COVID-19: A PANDEMIC'S IMPACT ON PSYCHOSOCIAL FACTORS AND
HEALTH-RELATED QUALITY OF LIFE OF BREAST CANCER PATIENTS

A DISSERTATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

IN THE GRADUATE SCHOOL OF

TEXAS WOMAN'S UNIVERSITY

SCHOOL OF HEALTH PROMOTION AND KINESIOLOGY

COLLEGE OF HEALTH SCIENCES

BY

IRMA MARIE CORONA, M.S.R.S

DENTON, TEXAS

MAY 2023

DEDICATION

This is dedicated to my late mother Juanita Corona and my father Lucio Corona, who have instilled in me from an early age the importance of education and dreaming big. As well as the constant reminder that any worth getting is not easy and that it takes courage and persistence to endure the roadblocks that will undoubtedly come. We did it, Mom and Dad! This accomplishment is yours more than mine.

ABSTRACT

IRMA MARIE CORONA

COVID-19: A PANDEMIC'S IMPACT ON PSYCHOSOCIAL FACTORS AND
HEALTH-RELATED QUALITY OF LIFE OF BREAST CANCER PATIENTS

MAY 2023

In January of 2020, the coronavirus, or SARS-COV2, quickly became a pandemic with
its exponential transmission. It caused an astounding loss of life and shut down multiple nations.
The purpose of this explanatory sequential research study was to examine the psychosocial
impact of the COVID-19 on the breast cancer community in terms of disruption of life,
resiliency, medical care decision making, and health-related quality of life based on their
personal and familial COVID-19 status. A total of 33 participants, all of whom were female
breast cancer patients who were or had recently completed radiation therapy at a medical center
in Texas, were recruited. All 33 participants completed the *COVID-19: Impact of the Pandemic
and HRQOL in Cancer Patients and Survivors* quantitative survey. From the 33 participants, 15
also participated in a qualitative follow-up interview to provide a more in-depth understanding of
the psychosocial impacts of the pandemic. Based on the findings of descriptive statistics and
independent *t*-tests, the researcher concluded that there were no statistically significant
disruptions in patients daily lives, health care, or resilience based on individual or familial
COVID-19 status (i.e., testing positive or negative for COVID-19). However, a moderate effect
size ($d = -.69$) was determined for resilience for individuals whose personal status remained
negative. Regarding health-related quality of life, the researcher concluded COVID-19 status
had no statistically significant impact on a breast cancer patients' quality of life, though a
medium effect size ($d = -.61$) was found based on personal COVID-19 status. A Fisher's Exact
Test determined that breast cancer patients attended general medical appointment similarly

regardless of COVID-19 status; however, breast cancer patients who were COVID-19 negative were statistically more likely to attend cancer-related appointments in person. From Chi-Square analyses, it was concluded that breast cancer patients' decisions to attend general medical appointments were impacted if a family member tested positive for COVID-19, though no statistically significant differences were found for attendance of cancer-related appointments and a family member's status. Qualitative evidence shared by the breast cancer patients, which offered greater insights on disruption, resilience, quality of life, and medical decision making, supported these findings.

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Rationale

A substantive increase in the number of pneumonia cases of unknown origin in China was observed in late December 2019. A lengthy investigation linked the sudden surge in pneumonia cases to a zoonotic virus whose reservoir was a bat; however, the intermediate host remains unknown. Despite the lack of information on the host itself, the epicenter of the outbreak was established and confirmed to be the Huanan wholesale food market in Wuhan, China (World Health Organization [WHO], 2020). In January 2020, the WHO designated this pathogen as severe acute respiratory syndrome coronavirus 2 (SARS-COV2), more commonly known as COVID-19. In addition, the WHO (2020) discovered the virus possessed the ability to spread easily from human to human via droplets or fomites during close and unprotected contact.

Despite efforts to contain the virus by China, the United States confirmed its first case in Washington State on January 21st, 2020 with countries including Germany, Japan, Vietnam, and Taiwan soon following suit (American Journal of Managed Care Staff [AJMCS], 2021). As a result, the United States restricted global air travel on February 2, 2020 and announced a public health emergency the following day. The WHO went one step further on March 11, 2020 and declared COVID-19 to be a pandemic (AJMCS, 2021).

As of March 13, 2021, there were over 111.7 million cases reported worldwide, which resulted in more than 2.6 million deaths worldwide (WHO, 2021). On that same day, the United States' case count reached over 29.1 million, accounting for over 26% of the total number of global infections, with 52.2% of those ill being female and 47.8% being male. As result of the surmounting number of cases, the national death count exceeded 530,000 as of mid-March 2021

(Centers for Disease Control and Prevention [CDC], 2021). Furthermore, during the same time frame California led in the number of coronavirus cases reported with Texas following in a close second with over 2.3 million cases identified and 45,000 deaths reported (CDC, 2021; Texas Department of Health and Human Services [TXDSHS], 2021).

The high case counts may be partially attributed to the fact that some individuals who carry the virus can be asymptomatic during the incubation period of 5 to 6 days and not display the more obvious symptoms of COVID-19 virus such as a high-grade fever, dry cough, fatigue, as well as loss of smell and taste; in addition, the prolonged incubation period has led to an increased transmissibility and exponential spread of the virus (WHO, 2020). To further compound the issue, it is reported that certain populations were more at risk of severe disease and death should they acquire the COVID-19 virus. The individuals deemed most vulnerable include those over the age of 60 as well as persons with underlying health conditions such as hypertension, cardiovascular disease, chronic respiratory disease, and cancer (WHO, 2020).

As mentioned, cancer patients are considered a higher risk subgroup when compared to the general population. This is due to their compromised immune system as a result of their treatment regimen. This became evident in a study conducted at the initial epicenter of the COVID-19 pandemic, Wuhan, China, when it was found that the infection rate among cancer patients was approximately five times higher than the general population (Mei et al., 2020). In addition, it was noted that cancer patients who contract COVID-19 were more likely to experience severe illness such as pneumonia and respiratory failure. In fact, Liang et al. (2020) reported a history of cancer as a predictor of severe illness from COVID-19. Tian et al. (2020) confirmed this reporting as the research found that in general 64% of cancer patients experience severe COVID-19 compared to 32% of individuals who do not have cancer as a predisposition.

Additionally, cancer patients were more likely to succumb to the virus and die as a result. Mei et al. (2020) stated a fatality rate of 46.2% among cancer patients with blood cancers and 10% among patients with solid tissue tumor cancers such as lung, colorectal, and breast cancer.

Another important note to point out is that cancer patients were not only more at risk of contracting the coronavirus, but they have also experienced delays in health care as a result of the pandemic (Riera et al., 2021). This is because the pandemic has led to a disruption of not only daily lives but the health care system as well. In the health care paradigm, there were concerns of resource shortages ranging from medical personnel to personal protection equipment. Of even more dire concern were the clinical decisions that had to be made by medical professionals including oncologists. For patients with solid tissue tumors such as breast cancer it has been suggested that if there is curative intent then adjuvant therapy, such as radiation therapy after surgery, should be continued as planned. However, delaying chemotherapy treatments requires more consideration due to the treatments impact on an individual's immune system and survivorship (Ueda et al., 2020).

These types of decisions play a vital role in the treatment regimen and follow-up care a cancer patient will receive and that includes breast cancer patients. To that end, Dietz et al. (2020) established a set of guidelines stratifying breast cancer patients into three degrees of importance: Priority A, B, and C. Dietz et al. (2020) defined each group as follows:

> Priority A are considered patients that have conditions that are immediately life threating, clinically unstable, completely intolerable, and for whom even a short delay would significantly alter the patient's prognosis… Patient in priority B are patients who do not have immediate life-threating conditions but for whom treatment should not be indefinitely delayed until the end of the pandemic… Patients in Priority C, patients for

whom certain treatment or services can be indefinitely deferred until the pandemic is over

without adversely impacting outcomes. (p. 488)

Most breast cancer patient will fall into Priority B classification and a moderate delay of 6-12 weeks will not have a significant impact on the patient's overall survival outcome (Dietz et al., 2020). However, it is important to note that breast cancer patients can fall anywhere in this continuum based on their specific tumor staging.

Regardless of the stage, a cancer diagnosis can be overwhelming to process and will inherently impact a person's quality of life. Quality of life is a broad concept that involves a "persons' physical health, psychological state, level of independence, social relationships, personal beliefs and their relationships to salient features of the environment" (WHO, 2012, p.11). As it relates specifically to an individual's health, the CDC (2018, para. 3) defined health-related quality of life (HRQOL) as "physical and mental health perceptions and their correlates including health risks and conditions, functional status, social support, and socioeconomic status." In respect to breast cancer patients, Engel et al. (2003) found that age, communication, and comorbidity were strong predictors of quality of life. In addition, breast cancer patients who experience poor communication reported higher levels of depression and future health worries. Furthermore, it has been reported that those who must manage comorbidities express a lower quality of life as well (Engel et al., 2003). This is especially concerning in times of a pandemic where entire states and cities have been placed on lockdown, personal communication is sometimes limited, and there is a potential delay in treatment.

Statement of Purpose

Therefore, the purpose of this explanatory mixed methods study was to investigate breast cancer patients, who reside in Texas and were undergoing radiation therapy, and their unique

personal and familial experiences with COVID-19 and the impact that the pandemic has had on psychosocial factors of disruption of life, resiliency, health-related quality of life, and medical care decision making. For the purposes of this study, disruption of life was inclusive of health care, daily activities, social interactions, and financial hardship. When assessing disruption of health care items such as a delay in medical care, or a medical appointment being rescheduled were analyzed. In addition, inability to take care of family members or go to work as usual were examples of items examined for the disruption of daily and social activities as a result of the pandemic. Finally, regarding financial hardship due to COVID-19, areas such as the inability to purchase necessities and a loss of financial support were analyzed.

Whereas perceived benefits, functional social support, and perceived stress management were used to assess the resiliency factor. Perceived benefit in this research study was measured through items specific to having a deeper appreciation of family, friends, and life. As for functional social support, receiving and/or giving emotional support to family or friends is an example of how this component of resilience was assessed. Perceived stress management, a component of resilience, was addressed by analyzing items such as the ability to recognize thoughts or situations that lead to stress because of COVID-19, as well one's ability to practice relaxation methods when feeling stressed due to the pandemic. In addition to resilience, medical decision-making was also evaluated as well in terms of attendance to a general medical and cancer related appointment. Finally, one's HRQOL was evaluated by examining how the cancer patients felt physically, including pain and energy level as well as how they directly rated their quality of life.

To probe these psychosocial factors, a quantitative survey analysis of breast cancer patients was conducted, which was followed up by a purposeful qualitative interview on the

same population sample to explore the quantitative results in more depth. In the first (quantitative) phase of the research study, the focus was on the independent variables of (a) personal experiences; (b) individual experiences with COVID-19 including whether a patient tested positive; (c) familial experiences with COVID-19 to include whether a family member has tested positive or died as a result of COVID-19; and (d) the impact these variables have on the dependent variables of health-related quality of life, decision-making specific to cancelling or seeking medical care, as well as the overarching concepts of disruption and resiliency. In the second (qualitative) phase of the study, a 1-hour audio recorded conference call was conducted to explore in more detail the results of the quantitative findings including the leading disruptor, top resiliency factor, health-related quality factor most impacted, and medical decisions most affected due to the COVID-19 pandemic.

Research Questions

To address these concepts within the research the following quantitative research questions were examined:

1. Did a breast cancer patient's personal experience with COVID-19 virus status impact disruption of life?

2. Did a breast cancer patient's family members COVID-19 virus status impact disruption of life?

3. Did a breast cancer patient's personal experience with COVID-19 and their virus status impact their resilience ?

4. Did a breast cancer patient's family members COVID-19 virus status impact their resilience?

5. Did a breast cancer patient's personal experience with COVID-19 and their virus status impact health-related quality of life?

6. Did a breast cancer patient's family member COVID-19 virus status impact their health-related quality of life?

7. Did a breast cancer patient's personal experience with COVID-19 and their virus status have a relationship with their decision to seek medical care?

8. Did a breast cancer patient's family members COVID-19 virus status have a relationship with their decision to seek medical care?

In addition, to examine in more detail the quantitative results the following qualitative questions were asked via a probing interview:

1. How did COVID-19 affect the overarching idea of disruption among breast cancer patients?

2. How did COVID-19 affect the resilience of breast cancer patients?

3. How did COVID-19 affect the health-related quality of life of breast cancer patients?

4. How did COVID-19 affect a breast cancer patient's decision to seek medical care?

Hypotheses

The researcher proposed the following null (H_0) and research (H_1) hypotheses for the quantitative components of the study:

1. H_0: There will be no significant difference in disruption of life scores for breast cancer patients who test positive for COVID-19 and those who test negative for COVID-19.

H_1: Breast cancer patients who test positive for COVID-19 will have increased disruption of life scores compared to those who test negative for COVID-19.

2. H_0: There will be no significant difference in disruption of life scores for breast cancer patients whose family members test positive for COVID-19 and those whose family members test negative for COVID-19.

H_1: Breast cancer patients who have a family member test positive for COVID-19 will have increased disruption of life scores compared to those whose family members all test negative for COVID-19.

3. H_0: There will be no significant difference in resilience scores for breast cancer patients who test positive for COVID-19 and those who test negative for COVID-19.

H_1: Breast cancer patients who test positive for COVID-19 will have decreased resilience scores compared to those who test negative for COVID-19.

4. H_0: There will be no significant difference in resilience scores for breast cancer patients whose family members test positive for COVID-19 and those whose family members test negative for COVID-19.

H_1: Breast cancer patients who have a family member test positive for COVID-19 will have decreased resilience scores compared to those whose family members all test negative for COVID-19.

5. H_0: There will be no significant difference in health-related quality of life scores for breast cancer patients who test positive for COVID-19 and those who test negative for COVID-19.

H_1: Breast cancer patients who test positive for COVID-19 will have decreased health-related quality of life scores compared to those who test negative for COVID-19.

6. H_0: There will be no significant difference in health-related quality of life scores for breast cancer patients whose family members test positive for COVID-19 and those

whose family members test negative for COVID-19.

H_1: Breast cancer patients who have a family member test positive for COVID-19 will have decreased health-related quality of life scores compared to those whose family members all test negative for COVID-19.

7. H_0: There will be no relationship between breast cancer patients' COVID-19 status (positive or negative) and their decision to seek medical care.

H_1: Breast cancer patients who test positive for COVID-19 will not seek medical care while those who test COVID-19 negative will seek medical care.

8. H_0: There will be no relationship between breast cancer patients' family members' COVID-19 status (positive or negative) and their decision to seek medical care.

H_1: Breast cancer patients who have a family member test positive for COVID-19 will not seek medical care while those whose family members test COVID-19 negative will seek medical care.

Delimitations

The research topic and design display the innate delimitations of the study. First, this research study was based on the emergence of a new public health pandemic, the COVID-19 virus. Initially, no preexisting survey instrument assessing COVID-19 and its psychological impact was available for use. However, a novel survey, created in 2020, that drew from published measures addressing issues including the impact of pandemics and natural disasters such as 9/11 was developed by Penedo et al. (2021) was made available for use. Secondly, the research study was exclusive to breast cancer patients and did not include other cancers. In addition, the sample population focused solely on female breast cancer patients who were currently undergoing or had just completed radiation therapy alone or in conjunction with

9

surgery and/or chemotherapy. Furthermore, the sample population was small in nature as the pool of participants was drawn from only one cancer center, UT Health San Antonio MD Anderson Mays Cancer Center located in San Antonio, Texas. Contributing to the sample size was the eligibility requirement of receiving a confirmed breast cancer diagnosis between March 1, 2020, and August 31, 2021. These predefined dates for participation eligibility were based on the month in which the state of Texas was placed under quarantine lockdown and the subsequent 17 months.

Addtionally, potential limitations existed due to the specificity of the study population. First, a convenience sample of cancer patients and survivors was used. The study population consisted of only female breast cancer patients who had undergone or were commencing radiation therapy at the Mays Cancer Center in San Antonio, Texas between March 1, 2020, to August 31, 2021. The predefined date range for participant accrual was designed specifically to garner data both quickly and while the pandemic remains prolific within the community. As a result, the sample size was small, drawn from only one cancer center, and limited to only one form of cancer. Therefore, the results may lack generalizability to the overall cancer population as the target population was strictly breast cancer patients.

Finally, while COVID-19 may impact many psychosocial and/or aspects of quality of life may, the qualitative personal interview component of the research study focused exclusively on the leading cause of disruption, factor precipitating most resilience, the top health-related quality of life aspect COVID-19 impacted, and the principal reason for seeking or revoking medical care during the pandemic.

Limitations

The following were limitations to the current research study. The research area was based entirely on the impact of the emergence of the novel COVID-19 virus and its impact on

cancer patients and survivors. An innovative survey specifically targeting COVID-19 personal

experiences, psychosocial ideals of disruption and resiliency, and quality of life, and the impact

pandemic has on a cancer patient and survivors developed by Penedo et al. (2021), which has yet

to be published, was utilized to conduct the research study. As a result, the reliability of the

study may come under scrutiny as only preliminary data ($N = 14183$) of the consistency of the

survey were available at the time of its use with a reported Cronbach's alpha of 0.9 (Penedo et

al., 2021).

Definition of Terms

For a better understanding of the research study the following is a list of definition of

terms:

- Adjuvant therapy: a treatment that occurs after initial care (i.e., radiation therapy after
  surgery).

- Breast cancer: cancer that manifests itself via abnormal and out of control cell
  growth within the breast tissue.

- Chemotherapy: a drug treatment delivered orally or intravenously to kill cancer cells
  or stop them from proliferating.

- COVID-19: formal name according to the World Health Organization severe acute
  respiratory syndrome coronavirus 2, SARS-CoV-2

- Disruption: the overarching notion of causing a delay and/or stoppage in health care,
  daily activities, social interactions, in addition to incurring financial hardship.

- EPIC: the epic system corporation software that houses medical information.

- Familial experience: in the context of COVID-19 familial experience involves
  whether a family member tested positive for COVID-19 or dies as a result of the

virus.

- Fomite: an object or material that can carry infection.

- Health-related quality of life: "Physical and mental health perceptions and their correlates including health risks and conditions, functional status, social support, and socioeconomic status" (CDC, 2018, para. 3).

- HIPAA: the health insurance and portability and accountability act of 1996 that protects the disclosure of an individual's medical information.

- ICD-10: international classification of diseases, 10th revision.

- Immunocompromised: one's immune defense system working in a lower than normal capacity; thus, affecting their ability to fight off illnesses and infections

- Incubation period: the timeframe from exposure to a virus to when signs and symptoms present themselves.

- Intermediate host: the species that serves as the harbor for transmission of a virus

- MERS-CoV: Middle East respiratory syndrome caused by a coronavirus that originated in Saudi Arabia in 2012

- Pandemic: an epidemic occurring worldwide crossing international boundaries and affecting a large number of people

- Personal experience: COVID-19 personal experience is defined as being infected with the virus, having a family member be infected with the virus, and/or having a family member die as a result of the virus.

- Radiation therapy: a form of cancer treatment that utilizes high doses of radiation to kill cancer cells.

- REDCap: the research electronic data capture software system designed to store research databases developed by Vanderbilt University.

- Reservoir: a habitat in which an infectious microorganism lives.

- Resilience: the ideal that encompasses an individual's perceived benefit of having experienced something, in addition to having social support, and the ability to manage stress.

- SARS-CoV-2: a severe acute respiratory syndrome, coronavirus 2.

- Solid tumor: an abnormal mass of tissue such as lung, breast, or colorectal cancer.

Importance of Study

COVID-19 continues to impact the United States more than 2 years into the pandemic. By 2020, the United States had over 29.1 million cases of the virus with 52.2% of them being women (CDC, 2020). Given this statistic, the 33% of American women who are at risk of developing cancer in their lifetime had also to contend with the possibility of being diagnosed with COVID-19 (American Cancer Society [ACS], 2020). Thus, it is evident that during the pandemic, a substantial proportion of women in the United States dealt with the inherent risk of contracting the virus while also being diagnosed with breast cancer, which is the most prevalent form of female cancer. As a result, many women were dealing with managing multiple health concerns at once, which could have not only diminished their quality of life but their survivorship as well.

The physical and mental wellbeing of an individual, otherwise known as quality of life, can significantly impact on how an individual copes/ with their cancer diagnosis and the treatment that follows. Breast cancer patients specifically, have been reported to display a wide array of emotions including distress, anxiety, and depression; all of which impact one's quality

of life (Guimond et al. 2020). Additionally, comorbidity has been shown to decrease a breast

cancer patient's quality of life (Engel et al., 2003). Hence, the importance of exploring the

impact of a comorbidity, such as COVID-19, on a cancer patients and survivors' psychosocial

constructs and HRQOL is critical.

CHAPTER II

LITERATURE REVIEW

COVID-19

The purpose of this research study was to analyze the impact of the SARS-CoV-2:

COVID-19 pandemic on a breast cancer patient regarding their medical decision making and

HRQOL in addition to the psychosocial impact the pandemic has imposed on disruption of life

and resilience. Therefore, the review of the literature begins with an analysis of the arrival of the

SARS-CoV-2 virus to the United States and the nature of the novel COVID-19 virus, including

how the virus has affected general public health and cancer patients. The literature review also

addresses breast cancer (a) statistics, (b) detection, (c) treatment, (d) prognosis and survival, and

(e) COVID-19-related impacts. The chapter concludes with discussions of HRQOL, notions of

disruption and resilience impacted by a breast cancer diagnosis, and how the COVID-19

pandemic has impacted the breast cancer community.

SARS

The first case of the SARS coronavirus presented itself in February of 2003 in Asia,

specifically in Guangdong a province of Southern China (CDC, 2013). It is believed that food

handlers were the source of the epidemic. The most favorable route of transmission of the virus

is direct contact with the mucous membrane of the eyes, nose, and mouth as well as contact with

respiratory droplets and/or fomites (WHO, 2003). Those individuals who have contracted the

virus display an onset of symptoms anywhere from 14 to 22 days post infection. The most

commonly reported ailment among those who contract the virus is a fever (94%) followed by

51-72% people reporting symptoms like that of influenza such as chills, malaise, loss of appetite,

and myalgia (Donnelly et al., 2003). By the end of the epidemic in July of 2003, the viral

outbreak had been accounted for in 29 different countries, resulting in 8,096 infections and 774 deaths worldwide, but notably only 27 cases in the United States with no reported fatalities (CDC, 2013; WHO, 2003).

