SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

RESILIENCE AND SOCIAL SUPPORT AS INFLUENCING FACTORS ON THE RELATIONSHIP BETWEEN PSYCHOLOGICAL DISTRESS AND QUALITY OF LIFE IN PERSONS LIVING WITH CANCER. A CROSS-SECTIONAL STUDY AT THE KORLE-BU TEACHING HOSPITAL

BY

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THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE

DECEMBER, 2022

DECLARATION

I, Swithin Mustapha Swaray, declare that this dissertation is my original work and has not been taken from the contents of others save to the extent that such work has been cited and acknowledged within the text of my own elaboration and development. This research was under the guidance of Dr. Benedict Weobong, Department of Social and Behaviour Change, School of Public Health, University of Ghana. The matter embodied herein has not been submitted in part or whole to any other university for the award of any other academic degree. All materials cited have been acknowledged by means of a complete reference.

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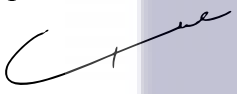
Signature: 

Date: **21/10/2023**

DEDICATION

In loving memory of my dear father Dr. Swithin Mustapha Swaray Snr, Mr. Alexis Wulluh Nakaar, Angelina Nyamekye, Raymonda Okeke-Macauley, Prof. Frederick Rodrigues, Halima Amoa, Nutifafa Kanawatey and all the beautiful minds and loving hearts who were swept away by the storm of cancer. Your footprints remain in our hearts.

ACKNOWLEDGEMENT

To Prof. Alfred Edwin Yawson, thanks for opening my eyes to new stages of opportunity and strength. I will forever be grateful for your guidance and kindness.

To Dr. Benedict Weobong, thanks for your encouragement and guidance. You always seek to bring out the best in your students. You are everything one could look for in a good supervisor.

To my buddies John Tetteh, Ewurabena Oduma Duker, Alex Ackon, Isabella Asamoah, Prosper Kaba, and Adwoa Kumiwa A Afrane, when we have friends to support and wish us well, we will most certainly excel. Thanks for making this journey worth the while. To you Mr. John Tetteh, I could not have completed this in good time without your immense support. You are simply phenomenal, the one person who gives meaning to data, that I could run to no matter the hour. I owe you a debt of gratitude.

To my SPH SOBS class of 2021/2022, you were simply incredible. Gloria Fiifi Yankson, you became my best buddy.

To my mothers, Felicia Boye-Doe and Prof. Onike Rodrigues, your support has simply been amazing.

To my loving wife, Ama Dede, my awesome boys, Malachi, Micaiah, and Zion, and my supportive sister Madia, you are the wind in my sails. It was never going to be easy being away from family for the whole run. Thanks for your love, understanding, and support. You remain my world.

ABSTRACT

Background: The psychological well-being of persons living with cancer (PLWC) could be enhanced if factors influencing the effect of psychological distress (distress) on quality of life (QoL) are well understood. Distress in PLWC is reshaped over the course of the disease, prompting the need for awareness and constant monitoring by health professionals and caregivers to identify and understand factors that mitigate the long-term implications for QoL. The influencing roles of resilience and social support on the distress-QoL relationship amongst PLWC in Ghana have not been widely explored. This study was conducted to assess the mediating role of resilience and social support in the relationship between distress and QoL.

Methods: This research employed a facility-based cross-sectional analytical design. The exposure and primary outcomes were distress and QoL respectively. Resilience and social support were the mediators. A causal path analysis was adopted to assess the mediation effect of resilience and social support on the relationship between distress and QoL. All estimations were done using the 95% confidence interval.

Results: The prevalence of high distress amongst respondents was 45.4% (95%CI=40.95-49.96) with overall good QoL being 52.7% (95%CI=48.12-57.16). There was no indirect effect of resilience and social support on the relationship between distress and QoL [(β(95%CI)p-value = -0.0001(-0.002 to 0.002)0.877 and 0.004 (-0.01 to 0.02)0.630 respectively]. Generally, amongst persons with high distress, the adjusted odds of good QoL was 0.18 (95%CI=0.11-0.30) statistically significant. However, it significantly increased to 0.28(95%CI=0.12-0.64) when resilience was high.

Conclusion: Approximately 2 out of 5 respondents experienced high distress and a little more than half experienced good QoL. There was insufficient evidence to conclude that resilience and social support mediate the relationship between distress and QoL. However, resilience was found to be an effect modifier in the relationship. This study provides evidence supporting the

need for a more holistic approach to cancer care and management, focusing on facilitating positive traits like resilience and improving social support.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
ACS	American Cancer Society
ANOVA	Analysis of Variance
APS	American Psychological Society
CD-RISC	Conor-Davidson Brief Resilience Scale
CVDs	Cardiovascular diseases
GLOBOCAN	Global Cancer Observatory/Data
GSEM	Generalized Structural Equation Modelling
HBV	Hepatitis B virus
HCC	Hepatocellular carcinoma
HPV	Huma papilloma virus
HRQoL	Health related quality of life
IARC	International Agency for Research on Cancer
KBTH	Korle-Bu Teaching Hospital
MSPSS	Multidimensional Scale of Perceived Social Support
NCDs	Non-communicable diseases
PD	Psychological distress
PDI	Psychological Distress Inventory
PDI-R	Psychological Distress Inventory - Revised
PLWC	Persons living with cancer
PsyCap	Psychological Capital
QoL	Quality of Life
SF-8	Short Form-8
SSA	Sub-Saharan Africa
WHO	World health organization

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the study

Globally, after cardiovascular diseases (CVDs), cancer is the second principal cause of premature deaths and significant disability-adjusted life years (DAILYs) (Roberts et al., 2022; WHO, 2022). In 2020, using data from the International Agency for Research on Cancer (IARC), GLOBOCAN projected 19.3 million new cases of cancer were reported globally, with resulting mortality of 9.9 million. In that same period, the African region alone accounted for over 1 million new cases, with a resultant 711,429 deaths (Roberts et al., 2022). This alarming trend presents the public health community with a huge crisis, especially in Western Sub-Saharan Africa where most people with cancer report for treatment in the advance stages of the disease and epidemiologic data points to a steady rise in mortalities over the next ten years (Abda et al., 2017; Kingham et al., 2013; Twahir et al., 2021). Although breast, cervical, and prostate cancers account for most malignancies in the region, the cancer profile in Sub-Saharan Africa is highly varied and public health data suggest deaths due to breast and cervical cancers are amongst the highest worldwide (ACS, 2022; Bahnassy et al., 2020; Roberts et al., 2022). The IARC stipulates the number of new cases in Ghana approximates 24, 009, with breast cancer (18.7%), hepatocellular carcinoma (14.4%), cervix uteri (11.6%), prostate cancers (8.9%) and non-Hodgkin lymphoma (5.0%) topping the chart for reported cancers, cancer mortality and prevalence for all ages (IARC, 2021). Poor diagnosis and limited access to appropriate management are important variables that contribute to poor prognosis. This is affirmed by the low availability of pathology services in the region, with just about 26% present in low-income countries in 2017 (Ayandipo et al., 2020). The rising expense of cancer treatment is a public health concern, particularly in developing nations (Colonio et al., 2021; Twahir et al., 2021). The impact of the disease can be so overwhelming that the World Health

Organization's (WHO) global health observation reports an alarming 703,000 persons living with cancer commit suicide yearly with many others having suicidal ideations (WHO, 2022). Cancer has been associated to mental disorders with systematic reviews linking specific cancers to distress and post-traumatic stress disorders (Arnaboldi et al., 2017; Caruso et al., 2017; Watts et al., 2014).

Data on cancer in Ghana may not be indicative of the actual burden as they were sourced from a single cancer registry. Despite this likely under reporting, figures are in line with the global picture (Mensah & Mensah, 2020; Roberts et al., 2022). The rise is strongly linked to the growing behavioural risk factors observed in Ghanaian society today. These include overweight and obesity, physical inactivity, poor consumption of fruits and vegetables, excessive consumption of alcoholic drinks (Juma et al., 2020; Mensah & Mensah, 2020) as well as indiscriminate sex (Binka et al., 2017). The epidemiology of cancer in sub-Saharan Africa has also been linked to urbanization and the development and exposure to more hazardous waste as a result of inadequate disposal systems (Bickler et al., 2018; Fasinu & Orisakwe, 2013).

1.1.1 Cancer and Psychological Distress

Persons living with cancer (PLWC) are often overwhelmed due to the psychological impact of the diagnosis, the high symptom burden associated with the disease and the related side effect of treatment (Grassi et al., 2017). These symptoms usually occur simultaneously, negatively affecting functional status and making PLWC susceptible to psychological distress (distress) (Kroenke et al., 2013; Matzka et al., 2016). These enfeebling symptoms aside, PLWC battle mental health challenges on a regular basis (Lim et al., 2014; Matzka et al., 2016). The taxing, unpleasant, and lengthy treatment can cause a loss of autonomy, physical fragility, and death anxiety leading to significant cancer-related discomfort with clinically relevant symptoms of various mental illnesses (Graf & Stengel, 2021).

The financial toxicity caused by cancer is strongly linked to distress as well, with implications for families of patients and their wellbeing (Chabowski et al., 2018; Yu et al., 2022). In some instances, cancer diagnosis has led to loss of employment (Munir et al., 2009; J.-H. Park et al., 2009; Paul et al., 2016; Taskila & Lindbohm, 2007), a predictor of psychiatric comorbidity that correlates with at least threefold increased risk of mental disorder (Nakash et al., 2014; Roick et al., 2022). Distress indeed is pervasive in PLWC and occurs at varying degree throughout the course of the illness highlighting the magnitude of this public health crisis (Islam, 2019; Lavelle et al., 2017; Matzka et al., 2016; Pásztor et al., 2019; Zamanian et al., 2018).

1.1.2 Cancer and Quality of Life

Quality of life (QoL) has been reported as one of the most critical variables related to survival in PLWC and in recent years, has become a key indicator of health service performance as it is influenced by the state of affairs of the healthcare system (Sheikhalipour et al., 2019; Stefani et al., 2016). This construct is defined by the World Health Organization (WHO) as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (Megari, 2013). In their integrative review of literature amongst a population of African female cancer survivals, Muliira et al., (2017) highlighted psychosocial, socio-demographic, illness-related, treatment related and cultural related factors influencing QoL. These point to the construct as a multi-dimensional concept reflecting the subjective nature of an evaluation which is also rooted in sociocultural as well as environmental context. With regards to cancer, illness related factors responsible for the limitations and strain on QoL have been found across types of cancer and at all phases of the medical process (Ruiz-Rodríguez et al., 2022). The distress associated with receiving a cancer diagnosis, the side effect of treatment and the high symptom burden are strongly linked to poor QoL (Liao et al., 2008; Peters et al., 2020). Such burden inundate persons with fear, shattering their dreams and confining them to a state of depressive

rumination negatively affecting functionality, cognition and in effect, QoL (Hajigholami et al., 2021).

1.1.3 Cancer and Resilience

The American Psychological Association defines resilience as "the ability to adapt successfully in the face of adversity, trauma, tragedy, danger, or severe causes of stress, such as family and relationship issues, serious health issues, or employment and financial difficulties" (APS, 2020). A growing body of research has firmly linked this dynamic process of adapting to adverse life changing circumstances to lower distress, better cancer adjustment, improved QoL, and better mental health and treatment results in PLWC (Duan-Porter et al., 2016; Martin et al., 2021; Matzka et al., 2016; Ye et al., 2017). In the context of cancer, resilience is a term used to describe a person's personal qualities that are thought to be adjustable and facilitate successful adaption to cancer. It involves, among other things, a sense of coherence, optimism, self-efficacy, self-esteem, cognitive flexibility, coping, social support, as well as spirituality (Helmreich et al., 2017). This positive psychological state of an individual in the face of adversity is influenced by social context and environmental factors interacting with several personality traits (Celik et al., 2021; Matzka et al., 2016) and confirmed to be a protective factor for good QoL emphasizing its usefulness in psycho-oncology (Seiler & Jenewein, 2019).

1.1.4 Cancer and Social Support

Social support is crucial for the psychological adjustment of PLWC as it has been found to provide a safety net, significantly influencing prognosis and improving QoL (Alizadeh et al., 2018; Quiroga et al., 2018). The presence of this support has implications that transcends treatment outcomes; promoting physical and mental well-being, encouraging healthy living, and aiding in the management of negative thoughts, depressed moods, and hazardous behaviours (Ekem-Ferguson et al., 2020). It has ramifications for financial worries, emotional

burden as well as assistance with daily routine (Adam & Koranteng, 2020). Researchers (Breuer et al., 2017; Ko et al., 2013; Melguizo-Garín et al., 2019; Morelli et al., 2015; Pejner et al., 2012) categorised social support into emotional (important during times of stress or feeling lonely), instrumental (important for addressing immediate needs) and informative (important when making major decisions). They evinced that due to its chronic debilitating nature, PLWC and their families may be exposed to a wide range of stressful events over time, presenting occasions where patients' social support requirements have not been met because their support system is inadequately prepared. Aside the type of support, the source and quality of support are key (Yıldırım & Tanrıverdi, 2021). Patients value support from partners, family, and friends. They consider this source of support essential to cope with the diagnosis and treatment (Pfaendler et al., 2015). Sometimes support source may include health care workers who constantly interreact with patients throughout their treatment and management. For the PLWC, social support can be therapeutic not just in the short term, but through the uncertain anxious journey.

In summary, adjustment to living with cancer is a tumultuous everyday process with different challenges at each stage of the illness. As indicated by Agostinelli et al., (2022) and Muzzatti et al., (2020) distress and QoL may be reshaped over the course of the disease prompting the need for awareness and constant monitoring by health professionals and care givers. To reduce the impact of the distress-QoL relation on PLWC and promote mental health and wellbeing in the face of serious illness, interventions must be informed by the understanding of factors potentially influencing the causal pathway of this association.

1.2 Problem Statement

Compared to the general population, PLWC have worse QoL (Alam et al., 2020; Quinten et al., 2015) as they are highly susceptible to distress (Momenimovahed et al., 2021). Such vulnerability has been strongly linked to poor QoL (Bitew et al., 2021; Kugbey et al., 2019).

Ideally, clinical practice should screen for distress in PLWC however this does not appear to be a routine practice in many parts of Sub-Saharan Africa (SSA) (Kagee, 2022). With the alarming rise in incidence observed in Africa, SSA in particular, trends could soon mirror that of developed nations where cancer is fast becoming the leading cause of mortality, responsible for twice as many deaths as cardiovascular diseases (Mahase, 2019). In Ghana, indications are that cancer incidence is on the rise as behavioural risk factors become pronounced (Juma et al., 2020; Kagee, 2022; Mensah & Mensah, 2020). Ghana has seen a rise in cancer cases from 61,388 in 2010, to 95,000 in 2019 (Sasu, 2022). This implies greater burden of chronic non-communicable diseases (NCDs) related mental health challenges for Ghana as PLWC battle mental health issues affecting their functionality, wellbeing and QoL (Lim et al., 2014; Matzka et al., 2016; Stein et al., 2019). It is particularly concerning that the average age of breast cancer diagnosis in Ghana is almost two times lower compared to Europe and America (Thomas et al., 2017). This could be attributed to variations in the expression of breast cancer genes specific to each population. Ekwueme et al., (2014) estimates about one fourth of cancer survivals feel less productive at work and nearly one third face limitations in carrying out daily routine. This has led to employment induced depression in an already precarious situation (Munir et al., 2009; J.-H. Park et al., 2009; Paul et al., 2016; Qan'ir et al., 2022; Taskila & Lindbohm, 2007) and contributed to poor QoL. The effect of cancer is immense not just for persons living with the condition, but for their families as well as employers, reflecting the public health burden of the problem. Cancer treatment cost has been reported to have negative impact on the individual and family placing them at high risk of bankruptcy (Ekwueme et al., 2014; Yu et al., 2022). In the race to improve cancer care, studies have attempted to better understand the distress dynamics (Krasnoselskyi et al., 2022). For instance, Kong & Guan, (2019) established a strong reciprocal link between distress of PLWC and their support system. This social safety net has been shown to improve resilience. Despite extensive work on distress

and QoL, there is scanty research on the causal pathway of the relationship by resilience and social support from Ghana. Kugbey, Oppong Asante, et al., (2020) examined the mediating roles of social support and religiosity with respect to depression and anxiety on QoL in a population of Ghanaian women with breast cancer and found significant associations though social support. Meanwhile, a systematic review of resilience in chronic illness, cited social support as a protective factor involved in resilience (Cal et al., 2015). Quality of life is one of the most important health outcomes used to assess healthcare quality and survivorship and this study seeks to evaluate how the effect of distress on QoL is influenced by resilience and social support.

1.3 Research Questions

1. What is the level of distress and quality of life amongst persons living with cancer?
2. What are the factors associated with distress and quality of life amongst persons living with cancer?
3. What is the mediation effect of resilience and social support on the relationship between distress and quality of life among persons living with cancer?
4. How does resilience and social support moderate the effect of distress on quality of life among persons living with cancer?

1.4 Aims and Objectives

The main aim of the study is to assess the mechanistic effect of resilience and social support on the association between psychological distress and quality of life among persons living with cancer.

1.4.1 Specific Objectives

The specific objectives are to:

1. Estimate the prevalence of distress and quality of life among persons living with cancer.
2. Determine factors associated with distress and quality of life amongst persons living with cancer.
3. Determine the indirect effect of resilience and social support on the relationship between distress and quality of life amongst persons living with cancer.
4. Determine how resilience and social support modify the effect of distress on quality of life among persons living with cancer.

1.5 Justification

The ever-increasing incidence, high prevalence, alarming death rate, and probable traumatic significance of cancer necessitates more research into identifying and understanding variables influencing QoL. Psychological distress has a substantial impact on the QoL for patients living with cancer. Evidence have shown that patients with moderate and severe distress experience worse outcomes. Although QoL of PLWC have been extensively studied and generally found to be adversely affected by distress, in the Ghanaian context, factors involved in the causal pathway have not been widely explored. Little is known about how much of the variance in QoL amongst PLWC in Ghana can be accounted for by resilience and social support. QoL is key to improving the mental health and well-being of PLWC and this study will not only contribute to the body of knowledge from Ghana on psycho-oncology but provide an evidence base platform for developing effective interventions.

1.6 Relevance of the study

This research provides a source of valuable knowledge for stakeholders in cancer care and management. It contributes to the understanding of QoL challenges faced by PLWC and serves as an evidence-based platform for informed interventions that build resilience at the individual,

family, and community levels. It strengthens the rich body of knowledge relating to cancer care and management, and aides in promoting comprehensive and meaningful social support systems through understanding the mechanistic effects of resilience and social support on the relationship between distress and QoL.

1.7 Hypothesis

H_1: Resilience does not mediate the relationship between distress and quality of life in persons living with cancer.

H_2: Social Support does not mediate the relationship between distress and quality of life in persons living with cancer.

H_3: Effect of distress on quality of life in persons living with cancer is not significantly different by resilience.

H_4: Effect of distress on quality of life in persons living with cancer is not significantly different by social support.

1.8 Theoretical and Conceptual Framework

1.8.1 Theoretical framework underpinning the study

1.8.1.1 The Psychological Capital Theory

This study is rooted in theories of psychological capital (PsyCap) and biopsychosocial model. Influenced by Bandura's theory in which an individual uses his abilities and strengths to succeed in life, the PsyCap theory encompasses an individual's psychological development and evolution on a daily basis. According to the theory credited to Luthans and his colleagues (Luthans et al., 2007), a combination of personal qualities can be adjusted to improve well-being and performance. Studies reveal that PLWC with comparable illness severity and treatment status frequently exhibit considerably varying levels of psychological stress, most

likely as a result of differences in resilience, optimism, self-efficacy, and hope (Leung et al., 2016; MacDonald et al., 2021; Moreno et al., 2018). Psycap idea is centered on a combination of these four-character traits that can be adjusted to enhance performance and well-being. The essence is the positive perspectives, perceptions, and consequence of an individual's behaviour translating into good QoL. Developing even one of the PsyCap resources can help an individual persevere through adversity. For this study, the trait of interest is resilience, which is one of the two intermediate outcome variables. Resilience is a psychological construct that is frequently connected to social support (the second intermediate outcome variable) and life satisfaction. It was described by Liu et al., (2017) as "the ability to adapt to stress and adversity."

Empirical evidence has shown resilience as a valuable psychological resource that can aid in the recovery of persons who have experienced turmoil (Wolf et al., 2018; Yıldırım & Arslan, 2022). Key resources required to cope with adversity are what the positive PsyCap theory offers. These resources are 'state-like', implying unlike fixed features, they can be developed and changed through intervention (Luthans et al., 2007). Given that social support serves as a buffer against the negative effects of distress on mental and physical health and well-being, as well as stimulates positive influence on resilience, it is the other intermediate outcome variable considered in this study. Social support is exceptionally important for maintaining good QoL and mental health as it reduces depression, anxiety, and stress (Ruiz-Rodríguez et al., 2022).

1.8.1.2 The Biopsychosocial model of health

The other major theory underpinning this study is the biopsychosocial (BPS) model credited to George Engel (Engel, 1977). This theory advocates for a holistic approach to health, one that is mindful of the confluence of biological, psychological, and social connections defining all facets of human illness. This central proposition of the BPS model provides the impetus for this research. According to this model, the interplay between these three elements will

determine the relative distress and in effect, the QoL experienced by PLWC. In PLWC, biological factors (e.g., infection due to weakened immunity or deep vein thrombosis as a side effect of chemotherapy), psychological factors (e.g., distress or negative mood) and social factor (e.g., social support or loss of job) interact to influence overall wellbeing or QoL. In this study biological factors such as demographic, disease, and treatment factors; psychological factors like distress, QoL, resilience and psychological services as well as social support and social resources comprising social factors, interact to influence the origin, progression, and resolution of cancer outcomes. Since these three factors are interdependent, any adverse effect in one domain frequently has negative implications for the others. It is thus crucial that health professionals involved in cancer care move beyond the traditional biomedical approach to recognizing the complex dynamics of factors influencing health for which the BPS model provides a more comprehensive approach.

