016). Jassim and Whitford (2013) have also reported lower QoL scores in emotional well-being of Bahrian women.

Personal appearance such a body image is an index for determining the PWB QoL among breast cancer patients. This study found that PWB was significantly highest (*p*=0.02) among the 50-59 years group, but statistically insignificantly moderate and lower than FWB among the married patients. In their study, Jassim and Whitford (2013) found highest QOL scores for body image, which can be likened to highest QoL for PWB. Khater *et al.*, (2019) also reported higher PWB among working breast cancer patients.

According to Imran *et al.*, (2019), some breast cancer treatment regimens can impact positively on QoL. Subsequently, Kool *et al.*, (2015) have suggested the use specific QoL scales to assess the effect of cancer treatment regimens on QoL.

University of Ghana http://ugspace.ug.edu.gh

In this study, 75 out of the 80 female breast cancer patients had undergone breast surgery (lumpectomy, partial mastectomy and mastectomy) and had presented for multimodal treatment including curative chemotherapy, radiotherapy, and surgery, curative radiotherapy and surgery, and palliative chemotherapy and radiotherapy. None had breast reconstruction. The results showed statistically significant higher scores i.e., higher QoL, in the EWB (QoL: 62.5%, p=0.000) and FWB (QoL: 62.5%, p=0.006) in patients who underwent curative adjuvant radiotherapy and surgery compared to those who received curative adjuvant chemotherapy, radiotherapy and surgery, and palliative chemotherapy & radiotherapy mastectomy (SMD = 0.606, 95% CI 0.075–1.138, p = 0.025). However, a moderate overall QoL domain score was found among patients who received curative adjuvant chemotherapy, radiotherapy and surgery, albeit higher than those who received the other multimodal treatment regimens. In this study, radiotherapy was provided as a combination treatment to all the patients. A significant difference was found between QoL and the three multimodal breast cancer treatment regimens (p = 0.000). A contrasting report by Cui *et al.*, (2004) however, showed no association between QoL and radiotherapy.

Breast cancer, like all other malignancies, is associated with compromised QoL especially in advanced stages. This, according to Freire (2014) can be attributed to several factors including physical, psychological and social factors. Imran *et al.*, (2019) indicated that patients who underwent conservative breast surgery showed more systematic therapy side effects compared to those who presented for mastectomy, and thus the choice of treatment can therefore significantly, impact the QoL in breast cancer survivors. In particular, Imran *et al.*, (2019) have associated immediate contra-lateral mastectomy with decreased QoL. The FWB score was significantly higher (p=0.027) in patients who had undergone BCS procedures compared to mastectomy. A significantly higher (p=0.044) ACBC score was seen in the older age group.

University of Ghana http://ugspace.ug.edu.gh

5.5 Lifestyle choices

The results of this study show that breast cancer patients are motivated to attempt several changes in lifestyle choices to sustain their survival and improve their QoL. The findings of the study also demonstrate a general notion that the patients could obtain more diagnostic information beneficial to them.

Healthy lifestyle choice was rated highest among the patients. Healthy lifestyle can be achieved through several approaches or strategies including physical activity and exercises. The scores ranged from 55.0 ± 12.5% (20-29 years group) to 65.0 ±15.0% (60 - 70years). Similarly, the highest median scores ≥ 60.0% were recorded for the healthy lifestyles of the patients with respect to their marital status, treatment regimens and types of surgery, except in partial mastectomy where a lower median score of 52.5% was found. In general, the overall mean score for healthy lifestyle was 60.0% and considered as high. There were no significant relationship between the other variables and health lifestyle choices.

Comparatively, Imran *et al.*, (2019) reported in their study patients ≤ 50 years exhibited better QoL with significant differences in global health (healthy lifestyle). The results of this study are evident that adoption of healthy lifestyle behaviours demonstrates capacity or assurance to effectively reduce the high morbidity burden associated with breast cancer which has been widely publicised as the most common diagnosed cancer, and the leading cause of cancer death in women (WHO, 2015, Bray *et al.*, 2018). Furthermore, this study argues that physical activity and exercise during the adjuvant treatment sessions for the breast cancer can improve physical fitness and subsequently improve the healthy lifestyle of the breast cancer patients and their QoL in general. This is supported by O'Neill *et al.*, (2013) who stated that promoting healthy lifestyle behaviours among breast cancer survivors is critical to their well-being and QoL. In other studies, high probalilities of avoiding or reducing the recurrence of breast cancer has been

University of Ghana http://ugspace.ug.edu.gh

associated with changes in lifestyles, especially physical exercise which invariable leads to improvement in healthy lifestyles (DeNysschen *et al.,* (2014). The results of this study are consistent with the literature and affirm that poor lifestyle choices and outcomes among breast cancer patients can be remedied by healthy lifestyle choices.

It has been reported severally in the literature that effective diet plans and appropriate food choices may affect cancer progression, risk of recurrence, and overall survival in individuals who have been treated for cancer (DeNysschen *et al.,* (2014). This study found statistically significant (p=0.001) median scores for diet lifestyle choices across the age groups in the range of 42.5 ± 15.0% (30-39 years) to 65.0±15.0% (60 – 70 years). On the contrary, no significant differences were found in the diet lifestyle scores in the marital status, treatment regimens and surgical procedures variables among the breast cancer patients.

Lifestyle guidelines for breast cancer survivors are important for ensuring their survival following neoadjuvant and adjuvant treatments. These guidelines include diet lifestyles which provide for healthy balanced dietary plans, daily physical activity and exercising, and maintenance of a healthy weight. The results of this study showed no statistically significant difference in the diet lifestyle scores between married and unmarried breast cancer patients. There was also no reported statistically significant difference in the diet lifestyle scores between the breast cancer women after mastectomy and those who presented for BCS procedures. However, according to DeNysschen *et al.,* (2014), there was a significant difference in the QoL perceived by patients who underwent BCS, breast reconstruction than those patients in whom total mastectomy has been performed. In view of the fact that QoL is impacted by lifestyle choices, this study agrees with the recommendation of DeNysschen *et al.,* (2014) for BCS procedures, and specific patient-centered interventions to improving the overall QoL and lifestyle choices of the patients who undergo radical mastectomy.

University of Ghana http://ugspace.ug.edu.gh

In acceding to this recommendation, the impact of diet lifestyle of the patients cannot be ignored. In particular, the breast cancer patients agreed they had sought professional dietetics counsel for balanced and healthy diet plans consisting of fruits, vegatables, and whole grains to enrich their diet lifestyle. In support of this finding, Pierce *et al.*, (2007) confirmed that breast cancer survivors who maintained high diet lifestyle consumed healthy and balanced diets consisting of fruits and vegetables and had a higher 10-year survival rate than those who declined non-adherance. Other studies also confirm that the diet of breast cancer survivors have emphasized vegetable, fruit, whole grain, fiber, and low fat dairy in order to promote high diet and healthy lifestyles health and prevent disease (Kroenke et al., 2005).

Subsequent to this, Jones and Demark-Wahnefried (2008) reported that breast cancer survivors were highly motivated to seek information and professional guidance about diet and dietary supplement use, and complementary nutritional therapies to improve their responses to cancer treatment, risk reduction of recurrence, and improvement in their overall QoL. Furthermore, Kwan *et al.*, (2009) reported a 43% reduction in overall mortality was observed in a study of breast cancer survivors in association with a dietary pattern characterized by the high intake of vegetables and whole grains. Consequentially, this influences their diet lifestyle.

Following BCS and mastectomy procedures, the physical body shape of female breast cancer survivors changes. Associated with this change are psychosocial issues, perceptions of how others see their bodies, their personal appearances and body image, among many others. The changes in the body shapes and personal appearance (loss of breast, colostomy, loss of hair, etc) due to breast cancer present consequences and challenges to the personal appearance lifestyle of breast cancer women undergoing various treatment regimens. The outcomes of the qualitative interviews of this study show that all the breast cancer patient affirmed experiencing changes in their physical bodies after treatment. The results of this study showed the worst

University of Ghana http://ugspace.ug.edu.gh

personal appearance lifestyle median scores among the 30 – 39 years and 50 – 59 years survivors, and highest score among the youngest patients (20- 29 years). Statistically, there was significant relations between their personal appearance and age (p=0.002).