A second emergence of a SARS zoonotic coronavirus occurred in 2012 in Saudi Arabia and became known as the MERS-COV2. This strain of the virus became an epidemic after it was transferred from a camel to a human subject and caused 858 deaths in 27 different countries. Fortunately, the United States reported no fatalities and only 2 cases of MERS -COV2 in the nation (CDC, 2019; WHO, 2019). Fortuitously, this form of the coronavirus virus did not transfer from one human subject to another easily; nevertheless, transmission did occur when an individual who was infected was in close contact with another person which mostly occurred in a hospital setting. Of the patients who contracted MERS, pneumonia was the most common symptom followed by fever, cough, and shortness of breath; however, it was found that some infected individuals were asymptomatic, and detection only occurred as a result of aggressive contact tracing (WHO, 2019).

SARS-COV2: COVID-19

Unfortunately, a zoonotic form of the coronavirus would present itself again to the world in December 2019; however, this time it reeked much more havoc. The first case of what is now known as SARS-COV2, otherwise referred to as COVID-19, was reported in Wuhan, China in December 2019. In January 2020, the United States along with Germany, Japan, Vietnam, and Taiwan would soon follow in reporting of COVID-19 cases (AJMCS, 2021). This resulted in an upward of 111.7 million COVID-19 cases and 2.6 million deaths worldwide as of March 13, 2021 (WHO, 2021).

While COVID-19 is like the SARS-COV (21%) and MERS-COV (50%) viruses, as reported by Lu et al. (2020), it is much more contagious. In fact, Zhao et al. (2020) stated, that the average number of people who will contract the virus from a single infected individual is between 2.25 to 3.58. The transmission occurs as a result of the virus being released via respiratory droplets or fomites between individuals who are in close contact. Further complicating the issue of transmission is the fact that a person infected with the virus may not even display symptoms until 5-6 days after contracting it (Drosten et al., 2003; WHO, 2020). However, those that do display symptoms most commonly reported a fever (98%), cough (76%), and myalgia or fatigue (44%) followed by less common ailments of a headache, hemoptysis, and diarrhea (Huang et al., 2020).

Reportedly, 63-81% of those who acquired COVID-19 displayed mild to moderate symptoms; however, hospitalization and severe illness were not out of the question (Garibaldi et al., 2021; Wu & McGoogan, 2020). Individuals who develop severe illness as a result of COVID-19 often develop complications including respiratory distress with a blood oxygen saturation of less than 93%, a partial pressure of arterial oxygen to fraction inspired oxygen ratio of less than 300, lung infiltrates of more than 50%, respiratory failure, acute cardiac injury, myocarditis, acute kidney failure, disseminated intravascular coagulation, pneumothorax, sepsis, decreased mental and cognitive status, and olfactory dysfunction (Huang et al., 2020; Murk et al., 2021; Van Kessel et al., 2022, Wu & McGoogan, 2020). In addition, Garibaldi et al. (2021) reported that 38% of individuals admitted to the hospital often progress to severe illness or death with 60% meeting one of these fates by Day 2 and 79% by Day 4.

Implication on Public Health in the United States

Despite the knowledge of the dire consequences of contracting COVID-19, the United States reported over 97.6 million cases that resulted in approximately 1.07 million deaths from December 2019 to November 2022 (CDC, 2022a). This was an unexpected result given that the United States is considered to have the most advanced public health system in the world (CDC, 2022b). In fact, the Global Health Index (n.d.) ranks the United States first in global health with an overall index score of 83.5 out of 100. The ranking is founded upon dimensions of prevention, detection, response, health, norms, and risk. The Global Health Index (n.d.) compartmentalizes each element as follows:

1) Preventing the emergence or release of pathogens to include antimicrobial resistance, zoonotic disease, biosecurity, biosafety, dual use of research, a cultural of responsible science, and immunization.

2) Early detection and reporting of epidemics of potential international concern thru laboratory systems, real time surveillance and reporting, procuring a sound epidemiologic workforce, as well as having data integration between human, animal, and health sectors.

3) A rapid response to and the mitigation of the spread of an epidemic as a result of emergency preparedness and response, exercising a response plan, having an emergency response operation, linking both public health and security authorities, communicating risk, having access to a communication infrastructure, as well as travel and trade restrictions.

4) Having a sufficient and robust health sector to treat the sick and protect health workers by having health capacity in clinic, hospital care centers, medical counter

measures with the ability of deployment of personnel, communication with healthcare workers during a public health emergency, formidable infection control practices and availability of equipment, in addition to the capacity to test and approve new counter measures.

5) A commitment to improving national capacity, financing, and adherence to norms thru international health reporting compliance and disaster risk reduction, cross border agreements on public health emergency response, joint external evaluation and performance veterinary services, financing, a commitment to the sharing of genetics, biological data, and specimens.

6) Finally, risk environment and vulnerability to biological threats by assessing political and security risks, socioeconomic resilience, infrastructure adequacy, environmental risks, and public health vulnerabilities.

Despite its efforts, the United States still fell short in abating the impact the COVID-19 virus would have on the country. The first case in the U.S. was reported in Washington State on January 21, 2020. After ascertaining that the COVID-19 virus had made it to the United States the federal government acted swiftly by restricting global air travel on February 2, 2020 and declared a public health emergency the following day in a feverish attempt to prevent and minimize the viral spread (AJMC,2021).

Even with these drastic measures in place the virus continues to spread and as of March 13, 2021, the United States has confirmed over 29.1 million cases and exceeded 530,000 deaths (CDC, 2021). Nationally, White, Non-Hispanics account for most cases at 55.7%, followed by Hispanics/Latinos (21.1%), Black-Non-Hispanics (12.2%), and the remaining ethnic groups of Multiple/other, Non-Hispanic, Asian, Native Hawaiian/Other Pacific Islander, and American

Indian/Alaska Native reporting less than 6%, respectively (CDC, 2021). Furthermore, those

between the ages of 18-29 account for most COVID-19 cases at 22.3%, followed closely by

those between the ages of 50-64 at 20.5%, the 30-39 age group comes in third at 14.9%, and

finally the remaining age groups reported no more than 14.9%, individually (CDC, 2021).

Conversely, those over the age of 85 account for a majority of virus-related deaths at 31.9%,

followed by those 75-84 years of age (27.7%), 65-74 next at 21.3%, those 50-64 represent 14.6%

of overall deaths, and the remaining age groups reporting less than 2.8% of deaths, respectively.

Furthermore, White-Non-Hispanic persons lead the death count with 63.3%; however, Black-

Non-Hispanics have a slightly higher disparity in deaths over Hispanic/Latinos with 14.6% and

12.3%, respectively (CDC, 2021).

Not only has the United States been unsuccessful in protecting the general public but it

has failed the health care community as well. Over 454,000 of the reported cases and more than

1,500 deaths in the United States involve a health care worker (CDC, 2021). According to

Cohen and Van Der Meulen Rodgers (2020), the lack of action by the federal government to

maintain and distribute personal protection equipment including N95 masks, eye protection, and

medical gloves exacerbated the ongoing pandemic by putting the health care workforce at an

increased risk of exposure. With a continuous rise and fall in COVID-19 related hospital

admissions as was seen between April (69.2%) and June (90%) of 2020 the strain on health care

workers and the hospital system itself will continue (Heist et al., 2021). In fact, the health care

system has been overrun for an entire year and as of March 2021 has seen over 1.9 million

hospital admissions which has led to the limited availability of intensive care beds and

ventilators (CDC, 2021; Nicola et al., 2020).

Impact on Cancer Patients

High infection rates and hospital admissions has led to many unforeseen health care circumstances, including a lack of access to care. A lack of access to care is detrimental to the public in general but it is especially harmful to more vulnerable populations such as cancer patients. Unfortunately, the COVID-19 pandemic has led to many obstacles and changes to cancer care. Jazieh et al. (2020) found that 88.2% of cancer facilities reported challenges in delivering care during the pandemic. In addition, a substantial decline in cancer screenings, visits, therapies, and surgeries has been observed. During the first COVID-19 spike in April 2020 cancer screenings decreased at the following rates: breast (85%), colon cancer (75%), prostate cancer (74%), and lung cancer by 56% (Patt et al., 2020).

In addition, to lessen the burden on an already overwhelmed health care system with limited supplies of personal protection equipment (PPE; 55.3% lacked adequate supplies of PPE), cancer centers reported reducing services as a preemptive strategy in resource conservation (Jazieh et al., 2020). Another tactic utilized to minimize the strain on the health care system and its lack of available resources was a ban on elective surgeries including cancer procedures (Ueda et al., 2020). While cancer surgery in general is not elective there were instances in which it was delayed without causing an increased health burden to the patient. For example, a cancer patient diagnosed with early-stage hormone receptor positive breast cancer may be considered for a delay in surgery following several months of endocrine therapy (Ueda et al., 2020).

Lack of access to care and a potential change in treatment course are not the only barriers cancer patients faced during the pandemic. It has been reported that cancer patients can have abnormal lymphocyte and Y cell counts for up to 10-11 years post treatment leaving them

21

immunocompromised for just as long (Rotstein et al., 1985). Therefore, not contracting the

COVID-19 virus is of great concern due to their compromised immune system as a result of their

prior or current cancer treatment regimen. Lee et al. (2021) reported that patients with cancer

had a 60% risk of becoming COVID-19 positive. Mei et al. (2020) substantiated this claim by

noting the infection rate among cancer patients to be approximately five times greater than that

of the general public. Moreover, it has been determined that cancer patients who have undergone

chemotherapy or immunotherapy are at a 2.2 -fold increased risk of becoming COVID-19

positive (Lee et al., 2021).

Furthermore, Liang et al. (2020) stated that cancer patients who contracted COVID-19

were more likely to experience severe illnesses such as pneumonia and respiratory distress. Tian

et al. (2020) confirmed this finding as their research found that 64% of cancer patients

experience severe COVID-19 symptoms. In comparison, only 32% of individuals who did not

have cancer as a predisposition developed serious COVID ailments. Unfortunately, cancer

patients were also more likely to succumb to the virus and die as a result. More specifically,

Erdal et al. (2021) identified a mortality rate of 23.9% among those with cancer compared to

1.5% for those without cancer.

Breast Cancer

At the start of the COVID-19 pandemic, there were approximately 17 million Americans

living with a medical history of cancer who were at increased risk of developing COVID-19

related complications. Of these reported cancer survivors, 3.86 million were women who had

been diagnosed with breast cancer at some point in their life. It is anticipated that during the

pandemic, new cases of breast cancer were added to the national count including 271,270 new

cases in 2019, 276,480 new cases in 2020, 284,200 new cases in 2022, and 339,250 in 2022 (ACS, 2019; 2020; 2021; 2022).

<div align="center">**Risk Factors for Breast Cancer**</div>

There are various factors that put a woman at a potential risk of developing breast cancer in her lifetime among them are personal traits, family history, and genetics. When assessing personal traits and breast cancer risk factors the following is taken into account: onset of menarche before the age of 11, obesity, high endogenous estrogen or testosterone levels before menopause, first full term pregnancy after the age of 30, menopause at age 55 or later, never bearing a child, abstinence from breast feeding a child, postmenopausal obesity, lack of physical activity, personal history of ovarian or endometrial cancer, hormonal contraceptive use, and recent or long-term use of menopausal hormone therapy containing estrogen and progestin (ACS, 2019). It is important to look at all of these aspects of a person because it is estimated that one-third of breast cancer cases can potentially be averted as they arise from factors that were preventable such as weight gain, alcohol consumption, lack of physical activity, and hormonal therapy (Tamimi et al., 2016). However, there are some personal characteristics that are out of one's personal control and put a woman at a higher risk of getting the disease such as early onset of menarche (Dall & Britt, 2017).

Another risk factor that is important to consider when it comes to breast cancer is family history. An individual whose family history includes a first degree relative having breast cancer puts a woman at a greater risk of developing the disease. In fact, it is reported that women with a first-degree family history of breast cancer have a 60% higher risk of getting breast cancer in their lifetime than their counter parts who have no known family history of the disease

(Shiyanbola et al., 2017). Furthermore, family history plays an important role in the detailing the possible genetic disposition one may have in developing the disease in the future.

When one speaks of genetics and breast cancer BRCA1 and BRCA2 are the genes most commonly considered. These two genomes account for approximately 5-10% of breast cancers overall and 15-20% of breast cancers that can be traced back to family history (Tung et al., 2016; Turnbull & Rahman, 2008). Moreover, those who have the BRAC1 and BRCA2 gene mutations are at a much higher risk of developing breast cancer by the age of 80 at 70% compared to the 10% risk the general population has of getting breast cancer by the same age (Kuchenbaecker et al., 2017).

Detection of Breast Cancer

While the risk of developing breast cancer depends upon various factors no one person is immune to the risk; therefore, breast cancer detection methods are critical. The recommended form of breast cancer detection can vary from a mammogram, or an ultrasound, to magnetic resonance imaging depending on the individual's age and risk level. Mammography which is a 2-dimensional low dose x-ray image of the breast tissue is the most commonly used technique to evaluate the composition of an individual's breast tissue. Women who are at an average risk of breast cancer should commence mammogram screenings between the ages of 40-44, with annual screenings for those between 45-54, and either annual or biannual imaging for those 55 and older (Oeffinger et al., 2015). Moreover, 3-dimensional digital mammogram, which allows for a 3D image of the breast tissue to be constructed for analysis, can be conducted alongside a routine mammogram. In fact, digital mammography has been found to have greater specificity and detection for breast cancer (Conant et al., 2019).

Additionally, should an abnormal finding during a routine mammogram or physical exam an ultrasound may be recommended. Ultrasound imaging uses sound waves to capture images of the breast tissue. It is often used in conjunction with a mammogram for individuals with dense breast tissue to increase the sensitivity of detection in potential areas of concern within the breast tissue. In fact, when compared to mammography, ultrasound has been found to increase breast cancer detection by 40% (Rebolj et al., 2018).

Finally, for an individual with a lifetime risk of breast cancer between 20-25% it is recommended that an MRI (magnetic resonance imaging) be performed in addition to an annual mammogram beginning at the age of 30 years (Saslow et al., 2007). According to Saslow et al. (2007) an individual may be placed in this high-risk category based on any of the following: suspicion for the BRCA1 or BRAC2 gene, a first-degree family member with a confirmed BRCA1 or BRCA2 genetic mutation, a family history of breast or ovarian cancer, prior radiation therapy to the chest, or a diagnosis of Li-Fraumeni, Cowden, and/or Bannayan-Riley-Ruvalcaba syndrome. Furthermore, an MRI may be considered if a woman is deemed to be within a 15-20% lifetime risk of developing breast cancer, including those with dense breast tissue (Saslow et al., 2007).

Types of Breast Cancer

The two most common forms of breast cancer are ductal carcinoma in situ (DCIS) and lobular carcinoma in situ (LCIS). While LCIS is considered a benign form of breast cancer that does not progress into an invasive form of the disease, it has been found to be associated with an increased risk of breast cancer (ACS, 2019). Coversely, according to the ACS (2019), DCIS is considered an invasive form of breast cancer that does present with the potential to progress. In

fact, 81% of breast cancers become invasive meaning they have broken through the glandular or ductal portions of the breast and have grown into other portions of the breast (ACS, 2019).

As a result, breast cancer is no longer viewed as a singular disease rather a group of diseases that consists of several subtypes. The histologic subtype of the disease is based on the size, shape, and arrangement of the abnormal cells within the breast tissue. The ductal carcinoma subtype accounts for more than 75% of invasive breast cancers; meanwhile, lobular carcinomas are responsible for 15% of invasive breast cancers with the remaining breast cancer diagnoses being of the tubular, mucinous, cirriform, papillary, and inflammatory histological subtypes (ACS, 2019).

Then there are the molecular subtypes, which are defined by their biological markers, to consider when assessing breast cancer. There four main molecular subtypes of note and which include Lumina A, Luminal B, Basal-like, and HER-2 enriched. Lumina A, which is an HR (hormone receptor) positive and HER2 (human epidermal growth factor 2) negative breast cancer is the most common molecular subtype accounting for 73% of cases. Fortunately, it is known to be both slow growing and less aggressive compared to its counterparts; thus, allowing for a better outcome (ACS, 2019). Conversely, Luminal B cancer lends itself to a poorer health prognosis than that of Luminal A since it tends to be a higher grade of cancer as well as HR and HER2 positive. Fortunately, this form of breast cancer only accounts for 11% of the subtypes (ACS, 2019). Then there is the Basal-like subtype, commonly referred to as triple negative breast cancer, which is ER (estrogen receptor), PR (progesterone receptor), and HER2 negative. While this subtype accounts for only 11% of breast cancer cases, it tends to result in a grimmer outcome for the patient, partially due to the lack of advanced treatment for this breast cancer subgroup (ACS, 2019; Plevritis et al., 2018). The final subgroup is HER2-enriched, which

accounts for the remaining 4% and is thought to produce the worst prognosis of them all until recently with the advent of new targeted immunotherapies (ACS, 2019).

Prognosis and Survival

Breast cancer subtypes do have a direct impact on the prognosis of a patient diagnosed with breast cancer. The 5-year survival rate of women diagnosed with Luminal A breast cancer is 92%, 89% for Luminal B, 83% for HER2-enriched, and 77% for the Basal-like subtype (ACS, 2019). However, the cancer subtype is not the only factor that determines a patient's prognosis after a breast cancer diagnosis.

The stage at which the breast cancer was detected is more instrumental in determining a patient's individualized survival rate. Stage I is invasive breast cancer that has spread to a small area of normal breast tissue with little to no spread to the sentinel lymph node. Stage II involves a larger volume of the breast containing cancer cells in addition to spread to a few nearby lymph nodes. Stage III involves more lymph node involvement along with tumors invading tissue below the muscles and/or above the skin. Finally, Stage IV involves breast cancer that has spread beyond the breast and lymph nodes into other parts of the body. For an individual diagnosed with either Stage I or II breast cancer the 5-year survival rate is deemed to be approximately 99%; whereas, individuals diagnosed with Stage III disease or regional disease have a lower yet relatively high predictive 5-year survival rate of 86%; however, the same cannot be said of Stage IV or metastatic breast cancer patients who only have a 27% 5-year survival rate (Howard et al., 2011).

Treatment of Breast Cancer

The stage of breast cancer at the time of diagnosis will determine the type of treatment recommended. Early-stage breast cancers will often be treated with surgery followed by one or a

combination of the following: radiation therapy, chemotherapy, hormone therapy, and/or targeted immunotherapy. Surgery is the mainstay in the treatment of Stage I breast cancers. The type of surgery can range from breast conservation surgery (BCS) where a lumpectomy or partial mastectomy is performed to full removal of the breast, mastectomy. In addition, a sentinel biopsy and/or axillary node dissection is performed to further assess disease involvement in Stage I breast cancers. Furthermore, patients who opt for BCS will also receive radiation therapy to decrease the chance of recurrent disease (ACS, 2019).

However, there are caveats when radiation may be omitted due to the lack of evidence supporting an increase in the time of survival. One stipulation for not recommending radiation, according to the ACS (2019), is for a patient over the age of 70 whose tumor measures less than 2 cm in dimension and is completely removed during surgery, none of the lymph nodes removed during the surgical procedure showed evidence of cancer, and they have either ER positive or PR positive cancer that was treated with hormone therapy. Another scenario in which radiation may be foregone is when a total mastectomy is performed; however, the details of the specific cancer detected must be considered before coming to this conclusion (ACS, 2019).

Furthermore, women with Stage I breast cancer may also be recommended a 5-year course of adjuvant hormone therapy such as tamoxifen or aromatase inhibitor if they display either ER or PR positive breast cancer; on the other hand, if the cancer subtype is HER2 positive trastuzumab for 1 year is the recommendation. In addition, chemotherapy may be discussed to be delivered in an adjuvant setting if the cancer is larger than 1 cm across in dimension, displays unfavorable features along with rapid progression, is HR negative, HER2 positive, or scores high on a genetic panel such as Oncotype DX (ACS, 2019).

Conversely, women diagnosed with Stage II breast cancer will start their treatment regimen with chemotherapy or hormone therapy based on their cancer specifics (i.e., HR positive and HER2 negative status). The treatment continues with either BCS or a total mastectomy in addition to a sentinel node biopsy or axillary dissection. This is the extent of the treatment if no cancer cells are detected during the biopsy or dissection; however, should either the biopsy or dissection show positive signs of cancer cells radiation therapy following the surgery is endorsed (ACS, 2019).

Stage III breast cancers display relatively large tumors that are at least 5 cm in dimension and have grown into nearby tissues such as the skin surface, muscles, and/or lymph nodes. The most common treatment regimen for this stage of breast cancer is to start with chemotherapy; however, surgery from the onset is also an option. For those who start their treatment with chemotherapy and are HER2 positive the drug of choice is trastuzumab, which may help shrink the tumor prior to surgery and allow for BCS. If the cancer does not shrink enough then a total mastectomy is performed. The surgery will then be followed by radiation therapy. However, some cases will require an additional year of chemotherapy should the tumor come back to be HER2 positive or hormone therapy if the cancer was deemed to be either ER or PR positive (ACS, 2019).

Finally, for Stage IV or metastatic breast cancer that has spread to other parts of the body, systemic therapies including chemotherapy, hormonal therapy, immunotherapy, or combination of the above is the treatment regimen of choice. Chemotherapy is the first line of treatment for Stage IV breast cancer patients because hormone treatments often take months to produce a response (ACS, 2020). Those individuals with either ER or PR positive tumors will be treated with tamoxifen or an aromatase inhibitor; whereas, those displaying HER2 positive cancers will

be prescribed one of the following: trastuzumab, pertuzumab, lapatinib, or ado-trastuzumab emtansine. Furthermore, women with HER2 negative cancer and a BRCA gene mutation will be given the option to take a hormone therapy consisting of either olaparib or talazoparib after chemotherapy; moreover, HER2 negative breast cancer patients who display a genetic mutation of the P13K inhibitor and are postmenopausal will be prescribed a regimen of hormone therapy of alpelisib along with fulvestrant (ACS, 2020). Finally, for the triple negative subgroup, the immunotherapy drug atezolizumab along with a regimen of paclitaxel chemotherapy will be the treatment of choice, according to the ACS (2020).