Combining these two models, highlights the significance of understanding the role personal traits as well as psychological and social factors play in the chronic illness trajectory thereby informing integrated interventions and improving psycho-oncology management. Based on these theoretical frameworks, a conceptual framework was developed as presented in figure 1.1

1.8.2 Conceptual framework underpinning the study

Studies have confirmed that in comparison with the general population, PLWC experience higher level of distress resulting either from the unilateral impact of the diagnosis, the treatment being received, and the functional impairment or because of their combined effect (Leong Abdullah et al., 2015, 2015; Taghizadeh et al., 2018; Tareke et al., 2022). It is important to acknowledge that a patient's personality, psychological make-up, family, and social support system, as well as any physical impairments, will impact on how they react to receiving a cancer diagnosis and these factors can also affect their treatment outcome. Several other factors

have been implicated as sources of high distress in PLWC. These include sociodemographic and economic factors, disease factors and treatment modalities (Choi et al., 2022; Roick et al., 2022; Velure et al., 2022; Yu et al., 2022). These cascade of factors, along with the high incidence and growing mortality rate, can be quite distressing. Long-term distress has been associated to high symptom burden, which translates to poor health and poor QoL (Nayak et al., 2017; Seiler & Jenewein, 2019; Zou et al., 2016).

The study hypotheses and the corresponding objectives were conducted using the conceptual framework as presented in Figure 1.1. The framework attempts to establish the dynamics of the relationship between distress and QoL among PLWC (mixed cancers). It explores the mechanistic effect of resilience and social support on this relationship. The solid red lines indicate the hypothetical idea of the study. The blue lines indicate covariates' influences on the study outcomes, which were adjusted during statistical analysis. The framework depicts that, the relationship between distress and QoL is probably mediated and or moderated by one's resilience and or social support. It is worth noting that both resilience and social support (perceived) have been found to correlate negatively with distress (Nigah et al., 2019; Yasien et al., 2016). This study held that factors including socio-demographic characteristics, disease factor and treatment modality were associated with distress and QoL as well as resilience and social support. All identified associated factors were adjusted to assess the possible mediating effect of resilience and social support as well as how these constructs modify the relationship between distress and QoL.

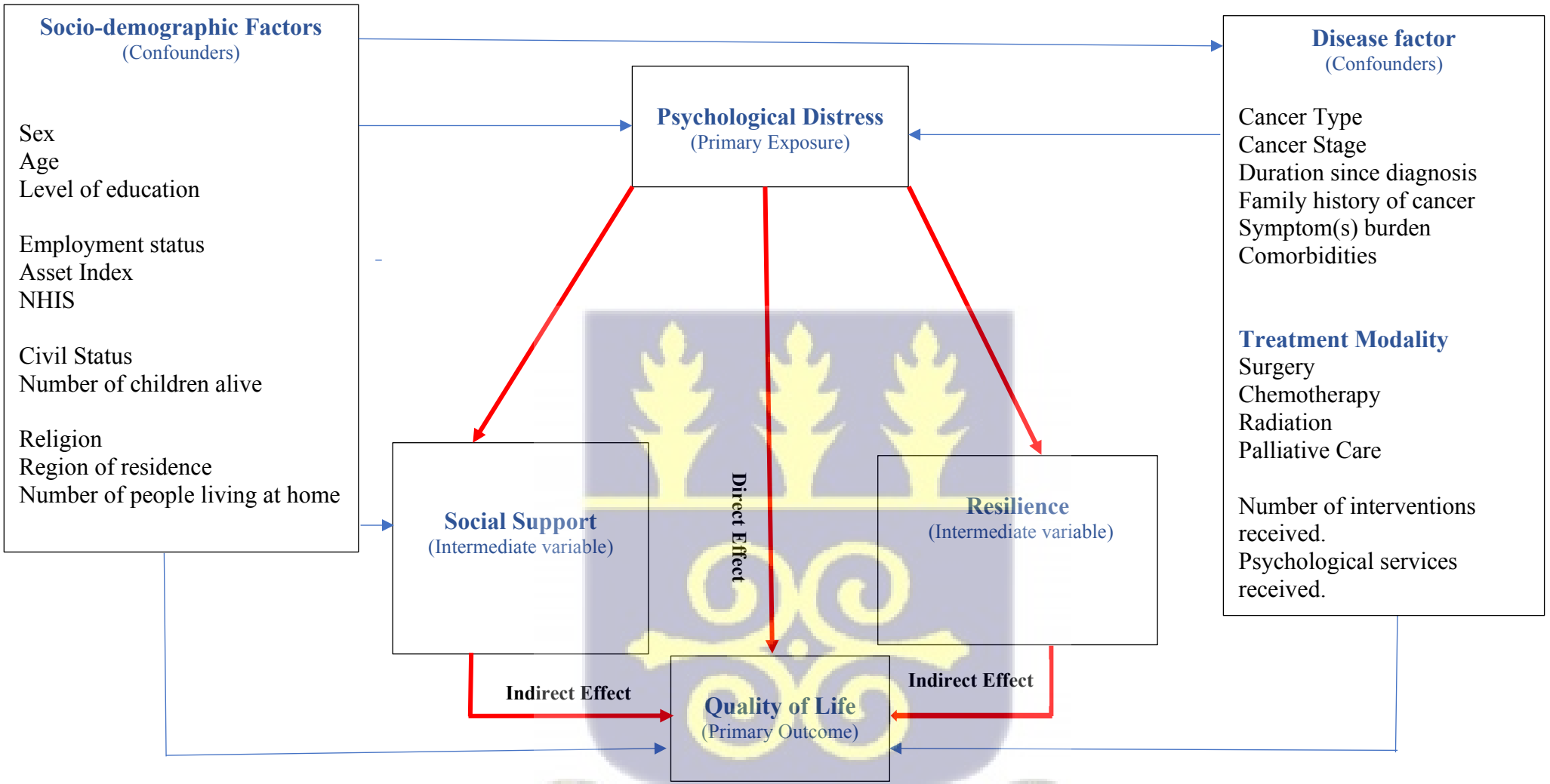

Figure 1.1: Conceptual framework defining the causal pathway of distress and QoL among PLWC

CHAPTER TWO
2.0 LITERATURE REVIEW

2.1 Introduction

This chapter provides a summary of earlier studies on the subject matter of this research. The review of literature covered the prevalence of distress and QoL amongst PLWC as well as factors associated with these constructs in the population. Applying their appropriate search protocols, literature search was thoroughly done using electronic resources like PubMed/MEDLINE, Google scholar, Google, African journal online (AJOL), African Index Medicus and Scopus. Taking PubMed as an example, using Boolean operators, keywords and phrases adopted during the literature search included, but not limited to:

1. ((((Psychological distress)) OR (distress)) AND (cancer)) OR (persons with cancer)
2. (((Quality of life) OR (health related quality of life)) AND (cancer)) OR (persons living with cancer)
3. (((((psychological distress) OR (distress)) AND (quality of life)) AND (cancer)) AND (Africa)) OR (Sub-Saharan Africa)

Search terms were identified in the title, abstract or the full text and resulting articles were examined to determine their appropriateness for inclusion. For searches conducted using the Google search engine, symbols such as (" "), around a phrase to look for the exact phrase, and (..) to look up a date within the search period were necessary. Search terms were explored in webpages and documents using the operators "allintext:", "filetype:", and "OR:" in this option as well. To a large extent, methodical search was carried out on publications from the year 2012 – 2022 and articles relevant to the focus of this work were thoroughly examined for information in line with this study.

2.2 Prevalence of Psychological distress in persons living with cancer

Cancer diagnosis and treatment continue to be extremely stressful events that can cause significant psychological distress because it is frequently viewed as a life-threatening condition (Ebob-Anya & Bassah, 2022; Grassi et al., 2017; Mason et al., 2019; Mehnert et al., 2018a). In PLWC, distress has been linked to poor QoL stemming from diminished functional status, reduced adherence to treatment and high symptom burden (Blenkiron et al., 2014; Peters et al., 2020a; Yee et al., 2017), all of which increase the risk of mental health challenges in this population (Anuk et al., 2019; Mehnert et al., 2014). The impact of distress on QoL of PLWC is well chronicled in literature for different cancer types and for different stages of the disease course (Nayak et al., 2017; Oh & Cho, 2020; Peters et al., 2020a; Prapa et al., 2021; Qan'ir et al., 2022). The evidence shows that cancer-related events are accompanied with extremely distressing emotional states that adversely affect health and life quality.

Prevalence of distress in PLWC have yielded ambiguous findings, with Peters et al., (2020) reporting distress levels ranging from 30% to 60%. Yet Ebob-Anya & Bassah, (2022) in their descriptive cross-sectional hospital base study, reported considerable clinical distress in 69.2% of in patients in two prominent cancer management centres in Cameroon. To ascertain the overall prevalence of distress among geographically different cancer programs, Carlson et al., (2019) reported 46% significant distress amongst PLWC from 55 North American cancer treatment centers. In a systematic review of the prevalence of distress among PLWC in the Southeast Asia region, Ostovar et al., (2022) found distress measured as anxiety and depression to range from 7% to 88% and 3% to 65.5% respectively. Mason et al., (2019) in a hospital based observational cross study carried out in a tertiary care facility in northern India, observed distress of 38.5%. Mehnert et al., (2018) using participants drawn from five diverse study centers across Germany which included respondents from outpatient cancer care facilities as

with this study, reported distress prevalence of 52%. While Arts et al., (2021) reported distress of 17% amongst participants diagnosed with lymphoma from 13 hospitals in Holland.

Some studies focused on the magnitude of distress with Peters et al., (2020) reporting high distress of 65.9% among participants with mixed cancers from their retrospective study. Mehnert et al., (2018) identified 52% also in a population of mixed cancers which included patients receiving ambulatory care as with this study.

All these findings confirm the ambiguity in distress prevalence rate. The differences in prevalence rates might be somewhat explained by the study populations, study settings (inpatient or outpatient), duration of study, and measures/scales employed.

2.2.1 Factors associated with psychological distress in persons living with cancer

Studies have identified several risk factors associated with distress in PLWC. While reports show consistency with some factors, others have been equivocal. In their cross-sectional multicenter study in 5 diverse cancer centers across Germany, Mehnert et al., (2018) reported high distress in women, patients 60 years and above, the unemployed, advanced cancer stage as well as gynecological and pancreatic cancers. Interestingly, in comparing cancer-related distress in young adults (18 – 39 years) with older adults (middle age :40 - 65 years and senior adults 66 – 90 years), Burgoyne et al., (2015) observed higher distress in young and middle-aged adults compared with senior adults. Similar findings were observed in Peters et al., (2020) who noticed significant high distress in patients above 65 years, compared to patients between ages 50 and 64 years. Furthermore, patients with children were significantly less distress than their counterparts without children. Quality of life, symptom burden, financial status and education level have also been linked to distress. Ebob-Anya & Bassah., (2022) in assessing the level of distress and QoL in PLWC in their study in Cameroon, found distress to be

significantly linked with QoL, and fatigue ($p<0.001$) as well as functionality, sleep disturbance and financial hardship ($p<0.05$).

Kim et al., (2017) in investigating the prevalence and prognostic significance of psychological distress in patients with gastric cancer found significant higher distress in females ($p=0.024$), patients who were jobless ($p=0.02$), patients with lower educational background ($p=0.021$) as well as those in advanced stage of the disease ($p=0.008$). Patients with low educational background had 2.39 higher odds of experiencing high distress compared to the well-educated and those with advanced cancer reported 2.72 times higher odds of experiencing distress than those in the early stage.Abu-Odah et al., (2022) reported women with breast cancer to have higher odds of significant distress compared to stomach and colon cancers (OR = 4.81,95%CI1.22-18.94;2.62,95%CI 1.11-6.16). Patients who were newly diagnosed were also more likely to experience high distress while physical challenges independently influenced distress (OR=0.16,95%CI 0.04-0.60).

2.3 Level of Quality of life in persons living with cancer

In relation to cancer, QoL has been cited as indicative of a patient's social, psychological and physiological status, as well as their well-being (Tian & Hong, 2014). Studies have shown varying QoL levels in PLWC by geographic location and scale of measurement (Alam et al., 2020; Almigbal et al., 2019; Nayak et al., 2017). In a systematic review and meta-analysis of health-related QoL and its determinants amongst patients with breast cancer in Africa, the pooled estimates mean score of general QoL based on the EORTC QLQ-C30 standard instrument was 52.77 (95% CI: 42.199 to 63.345; $I2 = 99.21\%$, $P < 0.001$) (Bitew et al., 2021). ElMokhallalati et al., (2022) on the other hand reported mean overall QoL to be 70.5 (SD 19.9) in their assessment of the association between sociodemographic and disease related characteristics, symptom burden and QoL amongst patients receiving outpatient services in

Gaza. Ramasubbu et al., (2020) also found overall mean score of QoL to be 61.93±5.86 in their cross-sectional analytic study of QoL and factors affecting it in PLWC undergoing treatment in a tertiary care hospital. In a hospital-based cross-sectional analytical study of cervical cancer survivals in Ghana, overall QoL scores was 79.6 (SD 16.0) with 74.5% of survivals reporting good QoL score within the median follow-up time of 3 years 5 months following cancer diagnosis (Amo-Antwi et al., 2022). In a pilot study assessing QoL and association with nutritional and performance status of PLWC Alam et al., (2020) found the prevalence of low and very low QoL were 53.76% and 28.67% respectively. Nayak et al., (2017) in an exploratory survey of patients with mixed cancers in selected reputable cancer hospital in Karnataka, India, reported the prevalence of low QoL to be as high as 82.3%.

2.3.1 Factors associated with quality of life in persons living with cancer

Studies have confirmed that QoL in PLWC is adversely affected by the psychological impact of the diagnosis, the treatment, and symptoms burden (Sharma & Purkayastha, 2017; Sheikhalipour et al., 2019). In a systematic review of quantitative studies on QoL among PLWC and their family caregivers in Sub-Saharan region, age and marital status were the two demographic characteristics that most frequently affected QoL. Cancer stage and type of treatment were cited as common cancer-related variables, while social determinants of health such as education, access to services and information, financial hardship, and place of residence (rural vs. urban) were the most common factors affecting QoL and its subdomains (Qan'ir et al., 2022). Qan'ir et al., (2022) further identified overall good QoL to be associated with younger age, the female sex, being married, early stage of the disease, higher education level and receiving a combination of chemo and radiotherapy. However, QoL correlated negatively with distress in the form of anxiety and depression as well as with challenges financing health needs. As with Qan'ir and colleagues, Ramasubbu et al., (2020) found education to be an

important protective factor for QoL. In their study aimed at assessing QoL and factors affecting it in PLWC receiving chemotherapy, cancer treatment was also found to decrease functionality, increase fatigue, and consequently affect QoL. Illiteracy, financial constraints and unemployment were also found to negatively affect QoL.

Nayak et al., (2017) also confirmed income to have significant association with QoL (P=0.006). Symptom burden (pain, sleep disturbance and fatigue) were also found to affect QoL. Megari, (2013) likewise documented limitations in daily activities as well as psychosocial elements such as troubled intermate relationship, sexual intimacy, distorted body image, maladaptive coping strategies, lack of social support and type of surgery (mastectomy) to be strongly associated with QoL. Interestingly, single participants, not receiving radiotherapy and end stage cancer were found to be linked with better QoL in a cross-sectional study carried out by ElMokhallalati et al., (2022). They also linked lower education level to poor QoL. Numerous literature have implicated distress as a key factor affecting QoL in PLWC (Ebob-Anya & Bassah, 2022; Kugbey et al., 2020; Ostovar et al., 2022; Prapa et al., 2021).

2.4 Mechanisms of Resilience and Social Support in Persons living with cancer

A thorough review of the mediation and moderation literature from Ghana on cancer related QoL found one study (Kugbey et al., 2020), that focused on the indirect effect of anxiety and depression on QoL through social support and religiosity, but not resilience. Social support was found to mediate the effect of anxiety and depression on QoL. Search engines did not produce any more results using key terms and Boolean operators combined. This poses a challenge presenting review of literature from Ghana. Nevertheless, in other jurisdictions, resilience and social support have been researched in relation to their mediating and/or moderating roles. While in the United States Wu et al., (2015) observed resilience to mediate the impact of distress resulting from cancer symptoms on QoL, Lee & Kim., (2018) established

no mediating effect of resilience on the relationship among uncertainty, distress, and health-related QoL in Korea. In a population of patients from Italy with prostate cancer, social support was found to mediate the relationship of body image distress and depressive symptoms which inevitably affects QoL (Scandurra et al., 2022). Poręba-Chabros et al., (2020) observed social support to moderate function in the formation of cancer stress response.

Huang & Hsu., (2013) also confirmed social support as a moderator between depression and QoL in survivals of breast cancer. With regards to resilience, Groarke et al., (2020) found the impact of stress on distress was greatest when resilience was low and watered down when resilience was high.

2.5 Knowledge Gap

Persons living with cancer are more at risk of developing high distress, a fact well chronicled in literature offering evidence of the debilitating effect of cancer related distress on QoL (Bitew et al., 2021; Ebob-Anya & Bassah, 2022; Kugbey et al., 2020; Ostovar et al., 2022). In addition to demographic, disease and treatment factors, resilience and social support have been cited by systematic reviews as factors influencing QoL in PLWC (El Haidari et al., 2020; Sousa et al., 2019), however their possible mediating or moderating roles on the relationship between distress and QoL has not been thoroughly explored in the Ghanaian context. A thorough review of literature found one study that focused on social support and religiosity as mediators (Kugbey et al., 2020). Elsewhere, studies have found resilience to mediate cancer related QoL with respect to cancer symptom distress (Wu et al., 2015) and psychological predictors (Zhou et al., 2022). Zhang et al., (2017) found social support to partially mediate the relationship between resilience and QoL. A systematic review of resilience in chronic illness, cited social support as a protective factor involved in resilience (Cal et al., 2015). Ruiz-Rodríguez et al., (2022) found social support and resilience to improve health quality in PLWC. Social support

improved patients' general health, improved coping, and reduced patients' symptoms while resilience enhanced general health, functioning and improved symptoms. To improve QoL in the study population, it is crucial that we understand the mechanistic effect of these constructs on health in order to develop appropriate evidence-based interventions.

Furthermore, seeing that QoL of life has a sociocultural context and considering the dearth of literature from Ghana examining the study's objectives, there is a compelling need to bridge the research gap.

CHAPTER THREE

3.0 METHODS

3.1 Introduction

Using an analytical facility-based cross-sectional study design, this study sought to assess the mechanistic effect of resilience and social support on the association between psychological distress and quality of life among PLWC. This chapter provides information by which the validity of the study is judged. It describes the study site, the research approach, the study population, sample size calculation and sampling method, the research tool and scales used, as well as the analysis plan to address the research objectives.

3.2 Description of site

The study was carried out at Ghana's top tertiary medical centre, the Korle Bu Teaching Hospital. The facility, which was set up on October 9, 1923, currently has over 2000 bed capacity. On a daily basis, ambulatory services account for 1,500 patients and inpatient admissions account for 250. The Hospital has 21 clinical and diagnostic departments and three Centres of Excellence, namely the National Radiotherapy Oncology and Nuclear Medicine Centre, the National Reconstructive Plastic Surgery and Burns Centre and the National Cardiothoracic Centre.

Departments include Internal Medicine and Therapeutics, Child Health, Surgery, Obstetrics and Gynaecology, Anaesthesia, Family Medicine/Polyclinic, Accident & Emergency, Psychiatry and Accident & Orthopaedics. Others are Pharmacy, Pathology, Laboratory, and Radiology (KBTH, 2020). The NRONMC offers a range of cancer care services supported by cutting-edge technology catering for about 1500 patients from various parts of the country and the sub region.

3.3 Research Approach

The study approach consisted of a quantitative method with the use of a questionnaire purposely designed for this research (Appendix 4).

3.4 Research design

An analytical facility-based cross-sectional study design was adopted to assess the causal pathway of psychological distress on quality of life by resilience and social support. To assess the study's constructs, this approach was adopted given the ease of studying multiple variables simultaneously to draw a picture of the current happenings in the population regarding the objectives. This approach enables description and explanation of possible relationships and thus provides a basis for making inferences and gathering preliminary data to support further research.

3.5 Study population

The study participants were PLWC undergoing clinical care at the National Radiotherapy Oncology and Nuclear Medicine Centre (NRONMC) of KBTH.

3.6 Inclusion and exclusion criteria

Eligibility criteria included adults living with cancer aged 18 years and above who were undergoing clinical care at the NRONMC in Korle-Bu and gave consent to participate in the study. PLWC who were critically ill and not able to communicate or had previous history of any mental illness as per their medical records, were excluded.

3.7 Sample size

Since the study sought to answer the question "what is the mechanistic effect of resilience and social support on the distress-QoL relationship?", sample size calculation was done taking distress and QoL as outcome variables. Considering the wide range of reported prevalence for these constructs, the 50% assumption was applied to give the largest sample size or maximum variability, which gives the study sufficient power. This study adopted the Cochran formula (1963:75) for the sample size calculation (Cochran, 1963).

n= $\frac{(Z_{\alpha/2})^2 pq}{e^2}$; Where n = sample size required, $Z_{\alpha/2}$ = Zscore (normal deviates for Type I error), p = Proportion population, q = 1-p, e = margin of error.

