FACTORS ASSOCIATED WITH HEALTH-RELATED QUALITY OF LIFE AMONG BREAST CANCER PATIENTS RECEIVING POSTOPERATIVE CHEMOTHERAPY IN HANGZHOU, CHINA

YE SONG

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR MASTER DEGREE OF NURSING SCIENCE
(INTERNATIONAL PROGRAM)
IN ADULT NURSING PATHWAY
FACULTY OF NURSING
BURAPHA UNIVERSITY
2025

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YE SONG

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรพยาบาลศาสตรมหาบัณฑิต (หลักสูตรนานาชาติ)

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The purposes of this correlational study were to describe the health-related quality of life and to examine relationships between symptom experience, social support and HRQoL among postoperative breast cancer patients receiving chemotherapy in Hangzhou, China. The study was based on the Symptom management theory. A simple random sampling method was used to recruit 130 participants who were treated in the Breast Surgery Department of Sir Run Run Shaw Hospital from November to December 2023. Data were collected using four research instruments, including the demographic questionnaire, the Chinese version of the Memorial Symptom Assessment Scale, the Chinese version of the Perceived Social Support Scale, and the Chinese version of the Functional Assessment of Cancer Therapy-Breast. Data were analyzed using descriptive statistics and Pearson product-moment correlation.

Results revealed that participants reported there were not too high and not too low in mean score of HRQoL (M = 93.45 out of 144, SD = 19.56). Considering the subscale, the functional well-being domain had the lowest mean score (M = 14.52, SD = 5.92), while the mean score of the breast cancer special module was 22.83 out of 36 (SD = 5.07). In addition, there was a high negative correlation between symptom experience and health-related quality of life (r = -.558, p < .01). While social support had a strong positive association with health-related quality of life (r = .556, p <.01).

Results of the study suggest that improving health-related quality of life among postoperative breast cancer patients receiving chemotherapy, nurses and healthcare providers should focus on promoting symptom management and provision of social support to this population.

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Ye Song

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CHAPTER 1
INTRODUCTION

Background and significance of the research problem

Breast cancer is one of the most prevalent malignant tumours affecting women globally, with a rising trend in incidence over recent decades. According to the Global Cancer Statistics report, breast cancer has the second highest incidence rate in the world, with about 2.3 million new cases globally, accounting for 11.6% of all new cancer cases and 6.9% of all cancer deaths (Bray et al., 2024). While incidence rates have plateaued or slightly declined in high-income countries due to advances in early detection and treatment, they continue to rise in many low- and middle-income countries, including China, driven by urbanization, westernized lifestyles, and increased life expectancy (Bray et al., 2024). In China, breast cancer accounted for around 420,000 new cases in 2020, with an age-standardized incidence rate of 28.3 per 100,000 women (Chen et al., 2019). Nationally, it represents approximately 16.2% of all female cancer cases.

Regionally, data from the Zhejiang Provincial Cancer Hospital indicate that breast cancer is the most commonly diagnosed cancer among women in Zhejiang Province (Zhejiang Cancer Center, 2020). In Hangzhou, the capital of Zhejiang, surveillance reports have shown incidence rates that exceed the national average, particularly among women aged 40 to 59 years (Wang et al., 2020). These findings underscore the escalating public health burden of breast cancer in China and emphasize the importance of targeted prevention strategies, early detection, and health-related quality of life interventions adapted to regional characteristics.

Some well-established risk factors for breast cancer include increasing age, family history of the disease, and genetic mutations such as breast cancer susceptibility gene 1 (BRCA1) and breast cancer susceptibility gene 2 (BRCA2) (Centers for Disease Control and Prevention, 2024; Kuchenbaecker et al., 2017). Reproductive factors, including early menarche, late age at first childbirth, and reduced parity, have also been associated with increased risk (Collaborative Group on Hormonal Factors in Breast Cancer, 2012). Additionally, modifiable lifestyle factors

such as high-fat diets, alcohol consumption, physical inactivity, and obesity further contribute to breast cancer risk (World Health Organization (WHO), 2021). In urban settings like Hangzhou, rising obesity rates and increasingly sedentary lifestyles are believed to be key drivers of the growing breast cancer burden (Fei et al., 2016).

Breast cancer is a malignant neoplasm originating from the epithelial cells of the breast, characterized by uncontrolled cell proliferation due to the influence of various carcinogenic factors. There are several subtypes of breast cancer, with invasive ductal carcinoma (IDC) being the most prevalent, accounting for approximately 70–80% of all cases (Society, (n.d.)-c). Breast cancer staging is determined based on tumour size, lymph node involvement, distant metastasis, and molecular markers such as estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2), which are critical in guiding treatment strategies and predicting outcomes (National Cancer Institute, 2022).

Breast cancer treatment typically involves a combination of surgery, chemotherapy, and radiation therapy, and may also include hormone therapy or targeted therapy, tailored to the stage, type, and characteristics of the cancer (National Comprehensive Cancer, 2023). Surgery is usually the first-line treatment, aimed at removing the tumor or affected breast tissue. Breast-conserving surgery (lumpectomy) or mastectomy (removal of the entire breast) are the most common surgical options (Society, (n.d.)-a). While surgery is crucial for achieving local control of the cancer, it also plays a significant role in influencing health-related quality of life (HRQoL), both immediately after surgery and in the long term (Cordova et al., 2019).

The impact of surgery on health-related quality of life (HRQoL) is primarily linked to both physical and psychological changes. Physical side effects of surgery include pain, swelling, limited arm mobility, and alterations in body image, particularly following the loss of a breast or breast tissue (Cordova et al., 2019). These physical changes can have a significant impact on functional status, often limiting an individual’s ability to engage in daily activities and adversely affecting physical health. Research has indicated that postoperative pain and restricted arm function, particularly due to lymph node removal, can result in reduced physical functioning (De Groef et al., 2015). Additionally, issues related to body image,

especially after a mastectomy, are closely associated with emotional well-being and social functioning (Jang et al., 2023).

Following surgery, patients typically receiving postoperative chemotherapy to target any remaining cancer cells and reduce the risk of recurrence (National Comprehensive Cancer, 2023). Postoperative chemotherapy, in addition to the effects of surgery, further exacerbates the decline in health-related quality of life (HRQoL). Chemotherapy side effects such as fatigue, nausea, neuropathy, and hair loss can significantly impair physical functioning (M. D. Anderson Cancer Center, 2023). Psychological effects, including anxiety, depression, and fear of recurrence, are common during chemotherapy and can negatively impact emotional health (Lam et al., 2010; Li et al., 2022). Furthermore, chemotherapy can induce cognitive impairments, often referred to as "chemobrain," which impair cognitive function and contribute to a decline in overall HRQoL (Onzi et al., 2022). These physical, psychological, and cognitive burdens, combined with the long-term effects of surgery, typically result in a marked decline in HRQoL during treatment and recovery.

QoL is a broad term that encompasses both health-related and non-health-related domains. It is generally defined as " an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." (World Health Organization, 2024). HRQoL is related to the way how illness and treatment affects QoL. Therefore, HRQoL is a multidimensional construct that assesses the physical, functional, psychological, social, spiritual, and sexual well-being relevant to an illness or its treatment (De Freitas Araújo et al., 2019). HRQoL has become a prominent health outcome and is frequently used as a primary endpoint in clinical trials, alongside traditional measures like tumor response and survival rates (Basch et al., 2016). Additionally, poor HRQoL has been associated with an increased risk of mortality (Barger et al., 2020). Therefore, it is essential for healthcare providers to understand the factors associate with HRQoL in breast cancer patients receiving postoperative chemotherapy.

Numerous studies have measured and described HRQoL in breast cancer patients. The majority of studies indicate that breast cancer patients who receive chemotherapy report lower HRQoL (Binotto et al., 2020; Chean et al., 2016; Takada

et al., 2018). For instance, Binotto et al. (2020) conducted a prospective cohort study revealing significant declines in global health status and functional domains during chemotherapy. Similarly, Takada et al. (2018) found that preoperative chemotherapy adversely affected HRQoL scores, which were predictive of patient prognosis.

In China, research utilizing the Functional Assessment of Cancer Therapy–Breast (FACT-B) questionnaire has provided comparable findings. A study by Chen et al. (2018) reported moderate HRQoL scores among breast cancer patients receiving postoperative chemotherapy, with physical and emotional well-being being the most impacted domains. Furthermore, Sun et al. (2022) assessed 80 patients receiving postoperative chemotherapy and found that physical and emotional health subscales were most severely affected, reflecting the side effects of chemotherapy and the emotional burden of cancer. Social and functional well-being scores were generally less affected but still showed moderate impairment, particularly in rural areas where healthcare access is limited. While some recovery in HRQoL is observed post-chemotherapy, it can take several months to years. A study by Koch et al. (2013) found that HRQoL scores remained significantly below baseline levels for up to five years after chemotherapy, emphasizing the long-term impact of chemotherapy on patients' quality of life, even when their condition is in remission or they are cancer-free.