While the systemic treatments just described are the mainstay for Stage IV breast cancer, other treatments including surgery and radiation therapy may be utilized as well. These treatments will be specific and be utilized to treat certain parts of the body to either inhibit more spread of the disease or to treat symptoms resulting from the cancer. For example, radiation therapy may be introduced to treat a portion of the spinal cord that is being invaded by cancer to avoid paralysis or a small area of the brain that has acquired a tumor may be treated if it is causing neurological symptoms (ACS, 2020). Additionally, surgery may be considered when a critical health situation arises such as a cancer protruding from the breast or a blood vessel blockage is occurring within the liver due to metastatic disease (ACS, 2020).

Impact of Coronavirus on Breast Cancer Patients

As has been noted, these treatment regimens are important and have a direct impact on the prognosis for a breast cancer patient. Unfortunately, the COVID-19 pandemic has impacted the health care systems ability to deliver care even to the most vulnerable of populations including the cancer community. Papautsky and Hamlish (2020) exposed this fact with their report that 44% of cancer patients have experienced a delay in care as a result of the pandemic.

A pause in cancer care as a result of the pandemic will likely lead to dire consequences for breast cancer patients. In fact, Bleicher et al. (2016) stated that increased time to surgery after a breast cancer diagnosis is associated with lower overall and disease specific survival. Furthermore, when it comes to breast cancer Gagliato et al. (2020) reported that a delay in the start of neoadjuvant chemotherapy of more than 61 days will also lead to decreased survival rates. Furthermore, a delay in chemotherapy treatment of more than 120 days post-surgery will lead to even poorer and more grim outcomes for breast cancer patients (Kupstas et al., 2019). Finally, research has shown that a delay in radiotherapy also has an impact on local control of breast cancer and the cancers propensity to reoccur within 5 years (Huang et al., 2003).

Medical Decision Making

While the pandemic has put cancer screenings and treatments on pause, the decision on how to proceed with treatment after a cancer diagnosis remains. A breast cancer diagnosis can be rather daunting without all the complexities of treatment options. It is important that a physician present a comprehensive treatment plan to his or her patient; however, many breast cancer patients report that the information being delivered is much too detailed and is not given at a level in which the person wishes to receive; thus, inhibiting their ability to fully understand what exactly the treatment plan entails (Tamirisa et al., 2017). Josfeld et al. (2021) validated cancer patients' high need for information on their treatment plan; however, along with that requisite came a feeling of information overload (O'Brien et al., 2013). In her 2013 study, O'Brien et al. (2013) reported cancer patients often express a feeling of being overwhelmed with the complexity and amount of information provided.

Despite the gravity of the decision most breast cancer patients want to directly partake in the decision-making process for their respective course of treatment (Brown et al., 2012;

Tamirisa et al., 2017; Josfeld et al., 2021). In making these crucial decisions in addition to information provided by their personal physician individuals rely on various factors including health literacy, access to health information, fluctuating emotional states. In fact, health literacy (ability to access, read, and comprehend health information) has been found to have a profound impact on one's decision-making capacity. Yadollahi et al. (2018) reported a statistically significant inverse correlation between health literacy and decisional conflict among breast cancer patients resulting in those with lower levels of health literacy to be less confident in their final decision. Later in 2021, Josfeld et al. reported similar findings and stated that cancer patients preferred shared decision making with their physician (91.4%) to ensure a clear informed decision was made. As a result, shared patient-physician decision making increased patient satisfaction and treatment compliance (Josfeld et al., 2021).

To further combat this uncertainty and increase their self-reliance and efficacy people often seek information from sources other than their physician such as the internet (Chen et al., 2018; Hall et al., 2015). Lee et al. (2010) reported that 37.1% of cancer patients scoured the internet within the past 30 days prior to study participation to gather information on their diagnosis. Nearly 10 years later, Bender et al. (2021) reported that utilization of the internet by patients to acquire information on cancer treatment and support had increased to 73%. The online health information garnered assisted with a patient's decision making by aiding in the formulation of questions to ask their physicians, increased compliance to attend appointments, and self-care (Thapa et al., 2021). An individual's emotions, both current and future, also play a pivotal role in the decision-making process (Power et al., 2011). Breast cancer patients have reported wanting to know about their prognosis but avoided discussing the details due to the emotional discomfort and distress it might precipitate (Niranjan et al., 2020). Breast cancer

patients also acknowledged that the emotion of regret played an important role in the decision-making process. More specifically, Tyner and Freysteinson (2021) reported that breast cancer patients identified three distinct areas of regret: outcome regret (poor and/or anticipated surgical, physical, psychological outcome), process regret (lack of information, poor communication), and regret of their chosen treatment option.

Familial Impact on Decision Making

People often see a medical decision as an autonomous decison. In fact, most of breast cancer patients (93%) believe that they play a key role in their own medical decision (Gilbar & Gilbar, 2009). However, there are instances in which family members play a vital role in the final treatment decision as well. For example, Gilbar and Gilbar (2009) found that breast cancer patients believe the participation of their spouses in the decision process along with their support of the final choice is just as important at 84% and 89%, respectively. In addition, breast cancer patients often seek information from family when deciding whether to undergo chemotherapy (O'Brien et al., 2013). Breast cancer patients also display a higher level of self-esteem and compliance during chemotherapy treatments when family social support exists (Aprillianto et al., 2021). Moreover, nearly half (49%) of less acculturated Latina breast cancers patients are more likely to leave the final decision to a family member; although, it is important to note that this is not the case for African American and Caucasian women with only 4% reporting a family member as the final decision maker (Maly et al., 2006). Further, it has been reported that a vast majority (90.8%) of caregivers, who are often family members, have reported some involvement in a cancer patients' medical decision making (Longacre et al., 2018).

Health-Related Quality of Life

Decision making along with the ensuing course of treatment will have an inherent impact on an individual's quality of life. Quality of life is multidimensional in nature as it is an evaluation of a "persons' physical health, psychological state, level of independence, social relationships, personal beliefs, and their salient features of the environment" (WHO, 2012). HRQOL goes slightly further and assesses how an individual's health is impacted by his or her "physical and mental health perceptions (e.g., energy level, mood) and their correlates including health risks and conditions, functional status, social support, and socioeconomic status" (CDC, 2018). HRQOL is important to track and asses because it gives insight into a patient's reported outcome, which in turn provides invaluable discernment into precipitating risk factors and areas that may need to be addressed in order to minimize the effects of a health burden (CDC, 2018).

HRQOL: Breast Cancer Women

HRQOL of breast cancer patients is most often affected by psychological factors including anxiety, distress, depression, and post-traumatic stress disorder (Dinapoli et al., 2021). Furthermore, 10-20% of breast cancer patients report feeling nervous, sad, or worried about dying as a result of their cancer diagnosis. In addition, only 30% of breast cancer patients stated that they were content with their quality of life at the time of their diagnosis (Colombo et al., 2018). Moreover, patients who undergo whole breast radiotherapy see higher levels of fatigue that lingers as opposed to their counterparts who opt for partial breast radiation therapy who see less fatigue that lessens with the passage of time (Albuquerque et al., 2012). This phenomenon has a direct impact on quality of life. As Albuquerque et al. (2012) reported women who chose partial breast radiation therapy exhibited a gradual increase in quality of life as time passes; whereas, the induction of whole breast radiation therapy as a treatment regimen denotes a

decrease in quality of life. Furthermore, women who underwent chemotherapy as a part of their treatment regimen tended to see higher rates of depression, less satisfaction with life, as well as poorer levels of physical and emotional well-being (Hwang et al., 2013). Physical symptoms reported for breast cancer patients that caused distress included hair loss, fatigue, insomnia, and pain; while emotional impacts included increased anxiety, depression, fear, and sadness (Liu et al., 2021).

HRQOL is not indicative to only the course of time involving treatment—some health treatments, such as those for cancer, have the propensity to cause health issues long past the completion of treatment. Götze et al. (2015) reported that 1 year post cancer treatment patients continue to see chronic fatigue and sleep disturbances in addition to financial difficulties. These symptoms of sleeping difficulty and lack of energy continue to persist 1.5 years after cancer treatment for many breast patients and have even been reported by 5 year breast cancer survivors (Colombo et al., 2018; Engel et al., 2003).

Disruption of Life

A breast cancer diagnosis often upends a person's daily life as they know it. Cancer treatment can lead to disruptions including health concerns, changes in social interactions and normal daily activities, and financial hardships. A common side effect of treatment that breast cancer patients often experience is a diminished ability to perform daily activities due to fatigue and lymphedema as a result of surgery, radiotherapy, and/or chemotherapy (Hayes et al., 2005; Kim et al., 2019). In addition, breast cancer patients often meet their diagnosis with an array of feelings and concerns including disbelief, shock, anger, fear, numbness, denial, confusion, and a sense of a loss of control (Fisher & O'Connor, 2012). It is important to note that if any of these feelings lead to a lack of social interaction, the breast cancer patient will likely experience a

higher mortality rate (Kroenke et al., 2013). However, when breast cancer patients displayed self-compassion, corresponding lower levels of stress and increased self-care were reported (Abdollahi et al., 2020).

Another livelihood disturbance that breast cancer patients often incur is a lack of flexibility of appointment times irrespective of their personal obligations (Fisher & O'Connor, 2012). This can have a direct impact on an individual's employment status and finances. In fact, over one-fourth (27.3%) of women report a disruption in their employment due to their breast cancer diagnosis (Meernik et al., 2021). Furthermore, one in five breast cancer patients report having experienced financial hardship and as a result had difficulty paying for their care and have had to borrow money and/or incur debt (Meernik et al., 2021). Financial stress and strain were reported by Sharp and Timmons (2016) to be even more burdensome among breast cancer patients who have dependents, mortgage loans, higher out-of-pocket medical costs, and household expenses.

Resilience

When analyzing an individual's resilience in terms of HRQOL concepts such as perceived benefits, functional support, and stress management are typically assessed by research teams. While a breast cancer diagnosis has the potential of creating or fostering a negative mindset many breast cancer patients opt to think more positively and see their diagnosis as a perceived benefit. Patients report that the diagnosis gives them a second chance at life in which they can reevaluate what is truly important in their life (Fisher & O'Connor, 2012). In addition, many women become more self-reliant, optimistic, and goal oriented, and resilient as a result of their breast cancer diagnosis (Pieters, 2016; Tu et al., 2020). Another important factor in a breast

cancer patients' resilience is their foundational social support. Drageset et al. (2012) found that breast cancer patients often rely upon a myriad of social supports forms including:

> (a) medical guidance from healthcare professionals thru explanation and counseling; (b) care in the form of respect, comfort, prayer, empathy, and love; (c) confidants with whom they can speak to freely about intimate facts regarding their health; (d) a social network that allows for both closeness and distance, as needed; and (e) available support that can be called upon at a moment's notice. (p. 39)

This is important because breast cancer patients who have significant social support report less depression, increased emotional well-being and resilience (Fong et al., 2017; Zhou et al., 2022). Additionally, Dooley et al. (2017) reported that breast cancer survivors who have experienced acute to moderate stress during their lifetime tend to have higher rates of resilience despite their diagnosis.

Impact of COVID-19 Psychosocial and Quality of Life of Breast Cancer Patients

The COVID pandemic had undoubtedly tested an individual's resilience, caused a fair amount of disturbance, and impacted their overall HRQOL. Most breast cancer patients (90%) that contracted the COVID-19 virus reported a delay in treatment, with Black, Non-Hispanic being disproportionately (62%) affected (Islam et al., 2022). However, cancer patients (80%) resoundingly reported the need to continue with their healthcare and appointments despite the COVID-19 pandemic (Koinig et al., 2021). A vast majority of cancer patients (83%) reported being well-informed about their treatment throughout the pandemic (Koinig et al., 2021); though female cancer patients did report that the pandemic disrupted their lives and their ability to conduct their daily activities, such as seeing family and the ability to work (Koinging et al.

2021). Additionally, younger cancer patients (< 60 years of age) reported distress as a result of the pandemic (Koinig et al., 2021).

It has also been documented that the pandemic has caused breast cancer patients specifically, to feel lonely, experience a deterioration in emotional well-being, and be less likely to seek follow-up care from their physicians, with only 40% of those at high risk of breast cancer getting a mammogram 10 months into the pandemic (Bargon et al., 2021; Conley et al., 2022). In addition, the pandemic has caused breast cancer patients to feel a heightened sense of uncertainty and vulnerability to the COVID virus (Supriati et al., 2022). However, they continue to strive for normalcy and keep hope alive (Chia et al., 2021).   Furthermore, breast cancer patients have exhibited an increase in resilience despite the pandemic thru virtues of optimism, mindfulness, self-efficacy, and hope (Chiesi et al., 2022). This research study strives to keep that hope alive as well and help with the road to normalcy by investigating exactly how the COVID-19 pandemic has continued to impact a breast cancer patient psychosocially in terms of resiliency and disruption of life, as well as their HRQOL and medical decision-making.

CHAPTER III

METHOD

Mixed Method Design

This chapter describes the explanatory sequential mixed method design utilized in this research study. Additional details are provided specific to the participant sample, and methods employed to protect human participants. Finally, data collection procedures, including instrumentation, and data analysis are detailed.

Participant Population and Sample

The research population for this study included a convenience and criterion sample. A convenience sample was utilized as this form of population sampling is expedient; though, it is important to note that convenience sampling at times lacks an underlying purpose, which results in an absence of critical information to lend to the research (Grembowski, 2001, p. 178). Given this limitation, specific criterion sampling, which allows for specified cases to be selected for in depth analysis, was also implemented in this study (Grembowski, 2001, p. 178).

The convenience sample was recruited derived from the Mays Cancer Center at UT Health San Antonio-MD Anderson Cancer Center located in San Antonio, Texas. The criterion for acceptance into the target population included: being a female of age 20 or above, have an affirmed ICD-10 diagnosis of breast cancer, and either undergoing or have received cancer treatment at the Mays Cancer Center between March 1, 2020 and August 31, 2021. The outlined dates of diagnosis were imposed to correlate with the lockdown in Texas as a result of the COVID-19 pandemic. Governor Greg Abbott instituted an executive order, GA-08, for the State of Texas effective March 20, 2020. The executive order GA-08 limited social gatherings to no more than 10 people, ordered people to avoid eating or drinking at bars and restaurants, abstain

from visiting gyms or massage parlors, limited nursing homes and retirement home visits to personnel providing direct care, and closure of all schools (Tex. Exec. Order GA-08). The Mayor of San Antonio, Texas declared a Public Health Emergency with a city ordinance on March 24, 2020. The San Antonio city ordinance aligned with the guidelines set forth by Governor Abbott's executive order; however, the ordinance extended the restrictions and put the city of San Antonio on lockdown. The ordinance required that all individual's residing in the city of San Antonio stay at home and only go outside of the home to either seek health care or necessary supplies such as food or sanitary items (S.A. City Ord., Declaration 8).

An a priori power analysis was conducted using G*Power 3.1.9 to determine the minimum sample size required to find statistical significance using t-test analysis. With a desired level of power set at .80, an alpha (α) level at .05, and a moderate effect size of .45 (ρ), the researcher determined that a minimum of 33 participants would be required to ensure adequate power (Cohen, 1988). For the qualitative component of the research study, it was estimated that at least 15 individuals who completed the quantitative survey would be asked to partake in the follow-up interview to reach data saturation with the caveat that should a consistent thematic construct present itself prior to the completion of 15 interviews, the research investigator would cease the qualitative data collection.

Protection of Human Participants

Prior to the commencement of the research study, approval was granted from the Institutional Review Boards of the University of Texas Health San Antonio Mays Cancer Center and Texas Woman's University. Upon review by the Institutional Review Board at the University of Texas Health San Antonio it was determined that the current research study presented low risk and would only require for a participant to give verbal consent to participate.

However, the researcher provided an information sheet detailing the research study and procedures to each consenting participant to ensure informed consent (see Appendix A). In addition, to ensure the integrity of the research, the survey responses were administered electronically via REDCap and retained in REDCap for enhanced data security. Furthermore, to minimize the risk of compromising the medical information and maintaining HIPAA compliance, each research participant received a unique identifier within REDCap with their medical record concealed (but not removed) to ensure the correct association between the individual's responses and the pertinent clinical data.

Data Collection Procedures

The current study design employed an explanatory sequential mixed method. The research design for the current study contained a quantitative phase followed by a qualitative phase. The quantitative phase of this research design was comprised of data collection of specified variables such as gender, socioeconomic status, disease state, in addition to close-ended Likert stylized questions. Upon the completion of quantitative data collection, an analysis was conducted to further develop the next qualitative phase of the study. The qualitative phase attempted to explain, in more detail, the quantitative findings (Creswell, 2014, p. 224).

To address this design, a thorough sampling was conducted in the quantitative phase of the study utilizing the *COVID-19: Impact of the Pandemic and HRQOL in Cancer Patients and Survivors* survey, which was followed by a purposeful audio-recorded interview of participants in the qualitative phase to enrich the findings (i.e., further investigate the mechanisms of interaction, extended data collection from the same participants in both phases). This methodology allowed for analysis of items such as significant predictors, results of relating variables, and/or insights on insignificant results (Creswell, 2014, p. 224).

In order to achieve all the components of this research design, a detailed data collection procedure was implemented. First, individuals who presented at the Mays Cancer Center Radiation Oncology Department either for a new patient consult, weekly check-up, or follow-up consult were offered information on the COVID-19 pandemic and this breast cancer research study and asked if they were interested in enrolling. Individuals who decided to partake in the study were provided with a participant information sheet. Upon consent, the research participant was provided the opportunity to complete the *COVID-19: Impact of the Pandemic and HRQOL in Cancer Patient and Survivors* survey (see Appendix B) electronically via REDCap and using a patient education computer or iPad at the Mays Cancer Center. The Electronic Medical Record System (EPIC) was utilized to garner descriptive variables including: age, gender, race, ethnicity, education level, marital status, employment status, insurance status, cancer diagnosis, stage of cancer, date of first radiation oncology consult, and date of first treatment. One week after completing the survey, the principal investigator (PI) contacted each research participant to invite them to participate in a 1-hour phone call interview. Though each research participant was consulted about the opportunity to partake in a qualitative follow-up interview, the final number of qualitative interviews was data driven and ended at the point of saturation and the identification of a thematic construct. The interview detailed the individual's experience and rationale for declining medical care or seeking emergency care during the pandemic, the psychosocial disruptions and resilience factors impacted by the COVID-19 health crisis, and the ways each patient's HRQOL was directly affected.

Instrumentation

The survey instrument utilized in this research study was the *COVID-19: Impact of the Pandemic and HRQOL in Cancer Patients and Survivors* developed in 2020 by Dr. Frank

Penedo and his team at the University of Miami Health Systems Sylvester Comprehensive

Cancer Center in collaboration with investigators from MD Anderson Cancer Center and the

University of California Los Angeles. Dr. Penedo and his team developed a new questionnaire,

drawing from published measures that have addressed the impact of previous pandemics as well

as disasters such as 9/11, in order to address the new need created by the COVID-19 pandemic

(Penedo et al., 2021). The overarching purpose of the survey questionnaire was to assess the

impact of the COVID-19 pandemic on cancer patients and survivors with the following concepts

in mind: COVID-19 exposure, risk factors, testing, isolation, seropositivity, hospitalization, loss

of significant others, financial loss, psychological distress brought on by the pandemic,

disruptions in healthcare and daily activities, valuation functional social support, perceived

benefits, stress management, as well overall health-related quality of life

(Penedo et al., 2021).

The survey contained 43 questions addressing: COVID experiences, psychological and

practical experiences to include COVID-19 specific distress both emotional and physical, health

care disruption and concerns, disruption to daily activities and social interactions, financial

hardship, perceived benefits, functional social support, perceived stress management, and

health-related quality of life. As reported by Penedo et al. (2021), these questions were based on

the functional assessment of cancer therapy-general (FACT-G) questionnaire. Item response

options for the COVID-19 experiences component of the questionnaire include nominal response

options (e.g., simply denoting a *yes*, *no*, *do not know*, or *not applicable* response) and Likert

scale responses of *very dissatisfied*, *somewhat dissatisfied*, *neutral*, *somewhat satisfied*, and *very*

satisfied. Whereas, the psychological and practical experiences component of the survey used

Likert scale responses only, which included *strongly disagree*, *disagree*, *neither agree or*

disagree, *agree*, and *strongly agree*. The HRQOL section of the survey posed questions with Likert style responses ranging from *not at all*, *a little bit*, *somewhat*, *quite a bit*, to *very much* (see Appendix B). Finally, the various sections were compartmentalized to address the specific notions of disruption and resiliency. Disruption-related questions addressed health care disruptions and concerns, disruptions to daily activities and social interactions, and financial hardship. Resiliency questions addressed perceived benefits, functional social support, and perceived stress management (Penedo et al., 2021).

While the survey had the propensity to provide generous information on the impact of the COVID-19 pandemic on cancer patients and survivors, it was vetted for reliability and validity before it was included in this study. The validity of as instrument indicates that it measures what it intends to; meanwhile, the reliability aspect signifies the consistency and stability of the questionnaire (Creswell, 2014, p. 201). The HRQOL component of the survey, FACT-G, is a widely used metric that is utilized often in cancer treatment and survivorship settings. Yanez et al. (2013) verified the internal consistency reliability of the FACT-G with an alpha of 0.74. Furthermore, the moderate to strong relationships shown thru statistical analysis of the variables substantiate the validity of the questionnaire (Yanez et al., 2013). The remaining portion of the survey was new and based on a specific COVID-19 subject matter that had just arose—the COVID-19 pandemic and the psychosocial and practical experiences it can precipitate. To address the validity and reliability of COVID-19 specific portion of the survey, Dr. Penedo was contacted and he agreed to share preliminary evidence (see Appendix C). In their unpublished study that utilized a convenience sample of 14,183 cancer survivors, strong reliability (alpha = 0.90) and validity were found providing evidence of the strong relationships among the investigative criteria (Penedo et al., 2021). While the survey was shown to be reliable,

participants' completion of each question on the survey significantly impacts the study conclusions. Therefore, to address any potential for missing data in the current study, submission of the survey would only occur when all questions were answered.