For this study the level of confidence is pegged at 95%, giving an $\propto$ = 0.5 with a standard normal deviate value of 1.96. The assumed proportion of population experiencing exposure outcome = 50.0%, therefore P = 0.50. The study aims to estimate the prevalence within 5 percentage points of the true population proportion, therefore the margin of error (e) = 0.05. The formula thus reads:

$$n = \frac{(1.96)^2 \, x \, 0.5(1 - 0.5)}{(0.05)^2}$$

n = 385

The sample size arrived at was thus 385. Taking into account a non-response rate of 5%, the minimum sample size required for this study was 405.

3.8 Sampling method and data collection procedure

Systematic sampling technique with a calculated sampling interval was employed to sample participants for this study. The idea behind this approach is that the study was conducted in tertiary healthcare facility operating a first come, first serve system for outpatients. At the NRONMC, even though patients are given appointments, consultation is based on this systematic process. The centre provides service to patients from Monday to Friday with an average daily attendance of 80. Sampling interval was calculated as below:

Number of days estimated for data collection = 10

Daily participants to be interviewed = 405/10 ≈ 41

Approximate daily attendance = 80

Therefore, daily sampling interval = 41/80 ≈1/2

This daily sampling interval implied that on the average, half of the daily attendance were to be recruited for the study; for every two patients attending the clinic, one was sampled. This sampling

frame was generated daily throughout the period of data collection based on this sampling methodology. To be able to sample the patient, a simple random sampling method was adopted among the first 2 patients and subsequently adopted the interval to select participants sequentially. This is to say, systematic sampling was used to recruit participants. However, simple random sampling was adopted to determine the starting point for the systematic sampling frame. The opportunity was given to the next patient if identified respondent refused to partake. Data collection was done on every clinic day starting from the first week of August to the first week of September 2022. Data collectors were trained on how to effectively collect the data and special codes were used to distinguish participants and to detect duplicates. About 15-20 minutes were spent interviewing and taking participants through the data collection tool.

3.9 Questionnaire piloting/pretesting

A total of eight research assistants were recruited and trained for data collection. The data collection instrument was pre-tested on a group of patients living with cancer who were attending the Haematology Day Care and Breast Clinic, both located within the Korle-bu Teaching Hospital. This was carried out in the last week of July 2022 (25th to 27 of July 2022). After pretesting, appropriate modifications were made to the questionnaires based on feedback from the sampled population.

3.10 Measurement Scales

The NRONMC is a facility that attracts interest from researchers all year round. In order to reduce the response burden or fatigue of participants in the study population who are already experiencing significant symptom burden, this study opted for shorter versions of standardized tools where applicable. As such, the revised psychological distress inventory (PDI-R), the short form-8 health survey for HRQoL, and the Conor-Davidson brief Resilience scale (CD-RISC 10) with minimum items were adopted along with the Multidimensional Scale of Perceived Social Support (MSPSS).

3.10.1 The Revised Psychological Distress Inventory (PDI-R)

Psychological distress was measured using the Revised Psychological Distress Inventory (PDI-R). This is an 8-items scale in which each item was scored on a five-point scale ranging from 1 to 5, with 1 representing least distress experienced ("not at all") and 5 indicating highest distress experienced ("very much"). The composite score was standardized and converted into percentages and scores below 50 was considered as low and those above 50 indicative of high (Abdi, 2007; Frey, 2018). This scale is the revised version of Morasso et al., 1996 psychological distress inventory (PDI). Rossi et al., 2022 investigated the psychometric properties of the original PDI and found it to lack a clear structure. This led to the provision of this revised version, showing more robust psychometric qualities, stronger factorial structure, and is age and gender invariant. It is a valid indicator of distress in various populations of patients with cancers is highly recommended for use in clinical and research settings to enhance accuracy of diagnosis and management of psychological distress in patients with oncological issues. The revised 8 items PDI scale was effective at discriminating between subjects with high or low level of internal and external distress. A Cronbach coefficient of 0.776 for its internal distress subscale and 0.754 for its external distress subscale. The general distress scale showed a Cronbach's alpha of 0.853. The tool can be found in Appendix 5.

3.10.2 Short Form-8 (SF-8) Health Survey for HRQoL

Quality of life was gauged using the Short Form-8 (SF-8) Health Survey. This is an 8-items scale with scores ranging from 0 to 100 for each domain. Six of the items (2, 3, 5, 6, 7, 8) were scored on a scale of 1 to 5, with 1 denoting the best QoL and 5 the worst. Two of the items (1, 4) had score ranging from 1 to 6. A composite score was generated, and scores were standardized and generated into percentage. The SF-8 produces two summary measures: Physical component summaries (PCS) and mental component summaries (MCS). As with all PDI-R, higher PCS and MCS scores suggest

a higher QoL. SF-8 demonstrated very good reliability in a population-based study conducted in Spain, with a Cronbach's alpha coefficient of 0.92 and high item-total correlations ranging from 0.57 to 0.93. In a different study on the Chinese population, the item-total correlations for all eight items, with the exception of VT (r=0.39), were moderate to high (r > 0.5). The aggregate Cronbach's alpha for these items was 0.85.

3.10.3 Conor-Davidson brief Resilience scale (CD-RISC)

Resilience was measured using the Conor-Davidson brief Resilience scale (CD-RISC-10) (Seiler & Jenewein, 2019). The CD-RISC-10 is a 10-item, unidimensional self-report scale that measures five components of resilience. Items relate to flexibility (1 and 5), sense of self-efficacy (2, 4 and 9), capacity to manage emotion (10), optimism (3, 6 and 8), and cognitive focus under stress, the scale primarily measures hardiness (7). A score of 0 indicates that the resilience statement is not true at all, while a score of 4 indicates that the statement is true almost always. Each item is graded on a five-point scale ranging from 0 to 4. The sum of the 10 items yields the final score. Therefore, the result can extend from 0 and 40. Higher scores indicate higher resilience, whereas lower scores indicate less resilience or a harder time overcoming distress. For this study, scores were standardized and converted into percentages and scores below 50 was considered as low and those above 50 indicative of high. Resilience may be measured well with CD-RISC thanks to its high psychometric quality, good internal consistency, and robust psychometric features (Ekem-Ferguson et al., 2022). Several research measuring resilience in patients with cancer have made used of the CD-RISC. Data obtained from the CD-RISC scale using PLWC authenticate findings from Connor and Davidson and demonstrates that PLWC who are resilient, are well adjusted to their condition and experience less psychological distress(Seiler & Jenewein, 2019).

3.10.4 Multidimensional Scale of Perceived Social Support (MSPSS)

This is a 12-item, seven-point scale ranging from 1 to 7 (Zimet et al., 1988). The response scale ranged from 12 to 84, however, the scores were standardized and converted into percentages ranging 1-100. The MSPSS has demonstrated good internal consistency and correlated negatively with depression. Additionally, support for convergent validity was determined by assessing the correlation between perceived family and friends support and satisfaction with family and friends' measure. Similar to the subscales of family and friends, univariate testing revealed a significant gender difference for each of these domains, with males exhibiting stronger perceptions of support in both. The MSPSS's psychometric features have revealed that it is reliable for measuring support perceptions in the Ghanaian setting (Wilson et al., 2017).

Table 3.1: Variable description, measurement, and scale of measurements

Variable	Type of variable	Description	Measurement	Scale of measurement
Quality of life	Primary outcome/ dependent	Patient Quality of Life	Raw counts as a continuous measure and categorical.	Continuous Binary
Resilience	Immediate outcome measures/Mediator	Resilience level among participants	Raw counts	Continuous
Social support	Immediate outcome measures/ Mediator	Level of social support among participants	Raw counts	Continuous
Psychological Distress	Exposure outcome/Independent variable	Patient psychological distress	Raw counts as a continuous measure and categorical.	Continuous Binary
Age	Confounder	Age group of the participant	≤39, 40-49,50-59, 60-69, 70+	Categorical
Sex	Confounder	Sex differential of participant	Male or Female	Binary
Education level	Confounder	Educational level of participant	None, basic, SHS, Tertiary	Categorical
Employment Status	Confounder	Employment status of participant	Unemployed, student, employed (non-self),	Categorical

Variable	Type of variable	Description	Measurement	Scale of measurement
			Employed (self), pensioner	
Asset Index	Confounder	Income range of participant	Low, Medium, High	Categorical
Valid NHIS card	Confounder	Validity of NHIS card	Yes or No	Categorical
Civil status	Confounder	The marital status of the participant	Divorced/separated, Single, Married, Widow/Widower	Categorical
Number of Children alive	Confounder	Participant's number of children alive	None, 1-2, 3-5, 6+	Categorical
Religion	Confounder	Religious affiliation of the participant	Christian, Islam	Categorical
Region	Confounder	Participant's region of residence	Greater Accra, Central, Eastern, other	Categorical
Cancer type	Confounder	Participant's confirmed cancer diagnosis	Breast, Prostate, Gynae, Head &neck, Unaware, Others	Categorical
Duration since diagnosis	Confounder	Duration since participant was diagnosed	< 1 year, 1 year, 2+ years	Categorical
Cancer stage	Confounder	Participant's cancer stage	Stage I, stage II Advanced, unaware	Categorical
Family history of cancer	Confounder	Participant's family history of cancer	No, yes, unaware	Categorical
Symptom burden	Confounder	Symptom(s) burden of participants	None, 1-2, 3-5, 6+	Categorical
Comorbidity	Confounder	If participant has any other comorbid condition(s)	No, yes	Binary
Therapeutic Intervention	Confounder	Number of interventions received by participants	Yet to start, 1-2, 3+	Categorical

Variable	Type of variable	Description	Measurement	Scale of measurement
Ever received psychological service at facility	Confounder	Participant's report of ever receiving psychological service at the facility	No, yes	Binary

3.11 Data analysis

Data was collected into EpiData version 3.1 and then exported to Stata version 16.1 for data cleaning, processing, and analysis. Details of analysis for each objective are presented below.

3.11.1 Objective 1: The level of psychological distress and QoL amongst PLWC

To estimate the level of distress and QoL amongst PLWC, descriptive tabulation of the various outcomes was performed. Test of nonlinear hypotheses after prevalence estimation was adopted to assess significant difference within independent variables.

3.11.2 Objective 2: factors associated with psychological distress and QoL amongst PLWC

Under this objective, distress and QoL were considered as outcomes coded as 1 "High distress and good QoL respectively as well as 0 for "Low distress and poor QoL respectively". For this reason, logistic regression was performed to assess both crude and adjusted odd ratios of the outcomes by the independent variables. Multicollinearity was checked using variance inflation factor (VIF); however, no variable violated the rule of thumb (VIF≥10).

3.11.3 Objective 3 and 4: Mediation effect of Resilience and Social Support on the relationship between psychological distress and QoL amongst PLWC

A causal path analysis was adopted to assess the mediation effect of Resilience and Social Support on the relationship between distress and QoL. This causal path analysis offers counterfactual direct, indirect, and total effects of distress on QoL (Muthén & Asparouhov, 2015). All estimations were

done using the 95% confidence interval and a p-value≤0.05 was deemed significant. Initial analysis showed insignificant mediation effect of resilience and social support on the relationship between distress and QoL.

3.11.4 Objective 5: Effect Modification of Resilience on QoL among PLWC

Moderation analysis involving effect modification was employed to assess association between distress and QoL by resilience and social support. The assumption was tested using the Cochran–Mantel–Haenszel test. The test of homogeneity was statistically significant ($p<0.05$) for resilience. The association of distress with QoL was thus found to be statistically significant depending on level of resilience. The degree to which distress influence QoL differed between low and high resilience. Adjusted logistic regression was thus performed to show association between distress and QoL modified depending on the level of resilience.

3.12 Ethical considerations

Ethical approval for this study was granted by the Korle-Bu Teaching Hospital Scientific and Technical Committee Institutional Review Board (KBTH-STC/000118/2022 and KBTH-STC/IRB/000118/2022). Administrative permission was obtained from the National Radiotherapy Oncology and Nuclear Medicine Centre. Participants were informed of the study objectives both orally and in writing. Additionally, they were made aware of their right to discontinue participation in the study at any time. All respondents provided signed informed consent for this study participation. Information obtained was kept private with password protection on the computers used. Codes were used to identify respondents and were treated strictly confidential. Participants were asked to contact the KBTH-IRB on +233302667759/673034-6 from Mondays to Fridays between 8am-5pm for any issue regarding the study.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This study sought to estimate the prevalence of distress and state of QoL as well as determine factors associated with both constructs. It further sought to determine the mechanic effect of resilience and social support on the relationship between distress and QoL among PLWC. This chapter, in a logical sequence, thus summarizes and presents the findings of the study in context with the research objectives.

4.2 Sociodemographic and cancer related characteristics of study participants

The study involved 469 Persons Living with Cancer (PLWC). Most respondents were aged 50-59 years (22.81%) with mean±standard deviation of 55.1±14.8 years. More than half of the respondents were females (70.8%), with a larger percentage being senior high school graduates (34.9%) and non-income earners (51.4%) who comprised the unemployed, students and pensioners. Over half of the respondents were married (59.9%) and most had between three to five children (n=49%). Majority were Christians (87.6%) and resided in the Greater Accra region (69.1%). The bulk of respondents had a valid national health insurance scheme (NHIS) card (91.3%) and a large portion fell within the low asset index category (53.9%) (Table 4.1). The most common cancers were breast, gynecological (cervical, endometrial, and ovarian) and prostate. Forty-three percent of respondents were oblivious of their cancer stage while a quarter reported the disease being advanced. The majority confirmed being diagnosed within one year of this study and more than half indicated having no family history of cancer. Three-fourth of respondents recounted experiencing at least three cancer related symptoms (pain, fatigue, weight loss, sleep disturbance and lack of appetite) and over half reported never receiving any form of psychological services prior to commencing

therapeutic interventions even though over two thirds had already received between 1-2 interventions.

Table 4.1: Sociodemographic and cancer related characteristics of study participants

Variables	Response	Frequency	Percent
Age Groups (n=469)			
	≤39	73	15.57
	40-49	96	20.47
	50-59	107	22.81
	60-69	101	21.54
	70+	92	19.62
Mean±SD	55.1±14.8		
Sex (n=469)			
	Male	137	29.21
	Female	332	70.79
Education Level (n=469)			
	No formal education	65	13.86
	Basic	132	28.14
	Senior high	164	34.97
	Tertiary	108	23.03
Employment Status (n=469)			
	Unemployed	130	27.72
	Student	15	3.2
	Employed (self)	48	10.23
	Employed (non-self)	180	38.38
	Pensioner	96	20.47
Asset Index (n=469)			
	Low	253	53.94
	Middle	89	18.98
	High	127	27.08
Valid NHIS Card (n=649)			
	No	41	8.74
	Yes	428	91.26
Civil Status (n=469)			
	Single	85	18.12
	Married	281	59.91
	Divorced/Separated	44	9.38
	Widow/Widower	59	12.58
Number of children alive (n=456)			
	None	59	12.58
	1-2	116	24.73
	3-5	230	49.04
	6+	64	13.65
Region of residence (n=469)			
	Greater Accra	324	69.08

Variables	Response	Frequency	Percent
	Central Region	55	11.73
	Eastern Region	39	8.32
	Other Regions	51	10.88
Religion (n=469)			
	Christian	411	87.63
	Muslim	58	12.37
Cancer Type (n=469)			
	Abdominal	21	4.48
	Breast	146	31.13
	Gynaecological	79	16.84
	Head & Neck	35	7.46
	Prostate	76	16.2
	Other Cancers	52	11.09
	Unaware	60	12.79
Cancer Stage (n=469)			
	Stage 1	109	23.24
	Stage 2	40	8.53
	Advanced	117	24.95
	Unaware	203	43.28
Duration since diagnosis (n=469)			
	<1 year	169	36.03
	1 year	112	23.88
	2+ years	148	31.56
	Unaware	40	8.53
Family history of cancer (n=469)			
	No	305	65.03
	Yes	81	17.27
	Unaware	83	17.7
Symptom(s) burden (n=469)			
	≤2	*114*	24.31
	3-5	*181*	38.59
	6+	*174*	37.1
Comorbidities (n=469)			
	No	258	*55.01*
	Yes	211	*44.99*
Ever received psychological counselling (n=423)			
	No	230	54.37
	Yes	193	45.63
Therapeutic Intervention(s) (n=469)			
	None	80	17.06
	1-2	369	78.68
	3+	20	4.26

4.3 Prevalence of distress and quality of life among persons living with cancer

4.3.1 Level of psychological distress and quality of life amongst study respondents

Psychological distress (distress) scores ranged from 38.71 to 78.16 with an overall mean score of 50.00 and high distress prevalence of 45.42% (95%CI=40.95-49.96). Quality of Life scores ranged from 22.14 – 68.66, with an overall mean score of 49.99 and good QoL prevalence being 52.67% (95%CI=48.12-57.16) amongst the respondents (Table 4.2).

Table 4.2: Level of psychological distress and quality of life amongst study respondents

Outcome	Raw Scores (Min -Max)	Mean ±SD	Prevalence	95%CI
Psychological distress	38.71 – 78.16	50.00 ±10	45.42	40.95-49.96
Quality of Life	22.14 – 68.66	49.99 ±10	52.67	48.12-57.16

4.3.2 Prevalence of high psychological distress and good quality of life by sociodemographic characteristics

Differences in high distress by sociodemographic characteristics was significantly associated with education level, employment status, asset index, civil status, and number of children alive (p-value<0.05). Analysis showed that those with no formal education had a significant high proportion of high distress (58.46%; 95%CI=46.18-69.76). Among employment category, high distress was significantly observed among students (66.67%; 95%CI=40.53-85.43) and the unemployed (52.30%; 95%CI=43.71-60.76). High distress was also observed in respondents with low asset quintile (51.78%; 45.61-57.89). Patients who were single and those with no children recorded high distress prevalence of (63.52%; 95%CI=52.80-73.06) and (52.17%; 95%CI=37.91-66.08) respectively (Table 4.3).

The differences in proportions of good QoL by socio-demographic showed insignificant association (p-value≥0.05) even though good QoL was observed in those with tertiary educational (63.88%; 95%CI=54.41-72.39) (Table 4.3).

Table 4.3: Prevalence of high psychological distress and good quality of life by sociodemographic characteristics of participants

	Outcome domain	
Variable	**Psychological distress**	**Quality of Life**
	Prevalence[95%CI]	Prevalence[95%CI]
Age group		
≤39	49.31 [38.05-60.65]	57.53 [45.96-68.32]]
40-49	53.12 [43.12-62.87]	43.75 [34.17-53.81]
50-59	44.85 [35.70-54.37]	49.53 [40.16-58.93]
60-69	39.60 [30.53-49.44]	58.41 [48.57-67.62]
70+	41.30 [31.70-51.61]	55.43 [45.16-65.25]
Test	4.04 (0.256)	5.54 (0.136)
Sex		
Male	43.06 [35.01-51.49]	59.12 [50.68-67.05]
Female	46.38 [41.06-51.78]	50.00 [44.62-55.37]
Test	0.43 (0.510)	3.31 (0.069)
Education Level		
No formal education	58.46 [46.18-69.76]	46.15 [34.45-58.29]
Basic	55.30 [46.72-63.57]	46.21 [37.87-54.76]
SHS	39.02 [31.84-46.71]	53.04 [45.37-60.57]
Tertiary	35.18 [26.75-44.64]	63.88 [54.41-72.39]
Test	**11.31 (0.035)**	1.69 (0.429)
Employment Status		
Unemployed	52.30 [43.71-60.76]	45.38 [37.02-54.01]
Student	66.67 [40.53-85.43]	66.67 [40.53-85.43]
Employed (self)	31.25 [19.77-45.59]	64.58 [50.19-76.74]
Employed (non-self)	47.22 [40.02-54.54]	51.67 [44.36-58.89]
Pensioner	36.45 [27.44-46.53]	56.25 [46.18-65.83]
Test	**9.89 (0.019)**	3.65 (0.301)
Asset Index		
Low	51.78 [45.61-57.89]	48.61 [42.49-54.78]
Middle	41.57 [31.80-52.05]	56.17 [45.72-66.11]
High	35.43 [27.59-44.13]	58.26 [49.50-66.53]
Test	**10.16 (0.006)**	3.75 (0.153)
Valid NHIS Card		
No	46.34 [31.82-61.51]	51.21 [36.32-65.98]
Yes	45.32 [40.65-50.08]	52.80 [48.05-57.50]
Test	0.02(0.9010)	0.04 (0.846)
Civil Status		
Divorced/Separated	43.18 [29.47-58.02]	45.45 [31.49-60.17]
Single	63.52 [52.80-73.06]	44.70 [34.49-55.38]
Married	40.21 [34.62-46.07]	56.93 [51.06-62.62]
Widow/Widower	45.76 [33.55-58.50]	49.15 [36.68-61.72]
Test	**15.29(0.002)**	5.49 (0.139)
Number of Children alive		
None	52.17 [37.91-66.08]	58.69 [44.10-71.90]
1-2	34.48 [26.39-43.58]	60.34 [51.17-68.84]
3-5	47.82 [41.42-54.29]	49.13 [42.70-55.58]
6+	48.43 [36.49-60.56]	50.00 [37.95-62.04]
Test	**6.50 (0.038)**	4.19 (0.123)

	Outcome domain	
Variable	**Psychological distress**	**Quality of Life**
Religion		
Christianity	45.01 [40.25-49.86]	52.55 [47.70-57.35]
Islam	48.27[35.77-61.00]	53.44 [40.63-65.82]
Test	0.22 (0.641)	0.02 (0.898)
Place of Residence		
Greater Accra	42.59 [37.30-48.05]	53.08 [47.62-58.47]
Central Region	50.91 [37.90-63.79]	45.45[32.86-58.65]
Eastern Region	58.97 [43.12-73.15]	43.58 [29.06-59.30]
Other Regions	47.05 [33.87-60.67]	64.70 [50.75-76.52]
Test	4.74 (0.192)	5.72 (0.126)

4.3.3 Prevalence of high psychological distress and good quality of life by cancer related characteristics

Differences in high distress by duration since diagnosis, symptom burden, comorbidities and receiving of psychological services prior to commencement of therapeutic intervention reflected significant association (p-value <0.05). Descriptive analysis showed the prevalence of high distress to be pronounced in respondents diagnosed less than a year of the study [50.29%;95%CI=42.78-57.79]. In relation to symptoms burden, persons experiencing at least six symptoms recorded the largest percentage of high distress [52.87%; 95%CI=45.42-60.19]. Respondents with no comorbid conditions as well as those who reported not receiving any psychological services accounted for elevated prevalence of high distress [50.77%; 95%CI=44.67-56.84) and 53.91%; 95%CI=47.42-60.27 respectively] (Table 4.4).