Generally, the median score in the patients personal appearance lifestyle in all the independent variables were low except for curative radiotherapy treatment and lumpectomy treatment regimens and surgery where their personal appearance lifestyles were significantly high (p <0.001). In particular, the observed low median scores is indicative of expressions of poor self-image and body image, and lack of self-confidence. Some reported studies in the literature support this finding. In particular, Anim-Sampong *et al.,* (2020), Demuth *et al.,* (2012) and Shrestha (2012) have reported that women regarded their appearances as deformed, irregular, non-proportional, and ugly after mastectomy. Chemotherapy was provided as part of the multimodal curative chemotherapy, radiotherapy and surgery, and palliative chemotherapy and radiotherapy treatment regimens. The personal lifestyle median scores associated with these treatment strategies were low compared to the curative radiotherapy and surgery in which the highest score was recorded. The reason could be due the side effects associated with the chemotherapy treatment. In support of this, Chui (2019) reported depression, fatigue, interruption of sleep and pain as side effects associated with chemotherapy negative which reduce the QoL and lifestyle choices of patients undergoing chemotherapy treatment. Pearce *et al.,* (2017) also mentioned that chemotherapy associated side effects affect the emotional and physical health, as well as the QoL and invariably the lifestyles of cancer patients. According to Saparano *et al.,* (2018), adjuvant chemotherapy reduces the risk of recurrence, with effects that are proportionally greater in younger women.

The literature confirms that the partial or total absence of breasts in adult females due to mastectomy presents consequences and challenges in the personal appearance lifestyle of

University of Ghana http://ugspace.ug.edu.gh

breast cancer women. After mastectomy, the patients alleged that body shapes looked uneven, unbalanced, and hollow from inside, and therefore used breast prostheses improve their personal appearances. In a previous Ghanaian study on the psychosocial impact of mastectomy on female breast cancer patients, Anim-Sampong (2018) found that about 59% of the study participants agreed that the experienced low self-esteem, poor body image and were concerned about their physical and personal appearances, especially in public spaces. As a result, 75% of them therefore resorted to the use of breast prostheses or another form of replacement to minimise attention to their removed breast, while over 81% of them thought that breast prostheses enhanced their poise and self-regard, and about 88% felt feminine.

The findings of this study are also consistent with other reported studies. Indeed, Demuth *et al.*, (2012) and Shrestha (2012) stated that women considered their personal looks as distorted, asymmetrical, non-proportional, and obnoxious after mastectomy, and hence relied breast prostheses in their brassiere to cover their flat chest. After mastectomy their body shape looked uneven, unbalanced, and hollow from inside. The findings of this study is further supported with the work of Rasmuusen *et al.*, (2010) which reported that all the cancer survivors, regardless of type of cancer and treatment experienced change in their body and its appearance after treatment due to the disease, radiation, chemotherapy and/orsurgery. In particular, Rasmussen *et al.*, (2010) also reported the breast cancer survivors' feelings and description of their changed body as focal points of attention to those who interacted with them.

Positive social lifestyle choices and behaviours are important to breast cancer survivors' SWB overall QoL, and lifestyle choices. The median score for social lifestyle was significantly the lowest among the other dependent lifestyle choices (p=0.001). In particular, the lowest score was recorded among the 60-70 year group. The result can be explained by the fact that at 60 years and above, the probability of breast cancer to indulge in social activities is highly reduced

University of Ghana http://ugspace.ug.edu.gh

due decreased interest, physical weakness and inabilities, and general lack of desire. The median social lifestyle scores were also generally low across the other independent variables (marital status, treatment options ($p<0.001$), and type of surgery ($p<0.001$).

In this study, a number of indices including religion and spirituality, counselling, social support and involvement of the patient‗s family were used to ascertain the social lifestyles of the patients in this study. Religion and spirituality are important indices or factors in defining the social lifestyle of cancer patients. Previous studies have stated that about 59% of a female breast cancer population presenting for treatment at radiotherapy and oncology hospital in Ghana answered that God was their source of strength to carry on in life, while 72.5% said God was their source of peace and comfort (Anim-Sampong *et al.*, 2020).

The findings of this study are further supported by the work of Davis *et al.*, (2018) in which the participants indicated that their faith in God was their primary support for their continued survivorship. Koçan and Gürsoy (2016) also stated that some breast cancer patients after post-mastectomy turned to God as a source of strength and acceptance. Park *et al.*, (2009) confirmed from a study that although religious attendance had little impact on health behaviours, daily spiritual experiences were related to greater performance of health behaviors, while religious struggle was related to less, and concluded that aspects of religiosity and spirituality played important and different roles in the social lifestyle choices of cancer survivors.

In a previous study, Anim-Sampong (2018) found that counselling sessions for affected breast cancer patients is important to improving the social lifestyle of breast cancer patients in coping with mastectomy.

Social support is a very important factor and primary goal in determining the social lifestyle of breast cancer patients which is required to improve their SWB QoL. According to Anim-

University of Ghana http://ugspace.ug.edu.gh

Sampong (2018), family dynamics among breast cancer patients can be achieved via involvement of their families and seeking their support before, during and after the treatment. The results of this study also reveal a weak social lifestyle score in respect of their marital status. A statistically insignificant difference in the marital status of the patients ((*p*=0.136) was found. An expected outcome of such low scores is an adverse impact on marital relationships with their husbands due to mastectomy. To support this argument, Koçan and Gürsoy (2016) reported damaged or strained relationships of married breast cancer women with their spouses after mastectomy, and consequently feared divorce, and avoided social interactions. The overall highest domain score of 43.7% (moderate QoL) was found among patients aged patiens aged 50 – 59 years (*p*=0.524).

5.6 Association between quality of life and lifestyle choices

The results show a negative significant correlation (*p*=-0.0255) between FWB and PWB subscales in the patients QoL, and between the ACBC and EWB QoL subscales (*p*=-0.0453). The overall, there were also statistically insignificant correlations between the overall QoL and any of the subscales (*p*> 0.05). The results further showed positive and statistically significant correlation between the patients dietary and healthy lifestyles (*p*=0.0144) only. There no significant relationships between the other variables of the patients' lifestyle choices (*p*=± 0.05).

One of the key aspects of this study was to investigate any relationship between the QoL and lifestyle choices of the breast cancer patients. The results of this study showed that the dietary lifestyle of the patients was very important as evident in its median scores. A positive statistically significant correlation between the patients' dietary lifestyle and the ACBC QoL subscale (*p*=0.0452). Similarly, a positive statistically significant correlation between the patients' overall lifestyle choice and their EWB QoL (*p*=0.0038). Negative but statistically

University of Ghana http://ugspace.ug.edu.gh

significant relationships were also found between their overall QoL and physical appearance (*p*=-0.0481) and social (*p*=-0.0296) lifestyle choices.

Three linear regression models: unadjusted model, adjusted model 1 and adjusted model 2 were used. No statistically significant relationships were found in the unadjusted regression model (range: *p*=0.083 – 0.7980>0.05) of their lifestyle choices. However, significant relations were found only in the healthy lifestyle choice in the regression adjusted model 1 (*p*=0.019) and model 2 (*p*=0.008) respectively. With respect age, statistically significant relations was found only in the adjusted model 1 regression model (*p*=0.049), but none in the unadjusted (*p*=0.061) and adjusted model 2 (*p*= 0125) regression models. Marriage among the breast cancer patients was considered as reference in the linear regression analysis. The range of *p*-values for the three models (*p*= 0.640 -0. 9530) indicate no statistically significant relationships in their marital status.

Multimodal adjuvant curative chemotherapy radiotherapy and surgery as used as reference in the linear regression analysis of the QoL and breast cancer treatment regimens. The results showed positive statistical significance (*p*=0.046) in the adjusted model 2 for adjuvant curative radiotherapy and surgery, in the unadjusted model for palliative chemotherapy radiotherapy (*p*<0.001), and in adjusted model 2 (*p*=0.000) for adjuvant curative radiotherapy and surgery No statistically significant relationships were found in any of the regression models for all the surgical procedures.