Additional measures were employed to address reliability and validity in the qualitative phase of the research. First, to ensure consistency in administration of the interview guide, only the principal investigator conducted the follow up interviews. Second, the interviewer asked the same open-ended probing questions to each participant:

1. According to your survey responses, the psychosocial experience that caused the most disruption to you during the COVID-19 pandemic is _____. Would you say that is correct?

2. Can you please tell me a little more about this experience?

3. So, what I am hearing from you is _____. Do you feel that is an accurate statement?

4. According to your survey responses, the psychosocial experience that presented you the most resilience during the COVID-19 pandemic is _____. Would you say that is correct?

5. Can you please tell me a little more about this experience?

6. So, what I am hearing from you is _____. Do you feel that is an accurate statement?

7. In regard to your quality of life, _____ seems to have been affected the most during the COVID-19. Would you say that is correct?

8. Can you please tell me a little more about this?

9. So, what I am hearing from you is _____. Do you feel that is an accurate statement?

10. Finally, during the COVID-19 pandemic you decided to _____ a general medical

appointment, _____ a cancer appointment or treatment and _____ seek emergency

care at an urgent care facility or emergency room. Is that correct?

11. Can you please tell me a little more about why you made these decisions?

12. So, what I am hearing from you is _____. Do you feel that is an accurate statement?

Finally, triangulation of data and member checking were utilized during the qualitative data

collection process. Triangulation was done by examining the evidence found in the quantitative

analysis to build a coherent justification of themes that present themselves via the perspectives of

the research participants. Meanwhile, member checking occurred as quantitative findings and

themes were presented to the study participants themselves during the interview process to

ensure their accuracy.

Data Analysis

Statistical analyses were conducted using SPSS (Version 25 Package). Descriptive

statistics were completed for all variables to identify measures of central tendency and measures

of dispersion. In addition, independent t-test analyses were conducted to ascertain if any

difference existed between the groups, based on the nominal independent dependent variable of

COVID-19 virus status (positive or negative COVID-19 status), both personal and familial

status, for the ordinal dependent variables of disruption of life, resiliency, and HRQOL. To

identify the concepts of disruption and resiliency the following computation was performed

(Penedo et al., 2021):

- Disruption Composite Score was calculated by summing the Healthcare Disruption and

  Concerns Subscale, Disruption to Daily Activities and Social Interactions Subscale,

and Financial Hardship Subscale and dividing the sum by 15. The Disruption

Composite Score was presented as a mean score.

- Resiliency Composite Score was calculated by summing the Perceived Benefits

    Subscale, Functional Social Support Subscale, Perceived Stress Management Subscale

    and dividing the sum by 15. The Resiliency Composite Score was presented as a mean

    score.

Furthermore, to assess statistical significance of the relationship between the nominal

independent variable of COVID-19 status (positive or negative), both personal and familial, and

the nominal dependent variable of attendance to a general medical appointment and cancer-

related appointment, a Chi-squared test was conducted. Additionally, because the assumption of

the Chi square test was violated, due an expected case count of less than five case of COVID-19

positive status, a Fishers exact test was performed. The effect size was also calculated by

subtracting the mean of the positive test group from the mean of the negative test group, and then

dividing that number by the pooled standard deviation (Green & Salkind, 2014). As a result, a

negative effect size was possible and would indicate more of an effect on the group that tested

positive for COVID-19.

Finally, qualitative analysis was conducted using thematic analysis. The participants

interviews were audio recorded and imported into NVivo software for transcription and analysis.

Thematic coding was used to determine prominent themes from the data specific to personal

experiences, the COVID-19 pandemic, disruption, resilience, HRQOL, and their decisions to

seek or decline medical care.

Summary

The explanatory sequential mixed method research employed is a multifaceted approach. The strength of this approach, while complex, is that it allowed for gathering data and enriching the analysis by first examining quantitative data and then following up with probing qualitative questioning. Conducting the qualitative interviews with knowledge of the quantitative findings allowed the researcher to probe more specifically during the interviews and produce richer, more detailed findings.

CHAPTER IV

RESULTS

Mixed Methods Results

The purpose of this mixed method research study was to explore the impact of the COVID-19 pandemic on women in active treatment for breast cancer. The study investigated for main topics: (a) disruption, (b) resilience, (c) the propensity to attend medical appointments in person, and (d) HRQOL. This chapter presents, in order, the findings of the quantitative and qualitative phases of the research.

Participants

In the spring of 2022, a total of 33 females, who were about to commence, currently receiving, or had just completed radiation therapy at the Mays Cancer Center at the University of Texas Health-San Antonio, were recruited to participate in the quantitative component of the psychosocial impact of COVID-19 and breast cancer research study. Of the 33 participants, all 33 completed the quantitative survey and 15 participants completed the follow-up qualitative interview. Most of the participants identified as White (81%) with the remaining (19%) classifying as either Black, American Indian, or other. Regarding ethnicity, a majority of the participants identified as Non-Spanish (57.6%) with the remaining reporting their ethnic background as either Spanish/Hispanic/Latino/Not otherwise specified (39.4%), or unknown (3%). Finally, most of the study participants reported that they were married (66.7%), while others reporting being single (21.2%), divorced/separated (6.1%), living as married (3%), or widowed (3%). The reported education of the participants varied, with associate degree/some college being the most prevalent response at 27.3%. The varying responses for educational status

are presented in Table 1, though many of the participants (66%) reported completing some type of post-secondary education.

Table 1

Participants' Education Level

Education Level	Number	Percent
Associate Degree/Some College	9	27.3%
High School Graduate/GED	8	24.2%
Advanced Degree	6	18.2%
Vocational/Technical School	2	6.1%
9-11th Grade	2	6.1%
Other	1	3.0%
Bachelor's Degree	5	15.2%
Total	33	100.0%

Employment status among study participants also varied with the greatest number of participants reporting being employed full time (36.4%) or retired (27.3%). The full spectrum of employment statuses of study participants is displayed in Table 2. Regarding health insurance status and coverage, all the participants report having some form of health insurance and coverage with 15.2% ($n = 5$) reporting insurance coverage through multiple health insurance plans. The frequencies of insurance plan types as reported by the participants are depicted in Figure 1.

Table 2

Participants' Employment Status

Employment	Number	Percent
Unemployed	3	9.1%
Retired	9	27.3%
Employed Full-Time	12	36.4%
Employed Part-Time	2	6.1%
Don't Know	1	3.0%
Not Able to Work Due to Illness	3	9.1%
Other	3	9.1%

Figure 1

Frequencies of Insurance Plan Types Reported by Participants

Frequencies of Insurance Plan Types Reported by Participants

Category	Value
Other	3
Individual Health Services	1
Champus	1
Medicare	11
Medicaid	7
Individual Plan	13
Carelink	2
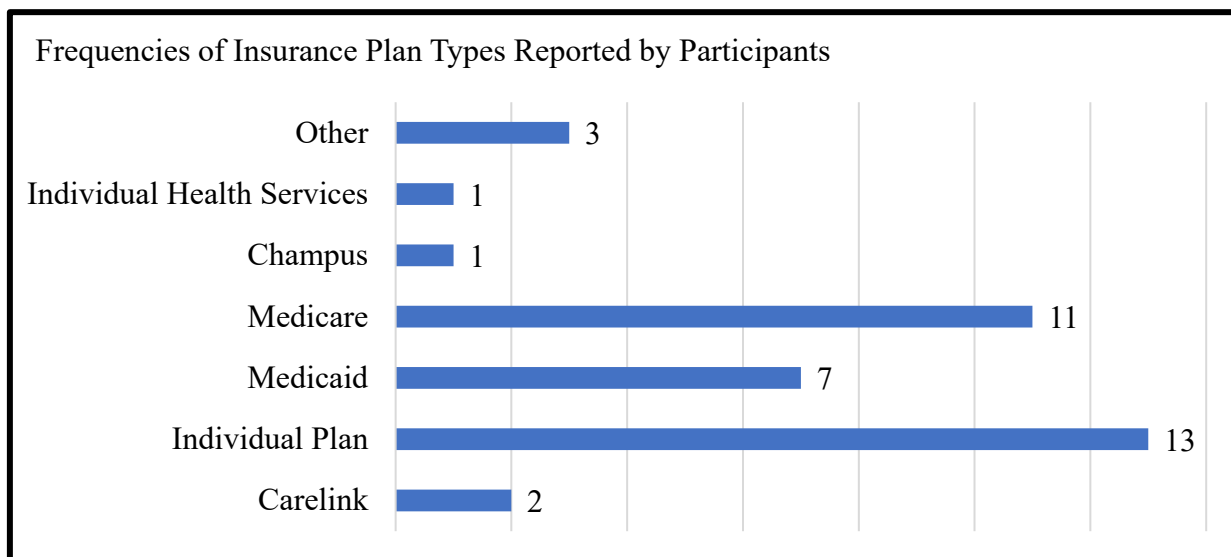
Note. All 33 participants reported having medical insurance; 5 reported multiple insurers.

For all breast cancer patients, the stage of breast cancer diagnosis varies based on the clinical identification of the tumor and the size of the tumor within the breast tissue (clinical stage; see Figure 2). Breast cancer staging also includes consideration of the possible spread of disease to other parts of one's body (clinical metastatic stage; see Figure 3). For all participants, this information was retrieved from their electronic medical record by the PI with the clinical and metastatic breast cancer stages noted for the participants.

Figure 2

Frequency of Participants' Breast Cancer by Clinical Stage
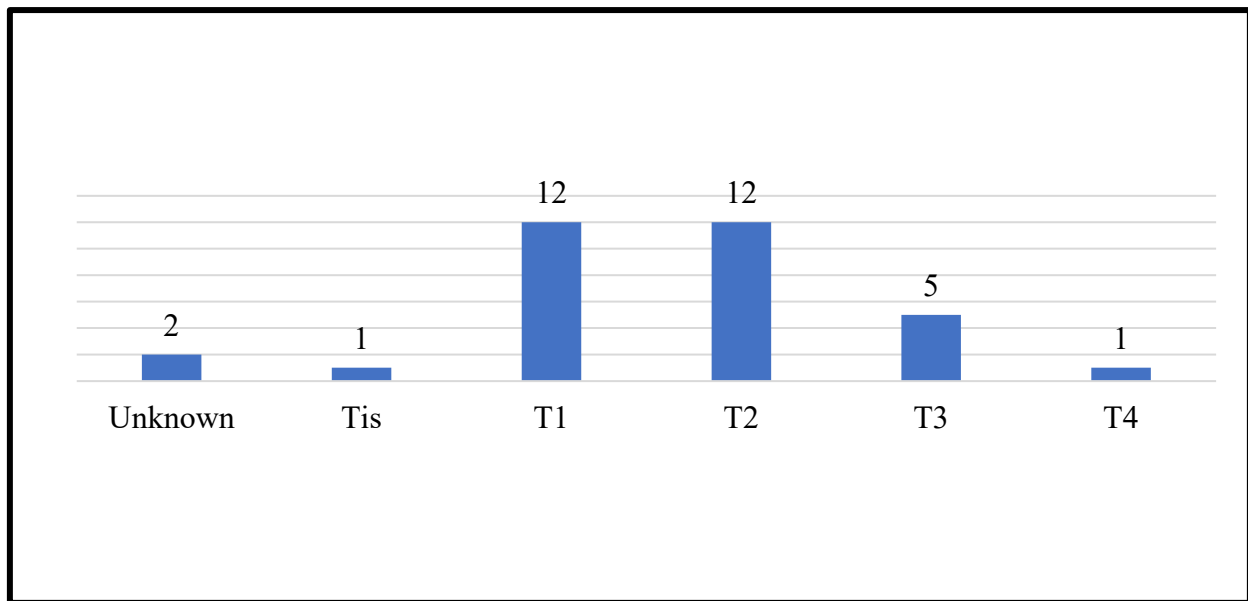
Note. "TX: Primary tumor cannot be assessed; T0: No evidence of primary tumor; Tis: DCIS, or Paget disease of the breast; T1 Tumor is 2 cm or less across.; T2: Tumor is more than 2 cm but not more than 5 cm across.; T3: Tumor is more than 5 cm across; T4 Tumor of any size growing into the chest wall or skin" (ACS, 2021).

Figure 3

Percentage of Participants' Breast Cancer by Metastatic Stage
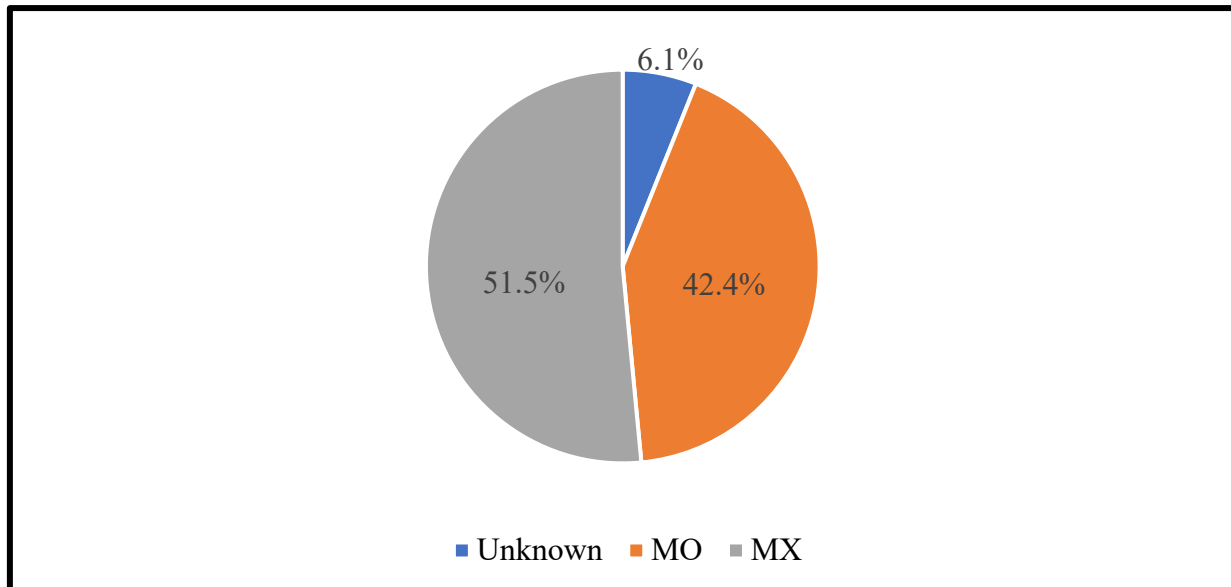
Note. M0: No distant spread is found on imaging or by physical exam; MX: Cannot be measured (ACS, 2021).

Impact of COVID-19

Psychosocial Impact of COVID-19

This study aimed to investigate the impact, if any, of COVID-19 pandemic had on the breast cancer patient's sense of disruption and resilience. Within the following section, each of these areas of psychosocial impact is addressed with support from quantitative and qualitative evidence.

Disruption

Through survey responses, participants reported how, if at all, the COVID-19 pandemic disrupted their life based on whether they or a family member tested positive for the COVID-19 virus. The researcher reported a composite disruption score of $M = 1.8$, $SD = 0.7$

$\alpha = 0.9$. Descriptive statistics were computed, and the researcher concluded more strongly agreed that factors limited disruption during the COVID-19; they were healthcare providers taking necessary measures to address COVID-19 ($M = 3.4$, $SD = .7$) and having received adequate information on prevention, protection, and care for COVID-19 from cancer care workers ($M = 3.0$, $SD = 1.1$). The descriptive statistics for all the psychosocial questions specific to disruption are displayed in Table 3.

Specific to disruption and a breast cancer patient's personal and familial COVID-19 status, the following null (H_0) and research (H_1) hypotheses were declared.

1. H_0: There will be no significant difference in disruption of life scores for breast cancer patients who test positive for COVID-19 and those who test negative for COVID-19.

    H_1: Breast cancer patients who test positive for COVID-19 will have increased disruption of life scores compared those who test negative for COVID-19.

2. H_0: There will be no significant difference in disruption of life scores for breast cancer patients whose family members test positive for COVID-19 and those whose family members test negative for COVID-19.

    H_1: Breast cancer patients who have a family member test positive for COVID-19 will have increased disruption of life scores compared to those whose family members all test negative for COVID-19.

Table 3

Descriptive Statistics of Psychosocial Questions on Disruption

Psychosocial Questions on Disruption	M	SD
My general medical care has been disrupted or delayed.	1.5	1.3
My cancer care or follow-up has been disrupted or delayed.	1.2	1.2

Psychosocial Questions on Disruption	M	SD
I have experienced disruptions in day-to-day social interactions with family and/or friends.	2.6	1.1
I have not been able to adequately take care of family members or friends I provide for.	1.5	1.0
I have been unable to perform my typical daily routines (e.g., work, physical activity, leisure activity).	2.1	1.2
I have experienced conflict with household members (e.g., spouse/partner, children, parents, others).	1.1	1.0
I have had difficulty or been unable to perform my work as usual.	1.7	1.4
I have had difficulty taking care of my children's needs and/or balancing their needs with other responsibilities.	1.5	1.0
I have experienced financial difficulties.	1.8	1.3
I have not been able to purchase or obtain basic necessities (e.g., food, personal care products).	1.0	1.0
I have been anxious about losing or having lost my job, or my primary source of income.	1.7	1.4
I have not been able to adequately provide for others I financially support.	1.1	1.0
I feel anxious about being able to maintain or not having adequate health care insurance.	1.4	1.3

Note. Scale: 0 = *Strongly Disagree*, 1 = *Disagree*, 2 = *Neither Agree or Disagree*, 3 = *Agree*, and 4 = *Strongly Agree*

Two independent *t*-tests were conducted to ascertain whether an individual felt as though their life was disrupted due to the COVID-19 pandemic based on their own or a family member's COVID-19 positive status. Results of the first analysis, which assessed whether a participant (i.e., a female breast cancer patient) testing positive or negative for COVID-19 caused disruption in their life, indicated no statistically significant difference. More specifically, there was no statistically significant difference in disruption scores between the participants who tested

positive for COVID-19 ($M = 4.2$, $SD = 1.3$) and those who did not test positive for COVID-19 ($M = 2.2$, $SD = 0.8$); $t(26) = 0.007$, $p = .99$, $d = .004$. Therefore, the null hypothesis was accepted.

The quantitative findings for disruption were affirmed by the participants' responses to the interview questions addressing their experience with the COVD-19 pandemic and how, if at all, it caused disruption. Through the content analysis, two themes were identified that further explained the limited disruption: timing of diagnosis and COVID-19 mitigation efforts. Some participants perceived little disruption due to COVID-19 because of when they were diagnosed during the pandemic. This is reflected in Susie's remarks, "My breast cancer diagnosis came after the peak of the pandemic so I had no disruption to my life or the care I have received." Similarly, Cecilia stated, "I did not start treatment until last summer, so it was post pandemic in my view so I didn't feel as though my life or care was disrupted." Other participants shared how COVID-19 prevention measures mitigated disruption impacts. For example, Kristina shared, "Even though I knew I was immunocompromised, I felt safe because everyone was wearing masks." Similarly, Laura said, "The information and protection I was given made me feel safe in coming to receive my treatments," and Chelsea shared, "I was more worried about dying from my cancer than COVID."

A second independent t-test was conducted to compare disruption scores based on a breast cancer patient's familial COVID-19 status. There were no statistically significant differences in the scores for disruption between the two groups: breast cancer patients whose family member(s) had tested positive for COVID-19 ($M = 1.9$, $SD = 1.3$) and breast cancer patients whose family members did not test positive for COVID-19 ($M = 1.7$, $SD = 1.3$); $t(31) = -0.67$, $p = .51$, $d = -.24$. Therefore, the null hypothesis was accepted.

Participants' responses to disruption questions in the follow-up interview affirm and further explain the statistically insignificant results of the quantitative analyses. The participants shared that their lives were not disrupted by a family member's COVID-19 status because of COVID-19 mitigation behaviors of self-isolation and vaccinations. For example, Marilyn stated, "I practiced isolation once we went on lock down so I was not concerned about getting COVID from a family member." Similarly, Eva commented, "We did not go see grandma or grandpa to avoid getting COVID so I was not scared of getting the virus." Others noted vaccinations as a source of reassurance that likely contributed to low scores for disruption. Kaitlyn said, "I was vaccinated, and life must go on," while Kristin stated, "All of those around me including my doctors were vaccinated so I felt safe."

Resilience

Another psychosocial impact that a breast cancer patient can face, based on whether they or a family member has tested positive for the COVID-19 virus, is one's sense of resiliency. The researcher calculated a composite resilience score for each participant and for the total sample ($M = 3.0$, $SD = 0.5$, $\alpha = 0.9$). The participants' responses to psychosocial questions specific to resilience were analyzed and descriptive statistics were calculated. From these descriptive results, the researcher concluded that the participants agreed most strongly that they were more grateful for each day ($M = .3$, $SD = .1$), gained a greater appreciation for family and close friends ($M = 3.3$, $SD = 0.9$), received support from family and friends when needed ($M = 3.3$, $SD = 1.0$), and were able to listen to others' problems when needed ($M = 3.3$, $SD = 0.9$). Descriptive statistics for each of the psychosocial questions specific to resilience are displayed in Table 4.