Differences in proportion of good QoL by symptoms burden, comorbidities and receiving of psychological services before treatment indicated significant associations as well (p-value <0.05). Respondents reporting 1-2 cancer related symptoms experienced the highest percentage of good QoL [69.36%; 95%CI=60.17-77.24] while those with comorbid conditions reported the best good QoL (60.81%; 95%CL=53.41-66.59). Participants who reported to have received psychological services accounted for greater good QoL (60.10%; 95%CI=53.01-66.79) (Table 4.4).

Table 4.4: Prevalence of high psychological distress and good quality of life by cancer related characteristics of participants

	Outcome domain	
Cancer related factors	**Psychological distress**	**Quality of Life**
	Prevalence[95%CI]	Prevalence[95%CI]
Cancer Type		
Abdominal Cancers	42.85 [23.96-64.08]	52.38 [31.78-72.19]
Breast Cancer	39.72[32.09-47.89]	52.05 [43.94-60.05]
Prostate Cancer	34.21 [24.43-45.54]	67.10 [55.79-76.72]
Gynae Cancers	53.16 [42.15-63.87]	45.56 [34.93-56.62]
Head & Neck Cancers	51.42 [35.25-67.30]	54.28 [37.86-69.82]
Other Cancers	50.00[36.69-63.30]	48.07 [34.91-61.50]
Test	8.51 (0.130)	9.13 (0.104)
Duration since diagnosis		
< 1 year	50.29 [42.78-57.79]	51.47 [43.94-58.94]
1 year	46.42 [37.39-55.70]	58.03 [48.69-66.83]
2+ years	35.81[28.48-43.86]	53.37 [45.30-61.28]
Test	**7.26 (0.0265)**	1.20 (0.549)
Symptoms burden		
None	33.33[4.31-84.72]	
1-2	24.32 [17.22-33.17]	69.36 [60.17-77.24]
3-5	51.38 [44.10-58.60]	51.93 [44.64-59.13]
6+	52.87 [45.42-60.19]	41.95 [34.82-49.43]
Test	**24.14 (<0.001)**	**216.53 (<0.001)**
Comorbidities		
No	50.77 [44.67-56.84]	46.51 [40.49-52.63]
Yes	38.86 [32.50-45.62]	60.81 [53.41-66.59]
Test	**6.77 (0.009)**	**8.91 (0.003)**
Ever received psychological service		
No	53.91[47.42-60.27]	46.52 [40.15-53.00]
Yes	34.19 [27.83-41.18]	60.10 [53.01-66.79]
Test	**17.31 (<0.001)**	**7.94 (0.005)**
Number of interventions		
Yet to start	57.50 [46.45-67.84]	51.25 [40.38-61.99]
1-2	42.81 [37.84-47.93]	53.38 [48.26-58.43]
3+	45.00 [25.27-66.43]	45.00 [25.27-66.43]
Test	5.80 (0.055)	0.62 (0.734)

4.4 Factors associated with high psychological distress and good quality of life amongst study participants.

4.4.1 Sociodemographic characteristics associated with high psychological distress and good quality of life amongst study participants

Table 4.5 shows the crude and adjusted sociodemographic factors associated with high distress and good QoL. For high distress, univariate estimates showed significant association with educational level, employment status, asset index, civil status, and number of children alive. Multivariate analysis on the other hand confirmed significant association by education level, civil status, and number of children alive (p-value < 0.05).

Respondents with no formal education were 2.19 times (95%CI=1.22-3.95) more likely to experience higher distress compared to respondents with senior high education. This was also reflected in the adjusted estimates with no formal education showing over two folds odds of high distress compared to senior high school level [aOR(95%CI=2.64(1.23-5.64). Relative to pensioners, students had higher odds of experiencing high distress [OR (95%CI=3.48 (1.96-11.03)].

No statistically significant association was identified from adjusted estimates for employment status. In relation to asset index, respondents in the low quantile showed higher odds of 1.96 compared to those in the high quantile. Though this trend appeared similar for adjusted estimated, it was not statistically significant. Compared with respondents who were married, persons who identified as single had higher odds of 2.59 and 3.93 respectively for crude and adjusted estimates. In the context of number of children, respondents with 1- 2 children had over two folds higher odds of high distress compared to those with none [OR (95%CI=32.07 (1.03-4.15)]. The odds were higher for the adjusted estimates for respondents with at least six children in comparison to the reference group [aOR (95%CI=3.00 (1.30-6.94)] (Table 4.5).

In the context of QoL domain, civil status, and number of children alive were the two predictor variables with statistically significant associations. Respondents who were single experienced close

to borderline significant reduction of 39% in the odds of having good QoL [aOR(95%CI=0.61(0.37-1.00)] compared to those who were married. Relative to respondents with 1-2 children, those with 3-5 had 37% reduced odds of experiencing good QoL [OR(95%CI=0.63(0.40-1.00). The adjusted analysis showed patients with 3 to 5 children had reduced odds of 63% for good QoL compared to those s with 1-2 children [aOR(95%CI=0.37(0.22-0.63) (Table 4.5).

Table 4.5: Crude and adjusted estimates showing sociodemographic characteristics associated with high psychological distress and good quality of life amongst study participants

	Outcomes			
Social-demographic factors	**Psychological Distress**		**Quality of Life**	
	OR[95%CI]p-value	aOR[95%CI]p-value	OR[95%CI]p-value	aOR[95%CI]p-value
Age group				
70+	**ref**		**ref**	
≤39	1.38 [0.74-2.56]0.305		1.09 [0.58-2.03]0.787	
40-49	1.61 [0.90-2.87]0.106		0.63 [0.35-1.11]0.110	
50-59	1.15 [0.66-2.03]0.614		0.79 [0.45-1.38]0.407	
60-69	0.93 [0.52-1.66]0.810		1.13 [0.64-1.99]0.676	
Sex				
Male	**ref**		**ref**	
Female	1.14 [0.76-1.70]0.512		0.69 [0.46-1.03]	
Education Level				
SHS	**ref**	**ref**	**ref**	
No formal education	2.19 [1.22-3.95]**0.008**	2.64[1.23-5.64]**0.013**	0.76 [0.43-1.35]0.348	
Basic	1.93 [1.21-3.08]**0.006**	2.14 [1.14-4.01]**0.017**	0.76 [0.48-1.20]0.243	
Tertiary	0.85 [0.51-1.41]0.523	1.22 [0.61-2.45]0.572	1.56 [0.95-2.57]0.078	
Employment Status				
Pensioner	**ref**	**ref**	**ref**	
Unemployed	1.91[1.11-3.28]**0.019**	0.97 [0.45-2.07]0.940	0.64[0.37-1.10]0.107	
Student	3.48 [1.96-11.03]**0.034**	0.83 [0.15-4.59]0.830	1.56 [0.49-4.90]0.451	
Employed (self)	0.79 [0.38-1.65]0.537	0.39[0.14-1.15]0.088	1.41 [0.69-2.90]0.399	
Employed (non-self)	1.56 [0.94-2.59]0.087	0.94 [0.46-1.91]0.861	0.83 [0.50-1.36]0.468	
Asset Index				
High	**ref**	**ref**	**ref**	
Low	1.96 [1.26-3.04]**0.003**	1.27 [0.69-2.33]0.438	0.68 [0.44-1.04]0.077	
Middle	1.29 [0.74-2.26]0.361	0.59 [0.28-1.23]0.165	0.92 [0.53-1.59]0.760	
Valid NHIS				
Yes	**ref**		**ref**	
No	1.04[0.55-1.97]0.901		0.94 [0.49-1.78]0.846	
Civil Status				
Married	**ref**	**ref**	**ref**	**ref**
Divorced/Separated	1.13 [0.59-2.15]0.710	1.28 [0.57-2.84]0.546	0.63 [0.33-1.19]0.157	0.45 [0.20-1.02]0.056

	Outcomes			
Social-demographic factors	**Psychological Distress**		**Quality of Life**	
Single	2.59 [1.57-4.28]**0.000**	3.93 [1.64-9.45]**0.002**	0.61 [0.37-1.00]**0.049**	0.61 [0.28-1.29]0.197
Widow/Widower	1.25 [0.71-2.21]0.432	0.59 [0.28-1.29]0.190	0.73 [0.42-1.28]0.275	0.89 [0.47-1.68]0.725
Number of Children alive				
1-2	**ref**	**ref**	**ref**	**ref**
None	2.07 [1.03-4.15]**0.040**	1.45[0.56-4.59]0.531	0.93[0.47-1.86]0.843	1.02 [0.41-2.55]0.964
3-5	1.74 [1.09-2.77]**0.019**	2.57[1.38-4.80]**0.003**	0.63 [0.40-1.00]**0.049**	0.37[0.22-0.63]**0.000**
6+	1.78 [0.96-3.32]0.068	3.00 [1.30-6.94]**0.010**	0.66 [0.35-1.21]0.182	0.44 [0.22-0.89]**0.022**
Religion				
Christianity	**ref**		**ref**	
Islam	1.14 [0.66-1.97]0.641		1.03 [0.59-1.79]0.899	
Place of Residence				
Greater Accra	**ref**		**ref**	
Central Region	1.39 [0.79-2.48]0.252		0.74 [0.41-1.31]0.297	
Eastern Region	1.94 [0.98-3.81]0.055		0.68 [0.34-1.33]0.265	
Other Regions	1.19 [0.66-2.17]0.550		1.62 [0.88-2.99]0.124	

4.4.2 Cancer related characteristics associated with high psychological distress and good quality of life amongst study participants.

Table 4.6 presents the crude and adjusted logistic regression for cancer related predictor variables associated with distress and QoL. While symptoms burden, comorbidities and ever received psychological services were found to be statistically significant for crude and adjusted estimations, duration since diagnosis was the significant predictor variable exclusive to crude estimation under the domain of distress (p-value <0.05). In reference to respondents whose duration since diagnosis was two or more years, the odds of experiencing high distress were 1.81 times more in persons diagnosed within less than a year of this study [OR(95%CI=1.81(1.15-2.85)]. Compared to respondents with no symptoms, the odds of high distress were 3.44 times higher in persons with six or more symptoms [OR(95%CI=3.44(2.05-5.79)]. A similar trend was observed for adjusted estimates with higher odds 5.10 [aOR(95%CI=5.10(2.59-10.01)]. While the odds of experiencing high distress was 1.62 times (95%CI=1.12-2.35) more in persons with no comorbidities, adjusted estimate showed 1.68 times higher odds compared to respondents with comorbidities. Relative to

respondents who received psychological services prior to treatment, the odds of experiencing high distress were 2.25 times and 3.12 times higher for persons who did not receive such services in both crude and adjusted estimates.

For QoL domain, symptoms burden, comorbid conditions and receiving psychological services were significantly associated. The odds of good QoL were significantly reduced by 69% in persons with six or more symptoms compared with those reporting no symptoms [OR(95%CI=0.31 (0.19-0.51)]. Similar trend was observed for the adjusted model with the odds being reduced by 73% in comparison to respondents with no symptoms [aOR (95%CI=0.27(0.16-0.48)]. In relation to respondents having comorbid conditions, those who reported having no comorbidities had 43% reduced odds of good QoL [OR(95%CI=0.57(0.39-0.83)]. A similar picture was revealed in the adjusted model with the odds of good QoL being reduced by 51% in respondents with no coexisting medical conditions [aOR(95%CI=0.49(0.32-0.75)]. Respondents who reported not having received psychological services prior to commencing treatment had 42% reduced odds of good QoL compared to those who had received such services (OR=0.58; 95%CI=0.39-0.85). This is reflected in the adjusted model where the odds of experiencing good QoL was reduced by 44% in persons who did not receive psychological services compared to the counterparts who did [aOR(95%CI=0.56(0.37-0.87)] (Table 4.6).

Table 4.6: Crude and adjusted estimates showing cancer related characteristics associated with high psychological distress and good quality of life amongst study participants

Cancer related factors	**Psychological Distress**		**Quality of Life**	
	OR[95%CI]p-value	aOR[95%CI]p-value	OR[95%CI]p-value	aOR[95%CI]p-value
Cancer Type				
Head & Neck Cancers	**ref**		**ref**	
Abdominal Cancers	0.71 [0.24-2.11]0.535		0.92 [0.31-2.74]0.890	
Breast Cancer	0.62 [0.29-1.31]0.211		0.91 [0.44-1.91]0.813	
Prostate Cancer	0.49 [0.22-1.11]0.088		1.72 [0.76-3.90]0.196	
Gynae Cancers	1.07 [0.48-2.38]0.864		0.71 [0.32-1.57]0.702	
Other Cancers	0.94 [0.40-2.23]0.896		0.78 [0.33-1.84]0.571	

Cancer related factors	Psychological Distress		Quality of Life	
Duration since diagnosis				
2+ years	**ref**	**ref**	**ref**	
< 1 year	1.81 [1.15-2.85]**0.010**	1.46 [0.82 - 2.57] 0.195	0.93 [0.59-1.44]0.736	
1 year	1.55 [0.94-2.56]0.085	1.44 [0.78-2.66] 0.246	1.21 [0.74-1.98]0.455	
Family history of Cancer				
No	**ref**		**ref**	
Yes	0.82 [0.44-1.51]0.529		0.91 [0.49-1.69]0.767	
Unaware	0.76 [0.47-1.24]0.281		0.81 [0.49-1.31]0.377	
Symptom burdens				
None	**ref**	**ref**	**ref**	**ref**
3-5	3.24 [1.93 - 5.44]**0.000**	3.59 [1.86-6.92]**0.000**	0.45 [0.27-0.75]**0.002**	0.41 [0.24-0.72]**0.002**
6+	3.44 [2.05 - 5.79]**0.000**	5.10 [2.59-10.01]**0.000**	0.31 [0.19-0.51]**0.000**	0.27 [0.16-0.48]**0.000**
Comorbidities				
Yes	**ref**	**ref**	**ref**	**ref**
No	1.62 [1.12-2.35]**0.010**	1.68 [1.02-2.75]**0.040**	0.57[0.39-0.83]**0.003**	0.49 [0.32-0.75]**0.001**
Ever received psychological service				
No	2.25[1.52-3.34]**0.000**	3.12 [1.89-5.14]**0.000**	0.58 [0.39-0.85]**0.006**	0.56[0.37-0.87]**0.010**
Yes	**ref**	**ref**	**ref**	**ref**
Number of interventions				
3+	**ref**		**ref**	
Yet to start	1.65 [0.62-4.44]0.318		1.28 [0.48-3.44]0.618	
1-2	0.91 [0.37-2.26]0.848		1.39 [0.57-3.46]0.466	

4.5 Indirect effect of resilience and social support on the relationship between distress and quality of life amongst persons living with cancer.

4.5.1 Relationship between psychological distress, quality of life, resilience, and social support amongst respondents.

Table 4.7 shows the pairwise correlations of the outcome and intermediate variables. The correlations between psychological distress and QoL as well as social support were negative and significant (r = -0.578 and -0.224; p-value ≤ 0.05 respectively). Even though there is a weak negative correlation between psychological distress and resilience it was statistically insignificant (r=-0.009; p-value ≥ 0.05). Though resilience correlated positively with QoL, the correlation was also insignificant (r = 0.024; p-value ≥ 0.05).

Table 4.7: Pairwise correlations showing the relationship between psychological distress, quality of life, resilience, and social support amongst study participants

Constructs	(1)	(2)	(3)	(4)
(1) Psychological Distress	1.000			
(2) Quality of Life	-0.578	1.000		
	(0.000)			
(3) Resilience	-0.009	0.024	1.000	
	(0.838)	(0.602)		
(4) Social Support	-0.224	0.110	-0.070	1.000
	(0.000)	**(0.018)**	(0.129)	

Note: numbers in bracket indicate p-values.

4.5.2: Direct and Indirect effect of resilience and social support on quality of life

Table 4.8 shows the result of the structural equation model to estimate the potential mediating roles of resilience and social support in the relationship between distress and QoL. There is an insignificant indirect effect of resilience and social support on QoL (p-value≥0.05).

Table 4.8: Direct and Indirect effect of resilience and social support on quality of life

Domain	Direct	Indirect	Total
	β(95%CI)p-value	**β(95%CI)p-value**	**β(95%CI)p-value**
Resilience	-0.58[-0.66 to -0.50]<0.001	-0.0001[-0.002 to 0.002]0.877	0.02[-0.06 to 0.09]0.649
Social support	-0.58[-0.65 to -0.51]<0.001	0.004[-0.01 to 0.02]0.630	-0.58[-0.65 to -0.51] <0.001

4.6 How resilience and social support modify the effect of distress on quality of life among persons living with cancer.

4.6.1 Association between psychological distress and quality of life modified by level of resilience.

Table 4.9 shows the association between psychological distress and QoL modified by level of resilience. Overall, amongst persons with high distress, the adjusted odds of good QoL was 18% statistically significant [aOR=0.18; 95%CI=0.11-0.30]. For modification effect, distress significantly influences good QoL by 11% when resilience was low (aOR=0.11; 95%CI=0.53-0.25) and 28% when resilience was high (aOR=0.28; 95%CI=0.12-0.64).

Table 4.9: Adjusted logistic regression showing association between psychological distress and quality of life modified by level of resilience

Variables	Logistic Regression model of QoL against predictive variables		
	Overall	Level of resilience	
		Low resilience	High resilience
	aOR[95%CI]p-value	**aOR[95%CI]p-value**	**aOR[95%CI]p-value**
Psychological Distress			
Low	**Ref**	**Ref**	**Ref**
High	0.18[0.11-0.30]**<0.001**	0.11[0.53-0.25]**<0.001**	0.28[0.12-0.64]**<0.001**
Education Level			
Senior High	**Ref**	**Ref**	**Ref**
No formal Education	1.57[0.66-3.73]0.305	1.16[0.36-3.76]0.808	2.19[0.59-8.09]0.240
Basic	0.84[0.46-1.54]0.572	0.90[0.37-2.17]0.816	1.15[0.42-3.11]0.785
Tertiary	1.63[0.80-3.34]0.178	0.67[0.19-2.33]0.527	5.78[2.05-16.32]**<0.05**
Employment Status			
Pensioner	**Ref**	**Ref**	**Ref**
Unemployed	0.77[0.36[1.67]0.506	0.54[0.16-1.83]0.326	1.18[0.38-3.62]0.778
Student	2.63[0.35-21.78]0.334	1.67[0.68-41.18]0.753	4.12[0.16-108.26]0.397
Employed (self)	1.53[0.61-3.84]0.360	2.30[0.57-9.28]0.241	1.21[0.27-5.45]0.802
Employed (non-self)	0.88[0.43-1.79]0.723	0.72[0.22-2.29]0.582	1.11[0.40-3.03]0.843
Asset Index			
High	**Ref**	**Ref**	**Ref**
Low	1.12[0.59-2.12]0.723	0.88[0.33-2.33]0.799	1.62[0.56-4.70]0.371
Middle	1.04[0.53-2.16]0.910	1.91[0.50-7.25]0.340	0.80[0.29-2.24]0.674
Civil Status			
Married	**Ref**	**Ref**	**Ref**
Divorced/Separated	0.61[0.24-1.56]0.300	0.35[0.08-1.43]0.143	0.84[0.24-2.91]0.785
Single	1.03[0.39-2.70]0.954	0.40[0.07-2.28]0.301	1.62[0.44-5.94]0.463
Widowed	0.84[0.40-1.78]0.650	0.77[0.29-2.05]0.597	1.26[0.27-5.81]0.766
Number of children alive			
1-2	**Ref**	**Ref**	**Ref**
None	0.63[0.17[2.30]0.485	1.38[0.17-10.96]0.759	0.46[0.05-3.87]0.473
3-5	0.38[0.20-0.72]**<0.05**	0.38[0.15-0.95]**<0.05**	0.34[0.13-0.91]**<0.05**
6+	0.49[0.22-1.10]0.085	0.55[0.16-1.88]0.339	0.39[0.13-1.19]0.097
Duration since diagnosis			
2+ years	**Ref**	**Ref**	**Ref**
<1 year	1.50[0.80-2.82]0.205	1.63[0.66-3.99]0.287	1.38[0.50-3.79]0.531
1 year	2.07[1.09[3.94]**<0.05**	1.55[0.61-3.95]0.361	2.33[0.82-6.64]0.114
Symptom(s) burden			
≤2	**Ref**	**Ref**	**Ref**
3-5	0.60[0.31-1.17]0.132	0.50[0.19-1.35]0.172	0.55[0.21-1.45]0.223
6+	0.37[0.19-0.70]**<0.05**	0.38[0.61-3.95]**<0.05**	0.23[0.08-0.58]**<0.05**
Comorbidities			
Yes	**Ref**	**Ref**	**Ref**
No	0.68[0.26-0.73]**<0.05**	0.40[0.18-0.89]**<0.05**	0.43[0.20-0.93]**<0.05**
Ever received psychological service			
Yes	**Ref**	**Ref**	**Ref**
No	0.68[0.40-1.13]0.139	0.66[0.29-1.49]0.314	0.53[0.24-1.18]0.120

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

Studies have confirmed the adverse impact of distress on the QoL of PLWC. This has strong implications for their well-being and mental health. Furthermore, it highlights the urgency for understanding the dynamics of factors that mitigate the relationship between distress and QoL. Resilience and social support have been confirmed to directly improve QoL in chronic conditions including cancer (Hofman et al., 2021; Seiler & Jenewein, 2019). However, their indirect effect on QoL has only barely been examined in a population of Ghanaians living with cancer. This study focused on investigating the mechanistic effect of resilience and social support on the relationship between distress and QoL amongst PLWC in a Ghanaian context. Such data would not only provide an evidence-based platform for decision making, but also highlight the need for more research into understanding the different influences and facets of challenges PLWC face along the trajectory of the illness continuum. It will provide the impetus for realigning oncology care to address the unmet needs of PLWC.