Therefore, surgery and postoperative chemotherapy play a crucial role in shaping the overall health-related quality of life (HRQoL) of breast cancer patients. While surgery is essential for local disease control, its physical and emotional impacts—such as changes in body image and impaired function—significantly affect patients' health status (Hsiao et al., 2019). Postoperative chemotherapy introduces its own set of side effects, further complicating recovery and contributing to declines in physical, emotional, and social well-being (Rautalin et al., 2021). These effects highlight the need for effective symptom management and comprehensive social and psychological support to improve HRQoL during treatment (Tao et al., 2024).

According to Symptom Management Theory (SMT), the experience of symptoms and the strategies employed to manage them are critical to patient outcomes, particularly health-related quality of life (HRQoL) (Dodd et al., 2001). SMT conceptualizes symptom management as a multidimensional process involving

three interrelated components: symptom experience, symptom management strategies, and outcomes. Based on SMT and a comprehensive review of the literature, this research chooses some factors may associate with HRQoL in breast cancer patients receiving postoperative chemotherapy. These factors include the experience of symptoms and the level of social support.

Symptom experience is defined as how an individual detects, interprets, and responds to a symptom, encompassing the frequency, intensity, distress, and meaning of the symptom(s) as perceived by the individual (Dodd et al., 2001).The Memorial Symptom Assessment Scale (MSAS) is commonly used to assess the frequency and severity of these symptoms. Symptom experience includes physical symptoms such as pain, fatigue, nausea, and neuropathy; psychological symptoms like anxiety, depression, and fear of recurrence; and the Generalized Distress Index (GDI), which measures the overall distress caused by these symptoms (Portenoy et al., 1994).

Research has shown that physical symptoms, such as pain and fatigue, negatively affect physical functioning, limiting patients' ability to perform daily activities. For example, a study found that higher pain levels were associated with lower functional status and quality of life in breast cancer patients (Al-Atiyyat et al., 2024). Similarly, fatigue is the most frequently reported symptom experienced by cancer patients and has a profound effect on their quality of life (Muthanna et al., 2021). Additionally, the GDI, which evaluates overall distress from physical and psychological symptoms, significantly impacts HRQoL. A study reported that higher GDI scores were significantly correlated with reduced HRQoL across all domains, indicating that greater distress is linked to poorer HRQoL in breast cancer patients (Browall et al., 2013).

Social support refers to the perceptions of breast cancer patients received help from many sources, such as family, friends, medical professionals, social health organizations (Zimet et al., 1988).-Social support has been shown to play a key role in promoting positive psychological outcomes among breast cancer survivors (Romeo et al., 2019). You and Lu (2014) have highlighted the significance of social support, which has been effectively utilized for cancer patients. A study on the role of social support in the relationship between stress coping ability and HRQoL in Chinese breast cancer patients showed that social support was positively correlated with HRQoL (r

= .745, p <.01) (Zhang et al., 2017). Due to the influence of Confucian values regarding family harmony in China, female breast cancer patients often choose to endure their illness in silence, fearing they may become a burden to their loved ones (Hsiao et al., 2006). However, some scholars argue that emotional support from family, particularly from close relatives like spouses and children, positively influences both psychological and physical adaptation to illness (Nissen et al., 2016; Oven Ustaalioglu et al., 2018). Internal and external positive coping strategies from society or family support are vital for patients to readjust with their surrounding changes (Toledo et al., 2020). Leung et al. (2014) highlighted that social support can enhance patients' mental health and boost their confidence in adhering to treatment. Moreover, previous findings in other types of studies also indicated that social support acted as a mediator in the association between stress and health outcomes in the context of cancer (Costa et al., 2017; Schury et al., 2017).

In summary, breast cancer is one of the most common cancers worldwide, and postoperative chemotherapy significantly affects patients' health-related quality of life (HRQoL). While chemotherapy is effective in treating breast cancer, its physical, psychological, and social side effects can severely impair HRQoL. In Hangzhou, China, where breast cancer cases are on the rise, the specific factors associated with HRQoL remain poorly understood. Given the region's unique healthcare and cultural characteristics, it is essential to explore how symptom experience, social support, and chemotherapy efficacy impact patients' well-being. This study aimed to describe health-related quality of life and its relationships with symptom experience and social support in postoperative breast cancer patients receiving chemotherapy in Hangzhou, China. The findings can help identify areas for additional support, ultimately improving care quality and HRQoL for breast cancer patients in Hangzhou, with broader implications for China and similar regions.

Objectives of the study

1. To describe health-related quality of life in postoperative breast cancer patients receiving chemotherapy in Hangzhou, China.

2. To examine relationships between symptom experience and social support with health-related quality of life in postoperative breast cancer patients receiving chemotherapy in Hangzhou, China.

Research hypothesis

1. There was a negative correlation between symptom experience (physical symptom, psychological symptom and GDI) and HRQoL among postoperative breast cancer patient receiving chemotherapy in Hangzhou, China.

2. There was a positive correlation between social support and HRQoL among postoperative breast cancer patient receiving chemotherapy in Hangzhou, China.

Scope of research

This descriptive correlational study aimed to examine the relationships between symptom experience, social support with health-related quality of life of postoperative breast cancer patients receiving chemotherapy at the Sir Run Run Shaw Hospital of Zhejiang University in Hangzhou, China. Data were collected from November to December 2023.

Conceptual framework

The conceptual framework of this study was based on the revised version of Symptom Management Theory (SMT) (Dodd et al., 2001). SMT is a meso-level theory that begins with empirical phenomena, extracts testable hypotheses from them, and validates these hypotheses with data (Lenz et al., 1997). SMT describes symptom management as a multidimensional process (Dodd et al., 2001). The symptom management model consists of three interacting components: symptom experience, symptom management strategies, and symptom management outcomes. Additionally, factors from the individual, environmental, and health/disease domains may contribute to non-adherence to symptom management.

Each variable in the Symptom Management Theory (SMT) may influence health-related quality of life (HRQoL) (Dodd et al., 2001). This theory links the symptom experience of breast cancer patients receiving postoperative chemotherapy

to HRQoL. Within this framework, symptom experience includes physical symptoms (e.g., pain, lack of energy, nausea), psychological symptoms (e.g., feeling sad, worrying), and the Generalized Distress Index (GDI), which measures the overall distress patients feel due to these symptoms. This study selected HRQoL as the dependent variable, which falls under the outcome domain. SMT suggests that the severity of symptoms has a negative impact on HRQoL, with more severe symptoms leading to reduced quality of life across various domains, such as physical functioning, emotional health, and social interaction (Miaskowski et al., 2017).

In addition to symptom experiences, social support was considered a key factor within this framework. Social support served as an environmental variable associated with HRQoL (Cohen & Wills, 1985). Social support refers to the perceptions of breast cancer patients received help from many sources, such as family, friends, medical professionals, social health organizations (Zimet et al., 1988). Higher levels of social support were shown to have a positive impact on HRQoL, as it helped reduce emotional distress, mitigated the effects of physical symptoms, and promoted coping strategies (Kroenke et al., 2006).

This study examined how symptom experiences (including physical and psychological symptoms, as well as GDI) and social support were associated with HRQoL in breast cancer patients receiving postoperative chemotherapy. This enabled researchers to explore the strength and direction of these relationships and understand how these factors jointly influenced HRQoL outcomes in this population.
The relationships between all variables in this study were shown in Figure 1.

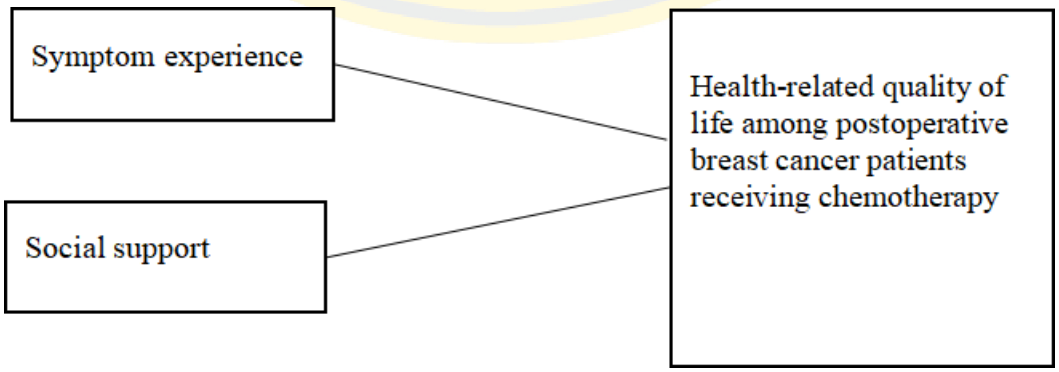

Figure 1 Research conceptual framework

Definition of terms

Postoperative breast cancer patient receiving chemotherapy refers to the breast cancer patients who received postoperative chemotherapy treatment at the Cancer Daycare Center of Sir Run Run Shaw Hospital Affiliated to Zhejiang University School of Medicine, Hangzhou City, Zhejiang Province, China.