Table 4

Descriptive Statistics of Psychosocial Questions on Resilience

Psychosocial Questions on Resilience	M	SD
I have greater appreciation for my family and close friends.	3.3	0.9
I have a deeper appreciation for life.	3.2	0.9
I have been more grateful for each day.	3.3	0.9
I have been more accepting of things I cannot change.	3.0	0.9
I have found new ways of connecting with family and friends.	2.9	0.9
I have used my experience in coping with cancer to deal with COVID-19.	2.9	0.8
I have received emotional support from family or friends when needed.	3.3	1.0
I have received tangible support (e.g., financial, practical) from family and friends when needed.	2.5	1.2
I am or have been there to listen to other's problem's when needed.	3.3	0.9
I have helped others with financial and practical support.	2.8	0.8
I am to recognize thoughts and situations that make me stressed or upset about COVID-19.	3.1	0.8
I am able to practice relaxation (e.g., deep breathing, meditation) when feeling stressed about COVID-19.	2.8	0.9
I am able to seek information and plan accordingly to address concerns over the COVID-19 pandemic.	3.0	0.8
I can re-examine negative thoughts and gain a new perspective when concerned about COVID-19.	2.9	0.7

Note. Scale: 0 = *Strongly Disagree*, 1 = *Disagree*, 2 = *Neither Agree or Disagree*, 3 = *Agree*, and 4 = *Strongly Agree*

As it relates to resilience and a breast cancer patient's personal and familial COVID-19 status, the following null (H_0) and research (H_1) hypotheses were declared:

1. H_0: There will be no significant difference in resilience scores for breast cancer

   patients who test positive for COVID-19 and those who test negative for COVID-19.

   H_1: Breast cancer patients who test positive for COVID-19 will have decreased

   resilience scores compared to those who test negative for COVID-19.

2. H_0: There will be no significant difference in resilience scores for breast cancer

   patients whose family members test positive for COVID-19 and those whose family

   members test negative for COVID-19.

   H_1: Breast cancer patients who have a family member test positive for COVID-19

   will have decreased resilience scores compared to those whose family members all

   test negative for COVID-19.

Based on the results of the independent t-test, there were no statistically significant differences in

the scores for resilience between the two groups: breast cancer patients who had a negative

COVID-19 status report ($M = 2.9$, $SD = 0.5$) and those who tested positive for COVID

($M = 3.3$, $SD = 0.5$), $t(26) = -1.40$, $p = .18$, $d = -0.69$. Though this result signifies a moderate

effect size, the threshold of statistical significance $p < .05$ was not met. Therefore, the null

hypothesis was accepted.

A second independent t-test was conducted on resilience scores based on the participant's

(i.e., breast cancer patient's) familial COVID-19 status. The t-test for resilience for participants

who did not have a family member test positive for COVID-19 ($M = 3.0$, $SD = 0.5$) and for

participants who did have a family member test positive for COVID-19 ($M = 3.0$, $SD = 0.5$) did

not research statistical significance [$t(31) = -0.22$, $p = .83$, $d = -0.08$]. Therefore, the null

hypotheses must be accepted.

A greater understanding of the participants' ability to remain resilient during the pandemic despite their own or a family member's COVID-19 diagnosis, as well as their own breast cancer diagnosis was identified from the interview responses. When the participants were asked to detail what they felt made them resilient during the COVID-19 pandemic two common themes emerged: appreciation and stress management. Specific to resilience and appreciation, participants report gaining more appreciation for life, family, and friends. Sarah stated, "I gained a better appreciation of family and friends since we could not see them." In addition, Sue stated, "I gained a greater appreciation for family and friends due to their support." Other participants shared sentiments of appreciation such as Cecilia, who commented, "I began to appreciate life more and not take things for granted," and Lucia, who stated, "I became more appreciate of family and friends and those around you because you don't know how much time you have."

Stress management also contributed to the participants' resilience. The participants noted being cognizant of their stress as well as strategies for managing the stress. Betty stated, "I was able to able to recognize my stress and managed it by reasoning everything out." Sue also noted her recognition of stress adding, "I was able to identify my stress and exercise helped me thru [*sic*]." Juanita noted how her faith helped her manage her stress sharing, "I was able to recognize my stress and thru faith I knew everything would be okay." Finally, Lucy and Esther shared their strategy of having a positive outlook to manage stress. Lucy commented, "I had more self-awareness and was able to manage my stress by having a good outlook on life;" while Esther shared, "I managed my stress by family and friends reminding me that there is something better around the corner."

COVID-19 Impact on Health-Related Quality of Life

The unexpected emergence of the COVID-19 pandemic had the potential to impact the

health-related quality of life of cancer patients, including the breast cancer patients participating

in this study. Within this study, impacts to HRQOL were measured specific to lack of energy,

physical pain, nausea, condition getting worse, sleep, ability to enjoy life, and being content with

the quality of one's life. Descriptive statistics were computed for each of these variables, and the

researcher determined that participants were *somewhat* able to enjoy life ($M = 2.9$) and *somewhat*

content with the quality of their life ($M = 2.8$) during the time of the study participation. The

means and standard deviations for items measuring HRQOL are presented in Table 5.

Table 5

Descriptive Statistics on Health-Related Quality of Life

Health Related Quality of Life Questions	*M*	*SD*
I have lack of energy.	2.0	1.4
I have pain.	1.1	1.1
I have nausea.	0.5	0.9
I worry my condition will get worse.	1.8	1.4
I am sleeping well.	2.0	1.1
I am able to enjoy life.	2.9	1.0
I am content with quality of life right now.	2.8	1.1

Note. Scale: 1= *Not at All*, 2 = *A Little Bit*, 3 = *Somewhat*, 4 = *Quite a Bit*, and 5 = *Very Much*

As related to health-related quality of life, the following null (H_0) and research (H_1) hypotheses were formulated:

1. H_0: There will be no significant difference in HRQOL scores for breast cancer patients who test positive for COVID-19 and those who test negative for COVID-19.

   H_1: Breast cancer patients who test positive for COVID-19 will have decreased HRQOL scores compared to those who test negative for COVID-19.

2. H_0: There will be no significant difference in HRQOL scores for breast cancer patients whose family members test positive for COVID-19 and those whose family members test negative for COVID-19.

   H_1: Breast cancer patients who have a family member test positive for COVID-19 will have decreased HRQOL scores compared to those whose family members all test negative for COVID-19.

An independent *t*-test was conducted to determine whether the individual's COVID-19 status affected their reported health-related quality of life. The *t*-test results, based on the individual's COVID-19 status and health related quality of life, were statistically non-significant $t(26) = -1.23$, $p = .23$, $d = -0.61$, with a small to moderate effect on an individual's quality of life based on Cohen's *d* effect size.

A second independent *t*-test was conducted if health-related quality of life was impacted by a participant's family members COVID-19 status (i.e., negative and positive COVID-19 status). The results of the *t*-test did not reach statistical significance $[t(31) = -0.93$, $p = .36$, $d = -0.33]$. Without statistically significant results, the null hypothesis must be accepted.

In follow-up interviews, the participants shared details suggesting that while they may have issues or concerns, they were content with their lives and able to enjoy it. For example,

Susie stated, "I am able to enjoy my life and am content," and Betty shared, "I was able to enjoy my life even with COVID." Other participants shared that, despite specific concerns or issues, they enjoyed their lives. For example, Kaitlyn commented, "Despite having a slight lack of energy, I am able to enjoy my life," and Juanita shared, "I worry about my condition getting worse but am content and enjoy my life right now." Similarly, when asked about the quality of her life, Lucia shared, "Even though, I have had some trouble sleeping, I am still able to enjoy my life and am content right now."

COVID-19 Impact on Attendance of Medical Appointments

The final potential impact of COVID-19 examined was the impact the COVID-19 pandemic on the participant's (breast cancer patient's) decision to seek medical care. The null (H_0) and research (H_1) hypotheses adopted for this study specific to the participants' propensity to seek out general or cancer related care during the COVID-19 pandemic were:

1. H_0: There will be no relationship between breast cancer patients' COVID-19 status (positive or negative) and their decision to seek medical care.

   H_1: Breast cancer patients who test positive for COVID-19 will not seek medical care while those who test COVID-19 negative will seek medical care.

2. H_0: There will be no relationship between breast cancer patients' family members' COVID-19 status (positive or negative) and their decision to seek medical care.

   H_1: Breast cancer patients who have a family member test positive for COVID-19 will not seek medical care while those whose family members test COVID-19 negative will seek medical care.

Chi-squared tests were planned to examine the impact of COVID-19 status (both personal and familial) on attendance of medical appoints. However, a chi-squared analysis could not be

conducted because fewer than five participants in the sample reported a positive COVID-19

diagnosis. Instead, a Fisher's exact test was performed to assess whether there were non-random

associations between the two categorical variables (i.e., positive, or negative for COVID-19). It

was concluded from this analysis that there was no association between COVID-19 status and a

breast cancer patient going to a general medical appointment in person during the pandemic with

a designated p = .06 (see Table 6). Conversely, an association was found between an individual

going to an in-person cancer appointment during the pandemic and their COVID-19 virus status

with a Fisher's exact test result of 0.02. The strength of this association was found to be strong

using a difference of probability calculation, which determined the likelihood of an individual

who tested negative for COVID-19 attending a cancer appointment in person to be 62.6% higher

than when an individual tested positive for COVID-19 (see Table 7).

      Chi-squared tests were conducted to examine the impact of COVID-19 status of family

members on attendance of medical appoints. Participants' decision to attend a general medical

appointment was found to be impacted by a family members' COVID-19 status as shown by

χ^2 (1, 33) = 4.54, ϕ = .37, which denoted a statistically significant association with a small effect

size (see Table 8). The researcher determined thru a difference of probability calculation that

36% of breast cancer patients were more likely to attend a general medical appointment even if a

family member tested positive for COVID-19. Participants' decision to attend their cancer-

related appointments was not found to be impacted by their family members COVID-19 status

with χ^2 (1, 33) = 1.82, ϕ = .23 (see Table 9).

Table 6

Attendance to In-Person General Medical Appointment by Personal COVID-19 Status

Personal COVID-19 Status	Attendance to In-Person General Medical Appointment	
	Did Not Attend	Attended
Negative	16	7
Positive	1	4***

***$p = .06$

Table 7

Attendance to In-Person Cancer Medical Appointment by Personal COVID-19 Status

Personal COVID-19 Status	Attendance to In-Person Cancer Medical Appointment	
	Did Not Attend	Attended
Negative	19	4
Positive	1	4***

***$p = .02$

Table 8

Attendance to In-Person General Medical Appointment by Familial COVID-19 Status

Familial COVID-19 Status	Attendance to In-Person General Medical Appointment	
	Did Not Attend	Attended
Negative	15	4
Positive	6	8***

***$\chi^2 (33) = 4.54, \phi = .37$

Table 9

Attendance to In-Person Cancer Appointment by Familial COVID-19 Status

Familial COVID-19 Status	Attendance to In-Person Cancer Appointment	
	Did Not Attend	Attended
Negative	15	4
Positive	6	8***

***χ^2 (33) = 1.82, ϕ = .23

To garner more insight into the quantitative results and breast cancer patient's propensity to attend their medical appointments in-person, a follow-up interview was conducted. The participants were asked about their decision-making process specific to attending medical appointments in-person and three themes were identified: (1) protective measures in place at medical facilities made the individual feel safe, (2) the need to truly understand the cancer treatment that lies ahead of them, and (3) the need to understand the risk to benefit ratio of going to the doctor in person.

Regarding feeling safe at medical facilities, Susie and Kaitlyn both shared that they attended all of their medical appointments in-person because they knew they could do so safely with a mask and being vaccinated. Specific to attending in-person medical appointments, Lucy added, "I felt as though I was safe because of all the protocols in place." Study participants also indicated that they were keen on understanding what their medical care entailed; therefore, attending in-person doctor's appointments were the preferred method, regardless of COVID status. For example, Juanita said, "I wanted to learn more about my cancer treatment, so I felt as though I needed to be there in person." Other participants shared sentiments that emphasized the

exchange of information between patient and medical provider that occurs with in-person appointments. This sentiment is reflected in Marilyn's response, "I have experienced a communication breakdown, so I needed to be there in person;" and Betty's response, "I prefer to speak to my doctors in person."

Participants also considered the risk of getting COVID compared to the benefit of seeing a medical professional in-person when deciding whether or not she would attend a medical appointment. For example, Juanita shared how she compared the risks and benefits when she stated, "I am vaccinated so receiving treatment outweighs the scare of getting COVID." Similarly, Eva shared, "I would have more anxiety if I did not keep my appointments… and because I did, they caught something." Other participants emphasized the time-sensitive nature of cancer treatments when comparing the risks and benefits, such as Susie, who commented, "I did not have time to be messing around with my breast cancer treatment."

From the results of data analysis the researcher determined that the COVID-19 pandemic had no statistically significant impact on the participants' sense of disruption, resilience, and HRQOL. The participant or their family member testing positive for COVID-19 did, however, impact their attendance at in-person medical appointments. Results from qualitative data analysis affirmed the quantitative findings and provided additional insights. Being well informed about, engaging in, and having medical personnel adhere to COVID-19 mitigation efforts (e.g., masks, vaccinations) positively contributed to the disruption, resilience, and HRQOL findings.

CHAPTER V

DISCUSSION

This explanatory sequential mixed method design sought to explore the psychosocial impact of COVID-19 on the experience of breast cancer patients. Eight research questions guided the quantitative phase of this study and focused on the breast cancer patient's personal and familial experience with COVID-19 related to disruption of life, resilience, HRQOL, and their decision to seek medical care. In the qualitative phase, a deeper exploration of the lived experiences of the breast cancer patients was sought by examining how COVID-19 affected their disruption, resilience, propensity to attend medical appointments in-person, and health-related quality of life.

Extending the seminal work of Penedo et al. (2021), this current study contributes to the literature on breast cancer patients experience during the COVID-19 pandemic. This study detailed how COVID-19 impacted females in Texas that had been diagnosed with breast cancer and who were in the midst of or had completed radiation therapy during the pandemic. More specifically, the study explored the impact of COVID-19 on female breast cancer patients' resilience, disruption of life, HRQOL, and medical appointment attendance. This chapter presents a discussion of the findings with implications for practice, limitations, and suggestions for future research.

Discussion of Research Questions

The purpose of this explanatory mixed methods study was to investigate breast cancer patients who lived in Texas and were undergoing radiation therapy, their unique personal and familial experience with COVID-19 virus and the impact that the pandemic has had on ideals such as disruption of life, resiliency, HRQOL, and medical care decision making. Disruption of

life in this research study is inclusive of healthcare, daily activities, social interactions, and financial hardship. When assessing disruption of health care items such as a delay was medical care, or a medical appointment being rescheduled were analyzed. In addition, inability to take care of family members or go to work as usual were examples of items under scrutiny when inquiring into the disruption of daily and social activities as a result of the pandemic. Finally, regarding financial hardship due to COVID-19, areas such as the inability to purchase necessities and a loss of financial support were analyzed.

Whereas, perceived benefits, functional social support, and perceived stress management assessed the resiliency factor. Perceived benefits in this research study were measured in terms of things such as having a deeper appreciation of family, friends, and life. As for functional social support, receiving and/or giving emotional support to family or friends is an example of how this component of resilience was assessed.   The final component of resilience, perceived stress management, was addressed by analyzing such items such as the ability to recognize thoughts or situations that lead to stress as a result of COVID-19 and one's ability to practice relaxation methods when feeling stressed due to the pandemic. In addition, a valuation of medical decision-making was based on whether a medical appointment was cancelled due to the COVID-19 pandemic and if emergency medical care was sought. Finally, one's HRQOL was evaluated by looking into how they were feeling physically regarding such things as pain and energy level as well as how they directly rated their quality of life at the moment of study participation.

The current research study was focused on examination of the factors of: (a) disruption, (b) resilience, (c) propensity to attend medical appointments in-person, and (d) HRQOL. Each factor was analyzed separately across groups comparing those within the study population who

had tested positive for COVID-19 test during the pandemic to those within the study population who never tested positive for the COVID-19 virus. In addition, a separate analysis was conducted for each of the respective factors to further ascertain if any effect presented itself if a family member tested positive for COVD-19 during the study period. Once again groups were generated based on a family member either testing positive or negative for the virus and the impact it had on a breast cancer patient's sense of disruption, resilience, medical decision making, and HRQOL. While literature specific to the impacts of COVID-19 on breast cancer patients is still emerging, the findings of the current study do appear to be supported by the limited existing literature.

RQ1 and RQ2: Did a breast cancer patient's personal or family experience with COVID-19 and their virus status have an impact their disruption of life?

It was hypothesized that a breast cancer patient's personal COVID-19 status as well as that of a family member would increase disruption with a positive COVID-19 virus test. From the study results, the researcher concluded that that neither personal nor familial COVID-19 viral status increased a breast cancer patient's disruption of life. These findings, inclusive of comments such as, "My breast cancer diagnosis came after the peak of the pandemic, so I had no disruption to my life or the care I received," are supported by research findings published in 2021 and 2022.

Ludwigson et al. (2022) reported only 18% of breast cancer patients had delayed care due to the COVID-19 pandemic. Further, Bartmann et al. (2021) reported that for breast cancer patients (receiving neoadjuvant, adjuvant, or palliative treatments), distress before and during the COVID-19 pandemic remained virtually the same and did not show any statistically significant change across the pandemic. In their cross-sectional study of 50 breast cancer patients whose

surgeries were postponed due to COVID-19, Soriano et al. (2021) reported similar findings. The authors reported that, while the COVID-19 pandemic seemingly disrupted health care in general, the breast cancer patients unequivocally denied that the pandemic causes them any distress in finances or resource access and reported only low to moderate levels of psychosocial distress. Breast cancer patients who reported disruptions of life and unmet needs were single, employed part-time, and had three or more comorbidities (Miroševič et al., 2022).

RQ3 and RQ4: Did a breast cancer patient's personal or family experience with COVID-19 and their virus status have an impact on their resilience factor?

The researcher hypothesized that one's personal and familial COVID-19 viral status would decrease resilience with a positive COVID-19 test. Upon analysis, the researcher found that neither one's personal nor familial COVID-19 status had any statistical significance on resilience. While not statistically significant, a moderate effect size was found for resilience among breast cancer patients who tested positive for COVID-19. The participants in the current study acknowledged their sense of resilience by having a greater appreciation for those around them as well as a having a heightened awareness of stress and strategies for managing it.

The findings of the current study are substantiated by the literature including the work of McAndrew et al. (2022), who reported that cancer patients had unexpected positive experiences as a result of the pandemic such as feelings that having cancer had better prepared them for the unknown allowing for them to take everything in stride. In addition, Chia et al. (2021) reported cancer patients' tendency to downplay the COVID-19 pandemic and view it as out of their control. As reflected in Lucia's poignant statement, "I became more appreciate of family and friends and those around you because you don't know how much time you have," Chia et al.'s research supports this study's breast cancer patients' resilience, which was reinforced by acts of

71

appreciation and stress management. Furthermore, Chiesi et al. (2022) reported breast cancer patients who displayed traits of optimism, hope, mindfulness, self-efficacy, and courage presented with less anxiety, depression, and stress despite the COVID-19 pandemic.

RQ5 and RQ6: Did a breast cancer patient's personal or family experience with COVID-19 and their virus status have an impact on their health-related quality of life?

Specific to HRQOL, the researcher hypothesized that HRQOL would be decreased by an individual's and/or familial positive COVID-19 test. However, the researcher concluded from the analysis of the data that a breast cancer patient's COVID-19 viral status and that of their family members did not statistically significant impact their health-related quality of life. Instead, despite the pandemic, current participants reported enjoyment of their life and being content with their quality of life. These findings are consistent with Petrillo et al. (2022), who also reported no impact on HRQOL among cancer patients during the COVID-19 pandemic. Furthermore, Aldhahi et al. (2021) reported breast cancer patients who displayed resilience during the COVID-19 displayed higher quality of life.

RQ7 and RQ8: Did a breast cancer patient's personal or family experience with COVID-19 and their virus status have a relationship with their decision to seek medical care?

Finally, the researcher hypothesized that a breast cancer patient's personal experience with COVID-19 and their viral status as well as that of a family member would impact their decision to seek medical care with those who test COVID-19 positive not seeking medical care. However, attendance to general medical appointment for the breast cancer patients in the current study were not impacted by their COVID-19 status (e.g., COVID-19 status did not dissuade participants from seeking or attending their general medical appointments). In addition, a family member's COVID-19 status did not affect the decision of breast cancer patients in the current

study to attend a cancer-related medical appointment. Whether a family member tested positive or negative for COVID-19, participants in the current study sought and attended cancer-related medical appointments. However, the researcher found that an individual's COVID-19 status impacted their decision to attend cancer-related medical appointments, with individuals testing negative for COVID-19 attending a cancer-related medical appointment at a 62.6% higher rate than those who tested positive for COVID-19. Breast cancer patients who tested negative for COVID-19 were more likely to maintain their schedule of cancer treatments.

Furthermore, the researcher determined that a family member's COVID-19 status impacted a breast cancer patient's propensity to attend a general medical appointment, with 33% of participants attending a general medical appointment even if a family member tested positive for COVID-19. This finding was not surprising given the participants preference for in-person medical appointments, as well as the possibility that the general medical appointment could have included being seen by a medical professional about their potential COVID-19 exposure, and/or tested for COVID-19 during the appointment. The likelihood of attending medical appointments and preference for in-person appointments is supported by the work of Gotlib Conn et al. (2021), who reported that cancer patients prefer in-person physician visits to virtual ones. In fact, the authors reported that only 4.5% of their study participants even considered cancelling their in-person treatment because the patients felt as though their physician could better assess their health, and the chances of forgetting to ask an important question to their health care professional was minimized if they were seen in-person (Gotlib Conn et al., 2021).

The current finding related to the protective protocols enacted by medical doctors and institutions that allowed participants to feel safe and protected is also reflected in the literature. The sentiments shared by Susie in her comment, " I attended all of my medical appointments in

person because I knew I could do it safely with a mask and being vaccinated," reflects the cancer patient's consideration of the risk-to-benefit ratio of attending a medical appointment and the sense of safety and trust in the COVID-19 mitigation protocols in place. The reported sense of safety and trust observed in the present study, was also reported in the work of Chia et al. (2021) who examined cancer patients' care management during the COVID-19 pandemic. Participants in the current study shared concerns and experiences similar to that of participants in the Chia et al. (2021) study, whose "resolve was supported by a sense of safety from the actions of authorities, hospitals and trust towards healthcare providers" (p. 1).