5.2 Prevalence of high distress and associated factors in persons living with cancer

Distress is reported to be more likely and higher in persons with chronic medical conditions like cancer than the general population as well as common in the early years of cancer diagnosis varying by country and region (Leong Abdullah et al., 2015; Ostovar et al., 2022; Tareke et al., 2022). In a comparative cross-sectional study conducted in Northwest Ethiopia, the odds of distress in people living with chronic medical condition were three times higher, compared with the general population. While distress in the general population was 35.1%, persons with chronic illness recorded distress as high as 62.0% (Tareke et al., 2022).

So enormous is the impact of this construct on the quality of patients' lives that distress is recognized as the sixth vital sign in cancer management and has stimulated the advancement of proven measures and evidence-based recommendations for integrating psychosocial screening into routine clinical practice (Bergerot et al., 2020; Bultz & Carlson, 2005). The enormity of this public health concern is reinforced by Mehnert et al., (2018) finding that one in two PLWC are significantly distressed. In the current study, the prevalence of high distress amongst respondents was 45.4%. Though the prevalence was higher than findings by Hong et al., (2015), it was lower in comparison to a study by Ebob-Anya & Bassah, (2022). Differences in prevalence rate could vary depending on the measure used. While both studies cited employed the National Comprehensive Cancer Network (NCCN) Distress Thermometer (DT), this study employed the revised psychological distress inventory. Their comparatively lower sample size (153 and 120 respectively) could explain the variation also. Peters et al., (2020) also reported higher distress prevalence of 65.9% in comparison to this study. It is worth mentioning though that their sample comprised inpatients in contrast to this study. Higher prevalence (nearly doubled) have been reported in inpatient population compared to outpatients (Clark et al., 2011; Peters et al., 2020a). However, in Mehnert et al., (2018) study involving 3724 participants that focused on mixed cancers as with this work, but combined in and out patients, significant distress was observed in 52% of the sample. The sample size difference, inclusion of in patients and geographical region of the study could account for the difference in prevalence. Nonetheless, Carlson et al., (2019) abstracted patients data and distress scores from electronic health records across cancer treatment centres in Canada and the United States and reported almost similar distress prevalence of 46.2% in their geographically diverse sample.

After controlling for all other influences, key findings suggest basic and no formal education, being single, having 3 or more children, experiencing at least 3 cancer related symptoms,

having no comorbid condition, and not receiving psychological service before commencing intervention were significantly associated with distress. Crude analysis confirmed employment status, asset index and duration since cancer diagnosis to have significant association with distress.

Regarding education, findings indicated increased odds of high distress with low or no formal education. Education has been conceptualized as an investment that pays off through greater access to a variety of tangible and intangible resources, such as income or healthier lifestyle options, all of which are beneficial to health (Zajacova & Lawrence, 2018). Accordingly, this could play into positive psychological state resulting from the broader social network formed. On the other hand, illiteracy influences morbidity and premature mortality and increase the burden of behavioral risk factors for chronic disease (Allen et al., 2017). Education has been affirmed as a key determinant of health and crucial in promoting relationship-centered care, strengthening physician-patient communication as well as improving patient self-management and empowering health choices (Fernández-González & Bravo-Valenzuela, 2019; Hall & Roter, 2011; Zajacova & Lawrence, 2018). Even in conditions such as chronic illnesses, education remains crucial. This was brought to the fore by Jabbour et al., (2017) highlighting the essential role of education in cancer care and management of persons living with head and neck cancer. The comparatively diminished odds of high distress amongst respondents with tertiary education as established by this study, is in sync with Kuroki et al., (2021) and consistent with other previously research (Dunn et al., 2013; Hong et al., 2015).

Concerning civil status, being single appears to be a risk factor for high distress. However, for poor QoL, this was close to borderline statistical significance and is worthy of further research. Being married appears to offer some level of protection. It could suggest that being in a healthy marriage provides some form of emotional as well as social support for affected partners. This form of support stemming from the perception of being loved and valued is essential to better-

QoL, building resilience and sustaining hope (Gouzman et al., 2015; Seiler & Jenewein, 2019). The latter two being key components of the psychological capital theory. Several studies have confirmed being married or in a long-term relationship is a predictive factor of good QoL and an objective predictor of survival in PLWC (Ding et al., 2021; X. Li et al., 2017; Qiu et al., 2016). Nevertheless, this is not to suggest that simply being married implies a healthy happy relationship. The degree of marital adjustment between partners is important as was confirmed by (Brandão et al., 2017) in their systematic review on patients with breast cancer.

In relation to the number of children, the ideal appears to be 1 to 2 children as the risk of high distress is increased by more children or being childless. This could be due to multiple reasons. The mean age of this study being 55 years, could be suggestive of the participants involved in parenting roles. Because data was not collected on ages of children, this study can only speculate that assuming children were minors or young adults, a greater number would imply patients experiencing double dose of distress emanating from the combined effect of the innumerable demands of the illness as well as the challenges of parenting. Such parenting concerns have been associated with high distress and poor QoL especially in parents with advanced cancer (E. M. Park et al., 2016)

Low symptom burden and receiving psychological service prior to cancer treatment appear to be protective against high distress. While patients who reported experiencing 3 to 5 symptoms reported 3.59 times increased odds of high distress, those with 6 or more symptoms had odds of 5.10. Top symptoms reported included pain, fatigue, weight loss, sleep disturbance and loss of appetite. High symptom burden can affect functionality and lead to serious distress in PLWC. This study findings are similar to those reported in other studies (Blenkiron et al., 2014; Peters et al., 2020a).

Psychological services have been shown to offer many benefits to PLWC, including learning coping skills, reducing distress, and improving QoL. This study confirmed over half of the

respondents reported not to have ever received psycho-oncology services prior to starting medical interventions. Accordingly, the odds of high distress were over three folds for such persons. While a plethora of factors could account for this, it is fit to think that in resource constrained settings, health system context challenges pose barriers to assessing these important services. Socio-cultural factors tagging anything psychology to mental illness could be a hurdle preventing patients from assessing such services. Deshields et al., (2021) identified patients' functional limitations, poor health literacy amongst patients, and lack of consensus on screening measures as some of the barriers to addressing distress in oncology. psychological services such as screening for distress, teaching coping strategies and helping build psychological capital are crucial components of oncology care (Peters et al., 2020a; Seiler & Jenewein, 2019)

Additionally, this study revealed that the odds of experiencing high distress was 1.68 times more in persons with no comorbidities compared to those with other disease conditions such as hypertension and diabetes. It is possible that having lived with comorbid conditions for some time, these individuals may have, to some extent acquired some effective coping strategies as well as self-care management and are possibly benefiting from good social support and resilience.

Crude analysis implicated unemployment and low asset index quantile in being potential risk factors for high distress. These two socioeconomic factors are confirmed as significant resource-related issues complicating the challenge of cancer management in Sub-Saharan Africa (Twahir et al., 2021). According to research, those who are unemployed are more likely than people who are employed to express distress (Reneflot & Evensen, 2014). Even amongst the 'cancer-free' Ghanaian population, distress has been strongly linked to unemployment and the association being described as bidirectional (Canavan et al., 2013). Comparatively, persons in the early period of cancer diagnosis (< 1 year) were also reported to be associated with

increased odds of higher distress. The diagnosis of cancer hits one like a raging storm and can leave many unsettled for quite a while. The physical, emotional, social, spiritual, and financial implications can throw one into a state of depressive rumination, causing significant distress. The high distress level in early diagnosed patients resonates with study by Conversano et al., (2020) stressing that distress is pronounced during the diagnostic phase of cancer and highlighting the impact of the diagnosis on psychological functioning.

5.3 Prevalence of good QoL and associated factors amongst persons living with cancer

For patients living with cancer, one of the most concerning health issues is QoL. This construct encompasses the expression of overall life satisfaction, as determined by the mentally alert patient whose life is being evaluated as he/she lives the illness experience. The concept is a multifaceted non-static patient-reported outcome and covers views on domains such as physical, psychological, social, spiritual as well as level of independence. The World Health Organization (WHO) defines QoL as the "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHO, 1996). Consistent with previous study in the field of oncology, QoL showed a significant strong negative correlation with psychosocial distress (Prapa et al., 2021). The prevalence of good QoL in this study was 52.7%, in contrast to finding by a study conducted in India by Nayak et al., (2017) and Bangladesh by Alam et al., (2020). Seeing that health is defined in a cultural context, sociocultural and dispositional factors could account for the differences observed. In concordance with ElMokhallalati et al.,(2022), good QoL in this study was influenced by respondents symptom burden.

Adjusted analysis revealed that having more than two children, experiencing at least 3 cancer related symptoms, no comorbidities and not receiving psychological services were significantly associated with lower odds of good QoL. The odds of good QoL appeared to decline with increasing number of children (3 or more). The majority of respondents reported

being diagnosed within not more than a year of this study. It is possible that the distress usually experienced in this phase of the disease trajectory, is compounded by the fear of death and preoccupation about leaving behind many dependents.

A similar trend was observed with regards to symptoms burden. The odds of good QoL reduced with reported increase of cancer related symptoms from 3 upwards. Nayak et al., (2017) also confirmed more symptom burden was negatively associated with good QoL. This outcome is expounded by the adverse impact symptom burden has on patient's functionality and QoL (Velure et al., 2022). Interestingly, in reference to persons who reported having other comorbid conditions, lower odds of good QoL were observed in respondents with no comorbid conditions. The main comorbid conditions recorded were also chronic illnesses. It is possible that respondents with these conditions have gained some level of mastery over the demands of living with chronic illness as well as managing illness related tasks. This previous exposure to cognitive adaptation and coping strategies may confer the benefit of resilience and position such individuals to better psychological adjustment compared to those with no previous exposure (Revenson & Hoyt, 2016). Respondents who had received psychological services prior to commencing interventions reported better odds of good QoL compared to those who reported not receiving any such services.

5.4 Mediation effect of resilience and social support on the relationship between psychological distress and quality of life in persons living with cancer

This study failed to reject the first and second hypotheses as there was insufficient evidence supporting resilience and social support as mediators of the relationship between distress and QoL in PLWC. Similar finding was reported by Lee & Kim., (2018) concluding that resilience had no mediating impact on the connection between uncertainty, distress, and health-related QoL. However, among adolescents with cancer, resilience was found to mediate the relationship between distress due to cancer symptoms and QoL (Wu et al., 2015). It is important

to point out that the current study had only 1.49% of participants who met their definition of adolescents. In a cross-sectional study spanning 14 months among patients with breast cancer, resilience mediated the relationship between anxiety, depression and post traumatic growth (L. Li et al., 2020). The present study contradicts a previous survey in Ghana, which confirm social support as a mediator among depression, anxiety and QoL in a population of women with breast cancer (Kugbey et al., 2020). It is of interest to note that they employed a purposive sampling approach which prevents generalization from the population. Another study among Chinese senior citizens with chronic disease found social support partially mediated the relation between depression and QoL. (L.-N. Kong et al., 2019).

Probable factors accounting for this study's outcomes include the fact that this study focused on a population of persons with mixed cancers. Other factors that were not considered by this study but could serve as probable explanation for findings are the influence of macro level determinants of chronic diseases such as cultural diversity and views on the etiology of cancer as well as individual locus of control and coping styles. The outcome variable tool used, and the phase of the disease trajectory as at the time of the study, bearing in mind that psychological distress remains unsteady throughout the disease course are all probably explanations for the variations observed.

5.5 Effect modification of resilience and social support on the relationship between psychological distress and QoL

For the third hypothesis, this study found sufficient evidence to support resilience as an effect modifier of the relationship between distress and QoL. The null hypothesis (H_3) was thus rejected. Overall, the adjusted odds of good QoL were significantly reduced by 82% if participants had high distress. For modification effect, adjusted odds of good QoL were significantly reduced by 89% among respondents with high distress if they had low resilience.

On the other hand, the odds of good QoL significantly reduced by 72% if participants had high resilience. Similar observation was made by Groarke et al., (2020) where distress was observed to be stronger when resilience was low and weak when resilience was high. Knowing the strong negative relationship between distress and QoL of life, it is fair to infer that QoL would be poor when resilience is low and good when resilience is high.

The present study failed to reject hypothesis four as there was insufficient evidence in favour of social support as a moderator in the relationship between distress and QoL. This was in sharp contrast to recent findings by Xiao et al., (2022) which found social support significantly moderated the impact of chronic disease on distress in a larger population of Chinese adults aged at least 60 years. Possible explanation for this study's finding could be the type, source and quality of social support received, which were not explored in this study.

5.6 Study implications for clinical and public health practice

The evidence from this study has implications for adjustment in the face of life-threatening illness. Although it does not establish resilience and social support as mediators of the relationship between distress and QoL, both intermediate variables significantly affect QoL directly with social support correlating positively with QoL. Resilience was found to moderate the relationship. This study provides evidence supporting the need for a more holistic approach to cancer care and management with a focus on promoting positive psychological traits like resilience and improving social support. Evaluating resilience and social support could inform the tailoring of targeted educational and interventional strategies to reduce distress, develop psychological capital, and ultimately improve the QoL of PLWC. The risk factors for high distress identified could help improve the identification of patients at risk and provide the much-needed support to mitigate their plight. As the global community strives to achieve target 3.4 of the sustainable development goals for 2030, to reduce by one third premature mortality

from non-communicable diseases through prevention, treatment, and promotion of mental health and well-being, concerted efforts must be geared towards extenuating the impact of distress on the QoL of PLWC.

5.7 Strength and limitations

A key strength of this study is that the process adopted to estimate the outcomes were robust and standardized.

However, it is not without some limitations. First, the cross-sectional design of this study only demonstrates correlation between variables statistically. Causality regarding associations cannot be inferred as such, findings must be interpreted in context. Follow-up longitudinal studies are needed to measure the outcomes in PLWC at several time points to assess changes in the disease status. Secondly, data in this study were collected through self-report questionnaires, making it difficult to totally eliminate socially desirable responses. Nevertheless, the scales adapted are standardized.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 Introduction

The main aim of the study was to assess the mechanistic effect of resilience and social support on the association between psychological distress and quality of life among persons living with cancer. This chapter summarizes the results of the study, discusses its implications, and provides recommendations for policy, clinical care, and public health decisions as well as for further research.

6.2 Conclusion

Approximately 2 out of 5 of the study participants reported experiencing high distress; a little over half reported good QoL. Having basic or no formal education, being single, having three or more children, high cancer-related symptom burden, having no comorbid condition and never receiving psychological services were significantly associated with an increase in distress. However, high resilience and social support were associated with distress reduction, underscoring their value as psychosocial buffers. Older age, high cancer-related symptom burden, having no comorbidities, and never receiving psychological services were significant contributors to QoL decline. In view of the hypothetical ideas, this study failed to reject the null hypotheses that resilience and social support do not mediate the relationship between psychological distress and QoL. Although social support was not found to be a mediator, the evidence confirmed a significant positive correlation with QoL. For the third hypothesis, there was sufficient evidence to reject the null hypothesis that resilience does not modify the association between distress and QoL. From the logistic regression model of association between distress and QoL modified by level of resilience, the odds of good QoL was better with high resilience compared to low resilience. This confirms resilience as a protective factor

for good QoL in PLWC. Although sufficient evidence was not found to support social support as an effect modifier, social support correlated positively with QoL. The pathways through which resilience and social support may influence QoL and distress warrant clarification as their hypothesized mediating effects were insignificant. Additional research should continue elucidating these complex associations given mixed findings across cultural settings. Prospective longitudinal designs could provide more conclusive insight into mediation processes. Overall, the disproportionate emotional burden revealed underscores the need for accessible, culturally appropriate psychosocial services aimed at fostering resilient coping and social capacities. Targeting interventions to at-risk demographic and clinical subgroups could help address disparities. As cancer prevalence rises amid strained healthcare resources, developing sustainable models of psychosocial supportive care should be a priority in this underserved population. Oncologists and other healthcare professionals may not be aware of the magnitude of co-morbid psychological distress in the cancer community. This study thus provides evidence supporting the need for a more holistic approach to cancer care and management with a focus on strengthening resilience while improving social support. It illuminates the urgency in understanding the dynamics of factors that palliate the relationship between distress and QoL and has key implications for enhancing psycho-oncology services to promote the mental health and well-being of patients with cancer in Ghana.

6.3 Recommendation

Cancer is of global public health concern as its incidence continues to soar. Amidst major risk factors and barriers to cancer care in Ghana, the weight of the disease burden is heavy on the health system. Accordingly, addressing severe distress and its long-term implication for the QoL of PLWC remains a matter of concern for all stake holders. To promote the mental health and wellbeing of PLWC, this study provides evidence supporting the following recommendations:

1. Policy: This study highlights the critical need for psycho-oncology services in our health delivery system. The Ministry of Health and stakeholders in cancer care and management should consider the development, implementation and advocacy of policies focused on integrating and sustaining psycho-oncology care. At the health system level, expanding the psychosocial oncology workforce through task-shifting approaches could help meet support needs despite shortages (Levit & Patlak, 2009). Oncology services must be augmented to promote programs targeted at developing resilience and encouraging social support at the individual, family, and community levels.
2. Clinical Care: Clinically, integrating routine psychological distress screening at diagnosis and before treatment initiation could help timely identify high-risk patients in greatest need of services. Evidence-based psychosocial interventions like cognitive behavioural therapy, relaxation training, and motivational interviewing could be made more available to strengthen coping skills and resilience (van der Heijden et al., 2017). To arrest QoL decline, clinical care models should incorporate comprehensive symptom assessment and management as a standard component of treatment planning. Referral systems to rehabilitation and palliative care specialists may further augment physical, emotional, and functional well-being (Hugar et al., 2021). For high-risk patients with cancer, clinical care protocols could be modified to provide additional psychosocial support for patients with low education, insecure relationships, extensive caregiving demands, and limited social support. Support groups tailored to such individuals could provide beneficial targeted intervention.
3. Public Health: For public health, community-based psychosocial counselling and skills training integrated into cancer outreach could help build distress management capacities. Partnerships with faith and traditional leaders could encourage social

support leveraging indigenous coping methods. Patient navigation programs may further promote access to information and resources in underserved areas (Hutchison et al., 2011).

4. Future Research: Future study could adopt a prospective longitudinal approach on larger sample of different cancer types in order to fully understand the mechanistic effect of social support and resilience on the relationship between distress and QoL.

These recommendations could deliver more holistic, patient-centered supportive care in Ghana's overburdened cancer care system.

REFERENCE

Abda, N., Najdi, A., Fakir, S. E., Tachfouti, N., Berraho, M., Khazraji, Y. C., Abousselham, L., Belakhel, L., Bekkali, R., & Nejjari, C. (2017). Knowledge, Attitudes, and Preventive Practice Towards Breast Cancer among General Practitioner Health Professionals in Morocco. *Asian Pacific Journal of Cancer Prevention : APJCP*, *18*(4), 963–968. https://doi.org/10.22034/APJCP.2017.18.4.963

Abdi, H. (2007). Z-scores. *Encyclopedia of Measurement and Statistics*, *3*, 1055–1058.