University of Ghana http://ugspace.ug.edu.gh

CHAPTER SIX

CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

6.1. Conclusion

A research study on the QoL and lifestyle choices of breast cancer patients presenting for treatment at the Sweden Ghana Medical Centre has been performed. The study was carried using the versatile FACT-B V4 QoL and lifestyle tool on a population of 80 breast cancer patients. The five domain subscales and four lifestyle dimensions of the were used in assessing the QoL and lifestyle choices, using the mean and median inter-quartile ranges of the measured scores. Overall, FWB was the most enjoyed QoL by the breast cancer patients across the independent variables. The overall QoL score for the population was about 43% and suggestive of moderate to low QoL in the various functional roles in the patients

Three treatment options were provided to the participants. Patients who received curative radiotherapy and surgery enjoyed the highest QoL scores as measured by their EWB (62.4 ± 5.4%, p=0.000) and FWB (62.5 ± 7.5%, p=0.006). Statistically significant relationships were established between the QoL domains and the treatment options (p=0.000). Functional well-being domain scores were significantly higher for the three surgical procedures (p=0.027).

The highest median scores ≥ 60.0% were recorded for the healthy lifestyles of the patients for all variables, except in partial mastectomy where a lower median score of 52.5% was found. There were no significant relationship between their healthy lifestyles choices and the independent variables. Statistically significant (p=0.001) median scores for diet lifestyle choices was found across the age groups, but none in the other variables. The median score in the patients' personal appearance and social lifestyles were low, except for curative radiotherapy treatment and lumpectomy treatment regimens and surgery where their personal appearance lifestyles were significantly high (p <0.001). A statistically insignificant difference

University of Ghana http://ugspace.ug.edu.gh

in the marital status of the patients ((p=0.136) was found. An expected outcome of such low scores is an adverse impact on marital relationships with their husbands due to mastectomy.

6.2. Recommendations

The covid-19 pandemic presented challenges to the study. In particular, the expected mean sample population size was 150. However, due to the adverse impact of the pandemic, only fewer patients could present for treatment. Also the restrictions on international travel hindered several patients from the West African sub-region to seek clinical treatment at the Centre.

The following are recommended;

1. Future research –
    - Future expansion of the work is required to be carried out on a larger sample size. This will allow for better generalization across the Ghanaian populace.
    - Additional research should include other demographic factors such as educational background and economic status which were not considered in this work.
    - Future studies should include breast cancer patients presenting at other cancer treatment facilities and hospitals in the country
    - Additional research in this subject area should be carried out with larger sample sizes and in other health facilities. This will allow for better generalization across the Ghanaian populace.

2. Health facilities and care:
    - Clinical psychologists and counsellors should be involved in the care of breast cancer patients.

University of Ghana http://ugspace.ug.edu.gh

- Breast prostheses should be made available at affordable prices to patients who required them to improve their QoL, and enhance their personal and social lifestyles choices.

3. Family and social care:
    - Family and close friends of breast cancer women should provide them support to improve their SWB and social lifestyle choices.

6.3. Limitations

The study was limited by the following considerations:

1. The convid-19 pandemic limited the number of patients presenting at the Centre for adjuvant multimodal breast cancer treatment. In particular, lockdown measures were imposed in some parts of the country which restricted travel and movement of persons including breast cancer patients.
2. The School of Public Health limits the data collection aspect of the Master of Public Health (MPH) research studies to only one month. An obvious impact of this limitation is effective sampling and reduced sample size in prospective studies such as this which required contact with the participants.
3. Consequently, the limited study period did not allow the use of a large sample size as only patients reporting to SGMC constituted the sample population at the time of sampling. In particular, the reduced average number of patients (about 150 patients/month) presenting for treatment at the study site, and the limited study period of one month resulted in a reduced sample size of 80.
4. Hence, generalization of results to the whole Ghanaian population, and the referred Nigerian population may not be possible.

University of Ghana http://ugspace.ug.edu.gh

5. Access to consenting patients in the study was initially difficult as some patients regarded the matter as sensitive and personal and did not initially want to open up about

REFERENCES

1. Aboshaiqah, A., Al-Saedi, T.S., Abu-Al-Ruyhaylah, M.M., Aloifi, A.A., et l. (2016). Quality of life and satisfaction with care among palliative cancer patients in Saudi Arabia. *Palliative Support Care.* 14(6):621-627.
2. Adorna, E. L., Morari-Cassol, E. G., & Ferraz, N. M. S. (2015). Breast cancer and support group in the life of mastectomized women. *Fisioterapia em Movimento, 28*(3). http://dx.doi.org/10.1590/0103-5150.028.003.A018
3. Almeida, T. G., Comassetto, I., Alves, K. M. C., Santos, A. A. P., Silva, J. M. O., & Trezza, M. C. S. F. (2015). Experience of Young women with breast cancer and mastectomized. *Escola Anna Nery, 19*(3). htpp://dx.doi.org/10.5935/1414-8145.20150057
4. American Cancer Society. (2016). Breast Cancer Facts & Figures 2015-2016. *Breast Pathology*.
5. Akarolo-Anthony, S. N., Ogundiran, T. O., & Adebamowo, C. A. (2010). Emerging breast cancer epidemic: Evidence from Africa. *Breast Cancer Research,* 12(4).
6. Anim-Sampong A.M, Vanderpuye V, Botwe BO, and Anim-Sampong S. (2020). Psychosocial impact of mastectomy on female breast cancer patients presenting at an

University of Ghana http://ugspace.ug.edu.gh

academic radiotherapy oncology centre in Ghana. J*ournal of Radiotherapy in Practice* 1-10, doi: 10.1017/S146039692000045X

7. Anim-Sampong, A.M. (2018). Psychosocial impact of mastectomy on female breast cancer patients at the national radiotherapy oncology and nuclear medicine centre of the Korle Bu Teaching Hospital. BSc Dissertation, University of Ghana.

8. Aslam, M.S., Naveed, S., Ahmed, A., Abbas, Z., Gull, I. and Athar, M.A. (2014) Side effects of chemotherapy in cancer patients and evaluation of patients opinion about starvation based differential chemotherapy. *Journal of Cancer Therapy*, 5, 817-822.

9. Bantema-Joppe, E.J.,de Bock, G.H., Woltman-van Iersel, M., Busz, D.M., Ranchor, A.V., Langendijk, J.A., J H Maduro, J.H., van den Heuvel, E.R. (2015). The impact of age on changes in quality of life among breast cancer survivors treated with breast-conserving surgery and radiotherapy. *British Journal of Cancer* 112(4)

10. Basu N.N., S Littlechild, S., Barr, L., Ross,G.L., Evans, D.G. (2016). Attitudes to contralateral risk reducing mastectomy among breast and plastic surgeons in EnglandAnn R Coll Surg Engl 2016; 98: 121–127

11. Bolm, L, Käsmann, L., Paysen, A., Karapetis, C., Rades, D., Wellner, U.F., Keck, T., Watson, D.I., Hummel, R., Hussey, D.J.(2018). Multimodal anti-tumor approaches combined with ımmunotherapy to overcome tumor resistance in esophageal and gastric cancer *Anticancer Research* 38: 3231-3242

12. Bontrager, K. L., & Lampignano, J. P. (2014). Textbook of Radiographic Positioning and Related Anatomy (8th edition). St. Louis: Elsevier Mosby.

13. Bray F, Jemal A, Grey N, Ferlay J, Forman D. Global cancer transitions according to the Human Development Index (2008-2030): a population-based study. Lancet Oncology, 2012(13), 790-801.

University of Ghana http://ugspace.ug.edu.gh

14. Borghesan, D. H. P., Gravena, A. A. F., Lopes, T. C. R., Brischiliari, S. C. R., Demitto, M. O., Agnolo, C. M. D., Carvalho, M. D. B., & Pelloso, M. S. (2014). Variables that affect the satisfaction of Brazilian women with external breast prostheses after mastectomy. *Asian Pacific Journal on Cancer Prevention*, *15*(22), 9631-9634.