Symptom experience refers to the perception of symptoms related to the disease and treatment in breast cancer patients receiving chemotherapy (Dodd et al., 2001). These symptoms include physical symptoms, psychological symptoms, and the Global Distress Index (GDI), which is used to assess the overall distress caused by these symptoms. The symptom experience was measured by the Chinese version of the Memorial Symptom Assessment Scale (MSAS), translated by Cheng et al. (2009).

Social support refers to perceptions of postoperative breast cancer patients receiving chemotherapy about help or support they received from family, friends, and others. It was measured by the Chinese version of perceived social support scale (PSSS) translated by Huang et al. (1996).

Health related to quality of life refers to a state of completed physical, social/family, emotional, functional, and breast cancer specific well-being and not merely the absence of disease or infirmity of breast cancer patients. It was measured by the Chinese version of Functional Assessment of Cancer Therapy-Breast Quality of Life Instrument (FACT-B) translated by Wan et al. (2007).

CHAPTER 2
LITERATURE REVIEW

This chapter presents the literature review including overview of breast cancer, HRQoL in breast cancer patients receiving postoperative chemotherapy, the symptom management theory, factors associate with HRQoL in postoperative breast cancer patients receiving chemotherapy (including symptom experience and social support).

Breast cancer

Breast cancer is the most diagnosed cancer among women globally and one of the leading causes of cancer-related deaths. It represents a major public health concern due to its increasing incidence, complex treatment modalities, and long-term impact on survivors. According to the Global Cancer Statistics report, breast cancer has the second highest incidence rate in the world, with about 2.3 million new cases globally, accounting for 11.6% of all new cancer cases and 6.9% of all cancer deaths (Bray et al., 2024). The disease not only affects physical health but also brings profound psychological, social, and economic consequences for patients and their families.

The burden of breast cancer in China has risen rapidly in recent decades due to urbanization, changes in reproductive behavior, lifestyle modifications, and increased awareness and screening efforts. Regionally, data from the Zhejiang Provincial Cancer Hospital indicate that breast cancer is the most commonly diagnosed cancer among women in Zhejiang Province (Zhejiang Cancer Center, 2020). It is now the most common cancer among Chinese women and poses a significant health care challenge, especially as survival rates improve and more women live with the long-term effects of the disease and its treatment.

In Hangzhou, a major urban center in eastern China, the incidence of breast cancer reflects national and regional trends. Urban environments typically report higher incidence rates than rural areas, likely due to factors such as delayed childbearing, lower fertility rates, dietary changes, and sedentary lifestyles (Fei et al.,

2016). While localized data is limited, cancer registry reports from Zhejiang Province indicate that breast cancer is among the top five cancers affecting women in the region. Hangzhou's healthcare infrastructure has improved access to diagnosis and treatment, but disparities in follow-up care and survivorship support remain.

Given the growing number of breast cancer survivors in China, attention has shifted from survival alone to survivorship quality. Health-Related Quality of Life (HRQoL) has become an essential indicator in evaluating treatment effectiveness and long-term outcomes. Understanding the multifaceted impact of breast cancer especially in patients undergoing chemotherapy after surgery, requires close examination of both clinical outcomes and psychosocial factors. This highlights the need for localized, patient-centered research to explore how cultural, social, and healthcare system factors influence HRQoL in Chinese populations, including in cities like Hangzhou.

Etiology of breast cancer

The etiology of breast cancer is multifactorial, involving a complex interaction between genetic, hormonal, environmental, and lifestyle-related factors. One of the most well-established risk factors is age; the risk of breast cancer increases significantly after the age of 50 (Centers for Disease Control and Prevention, 2024). Family history and genetic mutations, particularly in the BRCA1 and BRCA2 genes, are also major contributors, with mutation carriers facing a lifetime risk of up to 70% (Nelson et al., 2012).

Hormonal factors such as early menarche, late menopause, nulliparity, and late age at first childbirth can elevate risk due to prolonged estrogen exposure (Collaborative Group on Hormonal Factors in Breast Cancer, 2012). Additionally, the use of hormone replacement therapy (HRT) has been linked to increased breast cancer risk, particularly with long-term use (Collaborative Group on Hormonal Factors in Breast Cancer, 2019).

Lifestyle factors including obesity, physical inactivity, alcohol consumption, and high-fat diets have been associated with a higher risk of developing breast cancer (Society, (n.d.)-b). Obesity is particularly significant in postmenopausal women, where excess adipose tissue increases estrogen levels and promotes tumor growth (McCarthy et al., 2021).

Environmental exposures such as ionizing radiation and endocrine-disrupting chemicals may also contribute (Ronckers et al., 2005), although evidence remains less conclusive. Meanwhile, socioeconomic status and access to healthcare can affect both the risk and detection of breast cancer (Sprague et al., 2011).

Diagnosis and Staging of Breast Cancer

The diagnosis and staging of breast cancer are critical components of clinical management, determining the type, extent, and appropriate treatment of the disease. Early diagnosis and accurate staging are essential for improving patient outcomes, enabling tailored treatment strategies that maximize treatment efficacy and minimize side effects.

Breast cancer is diagnosed through a combination of clinical examination, imaging tests, and biopsy procedures. The process typically begins with a clinical breast exam (CBE), during which a healthcare provider palpates the breast tissue to detect any lumps or abnormalities (Farkas & Nattinger, 2023). Although CBE can identify suspicious areas, it is not definitive, and imaging tests are usually used to confirm the diagnosis.

Mammography remains the gold standard for breast cancer screening and is recommended for women aged 40 and older or those at higher risk due to family history or genetic predisposition (Fiorica, 2016). It can detect tumors before they can be felt and identify microcalcifications, which may indicate the presence of cancer. In some cases, ultrasound is used in combination with mammography to further evaluate abnormalities detected during imaging. Ultrasound is particularly useful for distinguishing between solid masses and cysts (Burkett & Hanemann, 2016).

For more detailed imaging, especially in dense breast tissue, magnetic resonance imaging (MRI) can be used. MRI is highly sensitive in detecting small tumors and is particularly beneficial for women at high risk of breast cancer or women with dense breasts, as mammograms may be less effective (Abeelh & AbuAbeileh, 2024). Once an abnormality is detected, a biopsy is performed to obtain tissue samples for histopathological examination. Biopsies can be performed using various techniques, including fine needle aspiration (FNA), core needle biopsy, and surgical biopsy. Histological examination confirms the presence of malignant cells,

determines the type of cancer (e.g., invasive ductal carcinoma, invasive lobular carcinoma), and allows for further molecular analysis (Farkas & Nattinger, 2023).

Breast cancer staging involves determining the size of the tumor, the involvement of regional lymph nodes, and whether the cancer has spread to distant organs. The most widely used staging system is the **"TNM"** (tumor, lymph node, metastasis) system established by the American Joint Committee on Cancer, which provides a comprehensive overview of the extent of the cancer (Amin et al., 2017).

Tumor (T) refers to the size and extent of the primary tumor and is categorized as follows:

- T1: Tumor is 2 cm or smaller.
- T2: Tumor is larger than 2 cm but no larger than 5 cm.
- T3: Tumor is larger than 5 cm.
- T4: Tumor of any size that has invaded the chest wall or skin

Node (N) describes the degree of regional lymph node involvement:

- N0: No regional lymph node involvement.
- N1: Cancer has spread to 1–3 axillary lymph nodes.
- N2: Cancer has spread to 4–9 axillary lymph nodes.
- N3: Cancer has spread to 10 or more axillary lymph nodes or internal mammary lymph nodes.

Metastasis (M) indicates whether the cancer has spread to distant organs:

- M0: No distant metastasis.
- M1: Distant metastasis present (e.g., to bones, lungs, or liver)

Breast cancer staging is typically expressed as a combination of these categories (e.g., T2N1M0), with the final stage ranging from stage 0 (in situ, or localized) to stage IV (metastatic disease). This staging not only helps in determining the prognosis but also guides therapeutic decisions, such as whether surgery, radiation therapy, chemotherapy, or targeted therapies are appropriate.

Treatment of breast cancer and its side effect

According to the National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines in Oncology and the Chinese Society of Clinical Oncology (CSCO) Breast Cancer Diagnosis and Treatment Guidelines (Gradishar et

al., 2024; Li et al., 2024), breast cancer treatment has evolved into a comprehensive model integrating surgery with adjuvant therapies such as chemotherapy, radiotherapy, targeted therapy, and endocrine therapy.

Surgical interventions for breast cancer include modified radical mastectomy, breast-conserving surgery, radical mastectomy, and extended radical mastectomy (Waks & Winer, 2019). Among these, the modified radical mastectomy is most commonly performed in China (Li et al., 2024). Breast-conserving surgery, typically reserved for younger patients with early-stage disease and a strong desire for breast preservation, carries a higher risk of local recurrence compared to mastectomy and is less commonly adopted. Radical and extended radical mastectomies are now rarely performed due to extensive tissue trauma and longer recovery periods (Waks & Winer, 2019).