Abu-Odah, H., Molassiotis, A., Zhao, I. Y., Su, J. J., & Allsop, M. J. (2022). Psychological distress and associated factors among Palestinian advanced cancer patients: A cross-sectional study. *Frontiers in Psychology*, *13*. https://www.frontiersin.org/articles/10.3389/fpsyg.2022.1061327

ACS. (2022). *Sub-Saharan Africa*. The Cancer Atlas. http://canceratlas.cancer.org/n6X

Adam, A., & Koranteng, F. (2020). Availability, accessibility, and impact of social support on breast cancer treatment among breast cancer patients in Kumasi, Ghana: A qualitative study. *PLOS ONE*, *15*(4), e0231691. https://doi.org/10.1371/journal.pone.0231691

Agostinelli, G., Muzzatti, B., Serpentini, S., Spina, M., & Annunziata, M. A. (2022). Cancer-Related Psychological Distress in Lymphoma Survivor: An Italian Cross-Sectional Study. *Frontiers in Psychology*, *13*. https://www.frontiersin.org/article/10.3389/fpsyg.2022.872329

Alam, M. M., Rahman, T., Afroz, Z., Chakraborty, P. A., Wahab, A., Zaman, S., & Hawlader, M. D. H. (2020). Quality of Life (QoL) of cancer patients and its association with nutritional and performance status: A pilot study. *Heliyon*, *6*(10), Article 10. https://doi.org/10.1016/j.heliyon.2020.e05250

Alizadeh, S., Khanahmadi, S., Vedadhir, A., & Barjasteh, S. (2018). The Relationship between Resilience with Self- Compassion, Social Support and Sense of Belonging in Women with Breast Cancer. *Asian Pacific Journal of Cancer Prevention*, *19*(9). https://doi.org/10.22034/APJCP.2018.19.9.2469

Allen, L., Williams, J., Townsend, N., Mikkelsen, B., Roberts, N., Foster, C., & Wickramasinghe, K. (2017). Socioeconomic status and non-communicable disease behavioural risk factors in low-income and lower-middle-income countries: A systematic review. *The Lancet Global Health*, *5*(3), e277–e289. https://doi.org/10.1016/S2214-109X(17)30058-X

Almigbal, T. H., Almutairi, K. M., Fu, J. B., Vinluan, J. M., Alhelih, E., Alonazi, W. B., Batais, M. A., Alodhayani, A. A., & Mubaraki, M. A. (2019). Assessment of psychological distress among cancer patients undergoing radiotherapy in Saudi Arabia. *Psychology Research and Behavior Management*, *12*, 691–700. https://doi.org/10.2147/PRBM.S209896

Amo-Antwi, K., Agambire, R., Konney, T. O., Nguah, S. B., Dassah, E. T., Nartey, Y., Appiah-Kubi, A., Tawiah, A., Tannor, E. K., Peprah, A., Ansah, M. B., Sam, D., Akakpo, P. K., Ankobea, F., Djokoto, R. M., Idun, M. Y. K., Opare-Addo, H. S., Opoku, B. K., Odoi, A. T., & Johnston, C. (2022). Health-related quality of life among cervical cancer survivors at a tertiary hospital in Ghana. *PLOS ONE*, *17*(6), e0268831. https://doi.org/10.1371/journal.pone.0268831

Anuk, D., Özkan, M., Kizir, A., & Özkan, S. (2019). The characteristics and risk factors for common psychiatric disorders in patients with cancer seeking help for mental health. *BMC Psychiatry*, *19*(1), 269. https://doi.org/10.1186/s12888-019-2251-z

APS. (2020). *Building your resilience*. Https://Www.Apa.Org. https://www.apa.org/topics/resilience

Arnaboldi, P., Riva, S., Crico, C., & Pravettoni, G. (2017). A systematic literature review exploring the prevalence of post-traumatic stress disorder and the role played by stress and traumatic stress in breast cancer diagnosis and trajectory. *Breast Cancer : Targets and Therapy*, *9*, 473–485. https://doi.org/10.2147/BCTT.S111101

Arts, L. P. J., Oerlemans, S., Schoormans, D., Sanders, A. L. T. M., Stevens, W. B. C., Posthuma, E. F. M., Tick, L. W., & van de Poll-Franse, L. V. (2021). Psychological distress among patients with lymphoma: The association with personality and coping strategies. *Journal of Psychosocial Oncology Research and Practice*, *3*(1), Article 1. https://doi.org/10.1097/OR9.0000000000000041

Ayandipo, O., Wone, I., Kenu, E., Fasehun, L.-K., Ayandipo, O., Gaye, F., Ojo, A., Ayoola, Y., Omogi, J., Lakew, D., & Thiam, S. (2020). Cancer ecosystem assessment in West Africa: Health systems gaps to prevent and control cancers in three countries: Ghana, Nigeria and Senegal. *The Pan African Medical Journal*, *35*(90), Article 90. https://doi.org/10.11604/pamj.2020.35.90.18516

Bahnassy, A. A., Abdellateif, M. S., & Zekri, A.-R. N. (2020). Cancer in Africa: Is It a Genetic or Environmental Health Problem? *Frontiers in Oncology*, *10*. https://www.frontiersin.org/article/10.3389/fonc.2020.604214

Bergerot, C. D., Philip, E. J., Bergerot, P. G., & Pal, S. K. (2020). Distress and Quality of Life Among Patients with Advanced Genitourinary Cancers. *European Urology Focus*, *6*(6), 1150–1154. https://doi.org/10.1016/j.euf.2019.10.014

Bickler, S. W., Wang, A., Amin, S., Halbach, J., Lizardo, R., Cauvi, D. M., & De Maio, A. (2018). Urbanization in sub-Saharan Africa: Declining rates of chronic and recurrent infection and their possible role in the origins of non-communicable diseases. *World Journal of Surgery*, *42*(6), 1617–1628. https://doi.org/10.1007/s00268-017-4389-5

Binka, C., Doku, D. T., & Awusabo-Asare, K. (2017). Experiences of cervical cancer patients in rural Ghana: An exploratory study. *PLOS ONE*, *12*(10), e0185829. https://doi.org/10.1371/journal.pone.0185829

Bitew, T. D., Ayenew, W., Baye, T., & Eshetu, E. (2021). *Health Related Quality of Life and Its Determinants Among Breast Cancer Patients in Africa: A Systematic Review and Meta-Analysis* [Preprint]. In Review. https://doi.org/10.21203/rs.3.rs-482636/v1

Blenkiron, P., Brooks, A., Dearden, R., & McVey, J. (2014). Use of the distress thermometer to evaluate symptoms, outcome and satisfaction in a specialist psycho-oncology service. *General Hospital Psychiatry*, *36*(6), 607–612. https://doi.org/10.1016/j.genhosppsych.2014.06.003

Brandão, T., Pedro, J., Nunes, N., Martins, M. V., Costa, M. E., & Matos, P. M. (2017). Marital adjustment in the context of female breast cancer: A systematic review. *Psycho-Oncology*, *26*(12), 2019–2029. https://doi.org/10.1002/pon.4432

Breuer, N., Sender, A., Daneck, L., Mentschke, L., Leuteritz, K., Friedrich, M., Nowe, E., Stöbel-Richter, Y., & Geue, K. (2017). How do young adults with cancer perceive social support? A qualitative study. *Journal of Psychosocial Oncology*, *35*(3), 292–308. https://doi.org/10.1080/07347332.2017.1289290

Bultz, B. D., & Carlson, L. E. (2005). Emotional Distress: The Sixth Vital Sign in Cancer Care. *Journal of Clinical Oncology*, *23*(26), 6440–6441. https://doi.org/10.1200/JCO.2005.02.3259

Burgoyne, M. J., Bingen, K., Leuck, J., Dasgupta, M., Ryan, P., & Hoffmann, R. G. (2015). Cancer-Related Distress in Young Adults Compared to Middle-Aged and Senior Adults. *Journal of Adolescent and Young Adult Oncology*, *4*(2), 56–63. https://doi.org/10.1089/jayao.2014.0005

Cal, S. F., Sá, L. R. de, Glustak, M. E., & Santiago, M. B. (2015). Resilience in chronic diseases: A systematic review. *Cogent Psychology*, *2*(1), 1024928. https://doi.org/10.1080/23311908.2015.1024928

Canavan, M. E., Sipsma, H. L., Adhvaryu, A., Ofori-Atta, A., Jack, H., Udry, C., Osei-Akoto, I., & Bradley, E. H. (2013). Psychological distress in Ghana: Associations with employment and lost productivity. *International Journal of Mental Health Systems*, *7*(1), 9. https://doi.org/10.1186/1752-4458-7-9

Carlson, L. E., Zelinski, E. L., Toivonen, K. I., Sundstrom, L., Jobin, C. T., Damaskos, P., & Zebrack, B. (2019). Prevalence of psychosocial distress in cancer patients across 55 North American cancer centers. *Journal of Psychosocial Oncology*, *37*(1), 5–21. https://doi.org/10.1080/07347332.2018.1521490

Caruso, R., GiuliaNanni, M., Riba, M. B., Sabato, S., & Grassi, L. (2017). Depressive Spectrum Disorders in Cancer: Diagnostic Issues and Intervention. A Critical Review. *Current Psychiatry Reports*, *19*(6), 33. https://doi.org/10.1007/s11920-017-0785-7

Celik, G. K., Çakır, H., & Kut, E. (2021). Mediating Role of Social Support in Resilience and Quality of Life in Patients with Breast Cancer: Structural Equation Model Analysis. *Asia-Pacific Journal of Oncology Nursing*, *8*(1), Article 1. https://doi.org/10.4103/apjon.apjon_44_20

Chabowski, M., Jankowska-Polanska, B., Lomper, K., & Janczak, D. (2018). The effect of coping strategy on quality of life in patients with NSCLC. *Cancer Management and Research*, *10*, 4085–4093. https://doi.org/10.2147/CMAR.S175210

Choi, J., Kim, S., Choi, M., & Hyung, W. J. (2022). Factors affecting the quality of life of gastric cancer survivors. *Supportive Care in Cancer*, *30*(4), 3215–3224. https://doi.org/10.1007/s00520-021-06683-y

Clark, P. G., Rochon, E., Brethwaite, D., & Edmiston, K. K. (2011). Screening for psychological and physical distress in a cancer inpatient treatment setting: A pilot study. *Psycho-Oncology*, *20*(6), 664–668. https://doi.org/10.1002/pon.1908

Cochran, W. G. (1963). *Sampling Techniques* (2nd Ed.). John Wiley and Sons, Inc.

Colonio, C., Lecman, L., Pinto, J. A., Vallejos, C., & Pinillos, L. (2021). Life expectancy and cancer survival in Oncosalud: Outcomes over a 15-year period in a Peruvian private institution. *Ecancermedicalscience*, *15*. https://doi.org/10.3332/ecancer.2021.1336

Conversano, C., Di Giuseppe, M., Miccoli, M., Ciacchini, R., Di Silvestre, A., Lo Sterzo, R., Gemignani, A., & Orrù, G. (2020). Retrospective Analyses of Psychological Distress and Defense Style Among Cancer Patients. *Clinical Neuropsychiatry*, *17*(4), 217–224. https://doi.org/10.36131/cnfioritieditore20200403

Deshields, T. L., Wells-Di Gregorio, S., Flowers, S. R., Irwin, K. E., Nipp, R., Padgett, L., & Zebrack, B. (2021). Addressing distress management challenges: Recommendations from the consensus panel of the American Psychosocial Oncology Society and the Association of Oncology Social Work. *CA: A Cancer Journal for Clinicians*, *71*(5), 407–436. https://doi.org/10.3322/caac.21672

Ding, Z., Yu, D., Li, H., & Ding, Y. (2021). Effects of marital status on overall and cancer-specific survival in laryngeal cancer patients: A population-based study. *Scientific Reports*, *11*(1), Article 1. https://doi.org/10.1038/s41598-020-80698-z

Duan-Porter, W., Cohen, H. J., Demark-Wahnefried, W., Sloane, R., Pendergast, J. F., Snyder, D. C., & Morey, M. C. (2016). Physical resilience of older cancer survivors: An emerging concept. *Journal of Geriatric Oncology*, *7*(6), 471–478. https://doi.org/10.1016/j.jgo.2016.07.009

Ebob-Anya, B.-A., & Bassah, N. (2022). Psychosocial distress and the quality of life of cancer patients in two health facilities in Cameroon. *BMC Palliative Care*, *21*, 96. https://doi.org/10.1186/s12904-022-00981-w

Ekem-Ferguson, G., Swaray, S., Tetteh, J., Swaray, A., Essuman, A., Acheampong, F., & Yawson, A. E. (2022). *The nexus of mental health and COVID-19-related duties among medical laboratory professionals: The mediating role of resilience*. *3*, 303–311. https://doi.org/10.46829/hsijournal.2022.6.3.1.303-311

Ekem-Ferguson, G., Tetteh, J., Udofia, E. A., Doku, A., Swaray, S. M., Mohammed, S., & Yawson, A. E. (2020). Influence of perceived social support on depression among Type 2 diabetes patients: A concurrent cross-sectional mixed-method study. *Health Sciences Investigations Journal*, *1*(2), 93–104. https://doi.org/10.46829/hsijournal.2020.6.1.2.93-104

Ekwueme, D. U., Yabroff, K. R., Guy, G. P., Banegas, M. P., de Moor, J. S., Li, C., Han, X., Zheng, Z., Soni, A., Davidoff, A., Rechis, R., & Virgo, K. S. (2014). *Medical Costs and Productivity Losses of Cancer Survivors—United States, 2008–201*. *63*(23), 16.

El Haidari, R., Abbas, L. A., Nerich, V., & Anota, A. (2020). Factors Associated with Health-Related Quality of Life in Women with Breast Cancer in the Middle East: A Systematic Review. *Cancers*, *12*(3), Article 3. https://doi.org/10.3390/cancers12030696

ElMokhallalati, Y., Alaloul, E., Shatat, M., Shneewra, T., El Massri, S., Shaer, O., Relton, S., Abu-Odah, H., & Allsop, M. J. (2022). The Symptom Burden and Quality of Life in Cancer Patients in the Gaza Strip, Palestine: A Cross-Sectional Study. *PLoS ONE*, *17*(1), e0262512. https://doi.org/10.1371/journal.pone.0262512

Engel, G. L. (1977). *The Need for a New Medical Model: A Challenge for Biomedicine*.

Fasinu, P., & Orisakwe, O. E. (2013). Heavy metal pollution in sub-Saharan Africa and possible implications in cancer epidemiology. *Asian Pacific Journal of Cancer Prevention: APJCP*, *14*(6), 3393–3402. https://doi.org/10.7314/apjcp.2013.14.6.3393

Fernández-González, L., & Bravo-Valenzuela, P. (2019). Effective interventions to improve the health literacy of cancer patients. *Ecancermedicalscience*, *13*, 966. https://doi.org/10.3332/ecancer.2019.966

Frey, B. B. (2018). T Scores. In *T Scores*. SAGE Publications, Inc. https://doi.org/10.4135/9781506326139.n683

Gouzman, J., Cohen, M., Ben-Zur, H., Shacham-Shmueli, E., Aderka, D., Siegelmann-Danieli, N., & Beny, A. (2015). Resilience and Psychosocial Adjustment in Digestive System Cancer. *Journal of Clinical Psychology in Medical Settings*, *22*(1), 1–13. https://doi.org/10.1007/s10880-015-9416-9

Graf, J., & Stengel, A. (2021). Psychological Burden and Psycho-Oncological Interventions for Patients With Hepatobiliary Cancers–A Systematic Review. *Frontiers in Psychology*, *12*. https://www.frontiersin.org/article/10.3389/fpsyg.2021.662777

Grassi, L., Spiegel, D., & Riba, M. (2017). Advancing psychosocial care in cancer patients. *F1000Research*, *6*, 2083. https://doi.org/10.12688/f1000research.11902.1

Groarke, A., Curtis, R., Skelton, J., & Groarke, J. M. (2020). Quality of life and adjustment in men with prostate cancer: Interplay of stress, threat and resilience. *PLoS ONE*, *15*(9), e0239469. https://doi.org/10.1371/journal.pone.0239469

Hajigholami, A., Yusefzadeh, M., Amini Pozveh, Z., & Ansari, H. (2021). The relationship between social support and life expectancy in cancer patients during chemotherapy;an original study. *Immunopathologia Persa*, *8*(1), e11–e11. https://doi.org/10.34172/ipp.2022.11

Hall, J. A., & Roter, D. L. (2011). Physician–Patient Communication. In H. S. Friedman (Ed.), *The Oxford Handbook of Health Psychology* (p. 0). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195342819.013.0014

Helmreich, I., Kunzler, A., Chmitorz, A., König, J., Binder, H., Wessa, M., & Lieb, K. (2017). Psychological interventions for resilience enhancement in adults. *The Cochrane Database of Systematic Reviews*, *2017*(2), CD012527. https://doi.org/10.1002/14651858.CD012527

Hofman, A., Zajdel, N., Klekowski, J., & Chabowski, M. (2021). Improving Social Support to Increase QoL in Lung Cancer Patients. *Cancer Management and Research*, *13*, 2319–2327. https://doi.org/10.2147/CMAR.S278087

Hong, J.-F., Zhang, W., Song, Y.-X., Xie, L.-F., & Wang, W.-L. (2015). Psychological distress in elderly cancer patients. *International Journal of Nursing Sciences*, *2*(1), 23–27. https://doi.org/10.1016/j.ijnss.2015.02.006

Huang, C.-Y., & Hsu, M.-C. (2013). Social support as a moderator between depressive symptoms and quality of life outcomes of breast cancer survivors. *European Journal of Oncology Nursing : The Official Journal of European Oncology Nursing Society*, *17*. https://doi.org/10.1016/j.ejon.2013.03.011

IARC. (2021, March). *Cancer today*. https://gco.iarc.fr/today/data/factsheets/populations/288-ghana-fact-sheets.pdf

Islam, F. M. A. (2019). Psychological distress and its association with socio-demographic factors in a rural district in Bangladesh: A cross-sectional study. *PLOS ONE*, *14*(3), e0212765. https://doi.org/10.1371/journal.pone.0212765

Jabbour, J., Milross, C., Sundaresan, P., Ebrahimi, A., Shepherd, H. L., Dhillon, H. M., Morgan, G., Ashford, B., Abdul-Razak, M., Wong, E., Veness, M., Palme, C. E., Froggatt, C., Cohen, R., Ekmejian, R., Tay, J., Roshan, D., & Clark, J. R. (2017).

Education and support needs in patients with head and neck cancer: A multi-institutional survey. *Cancer*, *123*(11), 1949–1957. https://doi.org/10.1002/cncr.30535

Juma, K., A. Juma, P., Shumba, C., Otieno, P., & Asiki, G. (2020). Non-Communicable Diseases and Urbanization in African Cities: A Narrative Review. In E. Eze Anugwom & N. Awofeso (Eds.), *Public Health in Developing Countries—Challenges and Opportunities*. IntechOpen. https://doi.org/10.5772/intechopen.89507

Kagee, A. (2022). The need for psychosocial oncology research in sub-Saharan Africa: A review of the terrain. *South African Journal of Psychology*, *52*(3), 392–403. https://doi.org/10.1177/00812463221093842

KBTH. (2020). *About us – Brief History*. https://kbth.gov.gh/brief-history/

Kim, G. M., Kim, S. J., Song, S. K., Kim, H. R., Kang, B. D., Noh, S. H., Chung, H. C., Kim, K. R., & Rha, S. Y. (2017). Prevalence and prognostic implications of psychological distress in patients with gastric cancer. *BMC Cancer*, *17*, 283. https://doi.org/10.1186/s12885-017-3260-2

Kingham, T. P., Alatise, O. I., Vanderpuye, V., Casper, C., Abantanga, F. A., Kamara, T. B., Olopade, O. I., Habeebu, M., Abdulkareem, F. B., & Denny, L. (2013). Treatment of cancer in sub-Saharan Africa. *The Lancet Oncology*, *14*(4), e158–e167. https://doi.org/10.1016/S1470-2045(12)70472-2

Ko, H.-C., Wang, L.-L., & Xu, Y.-T. (2013). Understanding the Different Types of Social Support Offered by Audience to A-List Diary-Like and Informative Bloggers. *Cyberpsychology, Behavior, and Social Networking*, *16*(3), 194–199. https://doi.org/10.1089/cyber.2012.0297

Kong, L.-N., Hu, P., Yao, Y., & Zhao, Q.-H. (2019). Social support as a mediator between depression and quality of life in Chinese community-dwelling older adults with

chronic disease. *Geriatric Nursing*, *40*(3), 252–256. https://doi.org/10.1016/j.gerinurse.2018.10.014

Kong, S. V., & Guan, N. C. (2019). Burden in Family Caregivers of Cancer Patients: The Association with Depression, Religiosity and Religious Coping. *Asian Pacific Journal of Cancer Care*, *4*(4), Article 4. https://doi.org/10.31557/apjcc.2019.4.4.171-182

Krasnoselskyi, M. V., Kyrylova, O. O., Rublova, T. V., Svynarenko, A. V., & Artiukh, S. V. (2022). ASSESSMENT OF DISTRESS DYNAMICS AND QUALITY OF LIFE OF CANCER PATIENTS AT THE STAGE OF RADIATION THERAPY AND POSSIBILITIES OF THEIR CORRECTION. *Problemy Radiatsiinoi Medytsyny Ta Radiobiolohii*, *27*, 353–362. https://doi.org/10.33145/2304-8336-2022-27-353-362

Kroenke, K., Johns, S. A., Theobald, D., Wu, J., & Tu, W. (2013). Somatic symptoms in cancer patients trajectory over 12 months and impact on functional status and disability. *Supportive Care in Cancer*, *21*(3), 765–774.

Kugbey, N., Meyer-Weitz, A., & Oppong Asante, K. (2019). Mental adjustment to cancer and quality of life among women living with breast cancer in Ghana. *The International Journal of Psychiatry in Medicine*, *54*(3), 217–230. https://doi.org/10.1177/0091217418805087

Kugbey, N., Oppong Asante, K., & Meyer-Weitz, A. (2020). Depression, anxiety and quality of life among women living with breast cancer in Ghana: Mediating roles of social support and religiosity. *Supportive Care in Cancer: Official Journal of the Multinational Association of Supportive Care in Cancer*, *28*(6), 2581–2588. https://doi.org/10.1007/s00520-019-05027-1

Kuroki, L. M., Morris, D. H., Greenwade, M., Landon, M., Hagemann, A. R., Thaker, P. H., Massad, L. S., McCourt, C. K., Fuh, K. C., Powell, M. A., Mutch, D. G., Khabele, D., & Vanderlan, J. R. (2021). Impact of employment and insurance status on distress in

gynecologic oncology patients. *Gynecologic Oncology*, *161*(2), 477–482. https://doi.org/10.1016/j.ygyno.2021.01.038

Lavelle, C., Ismail, M. F., Doherty, K., Bowler, A., Mohammad, M. M., & Cassidy, E. M. (2017). Association between psychological distress and cancer type in patients referred to a psycho-oncology service. *Irish Medical Journal*, *110*(6), 579.