15. Cardoso, F., Harbeck, N., Fallowfield, L., Kyriakides, S., & Senkus, E. (2012). Locally recurrent or metastatic breast cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Annals of Oncology*, *23*(7), vii11-vii19.

16. Centre for Disease Control. Breast cancer (2020). American Cancer Society. https://www.cdc.gov/cancer/breast/index.htm

17. Chan, H-K, Ismail, S. (2014) Side Effects of Chemotherapy among Cancer Patients in a Malaysian General Hospital: Experiences, Perceptions and Informational Needs from Clinical Pharmacists Asian Pac J Cancer Prev, 15 (13), 5305-5309

18. Chen Q., Li, S., Min Wang,, M., Liu, L., Chen, G. (2018). Health-related quality of life among women breast cancer patients in Eastern China. *BioMed Research International*. Vol. 2018,

19. Cherny NI, Paluch-Shimon S, Berner-Wygoda Y. (2018). Palliative care: needs of advanced breast cancer patients. *Breast Cancer* (Dove Med Press). 3;10:231-243.

20. Chui PL. Cancer- and Chemotherapy-Related Symptoms and the Use of Complementary and Alternative Medicine. Asia Pac J Oncol Nurs 2019;6:4-6

21. Daly, B, Olopade, O.I. (2015). (2015). Ethnicity, and the diagnosis of breast cancer *JAMA*. 2015 313(2): 141–142.doi: 10.1001/jama.2014.17323

Cui, Y, Shu,X-O., Gao, Y, et al. (2004). The long term impact of medical and sociodemographic factors on the quality of life breast cancer survivors among Chinese women. *Breast Cancer Research and Treatment*. 87:135-147.

University of Ghana http://ugspace.ug.edu.gh

24. Davis MP, Bruera E, Morganstern D. (2013). Early integration of palliative and supportive care in the cancer continuum: challenges and opportunities. *American Society of Clinical Oncology Education Book*. :144-50.

23. Demuth, A., Czerniak, U., Krzykala, M., Ziolkowska, E. (2012). Subjective assessment of body image by middle- aged men and women. *Studies in Physical Culture and Tourism, 19*(1), 25-29.

24. DeNysschen, C., Brown, J.K., Baker, M.,Wilding, G., Tetewsky, S., Cho, M.H., Dodd, M.J. (2014). Healthy lifestyle behaviours of breast cancer survivors. *Clinical Nursing Research*, 1-22 2014.

25. DeSantis, C. E., Lin, C. C., Mariotto, A. B., Siegel, R. L., Stein, K. D., Kramer, J. L., Alteri, R., Anthony, S., Robbins, A. S., & Jemal, A. (2014). Cancer treatment and survivorship statistics, 2014. A Cancer Journal for Clinicians, 64(4), 252-271. http://doi: 10.3322/caac.21235.

26. Dirksen and Epstein (2007)

27. Doherty LF, Bromer JG, Zhou Y, Aldad TS, Taylor HS. (2010). In utero exposure to diethylstilbestrol (DES) or bisphenol-A (BPA) increases EZH2 expression in the mammary gland: an epigenetic mechanism linking endocrine disruptors to breast cancer. *Hormones Cancer*. 1(3):146–55.

28. Early Breast Cancer Trialists' Collaborative Group. Effect of radiotherapy after breast-conserving surgery on 10-year recurrence and 15-year breast cancer death: meta-analysis of individual patient data for 10,801 women in 17 randomised trials. *Lancet* 2011;378:1707-1716

29. Fisher B, Anderson S, Bryant J, et al. (2002). Twenty-year follow-up of a randomized trial comparing total mastectomy, lumpectomy, and lumpectomy plus irradiation for the treatment of invasive breast cancer. *New England Journal of Medicine.* 347(16):1233-41

University of Ghana http://ugspace.ug.edu.gh

30. Fitch, M. I., McAndrew, A., Harris, A., Anderson, J., Kubon, T., & McClennen, J. (2012). Perspectives of women about the external breast prostheses. *Cancer Oncology Nursing Journal, 22*(3), 162-174.

31. Fouladi, N., Pourfarzi, F., Ali-Mohammadi, H., Masumi, A., Agamohammadi, M., & Mazaheri, E. (2013). Process of coping with mastectomy: a qualitative study in Iran. *Asian Pacific Journal on Cancer Prevention, 14*(3), 2079-2084.

32. Freire M.E, Sawada N.O, França I.S, Costa S.F, Oliveira C.D.(2014). Health-related quality of life among patients with advanced cancer: an integrative review. *Revista da Escola de Enfermagem da USP*. 48(2):357–67.

33. Gärtner S, Gunesch A, Knyazeva T, Wolf P, Högel B, Eiermann W, et al. (2014) PTK 7 Is a Transforming Gene and Prognostic Marker for Breast Cancer and Nodal Metastasis Involvement. PLoS ONE 9(1): e84472. https://doi.org/10.1371/journal.pone.0084472

34. Ganesh, S., Lye, M.S., Lau, F.N. (2016). Quality of life among breast cancer patients in Malaysia. *Asian Pacific Journal of Cancer Prevention.* 17(4)1677-1684

35. Gao, J., Dizon, D.S. (2013). Preparing for survivalship:quality of life in breast cancer survivors. *Journal of Sex Medicine.* 10:16-20

36. Gallagher, P., Buckmaster, A., O’Carroll, S., Kiernan, G., & Geraghty, J. (2009). Experiences in the provision, fitting and supply of external breast prostheses: Findings from a national survey. *European Journal on Cancer Care, 18*(6), 556-568.

37. Gallagher, P., Buckmaster, A., O’Carroll, S., Kiernan, G., & Geraghty, J. (2010). External breast prostheses in post-mastectomy care: Women’s qualitative accounts. *European Journal Cancer Care (England), 19*(1), 61-71.

38. Ghartey Jnr, F. N., Anyanful, A., Eliason, S., Adamu, M. S., & Debrah, S. (2016). Pattern of Breast Cancer Distribution in Ghana: A Survey to Enhance Early Detection, Diagnosis, and Treatment. *International Journal of Breast Cancer*

University of Ghana http://ugspace.ug.edu.gh

39. Ginsburg O, Yip CH, Brooks A, et al. Breast cancer early detection: a phased approach to implementation. *Cancer*. 2020; 126(suppl): 2365- 2378.

40. Giordano S.H, Hortobagyi G.N (2003). Inflammatory breast cancer: Clinical progress and the main problems that must be addressed". *Breast Cancer Research.* 5 (6): 284–8.

41. Glass, A.G., Lacey Jr, J.V., Carreon, J.D., Hoover, R.N.(2007). Breast cancer incidence, 1980-2006: combined roles of menopausal hormone therapy, screening mammography, and estrogen receptor status. *Journal of the National Cancer Institute.* 1;99(15):1152-61.

42. Griggs J.J, Culakova E, Sorbero M.E, et al. (2007). Social and racial differences in selection of breast cancer adjuvant chemotherapy regimens. *Journal of Clinical Oncology*. 25(18):2522–2527.

43. Griggs J.J, Sorbero M.E, Stark A.T, Heininger S.E, Dick A.W. (2003). Racial disparity in the dose and dose intensity of breast cancer adjuvant chemotherapy. *Breast Cancer Research and Treatment*. 81(1):21–31.

44. Gwyn K, Bondy M.L, Cohen D.S, et al. (2004). Racial differences in diagnosis, treatment, and clinical delays in a population-based study of patients with newly diagnosed breast carcinoma. *Cancer.* 100(8):1595–1604.

45. Hall M.J, Reid J.E, Burbidge L.A, *et al.* (2009). *BRCA1* and *BRCA2* mutations in women of different ethnicities undergoing testing for hereditary breast-ovarian cancer. *Cancer.* 115(10):2222–2233.