Although surgery significantly reduces recurrence risk and improves long-term survival, it can lead to several physical and psychological complications that adversely impact HRQoL. Postoperative complications such as chest wall deformities, lymphedema, limited shoulder mobility, and chronic pain are common, especially following axillary lymph node dissection. These complications not only affect physical functioning but also interfere with activities of daily living, contributing to functional limitations and long-term discomfort (Waks & Winer, 2019). Furthermore, body image disturbances due to partial or total breast removal can trigger emotional distress, including anxiety, depression, and reduced self-esteem, further compromising psychological well-being and social relationships (Miaja et al., 2017).

Adjuvant therapy plays a crucial role in reducing the risk of metastasis and recurrence. Chemotherapy usage among breast cancer patients is significantly lower and has been declining over recent years. A comprehensive study analysing data from 33,670 women diagnosed with stage I–IIIA breast cancer between 2006 and 2019 found that only 38.9% received chemotherapy. Moreover, the proportion decreased over time, from 40.2% in 2006 to 35.6% in 2019 (Bhimani et al., 2024). Common regimens include anthracycline-based combinations (e.g., doxorubicin, epirubicin) and taxane-based agents (e.g., paclitaxel, docetaxel), which are often used sequentially due to their synergistic effects (Li et al., 2024). However, chemotherapy-induced side effects significantly impair HRQoL. These include hematological

toxicities (e.g., anemia, neutropenia), gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea), alopecia, peripheral neuropathy, fatigue, and cognitive impairments ("chemo brain"). In particular, fatigue and cognitive dysfunction persist even after the completion of treatment, limiting work productivity and daily functioning (Omari et al., 2024; Tsaras et al., 2018). Chemotherapy also contributes to psychological distress, with studies reporting anxiety and depression in 26.1% to 46.9% of patients during treatment (Omari et al., 2024).

Radiotherapy, typically administered postoperatively in patients with high-risk features (e.g., large tumor size or multiple lymph node involvement), also poses considerable burdens. While effective in improving local control, radiotherapy may cause acute skin reactions (dermatitis), fatigue, and lymphedema. In some cases, long-term exposure can result in pulmonary fibrosis or cardiac complications, particularly when targeting left-sided breast tumors (Waks & Winer, 2019). These effects may result in chronic discomfort and restricted physical activity, leading to deterioration in both physical and role functioning.

Targeted therapy, particularly with HER2 inhibitors like trastuzumab, has revolutionized treatment for HER2-positive breast cancer. Although it improves survival, it is not without side effects. Cardiotoxicity is the most notable complication, especially when trastuzumab is used concurrently with anthracyclines (Hamirani et al., 2016). Cardiac monitoring is thus required throughout treatment. Such toxicities can limit physical exertion and contribute to fatigue, anxiety, and a diminished sense of health security, impacting HRQoL.

Endocrine therapy is commonly prescribed for hormone receptor-positive breast cancers and typically includes selective estrogen receptor modulators (e.g., tamoxifen) or aromatase inhibitors (e.g., letrozole, anastrozole) (Gradishar et al., 2024). This treatment is usually administered over 5 to 10 years, with significant long-term side effects such as hot flashes, joint pain, vaginal dryness, mood disturbances, and osteoporosis (Condorelli & Vaz-Luis, 2018; Zhao et al., 2022). These symptoms can result in sexual dysfunction, sleep disturbances, and emotional distress, significantly affecting overall HRQoL, especially in younger women (Lubián López et al., 2021; Van Dyk et al., 2021).

Importantly, both chemotherapy and endocrine therapy have been associated with reproductive toxicity, especially in premenopausal women. Side effects include premature ovarian insufficiency, infertility, menstrual irregularities, and diminished libido (Miaja et al., 2017). The impact on fertility can be a major source of psychological distress, particularly for young women with future childbearing desires. As a result, fertility preservation discussions and interventions are increasingly being recognized as essential components of patient-centered breast cancer care. For instance, the European Society for Medical Oncology (ESMO) published expert consensus statements highlighting the necessity of integrating fertility preservation into survivorship care plans, underscoring its significance in comprehensive cancer care (Vaz-Luis et al., 2022).

In conclusion, while multimodal treatments for breast cancer have improved survival outcomes, the associated side effects of surgery, chemotherapy, radiotherapy, targeted therapy, and endocrine therapy collectively impose a significant burden on patients' physical, psychological, and social well-being. The cumulative impact of these side effects underscores the importance of integrating symptom management and psychosocial support to maintain and improve the health-related quality of life of breast cancer survivors.

Health-related quality of life among postoperative breast cancer patients receiving chemotherapy

QoL is a broad term that encompasses both health-related and non-health-related domains. It is generally defined as " an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." (World Health Organization, 2024). HRQoL is related to the way how illness and treatment affects QoL. In the context of oncology, HRQoL is a key outcome measure reflecting the impact of cancer and its treatment on patients' daily lives, particularly in terms of symptom experience, emotional distress, and social functioning (Ferrans et al., 2005). Unlike general quality of life assessments, HRQoL focuses specifically on health-related domains, making it particularly relevant to chronic and life-threatening diseases such as breast cancer.

Currently, breast cancer treatment involves state-of -art biomedical therapies, but may not address HRQOL issues, particularly emotional health and social/family health following diagnosis and treatment. Doege et al. (2019) conducted a study comparing the HRQOL of breast cancer patients to that of non-cancer female controls, finding that long-term BC survivors had significantly lower social, emotional, functional, physical health, fatigue, insomnia, and dyspnea scores than the female control population.

Surgery, especially mastectomy, is associated with changes in body image, physical disfigurement, and functional impairments such as lymphedema or restricted arm movement (Kocan & Gursoy, 2016). These physical changes can trigger psychological distress and social withdrawal, further reducing HRQoL (Turk & Yilmaz, 2018). In a qualitative study, researchers explored women's experiences of arm impairment after axillary surgery for breast cancer. Participants reported various symptoms, including pain, burning sensations, numbness, and a feeling of swollen tissue in the armpit. Some of these symptoms persisted for more than a year post-surgery. These impairments affected daily activities, requiring adjustments in tasks like dressing and physical exercise (Appelgren et al., 2024).

Chemotherapy is a cornerstone of adjuvant therapy after breast cancer surgery but is frequently associated with a broad range of side effects. Studies have consistently shown that chemotherapy negatively impacts multiple HRQoL domains. Physical symptoms such as fatigue, nausea, pain, and cognitive dysfunction are commonly reported (Takada et al., 2018). Psychological symptoms—including anxiety, depression, and sleep disturbance—also contribute significantly to the decline in HRQoL during chemotherapy (Yeo et al., 2021).

In a longitudinal study, Takada et al. (2018) assessed HRQoL in 300 breast cancer patients receiving neoadjuvant chemotherapy and reported substantial declines in HRQoL, especially during cycles 4 and 5. The greatest impairments were observed in physical and emotional well-being. Similarly, Yeo et al. (2021) found that chemotherapy-induced nausea and vomiting, particularly delayed symptoms (3–5 days post-treatment), significantly reduced HRQoL, with nausea having a more substantial impact than vomiting.

So far, mainly studies from Western developed countries investigated HRQL following breast cancer (Fu et al., 2015; Gold et al., 2016; Kool et al., 2015). However, cultural and habitual practices such as the use of traditional medicine may limit the generalisability of results from HRQL studies in Caucasian patients with breast cancer to Asian patients with breast cancer (Chui et al., 2015). Drug tolerance is different across populations; paclitaxel in the Japanese population is less well tolerated than the USA (Chui et al., 2015; Nyman et al., 2005). Furthermore, Asian patients with breast cancer tend to be younger at diagnosis and have more advanced stages at diagnosis than Caucasians (Parsa et al., 2006). Even within Asian ethnicities, Malay patients with breast cancer were found to respond better to tamoxifen therapy than Chinese or Indian patients (Liberati et al., 2009). A better understanding of the factors associated with poorer HRQoL in Asian breast cancer patients will enable targeted interventions.

Research on health-related quality of life (HRQoL) among breast cancer patients is relatively recent in China. Existing studies indicate that Chinese patients undergoing postoperative chemotherapy tend to report lower HRQoL scores compared to their counterparts in Western countries. For instance, a study conducted in the United States reported the mean HRQoL score was 104.12±14.77 (Milbury et al., 2017). It was reported that the mean score for HRQoL in Germany in 2019 was 102.66±22 (Matthies et al., 2019). A study by Cui et al. (2021) involving 136 Chinese women reported a mean FACT-B score of 96.05 (SD = 18.70), indicating not too high and too low HRQoL levels. These measurement results show that although the HRQoL of breast cancer patients in China is not too bad, there are certain problems in all aspects. Analysis of the reasons, first, surgical treatment leads to breast loss, which is easy to cause body image disorders in patients. And lead to a series of limb dysfunction, such as lymphedema, shoulder joint activity limitation, and fine function loss. Studies have shown that breast-conserving surgery is the main choice for breast cancer surgery in developed regions such as Europe and the United States, while mastectomy is more commonly used in China. Mastectomy affects the patient's physical appearance, causing a decrease in the patient's body image level, and also increasing the patient's risk of postoperative lymphedema and dysfunction of the affected arm (Turk & Yilmaz, 2018).