Lee, J., & Kim, M. (2018). Relationships among Uncertainty, Distress, and Quality of Life in Lung Cancer Patients: Mediating effect of Resilience. *Journal of muscle and joint health*, *25*(2), 148–156. https://doi.org/10.5953/JMJH.2018.25.2.148

Leong Abdullah, M. F. I., Nik Jaafar, N. R., Zakaria, H., Rajandram, R. K., Mahadevan, R., Mohamad Yunus, M. R., & Shah, S. A. (2015). Posttraumatic growth, depression and anxiety in head and neck cancer patients: Examining their patterns and correlations in a prospective study. *Psycho-Oncology*, *24*(8), 894–900. https://doi.org/10.1002/pon.3740

Leung, J., Atherton, I., Kyle, R. G., Hubbard, G., & McLaughlin, D. (2016). Psychological distress, optimism and general health in breast cancer survivors: A data linkage study using the Scottish Health Survey. *Supportive Care in Cancer*, *24*(4), 1755–1761. https://doi.org/10.1007/s00520-015-2968-2

Li, L., Hou, Y., Kang, F., & Wei, X. (2020). The mediating and moderating roles of resilience in the relationship between anxiety, depression, and post-traumatic growth among breast cancer patients based on structural equation modeling: An observational study. *Medicine*, *99*, e23273. https://doi.org/10.1097/MD.0000000000023273

Li, X., Liu, Y., Wang, Y., Ruan, C., Wang, H., Liang, X., Sun, Y., & Hu, Z. (2017). The influence of marital status on survival of gallbladder cancer patients: A population-based study. *Scientific Reports*, *7*(1), Article 1. https://doi.org/10.1038/s41598-017-05545-0

Liao, M.-N., Chen, M.-F., Chen, S.-C., & Chen, P.-L. (2008). Uncertainty and Anxiety During the Diagnostic Period for Women With Suspected Breast Cancer. *Cancer Nursing*, *31*(4), 274. https://doi.org/10.1097/01.NCC.0000305744.64452.fe

Lim, J., Shon, E., Paek, M., & Daly, B. (2014). The Dyadic Effects of Coping and Resilience on Psychological Distress for Cancer Survivor Couples. *Supportive Care in Cancer : Official Journal of the Multinational Association of Supportive Care in Cancer*, *22*(12), 3209–3217. https://doi.org/10.1007/s00520-014-2334-9

Liu, J. J. W., Reed, M., & Girard, T. A. (2017). Advancing resilience: An integrative, multi-system model of resilience. *Personality and Individual Differences*, *111*, 111–118. https://doi.org/10.1016/j.paid.2017.02.007

Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M. (2007). Positive Psychological Capital: Measurement and Relationship with Performance and Satisfaction. *Personnel Psychology*, *60*(3), 541–572. https://doi.org/10.1111/j.1744-6570.2007.00083.x

MacDonald, C., Theurer, J. A., Fung, K., Yoo, J., & Doyle, P. C. (2021). Resilience: An essential element in head and neck cancer survivorship and quality of life. *Supportive Care in Cancer*, *29*(7), 3725–3733. https://doi.org/10.1007/s00520-020-05873-4

Mahase, E. (2019). Cancer overtakes CVD to become leading cause of death in high income countries. *BMJ*, *366*, l5368. https://doi.org/10.1136/bmj.l5368

Martin, C. M., Schofield, E., Napolitano, S., Avildsen, I. K., Emanu, J. C., Tutino, R., Roth, A. J., & Nelson, C. J. (2021). African-centered coping, resilience, and psychological distress in Black prostate cancer patients. *Psycho-Oncology*, *n/a*(n/a). https://doi.org/10.1002/pon.5847

Mason, A., Juyal, R., Das, S. C., Shikha, D., Saini, S., & Semwal, J. (2019). Prevalence and correlates of psychological distress among cancer patients in a tertiary care hospital in

northern India. *International Journal Of Community Medicine And Public Health*, *6*(5), Article 5. https://doi.org/10.18203/2394-6040.ijcmph20191848

Matzka, M., Mayer, H., Köck-Hódi, S., Moses-Passini, C., Dubey, C., Jahn, P., Schneeweiss, S., & Eicher, M. (2016). Relationship between Resilience, Psychological Distress and Physical Activity in Cancer Patients: A Cross-Sectional Observation Study. *PLOS ONE*, *11*(4), e0154496. https://doi.org/10.1371/journal.pone.0154496

Megari, K. (2013). Quality of Life in Chronic Disease Patients. *Health Psychology Research*, *1*(3), Article 3. https://doi.org/10.4081/hpr.2013.e27

Mehnert, A., Brähler, E., Faller, H., Härter, M., Keller, M., Schulz, H., Wegscheider, K., Weis, J., Boehncke, A., Hund, B., Reuter, K., Richard, M., Sehner, S., Sommerfeldt, S., Szalai, C., Wittchen, H.-U., & Koch, U. (2014). Four-Week Prevalence of Mental Disorders in Patients With Cancer Across Major Tumor Entities. *Journal of Clinical Oncology*, *32*(31), 3540–3546. https://doi.org/10.1200/JCO.2014.56.0086

Mehnert, A., Hartung, T. j., Friedrich, M., Vehling, S., Brähler, E., Härter, M., Keller, M., Schulz, H., Wegscheider, K., Weis, J., Koch, U., & Faller, H. (2018a). One in two cancer patients is significantly distressed: Prevalence and indicators of distress. *Psycho-Oncology*, *27*(1), 75–82. https://doi.org/10.1002/pon.4464

Mehnert, A., Hartung, T. j., Friedrich, M., Vehling, S., Brähler, E., Härter, M., Keller, M., Schulz, H., Wegscheider, K., Weis, J., Koch, U., & Faller, H. (2018b). One in two cancer patients is significantly distressed: Prevalence and indicators of distress. *Psycho-Oncology*, *27*(1), Article 1. https://doi.org/10.1002/pon.4464

Melguizo-Garín, A., Martos-Méndez, M. J., & Hombrados-Mendieta, I. (2019). Influencia del apoyo social sobre el estrés y la satisfacción vital en padres de niños con cáncer desde una perspectiva multidimensional. *Psicooncología*, *16*(1), Article 1. https://doi.org/10.5209/PSIC.63646

Mensah, K. B., & Mensah, A. B. B. (2020). Cancer control in Ghana: A narrative review in global context. *Heliyon*, *6*(8), e04564. https://doi.org/10.1016/j.heliyon.2020.e04564

Momenimovahed, Z., Salehiniya, H., Hadavandsiri, F., Allahqoli, L., Günther, V., & Alkatout, I. (2021). Psychological Distress Among Cancer Patients During COVID-19 Pandemic in the World: A Systematic Review. *Frontiers in Psychology*, *12*. https://www.frontiersin.org/article/10.3389/fpsyg.2021.682154

Morasso, G., Costantini, M., Baracco, G., Borreani, C., & Capelli, M. (1996). Assessing Psychological Distress in Cancer Patients: Validation of a Self-Administered Questionnaire. *Oncology*, *53*(4), 295–302. https://doi.org/10.1159/000227576

Morelli, S. A., Lee, I. A., Arnn, M. E., & Zaki, J. (2015). *Emotional and instrumental support provision interact to predict well-being. - PsycNET*. https://doi.apa.org/doiLanding?doi=10.1037%2Femo0000084

Moreno, P. I., Ramirez, A. G., San Miguel-Majors, S. L., Fox, R. S., Castillo, L., Gallion, K. J., Munoz, E., Estabrook, R., Perez, A., Lad, T., Hollowell, C., & Penedo, F. J. (2018). Satisfaction with cancer care, self-efficacy, and health-related quality of life in Latino cancer survivors. *Cancer*, *124*(8), 1770–1779. https://doi.org/10.1002/cncr.31263

Muliira, R. S., Salas, A. S., & O'Brien, B. (2017). Quality of Life among Female Cancer Survivors in Africa: An Integrative Literature Review. *Asia-Pacific Journal of Oncology Nursing*, *4*(1), 6–17. https://doi.org/10.4103/2347-5625.199078

Munir, F., Yarker, J., & McDermott, H. (2009). Employment and the common cancers: Correlates of work ability during or following cancer treatment. *Occupational Medicine*, *59*(6), 381–389. https://doi.org/10.1093/occmed/kqp088

Muthén, B., & Asparouhov, T. (2015). Causal Effects in Mediation Modeling: An Introduction With Applications to Latent Variables. *Structural Equation Modeling: A*

Multidisciplinary Journal, *22*(1), 12–23. https://doi.org/10.1080/10705511.2014.935843

Muzzatti, B., Bomben, F., Flaiban, C., Piccinin, M., & Annunziata, M. A. (2020). Quality of life and psychological distress during cancer: A prospective observational study involving young breast cancer female patients. *BMC Cancer*, *20*(1), 758. https://doi.org/10.1186/s12885-020-07272-8

Nakash, O., Levav, I., Aguilar-Gaxiola, S., Alonso, J., Andrade, L. H., Angermeyer, M. C., Bruffaerts, R., Caldas-de-Almeida, J. M., Florescu, S., de Girolamo, G., Gureje, O., He, Y., Hu, C., de Jonge, P., Karam, E. G., Kovess-Masfety, V., Medina-Mora, M. E., Moskalewicz, J., Murphy, S., … Scott, K. M. (2014). Comorbidity of common mental disorders with cancer and their treatment gap: Findings from the World Mental Health Surveys. *Psycho-Oncology*, *23*(1), 40–51. https://doi.org/10.1002/pon.3372

Nayak, M. G., George, A., Vidyasagar, M., Mathew, S., Nayak, S., Nayak, B. S., Shashidhara, Y., & Kamath, A. (2017). Quality of Life among Cancer Patients. *Indian Journal of Palliative Care*, *23*(4), 445–450. https://doi.org/10.4103/IJPC.IJPC_82_17

Nigah, Z., Ajmal, A., & Abid, S. (2019). *Resilience, perceived social support and psychological stress in diagnosis of cancer*.

Oh, P.-J., & Cho, J.-R. (2020). Changes in Fatigue, Psychological Distress, and Quality of Life After Chemotherapy in Women with Breast Cancer: A Prospective Study. *Cancer Nursing*, *43*(1), E54. https://doi.org/10.1097/NCC.0000000000000689

Ostovar, S., Modarresi Chahardehi, A., Mohd Hashim, I. H., Othman, A., Kruk, J., & Griffiths, M. D. (2022). Prevalence of psychological distress among cancer patients in Southeast Asian countries: A systematic review. *European Journal of Cancer Care*, *31*(6), e13669. https://doi.org/10.1111/ecc.13669

Park, E. M., Deal, A. M., Check, D. K., Hanson, L. C., Reeder-Hayes, K. E., Mayer, D. K., Yopp, J. M., Song, M.-K., Muriel, A. C., & Rosenstein, D. L. (2016). Parenting concerns, quality of life, and psychological distress in patients with advanced cancer. *Psycho-Oncology*, *25*(8), 942–948. https://doi.org/10.1002/pon.3935

Park, J.-H., Park, J.-H., & Kim, S.-G. (2009). Effect of cancer diagnosis on patient employment status: A nationwide longitudinal study in Korea. *Psycho-Oncology*, *18*(7), 691–699. https://doi.org/10.1002/pon.1452

Pásztor, N., Hegyi, B. E., Dombi, E., & Németh, G. (2019). Psychological Distress and Coping Mechanisms in Infertile Couples. *The Open Psychology Journal*, *12*(1). https://doi.org/10.2174/1874350101912010169

Paul, C., Boyes, A., Hall, A., Bisquera, A., Miller, A., & O'Brien, L. (2016). The impact of cancer diagnosis and treatment on employment, income, treatment decisions and financial assistance and their relationship to socioeconomic and disease factors. *Supportive Care in Cancer*, *24*(11), 4739–4746. https://doi.org/10.1007/s00520-016-3323-y

Pejner, M. N., Ziegert, K., & Kihlgren, A. (2012). Trying to cope with everyday life—Emotional support in municipal elderly care setting. *International Journal of Qualitative Studies on Health and Well-Being*, *7*(1), 19613. https://doi.org/10.3402/qhw.v7i0.19613

Peters, L., Brederecke, J., Franzke, A., de Zwaan, M., & Zimmermann, T. (2020a). Psychological Distress in a Sample of Inpatients With Mixed Cancer—A Cross-Sectional Study of Routine Clinical Data. *Frontiers in Psychology*, *11*. https://www.frontiersin.org/article/10.3389/fpsyg.2020.591771

Peters, L., Brederecke, J., Franzke, A., de Zwaan, M., & Zimmermann, T. (2020b). Psychological Distress in a Sample of Inpatients With Mixed Cancer—A Cross-

Sectional Study of Routine Clinical Data. *Frontiers in Psychology*, *11*. https://www.frontiersin.org/articles/10.3389/fpsyg.2020.591771

Pfaendler, K. S., Wenzel, L., Mechanic, M. B., & Penner, K. R. (2015). Cervical Cancer Survivorship: Long-term Quality of Life and Social Support. *Clinical Therapeutics*, *37*(1), 39–48. https://doi.org/10.1016/j.clinthera.2014.11.013

Poręba-Chabros, A., Mamcarz, P., & Jurek, K. (2020). Social support as a moderator between the perception of the disease and stress level in lung cancer patients. *Annals of Agricultural and Environmental Medicine*, *27*(4), 630–635. https://doi.org/10.26444/aaem/123099

Prapa, P., Papathanasiou, I. V., Bakalis, V., Malli, F., Papagiannis, D., & Fradelos, E. C. (2021). Quality of Life and Psychological Distress of Lung Cancer Patients Undergoing Chemotherapy. *World Journal of Oncology*, *12*(2–3), 61–66. https://doi.org/10.14740/wjon1371

Qan'ir, Y., Guan, T., Idiagbonya, E., Dobias, C., Conklin, J. L., Zimba, C. C., Bula, A., Jumbo, W., Wella, K., Mapulanga, P., Bingo, S., Chilemba, E., Haley, J., Montano, N. P., Bryant, A. L., & Song, L. (2022). Quality of life among patients with cancer and their family caregivers in the Sub-Saharan region: A systematic review of quantitative studies. *PLOS Global Public Health*, *2*(3), e0000098. https://doi.org/10.1371/journal.pgph.0000098

Qiu, M., Yang, D., & Xu, R. (2016). Impact of marital status on survival of gastric adenocarcinoma patients: Results from the Surveillance Epidemiology and End Results (SEER) Database. *Scientific Reports*, *6*(1), Article 1. https://doi.org/10.1038/srep21098

Quinten, C., Coens, C., Ghislain, I., Zikos, E., Sprangers, M. A. G., Ringash, J., Martinelli, F., Ediebah, D. E., Maringwa, J., Reeve, B. B., Greimel, E., King, M. T., Bjordal, K.,

Flechtner, H.-H., Schmucker-Von Koch, J., Taphoorn, M. J. B., Weis, J., Wildiers, H., Velikova, G., & Bottomley, A. (2015). The effects of age on health-related quality of life in cancer populations: A pooled analysis of randomized controlled trials using the European Organisation for Research and Treatment of Cancer (EORTC) QLQ-C30 involving 6024 cancer patients. *European Journal of Cancer*, *51*(18), Article 18. https://doi.org/10.1016/j.ejca.2015.08.027

Quiroga, C. V., Binfaré, L. F., Rudnicki, T., & Argimon, I. I. de L. (2018). Rumination and social support as predictors of posttraumatic growth in women with breast cancer: A systematic review. *Psicooncología*, *15*(2), Article 2. https://doi.org/10.5209/PSIC.61437

Ramasubbu, S. K., Pasricha, R. K., Nath, U. K., Rawat, V. S., & Das, B. (2020). Quality of life and factors affecting it in adult cancer patients undergoing cancer chemotherapy in a tertiary care hospital. *Cancer Reports*, *4*(2), e1312. https://doi.org/10.1002/cnr2.1312

Reneflot, A., & Evensen, M. (2014). Unemployment and psychological distress among young adults in the Nordic countries: A review of the literature. *International Journal of Social Welfare*, *23*. https://doi.org/10.1111/ijsw.12000

Revenson, T. A., & Hoyt, M. A. (2016). Chronic Illness and Mental Health. In H. S. Friedman (Ed.), *Encyclopedia of Mental Health (Second Edition)* (pp. 284–292). Academic Press. https://doi.org/10.1016/B978-0-12-397045-9.00151-8

Roberts, L. R., Rivers, B. M., Yates, C. C., Newman, L. A., Sarkodie, B. D., Davis, M. B., Asare-Aboagye, Y., Adjei, A. A., Harris, A. E., & Awuah, B. (2022). Unmet Needs in Oncology Clinical Research and Treatment in Africa: Focus on Ghana. *The Oncologist*, *27*(9), 760–767. https://doi.org/10.1093/oncolo/oyac109

Roick, J., Danker, H., Kersting, A., Dietrich, A., Dietz, A., Papsdorf, K., Meixensberger, J., Stolzenburg, J.-U., Wirtz, H., & Singer, S. (2022). Predictors of psychiatric comorbidity in cancer patients at the time of their discharge from the hospital. *Social Psychiatry and Psychiatric Epidemiology*, *57*(3), 553–561. https://doi.org/10.1007/s00127-021-02138-1

Rossi, A. A., Marconi, M., Taccini, F., Verusio, C., & Mannarini, S. (2022). Screening for Distress in Oncological Patients: The Revised Version of the Psychological Distress Inventory (PDI-R). *Frontiers in Psychology*, *13*. https://www.frontiersin.org/article/10.3389/fpsyg.2022.859478

Ruiz-Rodríguez, I., Hombrados-Mendieta, I., Melguizo-Garín, A., & Martos-Méndez, M. J. (2022). The Importance of Social Support, Optimism and Resilience on the Quality of Life of Cancer Patients. *Frontiers in Psychology*, *13*. https://www.frontiersin.org/articles/10.3389/fpsyg.2022.833176

Sasu, D. D. (2022, November 16). Number of cancer cases in Ghana from 2010 to 2019. *Statista*. https://www.statista.com/statistics/1283497/cancer-cases-in-ghana/#statisticContainer

Scandurra, C., Muzii, B., La Rocca, R., Di Bello, F., Bottone, M., Califano, G., Longo, N., Maldonato, N. M., & Mangiapia, F. (2022). Social Support Mediates the Relationship between Body Image Distress and Depressive Symptoms in Prostate Cancer Patients. *International Journal of Environmental Research and Public Health*, *19*(8), Article 8. https://doi.org/10.3390/ijerph19084825

Seiler, A., & Jenewein, J. (2019). Resilience in Cancer Patients. *Frontiers in Psychiatry*, *10*. https://www.frontiersin.org/articles/10.3389/fpsyt.2019.00208

Sharma, N., & Purkayastha, A. (2017). Factors Affecting Quality of Life in Breast Cancer Patients: A Descriptive and Cross-sectional Study with Review of Literature. *Journal of Mid-Life Health*, *8*(2), 75–83. https://doi.org/10.4103/jmh.JMH_15_17

Sheikhalipour, Z., Ghahramanian, A., Fateh, A., Ghiahi, R., & Onyeka, T. C. (2019). Quality of Life in Women with Cancer and Its Influencing Factors. *Journal of Caring Sciences*, *8*(1), 9–15. https://doi.org/10.15171/jcs.2019.002

Sousa, H., Castro, S., Abreu, J., & Pereira, M. G. (2019). A systematic review of factors affecting quality of life after postmastectomy breast reconstruction in women with breast cancer. *Psycho-Oncology*, *28*(11), 2107–2118. https://doi.org/10.1002/pon.5206

Stefani, L., Rotelli, M., Frulli, A., Amoroso, L., Belloni, L., & Galanti, G. (2016). Mental Health and Quality of Life Perception of Surviving Cancer Patients: A Pilot Study. *Journal of Functional Morphology and Kinesiology*, *1*(3), Article 3. https://doi.org/10.3390/jfmk1030322

Stein, D. J., Benjet, C., Gureje, O., Lund, C., Scott, K. M., Poznyak, V., & Ommeren, M. van. (2019). Integrating mental health with other non-communicable diseases. *BMJ*, *364*, l295. https://doi.org/10.1136/bmj.l295

Taghizadeh, A., Pourali, L., Vaziri, Z., Saedi, H., Behdani, F., & Amel, R. (2018). Psychological Distress in Cancer Patients. *Middle East Journal of Cancer*, *9*, 143–149.

Tareke, M., Bayeh, A. B., Birhanu, M., & Belete, A. (2022). Psychological distress among people living with chronic medical illness and the general population, Northwest Ethiopia: A comparative cross-sectional study. *PLOS ONE*, *17*(12), e0278235. https://doi.org/10.1371/journal.pone.0278235

Taskila, T., & Lindbohm, M. L. (2007). Factors affecting cancer survivors' employment and work ability. *Acta Oncologica*, *46*(4), 446–451. https://doi.org/10.1080/02841860701355048

Thomas, A. S., Kidwell, K. M., Oppong, J. K., Adjei, E. K., Osei-Bonsu, E., Boahene, A., Jiagge, E., Gyan, K., & Merajver, S. D. (2017). Breast Cancer in Ghana: Demonstrating the Need for Population-Based Cancer Registries in Low- and Middle-Income Countries. *Journal of Global Oncology*, *3*(6), 765–772. https://doi.org/10.1200/JGO.2016.006098

Tian, J., & Hong, J.-S. (2014). Assessment of the relationship between resilience and quality of life in patients with digestive cancer. *World Journal of Gastroenterology : WJG*, *20*(48), 18439–18444. https://doi.org/10.3748/wjg.v20.i48.18439

Twahir, M., Oyesegun, R., Yarney, J., Gachii, A., Edusa, C., Nwogu, C., Mangutha, G., Anderson, P., Benjamin, E., Müller, B., & Ngoh, C. (2021). Real-world challenges for patients with breast cancer in sub-Saharan Africa: A retrospective observational study of access to care in Ghana, Kenya and Nigeria. *BMJ Open*, *11*(3), e041900. https://doi.org/10.1136/bmjopen-2020-041900

Velure, G. K., Müller, B., & Hauken, M. Aa. (2022). Symptom burden, psychological distress, and health-related quality of life in cancer survivors with pelvic late radiation tissue injuries. *Supportive Care in Cancer*, *30*(3), 2477–2486. https://doi.org/10.1007/s00520-021-06684-x

Watts, S., Leydon, G., Birch, B., Prescott, P., Lai, L., Eardley, S., & Lewith, G. (2014). Depression and anxiety in prostate cancer: A systematic review and meta-analysis of prevalence rates. *BMJ Open*, *4*(3), e003901. https://doi.org/10.1136/bmjopen-2013-003901

WHO. (1996). *Cancer Pain Relief: With a Guide to Opioid Availability*. World Health Organization.