46. Habermann, E. B., Abbott, A., Parsons, H. M., Virnig, B. A., Al-Refaie, W. B., & Tuttle, T. M. (2010). Are mastectomy rates really increasing in the United States? Journal of Clinical Oncology, 28(21), 3437-3441.

47. Hershman, D.L., Kushi, L.H., Shao,T., Buono, D., Kershenbaum, A., Tsai, W-Y., Fehrenbacher, L., Gomez, S.L., Miles, S., Neugut, A.I. Early Discontinuation and

University of Ghana http://ugspace.ug.edu.gh

Nonadherence to Adjuvant Hormonal Therapy in a Cohort of 8,769 Early-Stage Breast Cancer Patients *Journal of Clinical Oncology.* 28(27): 4120–4128.

48. Hilarius, D.L, Kloeg, P.H., Elsken van der Wall, E., van den Heuvel, J.J.G., Gundy, C.M., Aaronson N.K. (2012). Chemotherapy-induced nausea and vomiting in daily clinical practice: a community hospital-based study *Support Care Cancer.* 20:107–117

49. Ho, S.Y., Rohan, K.J., Tager, F.a, McKinley, P.S., (2015). A longitudinal study of depression, fatigue and sleep disturbances as a symptom cluster in women with breast cancer. *Journal of Pain Symptoms Management.* 49(4)707-715.

50. Imran, M. Al-Wassia, R., Alkhayyat, S.S., Baig, M., Al-Saati, B.A. (2019). Assessment of quality of life in breast cancer patients by using EORTC QLQ-C30 and BR-23 questionnaires: A tertiary care center survey in the western region of Saudi Arabia. *PLoS ONE* 14(7):e0219093

51. Iles, K.E., Dale A. Dickinson, D.A., (2017) Carcinogens, Environmental in International Encyclopedia of Public Health (Second Edition)

52. Iqbal J, Ginsburg O, Rochon P.A, Sun P, Narod S.A. (2014). Differences in breast cancer stage at diagnosis and cancer-specific survival by race and ethnicity in the United States. *JAMA*. doi:10.1001/jama.2014.17322.

53. Jassim, G.A., Whitford, D.L. (2013). Quality of life of Bahraini women with breast cancer: a cross section study. *BMC Cancer*. 13(1):212

54. Jetha, A. Z., Gul, B. R., & Lalani, S. (2017). Women experiences of using external breast prosthesis after mastectomy. *Asia-Pacific Journal of Oncological Nursing, 4*(3), 250-258. http//doi.org/10.4103/apjon_25_17

55. Jones, L.W., Demark-Wahnfried, W. (2006). Diet exercise and complimentary therapies after primary treatment for cancer. *Lancet Oncology*. 7: 107-1026.

University of Ghana http://ugspace.ug.edu.gh

56. Khatcheressian J.L., Brown, S.E. (2009). Psychosocial issues of breast cancer survivorship. Medscape Oncology. Retrieved from 01/05/18.

57. Khater, A.I., Noaman, M.K. Abdel Hafiz, M.N., Moneer, M.M., Elattar, I.A. (2019). Health-related quality of life among egyptian female breast cancer patients at the National Cancer Institute, Cairo University *Asian Pacific Journal of Cancer Prevention,* 20 (10), 3113-3119

58. Kimberlin, C. L., Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health System Pharmacy*, *65*(23), 2276-84. http://doi.org/10.2146/ajhp070364

59. Kingsmore D, Hole D, Gillis C. (2004). Why does specialist treatment of breast cancer improve survival? The role of surgical management. *British Journal of Cancer*. 90:1920–5.

60. Koçan, S. & Gürsoy, A. (2016). Body image of women with breast cancer after mastectomy: A qualitative research. *The Journal of Breast Health, 12*(4), 145-150. http://doi.org/10.5152/tjbh.2016.2913

61. Khater, A.I., Noaman, M.K., Abdel Hafiz, M. A., Moneer, M.M., (2019). Health-related quality of life among Egyptian female breast cancer patients at the National Cancer Institute. *Asian Pacific Journal of Cancer Prevention.* 3113(20).

62. Kole A.J, Kole L, Moran M.S. (2017). Acute radiation dermatitis in breast cancer patients: challenges and solutions. *Breast Cancer (Dove Med Press)*. 9:313-323.

63. Komenaka, I.K., Martinez, M.E., Pennington Jr,R.E., Hsu,C-H., Clare, S.E, Thompson, P.A., Murphy, C., Noelia M., Zork, N,M., Goulet Jr, R.J (2010). Race and ethnicity and breast cancer outcomes in an underinsured population. *Journal of the National Caner Institute.* 102(15).

University of Ghana http://ugspace.ug.edu.gh

64. Kool, M., Fontein, D.B., Kranenbarg, E.M., Nortier, J.W., Rutger, E.J. et al. (2015). Long term effects of extended adjuvant endocrine therapy on quality of life of breast cancer patients. The Breast. 24(3) 224-229.

65. Kubon, T. M., McClennen, J., Fitch, M. I., McAndrew, A., & Anderson, J. (2012). A mixed- methods cohort study to determine perceived patient benefit in providing custom breast prostheses. *Current Oncology*, *19*(2), 43-52. http//doi.org/10.3747/co.19.851

66. Kwan ML, Weltzien E, Kushi LH, Castillo A, Slattery ML, Caan BJ. (2009).Dietary patterns and breast cancer recurrence and survival among women with early-stage breast cancer. *Journal of Clinical Oncology*. 27: 919-926.

67. Lahart, I.M., George S. Metsios, G.S., Alan Michael Nevill, A.M., Amtul Razzaq Carmichael, A.R., Physical activity, risk of death and recurrence in breast cancer survivors: A systematic review and meta-analysis of epidemiological studies *Acta Oncologica*, 2015; DOI: 10.3109/0284186X.2014.998275

68. Leclerc, A-F., Jerusalem, G., Devos, M., Jean-Michel Crielaard, J-M., & Didier Maquet, D. (2016). Multidisciplinary management of breast cancer *Archives of Public Health.* 74(10).

69. Li C.I, Malone K.E, Daling J.R. (2003). Differences in breast cancer stage, treatment, and survival by race and ethnicity. *Archives of Internal Medicine*. 163(1):49–56.

70. Marieb, E. N., and Hoehn, K. (2013). Human Anatomy & Physiology (9th Edition). San Francisco. https://doi.org/10.1007/BF00845519

71. Mayo Clinic. (2018) Lumpectomy. Mayo Clinic Family Health Book, 5th Edition

72. McCahill L.E, Single R.M, Aiello Bowles E.J, *et al.* (2012). Variability in reexcision following breast conservation surgery. *JAMA*. 2012;307:467–75.

73. MacMahon B. (2006). Epidemiology and the causes of breast cancer. International Journal of Cancer. 118(10): 2372-2378.

University of Ghana http://ugspace.ug.edu.gh

74. McGale, P., Taylor, C., Correa, C., Cutter, D., Duane, F., Ewertz, M., Gray, R., Mannu, G., Peto, R., Whelan, T., Wang, Y., Wang, Z., & Darby, S. (2014). Effect of radiotherapy after mastectomy and axillary surgery on 10-year recurrence and 20-year breast cancer mortality: meta-analysis of individual patient data for 8135 women in 22 randomised trials. Lancet (London, England), 383(9935), 2127–2135.

75. Meyns M, Jansen N, Deneufbourg J.M. (2006). Place de la radiothérapie dans le traitement du cancer du sein. Indications actuelles et perspectives. Rev Med Liege. 61:623–31.

76. Mohan N, Hosain, S., Zhao, J., Shen, Y., Luo, X., Jiang, J. *et al.*, (2019) Atezolizumab potentiates Tcell-mediated cytotoxicity and coordinates with FAK to suppress cell invasion and motility in PD-L1$^+$ triple negative breast cancer cells. *Journal OncoImmunology*. 8,(9).

77. Montazeri, A. (2008). Health-related quality of life in breast cancer patients: A bibliographic review of the literature from 1974 to 2007. Journal Experimental Clinical Cancer Research. 27:32.