The HRQoL of breast cancer chemotherapy patients is related to sociodemographic factors such as age, educational attainment, occupational status, and economic status. Studies by Arvidsdotter et al. (2016) have shown that the HRQoL of breast cancer patients receiving chemotherapy who are younger than 50 years old is better than that of patients older than 50 years old. Educational attainment is also one of the factors affecting the HRQoL of breast cancer patients. A prospective study by You et al. (2018) showed that breast cancer patients with higher educational attainment had better HRQoL, which may be related to the fact that patients with higher educational attainment have more access to disease-related knowledge and are better able to comply with treatment. Timperi et al. (2013) conducted a six-month follow-up study of breast cancer patients to explore the relationship between occupational status and quality of life. The results showed that patients who worked at least 20 hours per week had a better HRQoL than those who were unemployed.

Research has indicated that economic status has a significant impact on the quality of life of breast cancer chemotherapy patients, with patients who have poorer family economic status and greater economic pressure experiencing lower HRQoL (Xia et al., 2018). Once patients are able to pay for treatment without financial hardship, they are more likely to adhere to treatment and thus achieve better outcomes. Conversely, if patients cannot afford treatment, their outcomes will be worse. Health insurance is one of the most effective financial support solutions for breast cancer patients. However, health insurance coverage for breast cancer drugs and services remains inadequate, resulting in patients bearing significant catastrophic medical expenses in China (Sun et al., 2021).

In low- and middle-income countries, there are conflicting results regarding the impact of marital status on HRQoL among breast cancer patients. When most studies reported that women who were married or in a relationship had higher HRQoL than those who were divorced or single (Gangane et al., 2017; Wong & Fielding, 2009; Yang et al., 2020). Tran et al. (2019) and Ganesh et al. (2016) reported that marriage had a negative effect on HRQoL. A study on breast cancer survivors after 5 years of diagnosis found that married patients had higher levels of optimism than unmarried women (Croft et al., 2014) and optimism had a positive effect on the HRQoL of breast cancer patients (Zou et al., 2014).

The HRQoL of breast cancer patients receiving chemotherapy is closely related to the stage of cancer.Li et al. (2023)'s study confirmed that the later the stage of the disease, the lower the HRQoL of patients. In addition, disease staging affects patients' tumor marker levels and immune function. The earlier the stage, the stronger the body's ability to fight the disease and the better the functional status (Wang et al., 2021). The type of breast cancer surgery is also a factor affecting the quality of life of chemotherapy patients. A two-year follow-up study conducted in Finland on 1,065 breast cancer patients found that compared with other types of surgery, patients who underwent total mastectomy had the lowest HRQoL throughout the entire recovery process (Rautalin et al., 2021). A prospective study by Rosenberg et al. (2020) also confirmed the impact of surgical procedures on the quality of life of breast cancer patients.

Measurement of HRQoL

HRQoL is typically assessed using validated self-report questionnaires, which may be generic (e.g., SF-36, EQ-5D) or disease-specific (e.g., EORTC QLQ-C30, FACT-B). General tools allow comparisons between different diseases or populations but may lack sensitivity to cancer-specific symptoms. On the other hand, disease-specific tools are tailored to capture the subtle experiences of specific patient populations. For breast cancer patients, factors such as body image, fatigue, pain, and emotional functioning are particularly prominent and require precise tools for meaningful assessment (Osoba et al., 1994).

This study used the Functional Assessment of Cancer Therapy-Breast (FACT-B) as the primary tool for assessing HRQoL. FACT-B is a breast cancer-specific tool that combines the general FACT-G scale with a breast cancer-specific subscale (Brady et al., 1997). It includes five domains: Physical Well-Being (PWB), Social/Family Well-Being (SWB), Emotional Well-Being (EWB), Functional Well-Being (FWB), and Breast Cancer Subscale (BCS). FACT-B is well validated, reliable, and sensitive to changes in HRQoL in breast cancer patients receiving various treatments, including surgery and chemotherapy (Brucker et al., 2005). It comprehensively covers social, psychological, and symptom-related domains, making

it particularly suitable for assessing the HRQoL of postoperative patients undergoing chemotherapy.

In summary, health-related quality of life (HRQoL) represents a critical multidimensional construct that captures the impact of disease and treatment on the daily lives of breast cancer patients undergoing postoperative chemotherapy. The findings reviewed suggest that Chinese breast cancer patients generally report lower HRQoL scores compared to their counterparts in Western countries, which may be attributed to differences in surgical approaches, healthcare infrastructure, cultural perceptions, and socioeconomic factors. Prominent physical symptoms such as fatigue, pain, and dry mouth, along with psychological disturbances, substantially compromise functional capacity and emotional well-being. Furthermore, variables such as age, educational attainment, employment status, economic resources, and cancer stage are closely associated with HRQoL outcomes. As survival rates continue to improve due to advances in medical treatment, greater emphasis must be placed on comprehensive symptom management and psychosocial support. Developing culturally appropriate and targeted interventions is essential to addressing the specific needs of breast cancer patients, thereby promoting improved HRQoL and more equitable health outcomes.

The Symptom management theory (SMT)

The Symptom Management Theory (SMT) originated from the Symptom Management Model developed at the University of California, San Francisco (UCSF). It was first introduced in 1994 by the Symptom Management Teaching and Research Group at the UCSF School of Nursing. The model was subsequently revised in 2001 and 2008, and officially renamed SMT in 2008 (Dodd et al., 2001; Linder, 2010).

SMT is a middle-range theory and process-oriented theory that describes symptom management as a multidimensional process (Linder, 2010). After this theory was proposed, it has been widely applied in practice and studied scientifically.

The Symptom Management Theory (SMT) is grounded in six key assumptions (Dodd et al., 2001). First, all symptoms require management. Second, the targets of symptom management may include individuals, groups, families, or workplace environments. Third, symptom assessment should be based on the patient's

firsthand experience, with self-reported information regarded as the gold standard. Fourth, when individuals such as infants or patients with communication impairments (e.g., following a stroke) are unable to self-report, caregivers may provide symptom information on their behalf. Fifth, when an individual is at risk of developing a symptom, proactive intervention strategies may be implemented. Finally, symptom management is a dynamic process that evolves in response to changes in patient outcomes and the interaction among the theory's three core concepts.

Concept of the theory

The three essential concepts of the SMT are symptom experience, symptom management strategies, and symptom status outcomes (Dodd et al., 2001). These concepts are nested within three domains of nursing science (person, environment, and health/illness) to serve as a reminder of the contextual considerations for nursing research.

Symptoms are subjective experiences that reflect changes in an individual's physiological function, perception, or cognition (Dodd et al., 2001). Within the framework of Symptom Management Theory (SMT), symptoms may present as single entities or in clusters. The concept of symptom experience consists of three interrelated dimensions: symptom perception, symptom evaluation, and symptom response. Symptom perception refers to the patient's awareness of symptoms, such as noticing changes in sensations or behaviors. For example, the presence of pain or nausea. Symptom evaluation involves the patient's assessment of the symptom's cause, location, severity, and frequency, as well as their judgment regarding its seriousness, manageability, and impact on mood and daily functioning. Symptom response encompasses the physiological, psychological, social, cultural, and behavioral reactions to the symptom, which can, in turn, heighten the individual's perception of it. These three dimensions are dynamic and mutually influential, often occurring concurrently or cyclically. Understanding their interrelationships is essential for effective symptom management. Furthermore, identifying which dimension is most critical for a given study is especially important in longitudinal research, where repeated assessments may pose a burden on participants (Miaskowski et al., 2004).

Symptom experience is a dynamic and evolving process. In practice, it can be explored through longitudinal studies or qualitative research (Rajapakse, 2010). In longitudinal studies, information about patients' symptom experiences is primarily gathered through systematic symptom assessments. Self-reporting remains the most effective method for capturing these experiences (Van Cleve et al., 2002). Despite this, clinical practice still tends to emphasize the assessment of individual symptoms. Several tools have been developed to evaluate multiple symptoms in cancer patients, with commonly used instruments in research including the M.D. Anderson Symptom Inventory (MDASI) (Cleeland et al., 2000), the Symptom Distress Scale (SDS) (McCorkle, 1987), the Edmonton Symptom Assessment Scale (ESAS) (Bruera et al., 1991), and the Memorial Symptom Assessment Scale (MSAS) (Dodd et al., 2001). Among these, the MSAS is considered the most comprehensive multidimensional tool, as it effectively captures the three dimensions of symptom experience—perception, evaluation, and response—and demonstrates strong reliability and validity. In studies on symptom clusters, researchers often extract relevant items from these multi-symptom scales to investigate patterns and experiences associated with symptom clusters (Kearney et al., 2008).