WHO. (2022). *SDG Target 3.4 Non-communicable diseases and mental health*. https://www.who.int/data/maternal-newborn-child-adolescent-ageing/advisory-groups/gama/gama-related-resources/gho

Wilson, A., Yendork, J. S., & Somhlaba, N. Z. (2017). Psychometric Properties of Multidimensional Scale of Perceived Social Support among Ghanaian Adolescents. *Child Indicators Research*, *10*(1), 101–115. https://doi.org/10.1007/s12187-016-9367-1

Wolf, E. J., Miller, M. W., Sullivan, D. R., Amstadter, A. B., Mitchell, K. S., Goldberg, J., & Magruder, K. M. (2018). A classical twin study of PTSD symptoms and resilience: Evidence for a single spectrum of vulnerability to traumatic stress. *Depression and Anxiety*, *35*(2), 132–139. https://doi.org/10.1002/da.22712

Wu, W.-W., Tsai, S.-Y., Liang, S.-Y., Liu, C.-Y., Jou, S.-T., & Berry, D. L. (2015). The Mediating Role of Resilience on Quality of Life and Cancer Symptom Distress in Adolescent Patients With Cancer. *Journal of Pediatric Oncology Nursing*, *32*(5), 304–313. https://doi.org/10.1177/1043454214563758

Xiao, S., Shi, L., Dong, F., Zheng, X., Xue, Y., Zhang, J., Xue, B., Lin, H., Ouyang, P., & Zhang, C. (2022). The impact of chronic diseases on psychological distress among the older adults: The mediating and moderating role of activities of daily living and perceived social support. *Aging & Mental Health*, *26*(9), 1798–1804. https://doi.org/10.1080/13607863.2021.1947965

Yasien, S., Abdul Nasir, J., & Shaheen, T. (2016). Relationship between psychological distress and resilience in rescue workers. *Saudi Medical Journal*, *37*(7), 778–782. https://doi.org/10.15537/smj.2016.7.15004

Ye, Z. J., Qiu, H. Z., Li, P. F., Liang, M. Z., Zhu, Y. F., Zeng, Z., Hu, G. Y., Wang, S. N., & Quan, X. M. (2017). Predicting changes in quality of life and emotional distress in Chinese patients with lung, gastric, and colon-rectal cancer diagnoses: The role of psychological resilience. *Psycho-Oncology*, *26*(6), 829–835. https://doi.org/10.1002/pon.4237

Yee, M. K., Sereika, S. M., Bender, C. M., Brufsky, A. M., Connolly, M. C., & Rosenzweig, M. Q. (2017). Symptom incidence, distress, cancer-related distress, and adherence to chemotherapy among African American women with breast cancer. *Cancer*, *123*(11), 2061–2069. https://doi.org/10.1002/cncr.30575

Yıldırım, M., & Arslan, G. (2022). Exploring the associations between resilience, dispositional hope, preventive behaviours, subjective well-being, and psychological health among adults during early stage of COVID-19. *Current Psychology*, *41*(8), 5712–5722. https://doi.org/10.1007/s12144-020-01177-2

Yıldırım, M., & Tanrıverdi, F. Ç. (2021). Social Support, Resilience and Subjective Well-being in College Students. *Journal of Positive School Psychology*, *5*(2), Article 2.

Yu, H., Li, H., Zuo, T., Cao, L., Bi, X., Xing, H., Cai, L., Sun, J., & Liu, Y. (2022). Financial toxicity and psychological distress in adults with cancer: A treatment-based analysis. *Asia-Pacific Journal of Oncology Nursing*, *9*(9), 100069. https://doi.org/10.1016/j.apjon.2022.04.008

Zajacova, A., & Lawrence, E. M. (2018). The Relationship Between Education and Health: Reducing Disparities Through a Contextual Approach. *Annual Review of Public Health*, *39*(1), 273–289. https://doi.org/10.1146/annurev-publhealth-031816-044628

Zamanian, H., Poorolajal, J., & Taheri-Kharameh, Z. (2018). Relationship between stress coping strategies, psychological distress, and quality of life among hemodialysis

patients. *Perspectives in Psychiatric Care*, *54*(3), 410–415. https://doi.org/10.1111/ppc.12284

Zhang, H., Zhao, Q., Cao, P., & Ren, G. (2017). Resilience and Quality of Life: Exploring the Mediator Role of Social Support in Patients with Breast Cancer. *Medical Science Monitor*, *23*, 5969–5979. https://doi.org/10.12659/MSM.907730

Zhou, K., Ning, F., Wang, W., & Li, X. (2022). The mediator role of resilience between psychological predictors and health-related quality of life in breast cancer survivors: A cross-sectional study. *BMC Cancer*, *22*(1), 57. https://doi.org/10.1186/s12885-022-09177-0

Zou, G., Shen, X., Tian, X., Liu, C., Li, G., Kong, L., & Li, P. (2016). Correlates of psychological distress, burnout, and resilience among Chinese female nurses. *Industrial Health*, *advpub*. https://doi.org/10.2486/indhealth.2015-0103

APPENDICES

Appendix 1: Level of social support and resilience amongst study respondents

Outcome	Raw Scores (Min -Max)	Mean ±SD	Prevalence	95%CI
Social Support	14.87 – 69.56	50.00 ±9.99	50.00	49.09 - 50.91
Resilience	28.42 – 69.27	50.00 ±9.99	50.00	49.09 - 50.91

Appendix 2: Informed Consent Form

Protocol Number: .....

Study Title: Resilience and social support as influencing factors on quality of life in persons living with cancer. A cross-sectional study at the Korle-bu Teaching Hospital

Principal investigator: Dr. Swithin Mustapha Swaray, University of Ghana, School of Public Health, Tel: 0244626958.

Introduction

I am conducting this research to assess the possible mediating effect of resilience and social support on the relationship between psychological distress and quality of life in persons living with cancer (PLWC).

A member of the research team will explain what is involved in this study and how it affects you. This consent form describes the study procedure, the risks and benefits of participation as well as how your confidentiality will be maintained. Please take your time to ask questions and feel comfortable making a decision whether to participate or not. This process is called informed consent. If you decide to participate in this study, your will be asked to sign this form.

Study Procedure

The study procedure will involve responding to standard questionnaires to solicit responses on the constructs being investigated. Responding to a questionnaire will last for at most 10-15 minutes. It is only for a day and not intended to disrupt your activities**.**

Possible Benefits

There are no direct benefits for participation in the study. However, the findings will inform interventions to enhance resilience and social support in other to minimise the effects of cancer-related psychological distress and improve QoL in PLWC.

Possible Risks / Discomforts

I acknowledge that participants might experience some degree of distress during the interview. However, a licensed Clinical Psychologist is on standby to address any such concerns.

Confidentiality

All the information to be collected will be treated as confidential. All completed forms will be kept by the researcher only and no other person will have access to your information.

Compensation

No compensation is provided for participation in this survey. However, your role in this journey to find interventions aimed at improving the quality of life of PLWC is greatly appreciated.

Voluntary Participation and Right to Leave the Research

Participation in this study is purely voluntary. You can decide to refuse participation at any point of the study. If you should choose not to participate in the study, you have the right to opt out.

Your rights as a Participant

This research has been reviewed and approved by the Korle-Bu Teaching Hospital Scientific and Technical Committee (Ethics review board). If you have any questions about your rights as a research participant, you can contact the Korle-Bu Teaching Hospital Scientific and Technical Committee Office between the hours of 8 am – 5 pm on Monday to Friday on +233302667759/673034-6.

Appendix 3: Voluntary Agreement Form

Participant's Statement

I acknowledge that I have read or have had the contents of the participant's information sheet read and satisfactorily explained to me in a language I understand (English, French, Ga, Twi, Ewe, Dagbani and Hausa). I fully understand the contents and any potential implications as well as to change my mind (i.e., withdraw from the research) even after I have signed this form. I voluntarily agree to be part of this research.

Name of Participant: ……

Participant's signature: ……..OR thumb print…….

Date: ……..

Interpreter's Statement

I interpreted the purpose and content of the participant's information sheet to the afore named participant to the best of my ability in the (English, French, Ga, Twi, Ewe, Dagbani and Hausa) language to the participant's understanding. All questions, appropriate clarification sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter: ……

Interpreter's signature: …….. Date: …….…….

Statement of witness

I was present when the purpose and content of the Participant Information Sheet was read and satisfactorily explained to the participant in the language, he/she understood (English, French, Ga, Twi, Ewe, Dagbani and Hausa). I confirmed that he/she was given the opportunity to ask questions or seek clarification and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name of witness: …..……

Witness' signature: …….. OR thumb print…….

Date: ……..

Appendix 4: Questionnaire

Respondent Code: _____ Folder No_____

Socio-demographic Characteristics

1. Date of birth: …….
2. Sex: Male ☐ Female ☐
3. Level of education

   Basic ☐ SSS/Technical/Vocational ☐ University/Tertiary ☐

   No formal education ☐
4. Employment status: Student ☐ Employed (non-self) ☐ Employed(self) ☐

   Unemployed ☐ Pensioner ☐
5. Category of income earner:

   Daily ☐ Weekly ☐ Monthly ☐ Contractual ☐ Irregular ☐

   Other (specify) ……..
6. If employed/self-employed, what occupation? …… ……

Worth Index

7. a. Do you have electricity/generator/solar panel at home? Yes/No

   b. Do you have tap water in your house, compound, or property? Yes/No

   c. Do you have any toilet in your house, compound or property? Yes/No

   d. Do you or does anyone living with you have a radio? Yes/No

   e. Do you have a television? Yes/No

   f. Do you have internet access on a computer or a laptop? Yes/No

   g. Do you have a mobile phone? Yes/No

   h. Do you have a vehicle or truck? Yes/No

   i. Do you have a refrigerator? Yes/No
8. Do you have valid NHIS card? Yes ☐ No ☐
9. Source of the expense for treatment: Personal saving ☐ Family ☐

   Friends ☐ Philanthropist ☐ Other (specify) ……..
10. Marital status

    Single ☐ Married ☐ Divorced/separated ☐ Cohabiting ☐

    Widowed ☐
11. Living with partner (if currently married/cohabiting) No ☐ Yes ☐
12. Number of children alive……
13. Number of household members? ……

14. Religion: Christian ☐ Muslim ☐ Traditional ☐ Non-Religious
    Other ☐ Kindly state …….
15. Region of residence? Kindly State……..……
16. Ethnic Group ……
17. Nationality ……

Disease Factor and Treatment Modality

18. What type of cancer? ……
19. When were you diagnosed? ……19b. What is the stage of your cancer?.....
20. Any family history of cancer? Yes/No/Unaware
21. Symptom burden

Fatigue/tiredness ☐	Sleep disturbances ☐	Numbness/ tingling ☐
Drowsiness ☐	Distress ☐	Pain ☐
Sadness ☐	Dry mouth ☐	Lack of appetite ☐
Nausea ☐	Shortness of breath ☐	Vomiting ☐
Difficulty remembering ☐	Other…….	

22. What treatment interventions have you received?
    Surgery ☐ Chemotherapy ☐ Radiation ☐ Palliative ☐
23. Any other disease condition/comorbidity? Yes/No
24. If yes, kindly indicate
    Diabetes ☐ HBP ☐ CHD ☐ Asthma ☐ CKD ☐
    Depression ☐ Other. ……..

The Revised Psychological Distress Inventory (PDI-R)

Below are some questions. Your answers will help us to understand how you have been feeling over the past week. Please carefully read one question at a time and choose the answer that best describes your situation over the past week.

Please try to answer all questions as accurately as possible. THERE ARE NO RIGHT OR WRONG ANSWERS

1	2	3	4	5
NOT AT ALL	A LITTLE BIT	SOMEWHAT	QUITE A BIT	VERY MUCH

Over the past week:

1	Have you experienced moments of anxiety or inner tension?	1	2	3	4	5
2	Have you experienced moments of dejection or depression?	1	2	3	4	5
3	Have you felt worthless?	1	2	3	4	5
4	Have you felt a lack willpower?	1	2	3	4	5
5	Do you think that your desire to speak with others has diminished?	1	2	3	4	5
6	Have you felt more alone?	1	2	3	4	5
7	Has your interest in the world around you diminished?	1	2	3	4	5
8	Has the illness negatively influenced your relationships with others?	1	2	3	4	5

Short Form-8 (SF-8) Health Survey for QoL

This survey asks for your views about your health. This information will help you keep track of how you feel and how well you are able to do your usual activities. Answer every question by selecting the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can. For each of the following questions, please mark an [x] in the one box that best describes your answer.

1. Overall, how would you rate your health **during the past 4 weeks**?
   Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐ Very Poor ☐
2. During the past 4 weeks, how much did physical health problems limit your physical activities (such as walking or climbing stairs)?
   Not at all ☐ Very little ☐ Somewhat ☐ Quite a lot ☐ Could not do physical activities ☐
3. During the past 4 weeks, how much difficulty did you have doing your daily work, both at home and away from home, because of your physical health?
   Not at all ☐ Very little ☐ Somewhat ☐ Quite a lot ☐ Could not do daily work ☐
4. How much bodily pain have you had during the past 4 weeks?
   None ☐ Very mild ☐ Mild ☐ Moderate ☐ Severe ☐ Very severe ☐
5. During the past 4 weeks, how much energy did you have?
   Very much ☐ Quite a lot ☐ Some ☐ A little ☐ None ☐

6. During the past 4 weeks, how much did your physical health or emotional problems limit your usual social activities with family or friends?

   Not at all ☐ Very little ☐ Somewhat ☐ Quite a lot ☐ Could not do social activities ☐

7. During the past 4 weeks, how much have you been bothered by emotional problems (such as feeling anxious, depressed or irritable)?

   Not at all ☐ Slightly ☐ Moderately ☐ Quite a lot ☐ Extremely ☐

8. During the past 4 weeks, how much did personal or emotional problems keep you from doing your usual work, school or other daily activities?

   Not at all ☐ Very little ☐ Somewhat ☐ Quite a lot ☐ Could not do daily activities ☐

Conor-Davidson brief Resilience scale (CD-RISC)

*Please indicate how much you agree with the following statements as they apply to you over the last **month**. If a particular situation has not occurred recently, answer according to how you think you would have felt.*

		not true at all (0)	rarely true (1)	sometimes true (2)	often true (3)	true nearly all the time (4)
1.	I am able to adapt when changes occur.	☐	☐	☐	☐	☐
2.	I can deal with whatever comes my way.	☐	☐	☐	☐	☐
3.	I try to see the humorous side of things when I am faced with problems.	☐	☐	☐	☐	☐
4.	Having to cope with stress can make me stronger.	☐	☐	☐	☐	☐
5.	I tend to bounce back after illness, injury, or other hardships.	☐	☐	☐	☐	☐
6.	I believe I can achieve my goals, even if there are obstacles.	☐	☐	☐	☐	☐
7.	Under pressure, I stay focused and think clearly.	☐	☐	☐	☐	☐
8.	I am not easily discouraged by failure.	☐	☐	☐	☐	☐
9.	I think of myself as a strong person when dealing with life's challenges and difficulties.	☐	☐	☐	☐	☐
10.	I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	☐	☐	☐	☐	☐

Multidimensional Scale of Perceived Social Support (MSPSS)

Please indicate how you feel about the following statements.

		Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strong Agree
1.	There is a special person who is around when I am in need.	1	2	3	4	5	6	7
2.	There is a special person with whom I can share joys and sorrows.	1	2	3	4	5	6	7
3.	My family really tries to help me.	1	2	3	4	5	6	7
4.	I get the emotional help & support I need from my family.	1	2	3	4	5	6	7
5.	I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7
6.	My friends really try to help me.	1	2	3	4	5	6	7
7.	I can count on my friends when things go wrong.	1	2	3	4	5	6	7
8.	I can talk about my problems with my family.	1	2	3	4	5	6	7
9.	I have friends with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
10.	There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7
11.	My family is willing to help me make decisions.	1	2	3	4	5	6	7
12.	I can talk about my problems with my friends.	1	2	3	4	5	6	7

Appendix 5: Ethical Consideration

In case of reply the number
And the date of this
Letter should be quoted.
My Ref. No. KBTH/md/93/22
Your Ref. No.....

KORLE BU TEACHING HOS.
P. O. BOX KB 77,
KORLE BU, ACCRA.

Tel: +233 302 667759/673034-
Fax: +233 302 667759
Email: Info@kbth.gov.gh
pr@kbth.gov.gh
Website: www.kbth.gov.gh

25th July, 2022

SWITHIN MUSTAPHA SWARAY
DEPARTMENT OF SOCIAL AND BEHAVIOURAL SCIENCES
SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF GHANA, LEGON

SCIENTIFIC AND TECHNICAL COMMITTEE APPROVAL
PROTOCOL IDENTIFICATION NUMBER: KBTH-STC 000118/2022

The Korle Bu Teaching Hospital Scientific and Technical Committee (KBTH-STC), on 25th July, 2022, approved your submitted study protocol.

TITLE OF PROTOCOL: "Resilience and Social Support as Influencing Factors on the Relationship between Psychological Distress and Quality of Life in Persons Living with Cancer. A Cross-Sectional Study at the Korle-Bu Teaching Hospital"

This approval requires that you **forward your approved document to Korle Bu Teaching Hospital –Institutional Review Board (KBTH-IRB) for the ethical aspect of the proposal to be assessed before the project can be initiated.**

PRINCIPAL INVESTIGATOR: Swithin Mustapha Swaray

This STC approval is valid till 30th March, 2023

You may, however, request extension of the approval period, or renewal as the case may be, should the study extend beyond the stated period.

Upon completion, you are required to submit a final report on the study to the STC. This is to enable the STC ensure among others that, the project has been implemented as per the approved protocol. You are also required to inform the KBTH-STC and Research Directorate of any publications that may emanate from the research findings.

Kindly note that, should the need arise, the KBTH-STC or IRB may institute appropriate measures to satisfy itself that study is being conducted according to the highest scientific and ethical standards.

Please note that any modification to the study protocol without Scientific Technical Committee (STC) approval renders this approval invalid.

Prof. G. Obeng Adjei
Chairman, KBTH-STC

Cc: The Chairman, KBTH-IRB

In case of reply the number
And the date of this
Letter should be quoted
My Ref. No. KBTH/Hms/03/22
Your Ref. No.....

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28th July, 2022

SWITHIN MUSTAPHA SWARAY
DEPARTMENT OF SOCIAL AND BEHAVIOURAL SCIENCES
SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF GHANA, LEGON

RESILIENCE AND SOCIAL SUPPORT AS INFLUENCING FACTORS ON THE RELATIONSHIP BETWEEN PSYCHOLOGICAL DISTRESS AND QUALITY OF LIFE IN PERSONS LIVING WITH CANCER. A CROSS-SECTIONAL STUDY AT THE KORLE-BU TEACHING HOSPITAL

KBTH-IRB /000118/2022

Investigator: SWITHIN MUSTAPHA SWARAY

The Korle Bu Teaching Hospital Institutional Review Board (KBTH IRB) reviewed and granted approval to the study entitled: "Resilience and Social Support as Influencing Factors on the Relationship between Psychological Distress and Quality of Life in Persons Living with Cancer. A Cross-Sectional Study at the Korle-Bu Teaching Hospital"

Please note that the Board requires you to submit a final review report on completion of this study to the KBTH-IRB.

Kindly, note that, any modification/amendment to the approved study protocol without approval from KBTH-IRB renders this certificate invalid.

Please report all serious adverse events related to this study to KBTH-IRB within seven days verbally and fourteen days in writing.

This IRB approval is valid till 30th June, 2023. You are to submit annual report for continuing review.

Sincere regards,

DR. DANIEL ANKRAH
VICE CHAIR (KBTH-IRB)
FOR: CHAIR (KBTH-IRB)

Cc: The Chief Executive Officer, KBTH
The Director of Medical Affairs, KBTH

In case of reply the number
And the date of this
Letter should be quoted

My Ref. No. KBTH/MD/CB/72

Your Ref. No.....

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1st August, 2022

SWITHIN MUSTAPHA SWARAY
DEPARTMENT OF SOCIAL AND BEHAVIOURAL SCIENCES
SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF GHANA, LEGON

INSTITUTIONAL APPROVAL: KORLE BU TEACHING HOSPITAL-SCIENTIFIC AND TECHNICAL COMMITTEE/INSTITUTIONAL REVIEW BOARD (KBTH-STC/IRB/000118/2022

Following approval of your study entitled "Resilience and Social Support as Influencing Factors on the Relationship between Psychological Distress and Quality of Life in Persons Living with Cancer. A Cross-Sectional Study at the Korle-Bu Teaching Hospital" by the Korle Bu Teaching Hospital-Scientific and Technical Committee/Institutional Review Board.

I am pleased to inform you that institutional approval has been granted for the conduct of your study in Korle Bu Teaching Hospital.

Please contact the Head of Department to discuss the commencement date of the study.

Please note that, this institutional approval is rendered invalid if the terms of the Institutional Reviewed Board/Scientific and Technical Committee approval are violated.

Sincere regards,

Dr. Ali Samba
Director of Medical Affairs
For: Chief Executive