78. Moore, K. L., Dalley, A. F., & Agur, A. M. R. (2014). Clinically Oriented Anatomy (7th edition). Baltimore.

79. Mutebi, M., Anderson, B.O., Duggan, C., Adebamowo, C., Agarwal, G., Ali, Z., Bird, P., Bourque, J-M., DeBoer, R., *at al.*, (2020). Breast cancer treatment: A phased approach to implementation. *Cancer*. **126(10),** 2365-2378

80. Nasciemento, K. T. S., Fonsêca, L, C, T., Andrade, S. S. C., Leite, K. N. S., Zaccara, A. A. L., Costa, S. F. G. (2014). Multi-professional team care: discourse of women in preoperative mastectomy. *Escola Anna Nery, 18*(3), 435-440. http://dx.doi.org/10.5935/1414-8145.20140062

University of Ghana http://ugspace.ug.edu.gh

81. National Breast Cancer Foundation (2019), https://greatnonprofits.org/org/national-breast-cancer-foundation-inc

82. Navari R.,M., Aapro, M. (2016) Antiemetic Prophylaxis for Chemotherapy-Induced Nausea and Vomiting. N*ew England Journal of Medicine.* 374:1356-1367

83. Neto, A. E. A. A., Alves, B. C. A., Gehrke, F., Azzalis, L. A., Junqueira, V. C. B., Sousa, L. V., Adami, F., & Fonseca, F. L. A. (2017). Quality of life of post-mastectomy women living in a semi-arid region of Brazil. *International Journal of Environmental Research and Public Health, 14*(6), 601. http://doi.org/10.3390/ijerph14060601

84. Ng, E.T., Ang, R.Z., Tran, B.X, Ho, C.O., Zhang, Z., Tan,W., Bai, Y., et al. (2019). Comparing quality of life in breast cancer patients who underwent mastectomy versus breast-conserving surgery: a meta-analysis. *International Journal of Environmental. Research in Public Health* 2019, 16, 4970

85. Ng C.G., Mohammed, S., See, M.H., Harun, F., Dahlui, M. et al., (2015). Anxiety, depression, perceived social support and quality of life in Malaysian breast cancer patients: a 1-year prospective study. Health Quality Life Outcomes. 13(1): 205

86. Nurgali K, Jagoe RT and Abalo R. (2018) Editorial: Adverse effects ofcancer chemotherapy: anything new to improve tolerance and reduce sequelae? *Frontier in Pharmacology* 9:245.doi: 10.3389/fphar.2018.00245

89. Ohene-Yeboah, M., & Adjei, E. (2012). Breast cancer in Kumasi, Ghana. *Ghana Medical Medical Journal*, *46*(1), 8–13.

87. O'Neill S.C, DeFrank J.T, Vegella P, Richman A.R, Henry L.R, Carey L.A, et al. (2013) Engaging in health behaviors to lower risk for breast cancer recurrence. *PLoS ONE* 8(1): e53607. https://doi.org/10.1371/journal.pone.0053607

88. Onitilo, A.A., Engel, J.M., Stankowski, R.V., Suhail, A.R. Doi, M. (2015). Survival comparisons for breast conserving surgery and mastectomy revisited: community

University of Ghana http://ugspace.ug.edu.gh

experience and the role of radiation therapy. *Clinical Medicine & Research.* 13(2): 65-73

89. Ooi, S. L., Martinez, M. E., & Li, C. I. (2011). Disparities in breast cancer characteristics and outcomes by race/ethnicity. Breast Cancer Research and Treatment, 127(3), 729–738. https://doi.org/10.1007/s10549-010-1191-6

90. Opoku, S. Y., Benwell, M., & Yarney, J. (2012). Knowledge, attitudes, beliefs, behaviour and breast cancer screening practices in Ghana, West Africa. *The Pan African Medical Journal*, *11*, 28.

91. Ozmen,V., Ilgun,S., Ozden, B.C., Ozturk, A., Aktepe, F., Agacayak, F., et al., (2020). Comparison of breast cancer patients who underwent partial mastectomy with mini latissimus dorsi flap and subcutaneous mastectomy with implant regarding quality of life, cosmetic outcome and survival rates. *World Journal of Surgical Oncology*.18:87

92. Parikh D.A, Chudasama R, Agarwal A, Rand A, Qureshi M.M, Ngo T, et al. (2015). Race/Ethnicity, Primary language, and income are not demographic drivers of mortality in breast cancer patients at a diverse safety net academic medical center. *International Journal of Breast Cancer*. 2015:835074

93. Park, C.L., Edmondson, D., Hale-Smith, A., Blank, T.O. (2009). Religiousness /spirituality and health behaviors in younger adult cancer survivors: does faith promote a healthier lifestyle? *Journal of Behavioral Medicine* 32 (582).

94. Parkin D.M, Bray, F., Ferlay, J., Jemal, A. (2014). Cancer in Africa 2012. *Cancer Epidemiology, Biomarkers and Prevention; 23(6); 953–66.*

95. Phakathi, B.P., Basson, G., Karusseit, V.O.L., Olorunju, S.A.S., Mokoena, T (2016). The effect of HIV infection on the surgical, chemo- and radiotherapy management of breast cancer. A prospective cohort study. *International Journal of Surgery*.34:109-115

University of Ghana http://ugspace.ug.edu.gh

96. Pierce JP, Natarajan L, Caan BJ, et al., (2007). Influence of a diet very high in vegetables, fruit, and fiber and low in fat on prognosis following treatment for breast cancer: the Women's Healthy Eating and Living (WHEL) randomized trial. *JAMA.* 298: 289-298

97. Pollán, M. (2010). Epidemiology of breast cancer in young women. Breast Cancer Research and Treatment, 123(1), 3–6.

98. Punglia R.S, Morrow M, Winer E.P, *et al.* (2007). Local therapy and survival in breast cancer. *New England Journal Medicine*. 356:2399–405.

99. Quayson, S. E., Wiredu, E. K., Adjei, D. N., & Anim, J. T. (2014). Breast cancer in Accra, Ghana. *Journal of Medical and Biomedical Sciences*, *3*(3), 21–26.

100. Ramu, D., Ramesh, R. S., Manjunath, S., Shivakumar, Goel, V., Hemmath, G. N., & Alexander, A. (2015). Pattern of external breast prosthesis use by post mastectomy breast cancer patients in India: Descriptive study from tertiary care centre. *Indian Journal of Surgical Oncology*, 6(4), 374-377. http//doi.org/10.1007/s13193-015-0456-2

101. Rasmussen, D.M, Hansenb, H.P., Elverdam, B. (2010). How cancer survivors experience their changed body encountering others. *European Journal of Oncology Nursing,* 4 (2010) 154–159.

102. Roberts, S., Livingston, P., White, V., & Gibbs, A. (2003). External breast prosthesis use: experiences and views of women with breast cancer, breast cancer nurses, and prosthesis fitters. *Cancer Nursing, 26*(3), 179-186.

103. Ryan, M.E. (2018). lifestyle media in american culture: gender, class, and the politics of ordinariness. Routledge. ISBN 978-1-315-46495

104. Sacchini V, Pinotti JA, Barros AC, et al. (2006). "Nipple-sparing mastectomy for breast cancer and risk reduction: oncologic or technical problem?". *Journal of the American College of Surgeons, 203*(5): 704–14.

University of Ghana http://ugspace.ug.edu.gh

105. Safaee A, Moghimi-Dehkordi B , Zeighami B , Tabatabaee HR , Pourhoseingholi MA. (2008). Predictors of quality of life in breast cancer patients under chemotherapy *Indian Journal of Cancer* 45(3):107-11.

106. Schmitz K.H, Courneya K.S, Matthews C, Demark-Wahnefried W, Galvão D, Pinto B.M, et al., (2010). American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. *Medical Science Sports Exercise.* 42:1409–26.

107. Shapiro C.L., Recht A. (2001). Side effects of adjuvant treatment of breast cancer. New England Journal of Medicine. 344:1997–2008.