Implications for Practice

As documented by the quantitative and qualitative findings of this research study, and consistent with the literature (e.g., Gotlib Conn et al., 2021), cancer patients tend to seek and keep their medical appointments despite being amid the COVID-19 pandemic when measures are implemented that allow the patients to feel safely while doing so. For example, study participants attributed that being vaccinated for COVID-19 and having personal protection from a mask was helping them feel safe to attend their medical appointments. Therefore, a direct implication of this research to health care practice is the importance of sharing fact-based knowledge (e.g., the availability of a vaccine for a new virus), as well as the implementation of protocols to mitigate transmission of a virus. These efforts support the resilience of cancer patients and lessen disruptions to their much-needed cancer treatments. Efforts to support the cancer patient as they navigate the risk-to-benefit decision-making process may also support their resilience and improve their HRQOL (e.g., lessening anxiety and distress). In translating this research to practice, four of the Eight Areas of Responsibility as defined by the National Commission of Health Education Credentialing (NCHEC, 2020) appear to be of considerable

importance to health education specialists. They are Area of Responsibility I: Assessment of Needs and Capacity, Area II: Planning, Area III: Implementation, and Area VI: Communication (NCHEC, 2020). For example, as it relates to the findings of this study, competencies and sub-competencies of Area I are critical to health education specialists being able to determine key factors impacting the health of the breast cancer patients (i.e., priority population), the capacity (i.e., available resources and interventions) to support their health, and ultimately the needs of the breast cancer patients. Further, it appears critical that health education specialists demonstrate Area II competencies and sub-competencies of engaging with the priority population (i.e., breast cancer patients), partners (i.e., health care providers), and other stakeholders in identifying desired health outcomes (i.e., COVID-19 mitigation) and planning needed health education and interventions (i.e., health education on social distancing and mask wearing, provision of masks, implementation of social distancing practices in the office). By demonstrating competence across the NCHEC Areas of Responsibility, health education specialists can enhance patients' probability of appointment compliance, resiliency, and health-related quality of life, all while minimizing disruptions.

To increase the chance of a breast cancer patient maintaining an optimal HRQOL, a sense of resiliency, minimal disruption to life, and a commitment to attend medical appointments, health educators and/or promotors should use the information reported in this research study as a call to action and assess the needs of the cancer community and the capacity to meet that need. The first step in converting research findings into action is assessing the needs and resources reported by the individuals. This helps identify where a lack of knowledge existed, and poor practices hindered the community under investigation. During an unanticipated public health emergency (i.e., COVID-19 pandemic), the breast cancer community identified their personal

need to attend medical appointments in person, having fact-based knowledge on the COVID-19 virus, and information on possible COVID-19 mitigation efforts to ensure their safety while undergoing their cancer treatment.

The identification of these needs for breast cancer patients helps foster a foundation for health education and promotion practices. Acknowledging a breast cancer patient's desire to attend medical appointments in person can be addressed by health care institutions adhering to the CDC (2022a) guidelines of prevention, which include avoiding crowded places, increasing distance between yourself and others, wearing a mask at a health care practice, and by developing and implementing a plan that details each of those necessities. The planning process should involve forecasting the need of a mask for each patient for the duration of their radiation treatment; and implementing an intervention that provides each patient with a supply of masks for use when attending medical appointments that is sufficient to cover the duration of their treatment period and having additional masks available on-site if needed. Additionally, health care facilities can ensure physical distancing by having at least six feet between available seats and by minimizing the number of people in a waiting room at any given point in time by implementing a web-based form of appointment check-in. To further ensure communication between heath educators and the cancer community, flyers displaying updated COVID-19 prevention measures as well as where vaccinations are administered can be posted throughout the clinic. Finally, health care professionals can speak to their patients about the importance of being vaccinated given their immunocompromised state due to cancer treatments. Collectively, implementing such practices will aid in keeping the cancer community safe during the COVID-19 pandemic. The cancer community itself has displayed its propensity to partake in safety measures to help prevent contracting COVID-19. Sah et al. (2020) reported 98% of cancer

patients complied with preventative measures including the use of face masks and social distancing. Even with these mitigation measures, the physician-to-patient rapport must not be overlooked as cancer patients' acceptance of the COVID-19 vaccines rose from 61.8% to 91.2% when it was recommended by a physician (Chun et al., 2021).

Additionally, health educators and promotors should ensure the integrity of the mitigation measures established by the program by evaluating them quarterly. Cancer patients receiving treatments within the facility can be surveyed with a few questions such as: 1) Was a face mask available to you when arrived at the clinic? 2) Was a seat in the waiting room available for you when you arrived to the clinic? 3) Did you check in at the front desk or on-line? 4) Did someone speak to you about the COVID-19 vaccine? The information gleamed by a brief survey allows health educators and promotors administering the program to assess utilization of the program components as well as identify any areas that may need to be addressed. The ability to make timely adjustments to the program, if needed, can also help minimize disruption of life as well as aid in a cancer patient's sense of resilience and HRQOL.

<div align="center">**Limitations and Recommendations for Future Research**</div>

While this study's findings are consistent with previous findings (e.g., Gotlib Conn et al., 2021; Soriano et al., 2021) on the new topic of the COVID-19 pandemic and its impact on the cancer population, there are some limitations to this research that should be noted. Generalizability across the general cancer population and their caregivers does not exist because the current study was conducted at only one cancer center in the southwestern United States and the study's sample population was female-only breast cancer patients, all of whom were English speaking. In addition, despite conducting an a priori power analysis to ensure adequate power and establishing 33 participants as an acceptable sample size, only 15.2% ($n = 5$) of the

participants reported testing COVID-19 positive; therefore, the results may be skewed due to the abnormal distribution among the COVID-19 positive and negative groups. Sample size limitations attributed to unequal numbers of COVID-19 positive and negative participants may have impacted the statistical power needed to find group significance and reject the null.

Larger and on-going studies are warranted as the pandemic ramifications evolve and the COVID-19 virus mutates. Longitudinal COVID-19 research studies involving the cancer community are critical to support current and future cancer patients as well as their caregivers. Longitudinal studies can provide researchers, practitioners, and patients, with a more comprehensive understanding of cancer patients psychosocial health factors against the backdrop of an on-going pandemic. Findings from multi-faceted longitudinal studies could help inform healthcare providers and aid their ability to address psychosocial health among cancer patients in a timely manner, which can lead to improved outcomes for cancer survivors. In addition, researchers can use this information to better understand what causes a cancer patient to experience increased or decreased resilience, disruption, and HRQOL during a pandemic, which can aid in the development of health education programs to be implemented during future pandemics. A proactive approach to overall health care of the cancer community should be pursued in order to be best prepared to address their needs when another epidemiologic outbreak presents itself.

In addition to longitudinal studies of cancer patients during the COVID-19 pandemic, studies should be conducted regarding the impacts and preferences of patients using virtual medical care. As an unintended consequence of the COVID-19 pandemic, virtual health care became more prevalent as insurance models changed. De et al. (2022) reported that 33% of oncology patients utilized telemedicine services at the peak of the pandemic that then dropped to

15% when the national lockdown concluded. Researchers can explore these shifts in telemedicine usage and why cancer patients engaged in telemedicine. Furthermore, for the cancer patients that attended in-person appointments, researchers should investigate whether barriers to access played a role in their decision to attend their cancer appointment in the clinic.

Finally, the COVID-19 pandemic and its impact on cancer patient caregivers is also an area in need of investigation. Akkuş et al. (2022) reported that a vast majority (82.4%) of cancer patient caregivers stated fear of a patient contracting COVID-19 and 42% reported difficulty getting to a medical appointment. Furthermore, Cona et al. (2022) stated 58.8% of cancer care givers experienced anxiety and 19.8% felt fear of not managing their patients care at home properly during the pandemic. These findings show the need to explore methods to mitigate barriers to health care in times of public health emergencies and the possible psychosocial impact on caregivers on susceptible populations, such as cancer patients.

Conclusion

A cancer diagnosis of any kind has the propensity to impact the daily life of a person substantially. Adding an unexpected viral pandemic of unknown origin that is highly transmissible had the potential to further impact the life and cancer treatment for the individual. Supported by qualitative and quantitative results, the current study provides insights into the possible effects of a pandemic on a person's resiliency and quality of life amid the unknown. As reported, and despite the pandemic, breast cancer patients in the current study remained resilient and reported a good quality of life. Disruptions to their cancer care were limited, and their resilience factor manifested itself through a greater appreciation of each day as well as a greater appreciation of family and friends. Furthermore, while receiving radiation treatments for their

cancer during the unprecedented times of the COVID-19 pandemic, study participants reported

enjoyment and contentment with life.

REFERENCES

Abdollahi, A., Taheri, A., & Allen, K. A. (2020). Self-compassion moderates the perceived
　　stress and self-care behaviors link in women with breast cancer. *Psycho‑Oncology*, *29*(5),
　　927-933. https://doi.org/10.1002/pon.5369

Akkuş, Y., Karacan, Y., Ünlü, K., Deniz, M., & Parlak, A. (2022). The effect of anxiety and
　　spiritual well-being on the care burden of caregivers of cancer patients during the
　　COVID-19 pandemic. *Supportive Care in Cancer*, *30*(2), 1863-1872.
　　https://doi.org/10.1007/s00520-021-06611-0

Albuquerque, K., Tell, D., Lobo, P., Millbrandt, L., Mathews, H. L., & Janusek, L. W. (2012).
　　Impact of partial versus whole breast radiation therapy on fatigue, perceived stress,
　　quality of life and natural killer cell activity in women with breast cancer. *BMC
　　Cancer*, *12*(1), 1-12. https://doi.org/10.1186/1471-2407-12-251

Aldhahi, M. I., Akil, S., Zaidi, U., Mortada, E., Awad, S., & Al Awaji, N. (2021). Effect of
　　resilience on health-related quality of life during the Covid-19 pandemic: A cross-
　　sectional study. *International Journal of Environmental Research and Public
　　Health*, *18*(21), 11394. https://doi.org/10.3390/ijerph182111394

Aprillianto, E., Lumadi, S. A., & Handian, F. I. (2021). Family social support and the self-esteem
　　of breast cancer patients undergoing neoadjuvant chemotherapy. *Journal of Public
　　Health Research*, *10*(2). https://doi.org/10.4081/jphr.2021.2234

American Cancer Society. (2019). *Breast cancer: Facts & figures 2019-2020.*
　　https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-
　　statistics/breast-cancer-facts-and-figures/breast-cancer-facts-and-figures-2019-2020.pdf

American Cancer Society. (2020). *Cancer facts & figures 2020*.

https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-

statistics/annual-cancer-facts-and-figures/2020/cancer-facts-and-figures-2020.pdf

American Cancer Society. (2021). *Cancer facts & figures 2021*.

https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-

statistics/annual-cancer-facts-and-figures/2021/cancer-facts-and-figures-2021.pdf

American Cancer Society. (2022). *Cancer facts & figures 2022*.

https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-

statistics/annual-cancer-facts-and-figures/2022/2022-cancer-facts-and-figures.pdf

American Journal of Managed Care Staff. (2021, January 1). *A timeline of COVID-19

developments in 2020*. https://www.ajmc.com/view/a-timeline-of-covid19-developments-

in-2020

Bargon, C. A., Batenburg, M. C., van Stam, L. E., Mink van der Molen, D. R., van Dam, I. E.,

van der Leij, F., Baas, I. O., Ernst, M. F., Maarse, W., Vermulst, N., Young-Afat, D. A.,

Doeksenm A., & Verkooijen, H. M. (2021). Impact of the COVID-19 pandemic on

patient-reported outcomes of breast cancer patients and survivors. *JNCI Cancer

Spectrum*, *5*(1), 1-11. https://doi.org/10.1093/jncics/pkaa104

Bartmann, C., Fischer, L. M., Hübner, T., Müller-Reiter, M., Wöckel, A., McNeill, R. V.,

Schlaiss, T., Kittel-Schneider, S., Kammerer, U., & Diessner, J. (2021). The effects of the

COVID-19 pandemic on psychological stress in breast cancer patients. *BMC

Cancer*, *21*(1), 1-13. https://doi.org/10.1186/s12885-021-09012-y

Bender, J. L., Hueniken, K., Eng, L., Brown, M. C., Kassirian, S., Geist, I., Balaratnam, K.,

Liang, M., Paulo, C. B., Giest, A., Rao, P., Magony, A., Smith, E., C., Xu, W., Liu, G., &

Gupta, A. A. (2021). Internet and social media use in cancer patients: Association with distress and perceived benefits and limitations. *Supportive Care in Cancer*, *29*(9), 5273-5281. https://doi.org/10.1007/s00520-021-06077-0

Bleicher, R. J., Ruth, K., Sigurdson, E. R., Beck, J. R., Ross, E., Wong, Y. N., Sameer, A. P., Boraas, M., Chang, E. I., Topham, N. S., & Egleston, B. L. (2016). Time to surgery and breast cancer survival in the United States. *JAMA Oncology*, *2*(3), 330-339. https://doi.org/10.1001/jamaoncol.2015.4508

Brown, R., Butow, P., Wilson-Genderson, M., Bernhard, J., Ribi, K., & Juraskova, I. (2012). Meeting the decision-making preferences of patients with breast cancer in oncology consultations: Impact on decision-related outcomes. *Journal of Clinical Oncology*, *30*(8), 857-862. http://jco.ascopubs.org/cgi/doi/10.1200/JCO.2011.37.7952

Centers for Disease Control and Prevention. (2013, April 26). *CDC: SARS timeline.* https://www.cdc.gov/about/history/sars/timeline.htm

Centers for Disease Control and Prevention. (2018, October 31). *CDC: HRQOL concepts*. https://www.cdc.gov/hrqol/concept.htm

Centers for Disease Control and Prevention. (2019, August 2). *Middle East respiratory syndrome*. https://www.cdc.gov/coronavirus/mers/index.html

Centers for Disease Control and Prevention. (2020). *Weekly updates by select demographics and geographic characteristics*. https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm#SexAndAge

Centers for Disease Control and Prevention. (2021, March 13). *COVID data tracker*. https://covid.cdc.gov/covid-data-tracker/#datatracker-home

Centers for Disease Control and Prevention (2022a, October 19). *How to protect yourself and others*. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html - masks

Centers for Disease Control and Prevention. (2022b, November 9). *COVID Data Tracker*. https://covid.cdc.gov/covid-data-tracker/ - datatracker-home

Chia, J. M. X., Goh, Z. Z. S., Chua, Z. Y., Ng, K. Y. Y., Ishak, D., Fung, S. M., Ngeow, J. Y. Y., & Griva, K. (2021). Managing cancer in context of pandemic: A qualitative study to explore the emotional and behavioural responses of patients with cancer and their caregivers to COVID-19. *BMJ Open*, *11*(1), e041070. https://doi.org/10.1136/bmjopen-2020-041070

Chiesi, F., Vizza, D., Valente, M., Bruno, R., Lau, C., Campagna, M. R., Lo lacono, M., & Bruno, F. (2022). Positive personal resources and psychological distress during the COVID-19 pandemic: Resilience, optimism, hope, courage, trait mindfulness, and self-efficacy in breast cancer patients and survivors. *Supportive Care in Cancer*, 1-10. https://doi.org/10.1007/s00520-022-07123-1

Chen, Y. Y., Li, C. M., Liang, J. C., & Tsai, C. C. (2018). Health information obtained from the internet and changes in medical decision making: Questionnaire development and cross-sectional survey. *Journal of Medical Internet Research*, *20*(2), e9370. https://doi.org/10.2196/jmir.9370

Chun, J. Y., Kim, S. I., Park, E. Y., Park, S. Y., Koh, S. J., Cha, Y., Yoo, H. J., Joung, J. Y., Yoon, H. M., Eorn, B. W., Park, C. M., Han, J., Kim, M., Lee, D., Kim, J., Keam, B., Lee, M., Kim, T. M., Choi, Y. J., … Lim, M. C. (2021). Cancer patients' willingness to

take COVID-19 vaccination: A nationwide multicenter survey in Korea. *Cancers*, *13*(15), 3883. https://doi.org/10.3390/cancers13153883

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Lawrence Erlbaum Associates.

Cohen, J., & Van der Meulen Rodgers, Y. (2020). Contributing factors to personal protective equipment shortages during the COVID-19 pandemic. *Preventive Medicine*, *141*, 106263. https://doi.org/10.1016/j.ypmed.2020.106263

Colombo, R., Doherty, D. J., Wilson, C. M., Krzys, K., Lange, S., & Maynes, H. (2018). Implementation and preliminary analysis of FACT-G quality of life questionnaire within an oncology survivorship clinic. *Cureus*, *10*(3), e2272. https://doi.org/10.7759/cureus.2272

Cona, M. S., Rulli, E., Dalu, D., Galli, F., Rota, S., Ferrario, S., Tosca, N., Gambaro, A., Filipazzi, V., Piva, S., & La Verde, N. (2022). The emotional impact of the COVID-19 outbreak on cancer outpatients and their caregivers: Results of a survey conducted in the midst of the Italian pandemic. *Supportive Care in Cancer*, *30*(2), 1115-1125. https://doi.org/10.1007/s00520-021-06489-y

Conant, E. F., Barlow, W. E., Herschorn, S. D., Weaver, D. L., Beaber, E. F., Tosteson, A. N., Haas, J. S., Lowry, K. P., Stout, N., K., Trentham-Dietz, A., diFlorio-Alexander, R., Li, C. I., Schnall, M. D., Onega, T., & Sprague, B. L. (2019). Association of digital breast tomosynthesis vs digital mammography with cancer detection and recall rates by age and breast density. *JAMA Oncology*, *5*(5), 635-642. https://doi.org/10.1001/jamaoncol.2018.7078

Conley, C. C., Rodriguez, J. D., Brownstein, N. C., O'Neill, S. C., & Vadaparampil, S. T. (2022).

    Characteristics associated with healthcare disruptions during the COVID-19 pandemic

    for women in the United States at high risk for breast cancer. *Preventive Medicine*

    Reports, *30*, 101975. https://doi.org/10.1016/j.pmedr.2022.101975

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods*

    approaches. Sage publications.

Dall, G. V., & Britt, K. L. (2017). Estrogen effects on the mammary gland in early and late life

    and breast cancer risk. *Frontiers in Oncology*, *7*, 110.

    https://doi.org/10.3389/fonc.2017.00110

De, B., Fu, S., Chen, Y. S., Das, P., Ku, K., Maroongroge, S., Woodhouse, K. D., Hoffman, K.

    E., Nguyen, Q., Reed, V. K., Chen, A. B., Koong, A. C., Smith, B. D. & Smith, G. L.

    (2022). Patient, physician, and policy factors underlying variation in use of telemedicine

    for radiation oncology cancer care. *Cancer Medicine*. https://doi.org/10.1002/cam4.4555

Dietz, J. R., Moran, M. S., Isakoff, S. J., Kurtzman, S. H., Willey, S. C., Burstein, H. J., Bleicher,

    R. J., Lyons, J. A., Sarantou, T., Baron, P. L., Stevens, R. E., Boolbol, S. K., Anderson,

    B. O., Shulman, L. N., Gradishar, W. J., Monticciolo, D. L., Plecha, D. M., Nelson, H., &

    Yao, K. A. (2020). Recommendations for prioritization, treatment, and triage of breast

    cancer patients during the COVID-19 pandemic. *Breast Cancer Research and*

    Treatment, *181*(3), 487-497. https://doi.org/10.1007/s10549-020-05644-z

Dinapoli, L., Colloca, G., Di Capua, B., & Valentini, V. (2021). Psychological aspects to

    consider in breast cancer diagnosis and treatment. *Current Oncology Reports*, *23*(3), 1-7.

    https://doi.org/10.1007/s11912-021-01049-3

Donnelly, C. A., Ghani, A. C., Leung, G. M., Hedley, A. J., Fraser, C. F., Riley, S., Abu-Raddad, L. J., Ho, L., Thach, T., Mstat, P. C., MPhi, K. C., Lam, T., Tse, L., Tsang, T., Liu, S., Kong, J., Lau, E., Ferguson, N. M., & Anderson, R. M. (2003). Epidemiological determinants of spread of causal agent of severe acute respiratory syndrome in Hong Kong. *The Lancet*, *361*(9371), 1761-1766. https://doi.org/10.1016/S0140-6736(03)13410-1

Dooley, L. N., Slavich, G. M., Moreno, P. I., & Bower, J. E. (2017). Strength through adversity: Moderate lifetime stress exposure is associated with psychological resilience in breast cancer survivors. *Stress and Health*, *33*(5), 549-557. https://doi.org/10.1002/smi.2739

Drageset, S., Lindstrøm, T. C., Giske, T., & Underlid, K. (2012). "The support I need": Women's experiences of social support after having received breast cancer diagnosis and awaiting surgery. *Cancer Nursing*, *35*(6), E39-E47. https://doi/org/10.1097/NCC.0b013e31823634aa

Drosten, C., Günther, S., Preiser, W., Van Der Werf, S., Brodt, H. R., Becker, S., Holger, R., Panning, M., Kolesnikova, L., Fouchier, R., Berger, A., Burguiere, A., Cinatl, J., Eickmann, M., Escriou, N., Gryna, K., Kramme, S., Manuguerra, J., Mueller, S., ... Doerr, H. W. (2003). Identification of a novel coronavirus in patients with severe acute respiratory syndrome. *New England Journal of Medicine*, *348*(20), 1967-1976. https://doi.org/10.1056/NEJMoa030747

Engel, J., Kerr, J., Schlesinger-Raab, A., Eckel, R., Sauer, H., & Hölzel, D. (2003). Predictors of quality of life of breast cancer patients. *Acta Oncologica*, *42*(7), 710-718. https://10.1080/02841860310017658

Erdal, G. S., Polat, O., Erdem, G. U., Korkusuz, R., Hindilerden, F., Yilmaz, M., Yasar, K. K.,

    Isiksacan, N., & Tural, D. (2021). The mortality rate of COVID-19 was high in cancer

    patients: a retrospective single-center study. *International Journal of Clinical*

    Oncology, *26*(5), 826-834. https://doi.org/10.1007/s10147-021-01863-6

Exec. Order No. GA-08 relating to COVID-19 preparedness and mitigation. Tex. (March 19,

    2020). https://gov.texas.gov/uploads/files/press/EO-GA_08_COVID-

    19_preparedness_and_mitigation_FINAL_03-19-2020_1.pdf

Fisher, C., & O'Connor, M. (2012). "Motherhood" in the context of living with breast

    cancer. *Cancer Nursing*, *35*(2), 157-163.

    https://doi.org/10.1097/NCC.0b013e31821cadde

Fong, A. J., Scarapicchia, T. M., McDonough, M. H., Wrosch, C., & Sabiston, C. M. (2017).