Symptom management strategies involve the use of biomedical, professional, and self-care approaches to prevent or delay the onset of negative health outcomes (Dodd et al., 2001). These strategies can target one or more dimensions of symptom experience to achieve desired outcomes in symptom management effectiveness. A comprehensive description of symptom management strategies provides a framework for developing and implementing interventions. Each effective strategy should clearly define the nature of the intervention (what), the target population (who), the mode of implementation (how), the dosage or intensity (how much), the setting (where), the timing of initiation (when), and the rationale (why). Such detailed articulation supports healthcare providers in selecting appropriate interventions, which may help delay or prevent symptom development or reduce the severity of existing symptoms (Dodd et al., 2001).

Symptom status outcomes refers to measurable changes in patient outcomes resulting from improvements in symptoms (Dodd et al., 2001). According to Symptom Management Theory (SMT), seven key outcome measures are associated

with symptom changes: functional status, emotional status, self-care, healthcare costs, quality of life, incidence of complications, and mortality (Dodd et al., 2001). Miaskowski et al. (2004) have suggested that, in practical applications, to reduce the burden on patients and their families, researchers should limit the number of outcome measures assessed. Instead, studies should focus on selecting one or a few outcomes that are most relevant to the specific research objectives.

Relationship among the concepts

The SMT has three major concepts: symptom experience, symptom management strategies, and symptom status outcomes. The bidirectional arrows within the model of SMT are meant to indicate a simultaneous interaction among all three concepts. The symptom experience is conceptualized as influencing and being influenced by both symptom management strategies and symptom status outcomes. As individuals become aware of symptoms, initiate strategies, and assess symptom outcomes, their symptom perception is affected. This interaction can take place in a matter of moments as is often the case in common symptom self-care management (e.g., minor colds, rashes, stomach upset). However, when symptoms are more pronounced and/or distressing, other sources of symptom management strategies may be sought and symptom status outcomes may be assessed in a more formal fashion. This iterative process continues until symptoms resolve and/or are stabilized. However, the process of managing symptoms goes amiss when adherence (i.e., whether the intended recipient of the strategy actually receives or uses the strategy prescribed) becomes a problem. This breakdown is illustrated by the broken arrow between the symptom management strategies and symptoms status outcomes components of the SMT. Within the SMT, nonadherence occurs when interventions are too demanding, are not applied, or are applied inconsistently. In addition, factors situated in the person, environment, and health/illness domains may contribute to nonadherence in managing symptoms (Dodd et al., 2001; Linder, 2010).

Factors associated with health-related quality of life among breast cancer patients receiving postoperative chemotherapy

Guided by the SMT and literature review, this study aimed to examine relationships between symptom experience and social support among postoperative breast cancer patients receiving chemotherapy in Hangzhou, China.

Symptom experience

A systematic review indicated that breast cancer patients receiving chemotherapy commonly experience significant symptom experience, with many patients reporting multiple co-occurring symptoms that negatively affect their daily functioning and overall well-being (Liu et al., 2021). The manifestation of symptoms varies throughout the cancer treatment trajectory, with distinct symptom profiles emerging at different points, such as during the postoperative recovery period and across multiple chemotherapy cycles. Common symptoms among breast cancer patients receiving postoperative chemotherapy include fatigue, nausea, vomiting, hair loss, pain, sleep disturbances, and psychological symptoms such as depression and anxiety (Henry et al., 2008; Miaskowski, 2006).

Most patients begin experiencing symptom early in the treatment process, with chemotherapy-induced side effects often appearing after the first few treatment cycles and persisting over time (Deshields et al., 2014). Symptoms like fatigue, neuropathy, nausea, and emotional distress are frequently reported in both early- and late-stage breast cancer and may persist even after treatment ends (Bower, 2014). These symptoms not only impair physical function but also lead to psychological distress, social withdrawal, and decreased overall life satisfaction.

Symptom experience is defined as a person's perception of a physical or psychological change resulting from illness or its treatment, assessed in terms of frequency, severity, and associated distress (Dodd et al., 2001). Among breast cancer patients, these experiences are multidimensional and subjective, often evaluated using standardized tools such as the Memorial Symptom Assessment Scale (MSAS). The Global Distress Index (GDI), a subscale of the MSAS, specifically captures emotional and physical distress, including symptoms like sadness, nervousness, fatigue, and pain, providing a comprehensive understanding of overall symptom experience (Portenoy et al., 1994).

The literature consistently demonstrates that higher levels of symptom experience are strongly associated with decreased health-related quality of life (HRQoL). For instance, a study by Wang et al. (2023) found that patients experiencing more severe symptom clusters—such as emotional, digestive tract, pain-related, nervous system, and disease-related symptoms—reported significantly lower HRQoL during chemotherapy. Additionally, a cross-sectional study conducted in Palestine by Abu Farha et al. (2017) found moderate negative correlations between pain severity and HRQoL ($r = –.58$, $p < .001$), and between pain interference and HRQoL ($r = -.604$, $p < .001$) among breast cancer patients. These findings suggest that higher levels of pain and its interference with daily activities are associated with lower HRQoL.

In conclusion, breast cancer patients undergoing postoperative chemotherapy frequently experience a broad spectrum of physical and psychological symptoms. These symptoms—captured effectively through measures such as the MSAS and GDI—are strongly associated with poorer HRQoL. This underscores the importance of comprehensive symptom assessment and targeted interventions aimed at minimizing symptom distress and improving the overall quality of life in this patient population.

Social support

Social support refers to an individual's perception of the availability of external assistance (Leung et al., 2014) and has been long recognized as a key contributor to overall quality of life, especially social, functional and emotional well-being. There is a notorious link between low social support and higher depression and anxiety in breast cancer patients (Wondimagegnehu et al., 2019). Though in a longitudinal study and contrary to expectations, social support was unrelated to cancer-specific distress at the time of diagnosis but positively correlated after a six-month period from diagnosis (Roussi et al., 2007), and the effect of social support on psychological adjustment varies with survival stage (Jang & Kim, 2018). Since breast cancer may be associated with perceived stigma, the struggling patients are prone to social withdrawal and hence in dire need of external encouragement to engage in help-seeking behaviors (Daryaafzoon et al., 2020; Kang et al., 2020). In addition, the level of perceived support varies depending on the background factors such as age

and socioeconomic status and may have an impact on one's choice of coping response (Abbas et al., 2019; Naseri & Taleghani, 2018).

Furthermore, the potential mechanisms through which social support provides a buffer against anxiety and depression have been debated in several studies, in which core self-evaluations, optimism, resilience are revealed to pose a mediating effect between social support and subjective well-being (Hu et al., 2018). Constructive coping itself has been also found to lead to an individual's availing himself of more social resources, as seeking support itself falls within the coping categories (Suzuki et al., 2018). This mutual and bidirectional influence has set the ground for more dynamic implications of the relationship between social support and coping (Racine et al., 2019). Moreover, perceived social support from the community has been found to affect the relationship between coping strategies and depression. Remarkably enough, in the presence of social support, supposedly negative coping techniques which were expected to leave patients vulnerable to depression, alter their ultimate effect to inversely improve well-being, which was partly attributed to intercultural differences and explained as being specific to minority communities (Noh & Kaspar, 2003).

Summary

In summary, surgery and postoperative chemotherapy are essential in treating breast cancer, but they often lead to physical and psychological symptoms such as fatigue, poor appetite, nausea, sleep disturbances, and sadness. These symptoms can negatively impact a patient's daily life, including their mobility, work, mood, and relationships. The goal of care is to minimize the disruption these symptoms cause to psychological well-being and functioning, especially during chemotherapy. Effective symptom management requires understanding the trajectory of these symptoms and identifying which ones most affect patients' lives. Despite this, few studies have explored how symptoms evolve in large groups of postoperative breast cancer patients undergoing chemotherapy. This study aims to explore the associate factor with the health-related quality of life (HRQoL) in breast cancer patients receiving chemotherapy in Hangzhou, China, providing insights to improve nursing practice and enhance HRQoL for these patients.

CHAPTER 3
RESEARCH METHODOLOGY

This chapter presents the research methodology including research design, population and sample, setting of the study, instruments, ethical consideration, data collection procedures, and data analysis procedures.

Research Design

The descriptive correlational research design was used to investigate the correlation between symptom experience and social support with health-related quality of life among postoperative breast cancer receiving chemotherapy in Hangzhou, China.

Population and Sample

Population

The population of this research were breast cancer patient receiving postoperative chemotherapy at the Cancer Daycare Center of the Sir Run Run Shaw Hospital Affiliated to Zhejiang University of Medicine, in Hangzhou, Zhejiang province, China. They had received at least one course of chemotherapy and were receiving outpatient chemotherapy at the Cancer Daycare Center.