108. Sharma, G. N., Dave, R., Sanadya, J., Sharma, P., & Sharma, K. K. (2010) Various types and management of breast cancer: An overview. Journal of Advanced Pharmaceutical Technology & Research, 1(2), 109–126.

109. Sharma N, Purkayastha A. Factors Affecting Quality of Life in Breast Cancer Patients: A descriptive and cross-sectional study with review of literature. *Journal of Midlife Health*. 2017;8(2):75-83. doi:10.4103/jmh.JMH_15_17

110. Shin, Wk., Song, S., Jung, SY. et al. The association between physical activity and health-related quality of life among breast cancer survivors. Health Qual Life Outcomes 15, 132 (2017). https://doi.org/10.1186/s12955-017-0706-9

111. Shrestha, K. (2012). Psychological impact after mastectomy among Nepalese women: a qualitative study. *Nepal Medical College Journal*, *14*(1), 153-156.

112. Sjövall K, Strömbeck G, Löfgren A, Bendahl P, Gunnars B. (2010).Adjuvant radiotherapy of women with breast cancer - information, support and side-effects. *European Journal of Oncology Nursing.* 14:147–53

113. Smith K, Wray L, Klein-Cabral M, et al. (2005). Ethnic disparities in adjuvant chemotherapy for breast cancer are not caused by excess toxicity in black patients. *Clinical Breast Cancer.* 6(3):260–266.

University of Ghana http://ugspace.ug.edu.gh

114. Son, B. H., Ahn, S. H., Kim, S. W., Kang, E., Park, S. K., Lee, M. H., ... & Noh, D. Y. (2012). Prevalence of BRCA1 and BRCA2 mutations in non-familial breast cancer patients with high risks in Korea: the Korean Hereditary Breast Cancer (KOHBRA) Study. *Breast cancer research and treatment*, *133*(3), 1143-1152.

115. Saparano, J.A., Robert J., Gray, R.J., Makower, D.F., Pritchard, K.I., Albain, K.S., Hayes, D.F., Geyer Jr, Dees, E.C., Goetz, M.P., Olson, Jr., J.A., Lively, T., Badve, S.S. (2018) Adjuvant Chemotherapy Guided by a 21-Gene Expression Assay in Breast Cancer. New England Journal of Medicine, 379:111-12.

116. Spei, M-E, Samoli, E., Bravi, F, Vecchia, C, Bamia, C.,Benetou, V. (2019). Physical activity in breast cancer survivors: A systematic review and meta-analysis on overall and breast c*ancer survival*. *The Breast*. 44: 144-152

117. Suresh R, Raffi, J., FlorenceYuen, F., Murase, J.E. (2019). Treatment of moist desquamation for patients undergoing radiotherapy. *International Journal of Women's Dermatology* 5(2):124-125.

118. Strand J.J Mansel, J. K., Swetz, K.M. (2014). The growth of palliative care. *Clinical and Health Affair.Minnesota Medicine.*

119. Takuwa, H., Tsuji, W., Yotsumoto, F. (2017). PO114 - Metastatic breast cancer patients who achieved clinical complete response after multidisciplinary therapy: Clinical features from a single institution *The Breast.* 36(1) S63.

120. Thakkar, J. P., McCarthy, B. J., & Villano, J. L. (2014). Age-specific cancer incidence rates increase through the oldest age groups. *The American Journal of the Medical Sciences, 348*(1), 65-70.

University of Ghana http://ugspace.ug.edu.gh

121. Thomson C, Brewster D, Dewar J, Twelves C. (2004). Improvements in survival for women with breast cancer in Scotland between 1987 and 1993. *European Journal of Cancer*. 40:743–53.

122. Thrift-Perry, M., Cabanes, A., Cardoso, F., Hunt, K.M., Cruz, T.A., Faircloth, K. (2018) Global analysis of metastatic breast cancer policy gaps and advocacy efforts across the *The Breast*. 41:93-106

123. Tierney A.J, Leonard R.C.F, Taylor J, Closs S.J, Chetty U, Rodger A. Side effects expected and experienced by women receiving chemotherapy for breast cancer. *British Medical Journal*. 1991;302:272

124. Till, J. E. (2003). Evaluation of support groups for women with breast cancer: importance of the navigator role. *Health Quality Life Outcomes, 1*(1), 16. http://doi.org/10.1186/1477-7525-1-16

125. Tralongo, P.; Surbone, A.; Serraino, D.; Maso, L.D. (2019). Major patterns of cancer cure: Clinical implications. *European Journal of Cancer Care*. 28, 13139.

126. Vance, V, Mourtzakis, M., McCargar, L.Hanning, R. (2010). Weight gain in breast cancer survivors: prevalence, pattern and health consequences *Obesity Reviews*, 12(4).

127. Wambani, J. S., Korir, G. K., Bwonya, M. N. S., & Korir, I. K. (2011). Assessment of Patient Doses during Mammography Practice at Kenyatta National Hospital. East African Medical Journal, 88(11), 368–376.

128. Watkins D.J., Tellez-Rojo, M.M, Ferguson, K.K, et al. (2014). In utero and peripubertal exposure to phthalates and BPA in relation to female sexual maturation. *Environmental Research*. 134:233–41

129. Willett, W. (1989). The search for the causes of breast and colon cancer. Nature, 338, 389. Retrieved from http://dx.doi.org/10.1038/338389a0

University of Ghana http://ugspace.ug.edu.gh

130. Winer E.P, Hudis C, Burstein H.J, et al. (2005). American Society of Clinical Oncology technology assessment on the use of aromatase inhibitors as adjuvant therapy for postmenopausal women with hormone receptor-positive breast cancer: Status report 2004. *Journal of Clinical Oncology*. 23:619–629.

131. Wood, K., Cameron, M., & Fitzgerald, K. (2008). "Breast Size, Bra Fit and Thoracic Pain in Young Women: A Correlational Study." *Chiropractic & Manual Therapies,*

132. World Health Organization. (2012). GLOBOCAN Cancer Fact Sheets: Breast cancer. Retrieved November 7, 2017 from http://globocan.iarc.fr/old/FactSheets/cancers/breast-new.asp

133. Zucca-Matthes, G., Urban, C., & Vallejo, A. (2016). Anatomy of the nipple and breast ducts, *5*(5), 32–36.

134. Zurrida, S., Bassi, F., Arnone, P., Martella, S., Castillo, A. D., Martini, R. R., Semenkiw, M. E., Caldarella, P. (2011). The changing face of mastectomy (from mutilation to aid to breast reconstruction). *International Journal of Surgical Oncology*. 1–7.

University of Ghana http://ugspace.ug.edu.gh

APPENDIX I

QUESTIONNAIRE

SECTION A: DEMOGRAPHICS

A1: Age **Please tick appropriate box or otherwise specify.**

1. **Age:**

10-20 ( )

21-30 ( )

31-40 ( )

41-50 ( )

51-60)

61-70 ( )

A2: Marital status

Single ( )

Married ( )

Divorced ( )

Separated ( )

University of Ghana http://ugspace.ug.edu.gh

A3: Hometown/Region

Which region do you hail from? Specify please …………………………

SECTION B: QUALITY OF LIFE

Below is a list of statements that other people with your illness have said are important**. Please circle or mark one number per line to indicate your response as it applies to the past 7 days.**

Table B-1: Statements and responses pertaining to PWB QoL

	B1: PHYSICAL WELL-BEING (PWB)	**Not at all**	**A little bit**	**Some-what**	**Quite a bit**	**Very much**
GP1	I have a lack of energy ………………………………………………………………	0	1	2	3	4
GP2	I have nausea ………………………………………………………………	0	1	2	3	4
GP3	Because of my physical condition, I have trouble meeting the needs of my family ………………………………………………………………	0	1	2	3	4
GP4	I have pain ………………………………………………………………	0	1	2	3	4
GP5	I am bothered by side effects of treatment ………………………………………………………………	0	1	2	3	4
GP6	I feel ill	0	1	2	3	4
GP7	I am forced to spend time in bed ………………………………………………………………	0	1	2	3	4