    Changes in social support predict emotional well-being in breast cancer

    survivors. *Psycho‐Oncology*, *26*(5), 664-671. https://doi.org/10.1002/pon.4064

Gagliato, D., Lei, X., Giordano, S. H., Valero, V., Barcenas, C. H., Hortobagyi, G. N., &

    Chavez-MacGregor, M. (2020). Impact of delayed neoadjuvant systemic chemotherapy

    on overall survival among patients with breast cancer. *The Oncologist*, *25*(9), 749-757.

    https://doi.org/10.1634/theoncologist.2019-0744

Garibaldi, B. T., Fiksel, J., Muschelli, J., Robinson, M. L., Rouhizadeh, M., Perin, J., Schumock,

    G., Nagy, P., Gray, J. H., Malapati, H., Ghobadi-Krueger, M., Niessen, T. M., Kim, B. S.,

    Hill, P. M., Ahmed, M. S., Dobkin, E. D., Blanding, R., Abele, J., Woods, B., . . . Gupta,

    A. (2021). Patient trajectories among persons hospitalized for COVID-19: A cohort

    study. *Annals of Internal Medicine, 174*(1), 33-41. https://doi.org/10.7326/M20-3905

Gilbar, R. O. Y., & Gilbar, O. (2009). The medical decision-making process and the family: The

    case of breast cancer patients and their husbands. *Bioethics*, *23*(3), 183-192.

    https://doi.org/10.1111/j.1467-8519.2008.00650.x

Global Health Index. (n.d.). *Global health index*. https://www.ghsindex.org

Gotlib Conn, L., Tahmasebi, H., Meti, N., Wright, F. C., Thawer, A., Cheung, M., & Singh, S.

    (2021). Cancer treatment during COVID-19: A qualitative analysis of patient-perceived

    risks and experiences with virtual care. *Journal of Patient Experience*, *8*, 1-8.

    https://doi.org/10.1177/237437352110393

Götze, H., Ernst, J., Brähler, E., Romer, G., & von Klitzing, K. (2015). Predictors of quality of

    life of cancer patients, their children, and partners. *Psycho‑Oncology*, *24*(7), 787-795.

    https://doi.org/10.1002/pon.3725

Green, S. B. & Salkind. (2014). *Using SPSS for windows and macintosh: Analyzing and*

    understanding data. Pearson Education Inc.

Grembowski, D. (2001). *The practice of health program evaluation*. Sage Publications.

Guimond, A., Ivers, H., & Savard, J. (2020). Clusters of psychological symptoms in breast

    cancer: Is there a common psychological mechanism? *Cancer Nursing*, *43*(5), 343-

    353. https://doi.org/10.1097/ncc.0000000000000705

Hall, A. K., Bernhardt, J. M., & Dodd, V. (2015). Older adults' use of online and offline sources

    of health information and constructs of reliance and self-efficacy for medical decision

    making. *Journal of Health Communication*, *20*(7), 751-758.

    https://doi.org/10.1080/10810730.2015.1018603

Hayes, S. C., Battistutta, D., Parker, A. W., Hirst, C., & Newman, B. (2005). Assessing task

    "burden" of daily activities requiring upper body function among women following

breast cancer treatment. *Supportive Care in Cancer*, *13*(4), 255-265.

https://doi.org/10.1007/s00520-004-0729-8

Heist, T., Schwartz, K., & Butler, S. (2021, February 18). *Trends in overall and non-COVID-19 hospital admissions*. https://www.kff.org/health-costs/issue-brief/trends-in-overall-and-non-covid-19-hospital-admissions/

Howard, A. F., Balneaves, L. G., Bottorff, J. L., & Rodney, P. (2011). Preserving the self: The process of decision making about hereditary breast cancer and ovarian cancer risk prediction. *Qualitative Health Research*, *21*(4), 502-519.

https://doi.org/10.1177/1049732310387

Huang, J., Barbera, L., Brouwers, M., Browman, G., & Mackillop, W. J. (2003). Does delay in starting treatment affect the outcomes of radiotherapy? A systematic review. *Journal of Clinical Oncology*, *21*(3), 555-563. https://doi.org/10.12000/JCO.2003.04

Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., Zhang, L., Fan, G., Xu, J., Gu, X., Cheng, Z., Yu, T., Xia, J., Wei, Y., Wu, W., Xie, X., Yin, W., Li, H., Liu, M., & Xiao, Y. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*, *395*(10223), 497-506. https://doi.org/10.1016/S0140-6736(20)30183-5

Hwang, S. Y., Chang, S. J., & Park, B. W. (2013). Does chemotherapy really affect the quality of life of women with breast cancer? *Journal of Breast Cancer*, *16*(2), 229-235.

http://doi.org/10.4048/jbc.2013.16.2.229

Islam, J. Y., Hathaway, C., Lee, K. T., Hume, E., Turner, K., Hallanger-Johnson, J. E., Tworoger, S., & Camacho-Rivera, M. (2022). Racial/ethnic disparities of cancer treatment disruptions among patients with breast cancer with SARS-CoV-2 infection: An

analysis of the ASCO Survey on COVID-19 in Oncology Registry. *Journal of Clinical Oncology, 40*(16), p. 6556. https://doi.org/10.1200/JCO.2022.40.16_suppl.6556

Jazieh, A. R., Akbulut, H., Curigliano, G., Rogado, A., Alsharm, A. A., Razis, E. D., Mula-Hussain, L., Errihani, H., Khattak, A., De Guzman, R. B., Mathias, C., Alkaiyat, M. O. F., Jradi, H., & Rolfo, C. (2020). Impact of the COVID-19 pandemic on cancer care: A global collaborative study. *JCO Global Oncology*, *6*, 1428-1438. https://doi.org/10.1200/GO/20/00351

Josfeld, L., Keinki, C., Pammer, C., Zomorodbakhsch, B., & Hübner, J. (2021). Cancer patients' perspective on shared decision-making and decision aids in oncology. *Journal of Cancer Research and Clinical Oncology*, *147*(6), 1725-1732. https://doi.org/10.1007/s00432-021-03579-6

Kim, S., Han, J., Lee, M. Y., & Jang, M. K. (2019). The experience of cancer-related fatigue, exercise and exercise adherence among women breast cancer survivors: Insights from focus group interviews. *Journal of Clinical Nursing*, *29*(5-6), 758-769. https://doi.org/10.1111/jocn.15114

Koinig, K. A., Arnold, C., Lehmann, J., Giesinger, J., Köck, S., Willenbacher, W., Weger, R., Holzner, B., Ganswindt, Wolf, D., & Stauder, R. (2021). The cancer patient's perspective of COVID-19-induced distress—A cross-sectional study and a longitudinal comparison of HRQOL assessed before and during the pandemic. *Cancer medicine*, *10*(12), 3928-3937. https://doi.org/10.1002/cam4.3950

Kroenke, C. H., Quesenberry, C., Kwan, M. L., Sweeney, C., Castillo, A., & Caan, B. J. (2013). Social networks, social support, and burden in relationships, and mortality after breast cancer diagnosis in the life after breast cancer epidemiology (LACE) study. *Breast*

Cancer Research and Treatment, *137*(1), 261-271. https://doi.org/10.1007/s10549-012-2253-8

Kuchenbaecker, K. B., Hopper, J. L., Barnes, D. R., Phillips, K. A., Mooij, T. M., Roos-Blom,

Jervis, S., Van Leeuwen, F. E., Milne, R. L., Andrieu, N., Goldgar, D. E., Terry, M. B.,

Rookus, A., Easton, D. F., & Antoniou, A. C., & BRCA1 and BRCA2 Cohort

Consortium. (2017). Risks of breast, ovarian, and contralateral breast cancer for BRCA1

and BRCA2 mutation carriers. *JAMA*, *317*(23), 2402-2416.

https://doi.org/10.1001/jama.2017.7112

Kupstas, A. R., Hoskin, T. L., Day, C. N., Habermann, E. B., & Boughey, J. C. (2019). Effect of

surgery type on time to adjuvant chemotherapy and impact of delay on breast cancer

survival: A national cancer database analysis. *Annals of Surgical Oncology*, *26*(10),

3240-3249. https://doi.org/10.1245/s10434-019-07566-7

Lee, C. J., Gray, S. W., & Lewis, N. (2010). Internet use leads cancer patients to be active health

care consumers. *Patient Education and Counseling*, *81*, S63-S69.

https://doi.org/10.1016/j.pec.2010.09.004

Lee, K. A., Ma, W., Sikavi, D. R., Drew, D. A., Nguyen, L. H., Bowyer, R. C. E., Cardoso, M.

J., Fall, T., Freidin, M. B., Gomez, M., Graham, M., Guo, C., Joshi, A. D., Kwon, S., Lo,

C., Lochlainn, M. N., Menni, C., Murray, B., Mehta, R., . . . Chan, A. T. (2021). Cancer

and risk of COVID-19 through a general community survey. *The Oncologist*, *26*(1),

e182-185. https://doi.org/10.1634/theoncologist.2020-0572

Liang, W., Guan, W., Chen, R., Wang, W., Li, J., Xu, K., Li., C., Ai, Q., Lu, W., Liang, H. Li,

S., & He, J. (2020). Cancer patients in SARS-CoV-2 infection: A nationwide analysis in

China. *The Lancet Oncology*, *21*(3), 335-337. https://doi.org/10.1016/S1470-2045(20)30096-6

Liu, L., Wu, Y., Cong, W., Hu, M., Li, X., & Zhou, C. (2021). Experience of women with breast cancer undergoing chemotherapy: A systematic review of qualitative research. *Quality of Life Research*, *30*(5), 1249-1265. https://doi.org/10.1007/s11136-020-02754-5

Longacre, M. L., Miller, M. F., Golant, M., Zaleta, A. K., & Buzaglo, J. S. (2018). Care and treatment decisions in cancer: The role of the family caregiver. *Journal of Oncology Navigation & Survivorship*, *9*(9), 354-362.

Lu, R., Zhao, X., Li, J., Niu, P., Yang, B., Wu, H., Wang, W., Song, H., Huang, B., Zhu, N., Bi, Y., Ma, X., Zhan, F., Wang, L., Hu, T., Zhou, H., Hu, Z., Zhou, W., Zhao, L., … Tan, W. (2020). Genomic characterisation and epidemiology of 2019 novel coronavirus: Implications for virus origins and receptor binding. *Lancet*, *395*(10224), 565-574. https://10.1016/S0140-6736(20)30251-8

Ludwigson, A., Huynh, V., Myers, S., Hampanda, K., Christian, N., Ahrendt, G., Romandetti, K., & Tevis, S. (2022). Patient perceptions of changes in breast cancer care and well-being during COVID-19: A mixed methods study. *Annals of Surgical Oncology*, *29*(3), 1649-1657. https://doi.org/10.1245/s10434-021-11209-1

Maly, R. C., Umezawa, Y., Ratliff, C. T., & Leake, B. (2006). Racial/ethnic group differences in treatment decision-making and treatment received among older breast carcinoma patients. *Cancer*, *106*(4), 957-965. https://doi.org/10.1002/cncr.21680

McAndrew, N. S., Strong, Y., Morris, K. J., Sannes, T. S., Pirl, W. F., Cole, S., Mohanraj, L., & Knight, J. M. (2022). Impact of the COVID-19 pandemic on cancer patients and psycho-oncology providers: Perspectives, observations, and experiences of the American

Psychosocial Oncology Society membership. *Psycho-Oncology*.

https://doi.org/10.1002/pon.5894

Meernik, C., Sandler, D. P., Peipins, L. A., Hodgson, M. E., Blinder, V. S., Wheeler, S. B., &
    Nichols, H. B. (2021). Breast cancer–related employment disruption and financial
    hardship in the sister study. *JNCI Cancer Spectrum*, *5*(3), 1-8.
    https://doi.org/10.1093/jncics/pkab024

Mei, H., Dong, X., Wang, Y., Tang, L., & Hu, Y. (2020). Managing patients with cancer during
    the COVID-19 pandemic: Frontline experience from Wuhan. *The Lancet
    Oncology*, *21*(5), 634-636. https://doi.org/10.1016/S1470-2045(20)30238-2

Miroševič, Š., Prins, J., Borštnar, S., Besić, N., Homar, V., Selič-Zupančič, P., Smrdel, A. C. S.,
    & Klemenc-Ketiš, Z. (2022). Factors associated with a high level of unmet needs and
    their prevalence in the breast cancer survivors 1–5 years after post local treatment and
    (neo) adjuvant chemotherapy during the COVID-19: A cross-sectional study. *Frontiers
    Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.969918

Murk, W., Gierada, M., Fralick, M., Weckstein, A. Klesh, R., & Rassen, J. A. Diagnosis-wide
    analysis of COVID-19 complications: An exposure-crossover study. *Canadian Medical
    Association Journal*, *193*(1), E10-18. https://doi.org/10.1503/cmaj.201686

National Commission for Health Education Credentialing. (2020, January). *Areas of
    responsibility, competencies and sub-competencies for health education specialist
    practice analysis II 2020 (HESPA II 2020).*
    https://assets.speakcdn.com/assets/2251/hespa_competencies_and_sub-
    competencies_052020.pdf

Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., Agha, M., & Agha, R.

    (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A

    review. *International Journal of Surgery*, *78*, 185-193.

    https://doi.org/10.1016/j.ijsu.2020.04.018

Niranjan, S. J., Turkman, Y., Williams, B. R., Williams, C. P., Halilova, K. I., Smith, T., Knight,

    S. J., Bhatia, S., & Rocque, G. B. (2020). "I'd want to know, because a year's not a long

    time to prepare for a death": Role of prognostic information in shared decision making

    among women with metastatic breast cancer. *Journal of Palliative Medicine*, *23*(7), 937-

    943. https://doi.org/10.1089/jpm.2019.0457

O'Brien, M. A., Charles, C., Whelan, T. J., Ellis, P. M., Gafni, A., & Lovrics, P. (2013).

    Women's perceptions of their involvement in treatment decision making for early stage

    breast cancer. *Supportive Care in Cancer*, *21*(6), 1717-1723.

    https://doi.org/10.1007/s00520-013-1718-6

Oeffinger, K. C., Fontham, E. T., Etzioni, R., Herzig, A., Michaelson, J. S., Shih, Y. C. T.,

    Walter, L. C., Church, T. R., Flowers, C. R., LaMonte, S. J., Wolf, A. M., DeSantis, C.,

    Lortet-Tieulent, J., Andrews, K., Manassaram-Baptiste, D., Saslow, D., Smith, R. A.,

    Brawley, O. W., & Wender, R. (2015). Breast cancer screening for women at average

    risk: 2015 guideline update from the american cancer society. *JAMA*, *314*(15), 1599-

    1614. https://doi.org.10.1001/jama.2015.12783

Papautsky, E. L., & Hamlish, T. (2020). Patient-reported treatment delays in breast cancer care

    during the COVID-19 pandemic. *Breast Cancer Research and Treatment*, *184*(1), 249-

    254. https://doi.org/10.1007/s10549-020-05828-7

Patt, D., Gordan, L., Diaz, M., Okon, T., Grady, L., Harmison, M., Markward, N., Sullivan, M., Peng, J., & Zhou, A. (2020). Impact of COVID-19 on cancer care: How the pandemic is delaying cancer diagnosis and treatment for american seniors. *JCO Clinical Cancer Informatics*, *4*, 1059-1071. https://doi.org/10.1200/CCI.20.00134

Penedo, F.J., Cohen, L., Bower, J. & Antoni, M.H. (2021, May 4). Impact of the COVID-19 pandemic in cancer survivors. [Unpublished questionnaire]. University of Miami Health System.

Petrillo, L., El-Jawahri, A., Heuer, L., Post, K., Gallagher, E., Trotter, C., Ternel, J., & Greer, J. (2022). Quality of life and depression symptoms in a cross-section of patients with advanced lung cancer before and during the coronavirus disease 2019 (COVID-19) pandemic (RP322). *Journal of Pain and Symptom Management*, *63*(6), 1079-1080. https://doi.org/10.1016/j.jpainsymman.2022.04.038

Pieters, H. C. (2016). "I'm still here": resilience among older survivors of breast cancer. *Cancer Nursing*, *39*(1), E20-28. https://doi.org/10.1097/NCC.0000000000000248

Plevritis, S. K., Munoz, D., Kurian, A. W., Stout, N. K., Alagoz, O., Near, A. M., Lee, S. J., van den Broek, J. J., Huang, X., Schechter, C. B., Sprague, B. L., Song, J., de Koning, H. J., Trentham-Dietz, A., van Ravesteyn, N. T., Gangnon, R., Chandler, Y., Li, Y., Xu, C., … Mandelblatt, J. S. (2018). Association of screening and treatment with breast cancer mortality by molecular subtype in US women, 2000-2012. *JAMA*, *319*(2), 154-164. https://doi.org/10.1001/jama/2017/19130

Power, T. E., Swartzman, L. C., & Robinson, J. W. (2011). Cognitive-emotional decision making (CEDM): A framework of patient medical decision making. *Patient Education and Counseling*, *83*(2), 163-169. https://doi.org/10.1016/j.pec.2010.05.021

Rebolj, M., Assi, V., Brentnall, A., Parmar, D., & Duffy, S. W. (2018). Addition of ultrasound to mammography in the case of dense breast tissue: Systematic review and meta-analysis. *British Journal of Cancer*, *118*(12), 1559-1570. https://doi.org/10.1038/s41416-018-0080-3

Riera, R., Bagattini, Â M., Pacheco, R. L., Pachito, D. V., Roitberg, F., & Ilbawi, A. (2021). Delays and disruptions in cancer health care due to COVID-19 pandemic: Systematic review. *JCO Global Oncology*, (7), 311-323. https://doi.org/10.1200/GO.20.00639

Rotstein, S., Blomgren, H., Petrini, B., Wasserman, J., & Baral, E. (1985). Long term effects on the immune system following local radiation therapy for breast cancer. I. cellular composition of the peripheral blood lymphocyte population. *International Journal of Radiation Oncology, Biology, Physics*, *11*(5), 921-925. https://doi.org/10.1016/0360-3016(85)90114-2

Sah, G. S., Shrestha, G., Dhakal, A., Mulmi, R., Sapkota, A., & Poudel, S. (2020). Knowledge, attitudes, and practices of cancer patients towards COVID-19: A cross-sectional study in central Nepal. *Cancer Management and Research*, *12*, 10173- 10180. https://doi.org/10.2147/CMAR.S271910

San Antonio. City Ordinance. Declaration. 8: Public health emergency regarding COVID-19. (2020, March).

Saslow, D., Boetes, C., Burke, W., Harms, S., Leach, M. O., Lehman, C. D., Morris, E., Pisano, E., Schnall, M., Sener, S., Smith, R. A., Warner, E., Yaffe, M., Andrews, K.S., Russell, C. A., & American Cancer Society Breast Cancer Advisory Group. (2007). American cancer society guidelines for breast screening with MRI as an adjunct to mammography. C*A: Cancer Journal for Clinicians*, *57*(2), 75-89. https://doi.org/10.3322/canjclin.57.2.75

Sharp, L., & Timmons, A. (2016). Pre-diagnosis employment status and financial circumstances predict cancer-related financial stress and strain among breast and prostate cancer survivors. *Supportive Care in Cancer*, *24*(2), 699-709. https://doi.org/10.1007/s00520-015-2832-4

Shiyanbola, O. O., Arao, R. F., Miglioretti, D. L., Sprague, B. L., Hampton, J. M., Stout, N. K., Kerilikowske, K., Braithwaite, D., Buist, D. S., Egan, K. M., Newcomb, P. A., & Trentham-Dietz, A. (2017). Emerging trends in family history of breast cancer and associated risk trends in family history of breast cancer. *Cancer Epidemiology, Biomarkers & Prevention*, *26*(12), 1753-1760. https://doi.org/10.1158/1055-9965.EPI-17-0531

Soriano, E. C., Perndorfer, C., Otto, A. K., Fenech, A. L., Siegel, S. D., Dickson-Witmer, D., Clements, L., & Laurenceau, J. P. (2021). Psychosocial impact of cancer care disruptions in women with breast cancer during the COVID-19 pandemic. *Frontiers in Psychology*, *14*, 1878. https://doi.org/10.3389/fpsyg.2021.662339

Supriati, L., Sudiana, I. K., Nihayati, H. E., Ahsan, Rodli, M., & Kapti, R. E. (2022). Perspective of uncertainty and emotional responses in breast cancer patients during the COVID-19 pandemic. *SAGE Open Nursing*, *8*, 1-7. https://doi.org/10.1177/237796082211242

Tamimi, R. M., Spiegelman, D., Smith-Warner, S. A., Wang, M., Pazaris, M., Willett, W. C., Eliassen, H., & Hunter, D. J. (2016). Population attributable risk of modifiable and nonmodifiable breast cancer risk factors in postmenopausal breast cancer. *American Journal of Epidemiology*, *184*(12), 884-893. https://doi.org/10.1093/aje/kww145

Tamirisa, N. P., Goodwin, J. S., Kandalam, A., Linder, S. K., Weller, S., Turrubiate, S., Silva, S., & Riall, T. S. (2017). Patient and physician views of shared decision making in

cancer. *Health Expectations*, *20*(6), 1248-1253. https://doi.org/10.1111/hex.12564Texas

Department of Health and Human Services. (2021, March 13). *COVID-19 in Texas*.

https://txdshs.maps.arcgis.com/apps/dashboards/ed483ecd702b4298ab01e8b9cafc8b83

Thapa, D. K., Visentin, D. C., Kornhaber, R., West, S., & Cleary, M. (2021). The influence of

online health information on health decisions: A systematic review. *Patient Education*

and Counseling, *104*(4), 770–784. https://doi.org/10.1016/j.pec.2020.11.016

Tian, J., Yuan, X., Xiao, J., Zhong, Q., Yang, C., Liu, B., Cai, Y., Lu, Z., Wang, J., Wang, Y.,

Liu, S., Cheng, B., Wang, J., Zhang, M., Wang, L., Niu, S., Yao, Z., Deng, X., Zhou, F.,

& Wei, W. (2020). Clinical characteristics and risk factors associated with COVID-19

disease severity in patients with cancer in Wuhan, China: A multicentre, retrospective,

cohort study. *Lancet Oncology*, *21*(3) 335-337. https://doi.org/10/1016/S1470-
2045(20)30390-0

Tu, P. C., Yeh, D. C., & Hsieh, H. C. (2020). Positive psychological changes after breast cancer

diagnosis and treatment: The role of trait resilience and coping styles. *Journal of*

Psychosocial Oncology, *38*(2), 156-170. https://doi.org/10.1080/07347332.2019.1649337

Tung, N., Lin, N. U., Kidd, J., Allen, B. A., Singh, N., Wenstrup, R. J., Hartmann, A. Winer, E.