Sample

The sample were postoperative breast cancer patients receiving chemotherapy at the Cancer Daycare Center of the Sir Run Run Shaw Hospital in Hangzhou, Zhejiang province, China. The inclusion criteria of the sample include:

1. Age $\geqslant$ 18 years old
2. First time diagnosed with stage I, II or IIIA breast cancer

3. Have received at least one cycle of chemotherapy
4. Have a certain ability to understand, read, write, and can speak Chinese
5. Have good orientation to place and time and has no history of mental illness
6. No other malignant tumors or serious physical illnesses

Sample size

The sample sizes in this study were calculated by using the G*Power 3.1.9.7 program for correlational design. The researcher tested the relationship between the health-related quality of life and each independent variable. The effect size of .25 (Matthies et al., 2019), alpha of .05 and power of .90 were used for computing the sample size. The power analysis showed that the minimum sample size required for this study was 130 participants.

Sampling technique

A simple random sampling method was used to recruit samples into the study. Each patient was selected at random, and everyone had an equal chance or probability of being selected. The patient was extracted according to the following steps.

1. On working day, patients came to the Cancer Daycare Center of the Sir Run Run Shaw Hospital Affiliated to Zhejiang University of Medicine in the morning and afternoon. With help of a staff nurse at the Cancer Daycare Center, the participants were approached and screened to see whether they were eligible for the study.

2. Patients who met the inclusion criteria were identified and temporarily listed. Each eligible patient was assigned a number based on their appointment or arrival order for that day.

3. To randomly select participants, the researcher used a simple odd-even drawing method. Two identical slips of paper, labeled “odd number” and “even number,” were folded and placed in a bag. Each morning, one slip was drawn at random. If the slip read “odd number,” patients assigned odd numbers on the eligible list (e.g., 1, 3, 5...) were selected for that day; if “even number” was drawn, those with even numbers (e.g., 2, 4, 6...) were selected. This approach ensured random selection while maintaining simplicity and transparency.

4. Patients selected through the odd-even method were invited to participate. The researcher explained the study objectives, procedures, and their right to withdraw at any time without any impact on their care. Those who agreed signed the informed consent form. Participants were then guided to a private room within the Cancer Daycare Center to complete the questionnaire in a quiet and confidential environment.

5. Approximately 5–8 participants were recruited each day, depending on the number of eligible patients visiting the center. Recruitment continued until the required sample size was achieved, after which data collection ended.

Research setting

The study was conducted at the Cancer Day Care Center of Sir Run Run Shaw Hospital, affiliated with Zhejiang University School of Medicine in Hangzhou, Zhejiang province, China. The center operated Monday through Friday, from 8:00 a.m. to 5:30 p.m., and provided outpatient chemotherapy services to patients with cancer. On average, the center served between 60 and 80 patients per day, including 10 to 20 patients diagnosed with breast cancer. These patients received chemotherapy based on individualized treatment plans developed by their oncologists.

One to two days prior to chemotherapy, patients underwent routine blood tests, biochemical panels, and liver function evaluations at nearby hospitals. If results fell outside normal ranges, patients received treatment either at local hospitals or at the outpatient department of Sir Run Run Shaw Hospital.

Medical oncologists were responsible for adjusting chemotherapy regimens, addressing concerns raised by patients and caregivers, and issuing chemotherapy prescriptions. Following physician consultation, nurses guided patients and their companions to the treatment area. Nursing staff conducted comprehensive assessments, including vital sign checks, physical examinations, and evaluation of chemotherapy side effects such as nausea, vomiting, fatigue, skin condition, and venous access integrity.

Chemotherapy drugs were prepared and distributed by a centralized intravenous medication distribution center and typically arrived at the treatment site approximately one hour after the prescription was issued. Treatments were administered on-site, with patients seated or reclining on beds and accompanied by

family members. Chemotherapy sessions generally lasted between 3 and 6 hours. During this time, nurses monitored vital signs, managed acute side effects, and provided health education on dietary practices, symptom management, and psychological support.

Upon completion of treatment, patients were discharged under family supervision. If acute side effects occurred—such as allergic reactions, chemotherapy intolerance, or deterioration in health status—patients were transferred to the oncology inpatient ward for further care.

Research instruments

In this study, four self-reported questionnaires were used to collect data including 1) the Demographic data questionnaire with 17 items, 2) the Chinese version of Memory Symptom Assessment Scale (MSAS) with 32 items, 3) the Chinese version of perceived social support scale (PSSS) questionnaire with 12 items, 4) the Chinese version of Functional Assessment of Cancer Therapy – Breast (FACT-B) with 36 items. Information about all instruments was as follows:

1. The demographic questionnaire

The demographic questionnaire was developed by the researcher including two parts: 1) General information: age, ethnicity, marital status, educational level, place of residence, current working status, way of living, the average monthly income of family, type of medical insurance, religious beliefs, history of breast cancer in family, and 2) Health information: body mass index (BMI), type of breast cancer, clinical stage of TMN, type of surgery, type of chemotherapy, current medication cycle.

The general information was obtained by participants' self-report, and the health information was obtained from the medical record.

2. The Memorial Symptom Assessment Scale (MSAS)

The Chinese version of MSAS was used to measure symptom experience among breast cancer patients receiving postoperative chemotherapy in this study. It was developed by the American Cancer Center in 1994 (Portenoy et al., 1994). The Chinese version was translated from the original English version of the MSAS was

developed to assess common cancer-related physical and psychological symptoms with respect to frequency, intensity, and distress (Cheng et al., 2009).

The MSAS is a multidimensional instrument that evaluates 32 common physical and psychological symptoms. Twenty-four symptoms are evaluated with respect to frequency, intensity, and distress, and eight symptoms are evaluated in terms of severity and distress. In the MSAS, each symptom is recorded as present or absent, and if present, is rated using a four- or five-point rating scale for frequency, severity, and associated distress during the previous seven days, with higher scores indicating greater frequency, more severity, and higher distress. If a symptom is absent, each dimension is scored as 0 and the score for that symptom is 0. If a symptom is present, the symptom score is an average of its dimensions. The scoring of the MSAS yields several subscale scores, including a Physical Symptom subscale score (PHYS), a Psychological Symptom subscale score (PSYCH), and a Global Distress Index (GDI). **The PHYS** is the average of the score for the 12 symptoms: lack of appetite, lack of energy, pain, feeling drowsy, constipation, dry mouth, nausea, vomiting, change in food taste, weight loss, feeling bloated, and dizziness. **The PSYCH** is the average score for the six symptoms: worrying, feeling sad, feeling nervous, difficulty sleeping, feeling irritable, and difficulty concentrating. **The GDI** is the average frequency of four psychological symptoms (feeling sad, worrying, feeling irritable, feeling nervous) and the distress associated with six physical symptoms (lack of appetite, lack of energy, pain, feeling drowsy, constipation, dry mouth). The Total MSAS score (TMSAS) is the average of the symptom scores of all 32 symptoms in the MSAS (Portenoy et al., 1994). The score ranges from 0 to 4, the higher the score on each subscale, the higher the symptom experience level.

The Cronbach alpha for the MSAS subscales ranged from .82 to .88 (Portenoy et al., 1994). The Chinese version of Cronbach's α is .79-.97, the content validity is .94, the internal consistency reliability of each subscale and the total scale is .79-.87, and the reliability and validity are good (Cheng et al., 2009).

3. The Perceived Social Support Scale (PSSS)

The study used the perceived social support scale to measure breast cancer's social support level. The scale was compiled by Zimet et al. (1988) and

translated by Huang et al. (1996), and is mainly used to measure the source of social support subjectively felt by individuals.

The perceived social support scale has 12 items which consist of three subscales which are family, friends and significant others. The scale uses a 7-point Likert scale (1 = very strongly disagree; 2 = strongly disagree; 3 = disagree; 4 = neutral; 5 = mildly agree; 6 = strongly agree; 7 = very strongly agree). The accumulated score of items 3, 4 8, 11 indicate the final score of family support, and the accumulated score of items 6,7,9,12 indicate the final score of friend's support, other items indicate the final score of support significant other. The score range is 12–84 points. A total score between 12 and 36 points indicates a mildly supportive state, between 37 and 60 points indicates a moderately supportive state, and between 61 and 84 points indicates a highly supportive state. The higher the score, the higher the level of social support (Huang et al., 1996).

The Cronbach's α coefficient for the Chinese version of the Perceived Social Support Scale was 0.911, indicating good structural reliability and validity (Yang et al., 2024).

4. The Functional Assessment of Cancer Therapy-Breast (FACT-B)

The Chinese version of FACT-B was used to measure HRQoL among breast cancer patients receiving postoperative chemotherapy in this study it was developed by Cella of the American Center for Outcomes Research and Education (Cella et al., 1993). Wan et al. (2007) translated into Chinese to evaluate the HRQoL of Chinese breast cancer patients.