University of Ghana http://ugspace.ug.edu.gh

Table B-2 : Statements and responses pertaining to SWB QoL

	B2: SOCIAL/FAMILY WELL-BEING (SWB)	**Not at all**	**A little bit**	**Some-what**	**Quite a bit**	**Very much**
GS1	I feel close to my friends	0	1	2	3	4
GS2	I get emotional support from my family	0	1	2	3	4
GS3	I get support from my friends	0	1	2	3	4
GS4	My family has accepted my illness	0	1	2	3	4
GS5	I am satisfied with family communication about my illness	0	1	2	3	4
GS6	I feel close to my partner (or the person who is my main support)	0	1	2	3	4
Q1	*Regardless of your current level of sexual activity, please answer the following question. If you prefer not to answer it, please mark this box* ☐ *and go to the next section.*					
GS7	I am satisfied with my sex life	0	1	2	3	4

Table B-3: Statements and responses pertaining to EWB QoL

	B3: EMOTIONAL WELL-BEING (EWB)	**Not at all**	**A little bit**	**Some-what**	**Quite a bit**	**Very much**
GE1	I feel sad	0	1	2	3	4
GE2	I am satisfied with how I am coping with my illness	0	1	2	3	4
GE3	I am losing hope in the fight against my illness	0	1	2	3	4
GE4	I feel nervous	0	1	2	3	4
GE5	I worry about dying	0	1	2	3	4
GE6	I worry that my condition will get worse	0	1	2	3	4

University of Ghana http://ugspace.ug.edu.gh

Table B-4: Statements and responses pertaining to FWB QoL

	B4: FUNCTIONAL WELL-BEING (FWB)	**Not at all**	**A little bit**	**Some -what**	**Quite a bit**	**Very much**
GF1	I am able to work (include work at home) …………………………………………………………………………	0	1	2	3	4
GF2	My work (include work at home) is fulfilling …………………………………………………………………………	0	1	2	3	4
GF3	I am able to enjoy life …………………………………………………………………………	0	1	2	3	4
GF4	I have accepted my illness …………………………………………………………………………	0	1	2	3	4
GF5	I am sleeping well …………………………………………………………………………	0	1	2	3	4
GF6	I am enjoying the things I usually do for fun …………………………………………………………………………	0	1	2	3	4
GF7	I am content with the quality of my life right now …………………………………………………………………………	0	1	2	3	4

Table B-5: Statements and responses pertaining to ACBC QoL

	B5: ADDITIONAL CONCERNS (ACBC)	**Not at all**	**A little bit**	**Some-what**	**Quite a bit**	**Very much**
B1	I have been short of breath …………………………………………………………………………	0	1	2	3	4
B2	I am self-conscious about the way I dress …………………………………………………………………………	0	1	2	3	4
B3	One or both of my arms are swollen or tender …………………………………………………………………………	0	1	2	3	4
B4	I feel sexually attractive …………………………………………………………………………	0	1	2	3	4
B5	I am bothered by hair loss …………………………………………………………………………	0	1	2	3	4
B6	I worry that other members of my family might someday get the same illness I have …………………………………………………………………………	0	1	2	3	4
B7	I worry about the effect of stress on my illness …………………………………………………………………………	0	1	2	3	4
B8	I am bothered by a change in weight …………………………………………………………………………	0	1	2	3	4
B9	I am able to feel like a woman …………………………………………………………………………	0	1	2	3	4
P2	I have certain parts of my body where I experience pain …………………………………………………………………………	0	1	2	3	4

University of Ghana http://ugspace.ug.edu.gh

SECTION C: LIFESTYLE CHOICES

Table C-1: Statements and responses pertaining to health lifestyle

	C1: HEALTH LIFESYLE	Not at all	A little bit	Some-what	Quite a bit	Very much
HL1	I am paying more attention to my health now	0	1	2	3	4
HL2	I exercise regularly	0	1	2	3	4
HL3	I ask more questions concerning my health when in confusion	0	1	2	3	4
HL4	I put a stop to smoking	0	1	2	3	4
HL5	I am making efforts to maintain a healthy weight	0	1	2	3	4
HL6	I take drugs prescribed for me religiously	0	1	2	3	4

Table C-2 Statements and responses pertaining to diet lifestyle

	C2: DIET LIFESYLE	Not at all	A little bit	Some-what	Quite a bit	Very much
DL1	I have stopped consuming alcohol	0	1	2	3	4
DL2	I currently eat more fruits and vegetables	0	1	2	3	4
DL3	I eat more whole grains foods now	0	1	2	3	4
DL4	I have limited my intake of saturated and trans fats (eg. red meat, poultry skin, full fat dairy, fried foods, margarine)	0	1	2	3	4
DL5	I take in more good fats (polysaturated and monosaturated fats, eg. olive and canola oil, nuts and natural nut butters and avocado	0	1	2	3	4
DL6	I eat less junk food now	0	1	2	3	4
DL7	I follow a particular diet plan now	0	1	2	3	4
D8L	I take in soy products quite regularly	0	1	2	3	4

University of Ghana http://ugspace.ug.edu.gh

Table C-3: Statements and responses pertaining to physical appearance lifestyle

	C3: PHYSICAL APPEARANCE LIFESYLE	Not at all	A little bit	Some-what	Quite a bit	Very much
PAL1	I have changed my style of dressing	0	1	2	3	4
PAL2	I wear more loose fitting clothing after mastectomy	0	1	2	3	4
PAL3	I am less concerned about my appearance now	0	1	2	3	4
PAL4	I now use breast prostheses after mastectomy	0	1	2	3	4
PAL5	I have darker nails now which I am unhappy about	0	1	2	3	4
PAL6	I have noticed changes in my skin which feels weird	0	1	2	3	4

Table C-4: Statements and responses pertaining to social lifestyle

	C4: SOCIAL LIFESYLE	Not at all	A little bit	Some-what	Quite a bit	Very much
SL1	I avoid social gatherings as much as possible	0	1	2	3	4
SL2	I have decided to have fewer people in my space	0	1	2	3	4
SL3	I am not as outgoing as I used to be	0	1	2	3	4
SL4	I no longer have a social life	0	1	2	3	4
SL5	I have lost track of what goes on around me	0	1	2	3	4

University of Ghana http://ugspace.ug.edu.gh

APPENDIX II

APP II-1: PARTICIPANT`S INFORMATION LETTER AND CONSENT FORM

INFORMATION LETTER

Researcher: ANNA MARIA ANIM-SAMPONG
Address: School of Public Health (SPH)
College of Health Sciences
University of Ghana
Mobile Contact: 0540497920
E-mail: anna_sampong@yahoo.com

June, 2020

Dear Sir/ Madam,

INFORMED CONSENT

I am a Master of Public Health student of the University of Ghana School of Public Health (SPH). I am conducting a research on breast cancer with the aim of assessing the quality of life of breast cancer patients at the Sweden Ghana Medical Centre.

Your involvement, cooperation and commitment as a participant in this study are necessary for data collection. You are free to participate or withdraw at any time without any obligation to inform the researcher. There are no risks and/or discomforts associated with this study. You are encouraged to ask questions at any time about the study for any further clarifications. This study will ensure your confidentiality and anonymity by complying with data protection policy and any information provided would be kept on USB sticks with encryption software (such as integral crypto drive or secure storage). A copy of the findings will be made available to you if you so wish. Please give your consent to voluntarily participate by completing the following attached questions. Thank you.

University of Ghana http://ugspace.ug.edu.gh

APP-II-2: CONSENT FORM

Have you read the information sheet about this study?	Yes ( )	No ( )
Have you received enough information about this study?	Yes ( )	No ( )
Have you asked questions about this study?	Yes ( )	No ( )
Have you received answers to all your questions?	Yes ( )	No ( )
Do you understand that you are free to withdraw from this study?		
• At any time?	Yes ( )	No ( )
• Without giving a reason for withdrawing	Yes ( )	No ( )
Do you agree to take part in this study?	Yes ( )	No ( )

Name of participant…………………………… Date: ………………….

Signature of participant………………………….

Signature of researcher…………………………… Date: …………………..

University of Ghana http://ugspace.ug.edu.gh