P., & Garber, J. E. (2016). Frequency of germline mutations in 25 cancer susceptibility

genes in a sequential series of patients with breast cancer. *Journal of Clinical*

Oncology, *34*(13), 1460. https://doi.org/10.1200%2FJCO.2015.65.0747

Turnbull, C., & Rahman, N. (2008). Genetic predisposition to breast cancer: Past, present, and

future. *Annual review of genomics and human genetics*, *9*(1), 321-345.

https://10.1146/annnurev.genom.9.081307.164339

Tyner, T. E., & Freysteinson, W. M. (2021). A concept analysis of decision regret in women

    with breast cancer. *Nursing Forum*, *57*(1), 112-120. https://doi.org/10.1111/nuf.12642

Ueda, M., Martins, R., Hendrie, P. C., McDonnell, T., Crews, J. R., Wong, T. L., McCreery, B.,

    Jagels, B., Crane, A., Byrd, D. R., Pergam, S. A., Davidson, N. E., Liu, C., & Stewart, F.

    M. (2020). Managing cancer care during the COVID-19 pandemic: Agility and

    collaboration toward a common goal. *Journal of the National Comprehensive Cancer*

    Network, *18*(4), 366-369. https://doi.org/10.6004/jnccn.2020.7560

Van Kessel, S.A., Olde Hartman, T.C., Lucassen, P.L. & Van Jaarsveld, C.H. (2022). Post-acute

    and long-COVID-19 symptoms in patients with mild diseases: A systematic review.

    Family practice, *39*(1), 159-167. https://doi.org/10.1093/fampra/cmab076

World Health Organization. (2003, May 7). *Disease outbreak reported: SARS case fatality ratio,*

    incubation period. https://www.who.int/emergencies/disease-outbreak-

    news/item/2003_05_07a-en

World Health Organization. (2012, March). *WHOQOL user manual: Programme on mental*

    health.

    https://apps.who.int/iris/bitstream/handle/10665/77932/WHO_HIS_HSI_Rev.2012.03_en

    g.pdf

World Health Organization. (2019, January 13). *Clinical management of severe acute*

    respiratory infection when middle east respiratory syndrome coronavirus (MERS-CoV)

    infection is suspected: Interim guidance.

    https://apps.who.int/iris/bitstream/handle/10665/178529/WHO_MERS_Clinical_15.1_en

    g.pdf?sequence=1&isAllowed=y

World Health Organization. (2020, February 24). *Report of the WHO - China joint mission on*

    coronavirus disease 2019 (COVID-19). https://www.who.int/docs/default-

    source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf

World Health Organization. (2021, March 13). *WHO coronavirus (COVID-19) dashboard*.

    https://covid19.who.int/

Wu, Z., & McGoogan, J. M. (2020). Characteristics of and important lessons from the

    coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72 314

    cases from the Chinese center for disease control and prevention. *JAMA*. *323*(13):1239–

    1242. https://doi.org/10.1001/jama.2020.2648

Yadollahi, M., Siavashi, E., & Mostaghim, S. (2018). The relationship between health literacy

    and patient participation in medical decision making among breast cancer patients.

    Archives of Breast Cancer, 5(4), 183-188. https://doi.org/10.32768/abc.201854183-188

Yanez, B., Pearman, T., Lis, C. G., Beaumont, J. L., & Cella, D. (2013). The FACT-G7: A rapid

    version of the functional assessment of cancer therapy-general (FACT-G) for monitoring

    symptoms and concerns in oncology practice and research. *Annals of Oncology*, *24*(4),

    1073-1078. https://doi.org/10.1093/annonc/mds539

Zhao, J., Yuan, Q., Wang, H., Liu, W., Liao, X., Su, Y., Wang, X., Yuan, J., Li, T., Li, J., Qian,

    S., Hong, C., Wang, F., Liu, Y., Wang, Z., He, Q., Li, Z., He, B., Zhang, T., . . . Zhang,

    Z. (2020). Antibody responses to SARS-CoV-2 in patients with novel coronavirus

    disease 2019. *Clinical Infectious Diseases*, *71*(16), 2027-

    2034. https://doi.org/10.1093/cid/ciaa344

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), 1-8. https://doi.org/10.1186/s12885-022-09177-0

PANDEMIC'S IMPACT ON PSYCHOSOCIAL AND HEALTH-RELATED QUALITY OF

LIFE OF BREAST CANCER PATIENTS: INFORMATION SHEET

Information Sheet about participation in a research study titled: COVID-19: A Pandemic's Impact On Psychosocial and Health-Relathed Quality Of Life Of Breast Cancer Patients

Who is conducting the study?

Irma Corona, M.S.R.S, CMD, Senior Medical Dosimetrist, Radiation Oncology, Mays Cancer

Center, is conducting this study and is responsible for protecting your rights, safety and welfare

as a participant in the research.

What is the purpose of the research?

The purpose of the research is to evaluate the impact that the COVID-19 pandemic has had on

the psychosocial and health related quality of life of breast cancer patients.

Who is being asked to participate?

Mays Cancer Center breast cancer patients who are scheduled to receive, are currently receiving,

or have completed radiation treatment in the outpatient setting will be asked to participate in this

research study. Planned enrollment is a total of 40 patients.

Do you have to be in this study?

You do not have to participate if you don't want to. You may also leave the study at any time. If

you decide not to take part in this study or leave the study before it is finished, there will be no

penalty to you, you will not lose any benefits to which you are entitled, and your doctor will

continue to treat and see you.

Procedures

- At one of your visits (new patient, weekly during treatment, or follow-up), you will

  receive a survey consisting of 50 questions regarding: your COVID 19 experiences,

emotional and physical reactions you may have encountered during the pandemic, health

care disruptions/concerns that may have arisen, disruption of daily activities that may

have come to light, financial hardship that you may have incurred, positives that you may

have experienced during the pandemic, support you may have received, the stress you

may have experienced and how you may have managed it, and how COVID-19 impacted

your health-related quality of life (research only).

- At the time of your visit you will have the opportunity to complete the survey via iPad or

  computer in a patient education room. You may also choose another day to complete the

  survey, if you prefer.

- A week later you may be contacted to complete a short follow-up audio recorded

  interview (research only).

- During the study, the researcher will also review your medical records to collect

  information about you and the treatment your receiving at Mays Cancer Center (research

  only).

Future Use of Your Information Collected as Part of Your Participation

Identifiers may be removed from your identifiable private information and after the removal of

identifiers, the information could be used for future research studies or distributed to another

investigator for future research studies.

Risks and Benefits

While you may not receive any direct benefit from participating in this research, we hope the

information learned from this study will benefit other people with similar conditions in the

future.

If you feel uncomfortable answering questions or participating in the survey let the investigator know. You do not have to respond to any question that you do not feel comfortable answering. Your responses will be kept confidential.

Although rare, it is possible that there may be a breach of confidentiality, which is serious. However, the researchers have taken steps to minimize this risk such as keeping the research materials in a secure, locked location.

Confidentiality

Information we learn about you in this study will be handled in a confidential manner, within the limits of the law. If we publish the results of the study in a scientific journal or book, we will not identify you. The Institutional Review Board and other groups that have the responsibility of monitoring research may want to see study records which identify you as a subject in this study. Research policies require that private information about you be protected and this is especially true for your health information. However, the law sometimes allows or requires others to see your information. The information given below describes how your privacy and the confidentiality of your research records will be protected in this study.

What is Protected Health Information (PHI)?

Protected Health Information is information about a person's health that includes information that would make it possible to figure out who the individual is. According to the law, you have the right to decide who can see your protected health information. If you choose to take part in this study, you will be giving your permission to the investigators and the research study staff (individuals carrying out the study) to see and use your health information for this research study. In carrying out this research, the health information we will see and use about you will include: your race and ethnicity, age at time of enrollment, disease site, disease stage, preferred

language, education level, marital status, employment status, insurance status, date of 1st radiation oncology consult, and date of 1st radiation treatment. We will get this information by asking you or by looking at your chart at Mays Cancer Center.

How will your PHI be shared?

Because this is a research study, we will be unable keep your PHI completely confidential. We may share your health information with people and groups involved in overseeing this research study including:

- The committee that checks the study data on an ongoing basis, to determine if the study should be stopped for any reason.

- The members of the local research team

- The Institutional Review Board and the Compliance Office of the University of Texas Health Science Center at San Antonio, and other groups that oversee how research studies are carried out.

- The Research offices at the University of Texas Health Science Center at San Antonio
If you decide to participate in this study, you will be giving your permission for the groups named above, to collect, use and share your health information. If you choose not to let these groups collect, use and share your health information as explained above, you will not be able to participate in the research study.

How will your PHI be protected?

In an effort to protect your privacy, the study staff will use code numbers instead of your name, to identify your health information. Initials and numbers will be used on any study materials containing health information that are sent outside of the Mays Cancer Center for review. If the results of this study are reported in medical journals or at meetings, you will not be identified.

Do you have to allow the use of your health information?

You do not have to allow (authorize) the researchers and other groups to see and share your health information. If you choose not to let the researchers and other groups use your health information, there will be no penalties but you will not be allowed to participate in the study. After you enroll in this study, you may ask the researchers to stop using your health information at any time. However, you need to say this in writing and send your letter to Irma Corona, Mays Cancer Center, Department of Radiation Oncology, MC7889, 7979 Wurzbach Road, San Antonio, TX 78229. If you tell the researchers to stop using your health information, your participation in the study will end and the study staff will stop collecting new health information from you and about you for this study. However, the study staff will continue to use the health information collected up to the time they receive your letter asking them to stop.

Can you ask to see the PHI that is collected about you for this study?

The federal rules say that you can see the health information that we collect about you and use in this study. Contact the study staff if you have a need to review your PHI collected for this study.

How long will your PHI be used?

By agreeing to participate in this study, you agree to let us use and disclose your health information for purposes of the study until the end of the study. This permission to use your personal health information expires when the research ends, and all required study monitoring is over.

Contact Information

Contact Irma Corona at 210-450-1040 or Coronai@uthscsa.edu for questions or comments.

The University of Texas Health Science Center committee that reviews research on human subjects (Institutional Review Board) will answer any questions about your rights as a research

subject and take any comments or complaints you may wish to offer. You can contact the IRB by

calling 210-567-8250, or by mail to IRB, UTHSCSA, Mail Code 7830, 7703 Floyd Curl Drive,

San Antonio, TX 78229-3900.

This form is yours to keep.

APPENDIX B

COVID-19: IMPACT OF THE PANDEMIC AND HRQOL IN CANCER PATIENTS AND

SURVIVORS SURVEY

COVID-19: IMPACT OF THE PANDEMIC AND HRQOL IN CANCER PATIENTS

AND SURVIVORS

I. COVID-19 EXPERIENCES

Please answer the questions below to the best of your knowledge. If the item is not

applicable, please select N/A. If you do not know the answer, please select D/K.

1. To your knowledge, have you been exposed to someone with COVID-19? Yes No D/K

2. Have you been tested for COVID-19? Yes No D/K

    a. How many days ago were you tested? __ __ Days

    b. If tested, was your result positive: Yes No D/K

    c. If positive, are you currently experiencing COVID-19 symptoms? Yes No D/K

3. If you tested positive for COVID-19, were you hospitalized? Yes No N/A

    a. If you were hospitalized, how many nights were you in the hospital? __ __ Nights N/A

4. Did a family member or a member of your household test positive for COVID-19?

    Yes No D/K

    a. If yes, how many? __ __ N/A

5. Did a family member or a member of your household die of COVID-19? Yes No

    a. If yes, did they have COVID-19 symptoms (e.g., fever, cough)? Yes No

6. Were any friends, co-workers or neighbors diagnosed with COVID-19? Yes No

    a. If yes, how many? __ __

7. Did a friend, co-worker or neighbor die of COVID-19? Yes No

a. If yes, how many? __ __ N/A

8. If you practiced social isolation/stay at home/quarantine, for how many days did it last (total number of days up to today if still practicing isolation)? __ __ N/A

9. Do you have any of the following risk factors or experienced symptoms associated with COVID-19:

   a. 60 years of age Yes No

   b. Comorbidities such as diabetes, hypertension, kidney disease, and/or respiratory illnesses (e.g., COPD, asthma) Yes No

   c. International travel or travel to COVID-19 hotspots Yes No

   d. Exposure to someone who tested positive to COVID-19 Yes No

   e. Visiting/working in a nursing home or hospital Yes No

   f. Fever Yes No

   g. Dry cough Yes No

   h. Shortness of breath Yes No

10. Did you lose your job or primary source of income due to COVID-19? Yes No N/A

11. Did your spouse or partner lose their job or primary source of income? Yes No N/A

12. If employed, are you currently: ___ working from home ___ commuting to work N/A

13. Due to COVID-19, my household income has: __ Decreased __ Increased __ Not changed

   a. If your income decreased, what was the reason (check as many as apply):

   __ Lost job __ Spouse/Partner lost job __ Assisting family

   __ Inability to work at home __ Other

   b. If your income increased, what was the reason (check as many as apply):

   __ Started a new job __ Spouse/Partner started new job __ My work became busier

__ Other

14. How often are you spending time outside your home?

__ No time __ once a week __ every 2-3 days __ normal routine

15. Are you accomplishing more or less (e.g., activities, tasks, hobbies, interests)? More Less Same

16. Due to COVID-19, did you decide not to:

a. Attend a scheduled in-person **general medical appointment** not cancelled due to COVID-19?

Yes No

b. Attend a scheduled in-person **cancer appointment or treatment** not cancelled due to COVID-19?

Yes No

c. Seek **emergency care** in an urgent care facility or emergency room? Yes No

17. Did you participate in a Telehealth **medical appointment** (e.g., Zoom, Facetime) since COVID-19 pandemic? If yes, how many? __ __ __

If yes, how many were for **cancer care**? __ __ __ How many were for other **medical care**? __ __ __

18. If you had a Telehealth appointment for **cancer care**, how satisfied are you with your experience?

__ Very dissatisfied __ Somewhat dissatisfied __ Neutral __ Somewhat Satisfied

__ Very Satisfied

19. If you had a Telehealth appointment for **general care**, how satisfied are you with your experience?

__ Very dissatisfied __ Somewhat dissatisfied __ Neutral __ Somewhat Satisfied

__ Very Satisfied

II. COVID-19 PSYCHOSOCIAL AND PRACTICAL EXPERIENCES

Please indicate the extent to which you agree or disagree with the following statements.

Please use the scale below:

    0 = Strongly Disagree   **1 = Disagree**   **2 = Neither agree or Disagree**

    3 = Agree   **4 = Strongly Agree**

Since the breakout of the COVID-19 pandemic:

COVID-19 Specific Distress (Emotional and Physical Reactions):

1. I feel anxious about getting COVID-19 *(or if positive: I am anxious about becoming ill)*.

2. I worry about possibly infecting others.

3. I am concerned about a family member or close friend getting or dying from COVID-19.

4. I worry about the possibility of dying from COVID-19.

5. I fear how the COVID-19 pandemic will impact my cancer care or recovery.

6. I am concerned that cancer puts me at greater risk for being infected or dying from COVID-19.

7. I feel I have no control over how COVID-19 will impact my life.

8. I have experienced feelings of sadness or depression.

9. I feel negative and/or anxious about the future.

10. I have experienced changes in my sleep.

11. I have experienced changes in my eating.

12. I have experienced difficulty concentrating.

13. I have experienced feelings of social isolation or loneliness.

Health Care Disruptions and Concerns (Concerns About Medical Care):

14. My general medical care has been disrupted or delayed.

15. My cancer care or follow-up has been disrupted or delayed.

16. My healthcare providers have taken the necessary measures to address COVID-19.

17. I received adequate information on prevention, protection or care for COVID-19 from my cancer care providers.

Disruption to Daily Activities and Social Interactions:

18. I have experienced disruptions in day to day social interactions with family and/or friends.

19. I have not been able to adequately take care of family members or friends I provide for.

20. I have been unable to perform my typical daily routines (e.g., work, physical activity, leisure activity).

21. I have experienced conflict with household members (e.g., spouse/partner, children, parents, others).

22. I have had difficulty or been unable to perform my work as usual.

23. I have had difficulty taking care of my children's needs (e.g., providing care, supervising schoolwork)
and/or balancing their needs with other responsibilities.

Financial Hardship:

24. I have experienced financial difficulties.

25. I have not been able to purchase or obtain basic necessities (e.g., food, personal care products).

26. I have been anxious about losing or having lost my job, or my primary source of income.

27. I have not been able to adequately provide for others I financially support.

28. I feel anxious about being able to maintain or not having adequate health care insurance.

Perceived Benefits:

29. I have greater appreciation for my family and close friends.

30. I have deeper appreciation for life.

31. I have been more grateful for each day.

32. I have been more accepting of things I cannot change.

33. I have found new ways of connecting with family and friends.

34. I have used my experience in coping with cancer to deal with COVID-19.

Functional Social Support:

35. I have received emotional support from family or friends when needed.

36. I have received tangible support (e.g., financial, practical) from family or friends when needed.

37. I am (or "have been") there to listen to other's problems when needed.

38. I have helped others with financial or practical support.

Perceived Stress Management (Ability to Manage Stress):

39. I am able to recognize thoughts and situations that make me feel stressed or upset about COVID-19.

40. I am able to practice relaxation (e.g., deep breathing, meditation) when feeling stress about COVID-19.

41. I am able to seek information and plan accordingly to address concerns over the COVID-19 pandemic.

42. I can re-examine negative thoughts and gain a new perspective when concerned about COVID-19.

43. I can give myself the caring and tenderness I need.

III. Health Related Quality of Life

Below is a list of statements that other people who receive cancer care (active treatment or follow-up care) said are important.

Please circle or mark one number per line to indicate your response as it applies to the past 7 days.

	Not at all	A little bit	Somewhat	Quite a bit	Very Much
1. I have a lack of energy	1	2	3	4	5
2. I have pain	1	2	3	4	5
3. I have nausea	1	2	3	4	5
4. I worry that my condition will get worse	1	2	3	4	5
5. I am sleeping well	1	2	3	4	5
6. I am able to enjoy life	1	2	3	4	5
7. I am content with the quality of life right now	1	2	3	4	5

APPENDIX C

IMPACT OF THE COVID-19 PANDEMIC IN CANCER SURVIVORS: SCORING

INSTRUCTIONS

Penedo, F.J., Cohen, L., Bower, J. & Antoni, M.H. (2021, May 4). Impact of the COVID-19

pandemic in cancer survivors. Unpublished questionnaire.

Disclaimer: Please note that these are preliminary scoring instructions and psychometrics based

on a convenience sample of 30 volunteer cancer survivors of mixed age, race/ethnicity and

cancer site. Upon a larger sample, confirmatory factor analyses will be conducted to establish the

factor structure of the measure, its internal consistency and factor invariance across key factors

such as gender, cancer site, language, etc.

Scoring Instructions:

- ▪ Scale Specific Summary Score = Sum of all item values in each scale and then
  divide by the number of items in each scale (average)

  1. Distress Subscale= Sum of response values / 13 items = Mean Score

  2. Health Care Disruptions & Concerns Subscale = Sum of response values / 4
     items = Mean Score

  3. Disruption to Daily Activities & Social Interactions Subscale = Sum of
     response values / 6 items = Mean Score

  4. Financial Hardship Subscale = Sum of response values / 5 items = Mean
     Score

  5. Perceived Benefits Subscale = Sum of response values / 6 items = Mean Score

  6. Functional Social Support Subscale = Sum of response values / 4 items =
     Mean Score

7. Perceived Stress Management Subscale = Sum of response values / 5 items = Mean Score

8. Emotional Distress Subscale: Sum of items 1, 2, 3, 4, 5, 6, 7, 8, 9, 13 / 10 = Mean Score

9. Anxiety Subscale: Sum of items 1, 2, 3, 4, 5 / 5 = Mean Score

10. Depression Subscale: Sum of items 8, 9 / 2 = Mean Score

Disruption Composite Score = Sum of Items in Scales 2, 3 and 4 / 15 = Mean Score

Resiliency Composite Score = Sum of Items in Scales 5, 6 & 7 / 15 = Mean Score

▪ Items 16, 17 and all items in Perceived Benefits (items 29 – 34), Functional Social Support (items 35 – 38), and Perceived Stress Management (items 39 – 43) are reverse scored.

▪ Total Measure Score = Sum of all item values divided by 43 (total items)

Subscale	All (N=14183)	
	Mean (SD)	ALPHA
Distress	2.05(0.84)	0.9
Healthcare Disruptions	1.36(0.73)	0.58
Disruption to Daily Activities	2.00(0.82)	0.77
Financial Hardship	1.17(0.87)	0.84
Perceived Benefit	1.07(0.75)	0.86
Functional Social Support	1.41(0.63)	0.62
Perceived Stress Management	1.34(0.61)	0.8
Emotional Distress	2.18(0.85)	0.88
Anxiety	2.34(0.97)	0.85
Depression	1.73(1.10)	0.79
Disruption Composite Score	1.51(0.61)	0.83
Resiliency Composite Score	1.28(0.51)	0.87
Total Measure Score	1.91(0.68)	0.88