The FACT-B has five dimensions and 36 items, including physiological status (7 items), social/family status (7 items), emotional status (6 items), functional status (7 items), and additional concerns of BCS (9 items). Each item adopts the Likert 5-level scoring method, where 4=very much, 3=quite a bit, 2=somewhat, 1=a little bit, 0=not at all, the sum of the scores of the items included in each dimension is the score of the extent. However, 19 items (GP1-GP7, GE1, GE3-GE6, B1-B3, B5-B8) are scored in reverse. Items that the patient refused to answer were treated as missing values, and the method was the sum of the scores of the remaining items in this dimension ÷ the number of items answered × the number of items in this dimension. The FACT-B permits calculation of subscale scores if at least 50% of

items within a subscale are completed (Wan et al., 2007), otherwise, the subscale score should not be calculated. The total score of the scale is the sum of the scores of each dimension, ranging from 0 to 144 points. The higher the patient's total score, the better the HRQoL (Cella et al., 1993).

For the simplified Chinese version, the scale maintains good psychometric performance. The test-retest reliability of the total scale ranges from .82 to .89, and the subscales show Cronbach's alpha values between .61 and .84, indicating satisfactory internal consistency and reproducibility (Cheng et al., 2009).

Quality of instruments

The original versions of the instruments used in the study have been tested and validated by relevant experts in previous studies to ensure that all instruments have good validity and reliability. The Chinese version of the instruments used in the study was also translated by experts, which confirmed the reliability and validity of the instruments and ensured the use of the Chinese version of the instruments. Before the actual data collection, the researchers tested the reliability of the research instruments used by calculating the Cronbach α of 30 postoperative breast cancer patients with chemotherapy who had similar characteristics of the main participants. The results were as follows:

Table 1 Reliability of research instruments

Reliability of research instruments	**Pilot study (n=30)**	**Main study (n=130)**
The Memorial Symptom Assessment Scale (MSAS)	.958	.945
The Perceived social support scale (PSSS)	.940	.930
The Functional Assessment of Cancer Therapy – Breast (FACT-B)	.939	.915

Protection of human rights

This research was approved by the Institutional Review Board (IRB) of Burapha University (Approval Number: G-HS036/2565) and the Research Ethical

Board of the Sir Run Run Shaw Hospital Affiliated to Zhejiang University of Medicine (Approval Number:2023-833-01).

Before data collection, all participants were thoroughly informed about the study's objectives and procedures. The researcher clearly explained the nature of the study and emphasized the participants' rights to refuse or withdraw from participation at any time. Data were collected only from individuals who voluntarily agreed to participate and signed an informed consent form prior to participation. Participants were informed that they had the right not to answer any questions and could withdraw from the study at any time without any consequences.

All data collection forms were anonymous, and participation posed no harm to the individuals. Confidentiality was strictly maintained; no names or identifiable information were disclosed in the study report. Paper documents were stored securely and used exclusively for research purposes, while electronic data were password-protected and accessible only to the researcher. All data will be destroyed one year after the publication of the research. Participants who wished to know the study results were able to contact the researcher directly.

Data collection

The data collection procedures in this study were carried out by the researcher as follows:

1. After receiving approval from the Faculty of Nursing at Burapha University (BUU), the researcher submitted the research proposal to the Institutional Review Boards (IRB) of BUU and the Sir Run Run Shaw Hospital of Zhejiang University, China, for ethical review.

2. The researcher obtained permission for data collection from both the Faculty of Nursing at BUU and the Sir Run Run Shaw Hospital, providing detailed information about the study's objectives and procedures.

3. Upon receiving permission from the Sir Run Run Shaw Hospital, the researcher explained the data collection procedures to the staff at the Cancer Daycare Center. The researcher also consulted with doctors and nurses in advance to ensure that if a participant was engaged during their queue call, their consultation with the physician would still be guaranteed.

4. The researcher was present at the Cancer Daycare Center from 8:30 a.m. to 4:30 p.m., Monday through Friday.

5. The queue numbers of individuals who met the inclusion criteria were recorded in advance using an application program for simple random sampling. Randomly selected individuals were invited to participate and were escorted by the outpatient nurse to a designated private room after their consultation with the oncology doctor.

6. The researcher met with each participant to explain the purpose of the study, ethical considerations, and participant rights. Written informed consent was obtained only after the participants demonstrated full understanding and agreed to participate voluntarily.

7. Data were collected using self-administered questionnaires in a private room. Reading glasses were provided to ensure participants could see clearly. Completing the questionnaire took approximately 20–40 minutes. The researcher ensured that participants received their chemotherapy treatment on time upon completing the survey.

8. The researcher reviewed each questionnaire upon submission to check for completeness. Participants were informed in advance that they could leave any questions unanswered if they chose not to respond.

9. At the Cancer Daycare Center entrance, patients were required to wear masks, undergo temperature screening, and present a health QR code. Only patients with a green QR code and a temperature below 37.3°C were allowed to enter.

10. The private room used for data collection was disinfected daily. The researcher always wore a face mask, and each participant maintained at least one meter of distance from others. After completing the questionnaire, participants were asked to take their personal belongings, and the researcher disinfected the reading glasses and pens with alcohol wipes.

11. This process was repeated daily until the required sample size was achieved.

Data analysis

In this study, SPSS 23 was used to analyse the data. The significance level was set at .05

1. Descriptive statistics (frequency, percentage, mean and standard deviation) were used to explain the demographic characteristics of the sample and the variables.

2. Assumption testing for Pearson's correlation coefficients was conducted. First, it was confirmed that the dependent variables were measured at the interval level. The Kolmogorov–Smirnov test was employed to verify that symptom experience, social support, and health-related quality of life followed a normal distribution. Additionally, scatter plots were used to confirm the presence of linear relationships between the independent and dependent variables.

3. The Pearson's product moment correlation was used to examine the relationship between symptom experience, social support with health-related quality of life among postoperative chemotherapy patients with breast cancer. (small relationship: 0.1-0.3, moderate relationship:0.3-0.5, high relationship 0.5-1.0) (Cohen, 2013).

CHAPTER 4
RESULTS

This chapter presents the results of the study about health-related quality of life and related factors (symptom experience and social support) among 130 postoperative breast cancer patients receiving chemotherapy in Hangzhou, China. The results are divided into three parts: The first part described the demographic characteristics of breast cancer patients including 2 sections: 1) personal information and 2) health information. The second part presents information about symptom experience, social support, and health-related quality of life of patients with breast cancer receiving postoperative chemotherapy. The third part explains the relationship between symptom experience and social support with health-related quality of life in breast cancer patients receiving postoperative chemotherapy.

Part 1 Description of demographic characteristics of postoperative breast cancer patients receiving chemotherapy

The demographic characteristics of the sample including age, ethnicity, marital status, educational level, place of residence, current working status, way of living, the average monthly income of family, type of medical insurance, religious beliefs, history of breast cancer in family; health information: body mass index (BMI), type of breast cancer, clinical stage of TMN, type of surgery, type of chemotherapy, current medication cycle were presented in table 2.

Table 2 Demographic Characteristics of breast cancer patients (n=130)

Breast cancer patients' characteristics	Number	Percentage
Age group (Max = 72, Min = 27, *M* = 47.5, *SD* =9.03, MD=48)		
＜40	21	16.15
40-49	55	42.31
50-59	39	30.00
60-69	14	10.77
≥70	1	0.77
Ethnicity		
Han	125	96.15
Minority	5	3.85
Marital status		
Single	5	3.85
Married	115	88.46
Divorced/Widowed/other	10	7.69
Educational level		
Primary school	30	23.08
Secondary school	52	40.00
Tertiary or higher level of education	48	36.92
Place of residence		
Rural	47	36.15
Urban	83	63.85
Current working status		
Working	57	43.85
Not working	73	56.15
Way of living		
Live alone	4	3.08
Live with others	126	96.92
The average monthly income of family		
Less than 1000 RMB	2	1.54
1000-2999 RMB	13	10
3000-4999 RMB	30	23.08
5000-9999 RMB	27	20.77
More than 10000 RMB	44	33.85
Don't know	14	10.77
Medical insurance		
Urban employed medical insurance	76	58.46
Urban resident medical insurance	27	20.77
New rural cooperative medical insurance	23	17.69
Other medical insurance	4	3.08

Table 2 (Continued)

Breast cancer patients' characteristics	Number	Percentage
Religious beliefs		
Yes	33	25.38
No	97	74.62
History of breast cancer in family		
Yes	15	11.54
No	113	86.92
Don't know	2	1.54

Table 3 Number and percentage of health information of breast cancer patients (n =130)

Breast cancer patients' characteristics	Number	Percentage
BMI		
Underweight: BMI < 18.5	5	3.85
Normal weight: BMI 18.5-24.9	79	60.77
Overweight: BMI 25-29.9	40	30.77
Obesity: BMI ＞30	6	4.61
Type of breast cancer		
Invasive carcinoma	119	91.54
Noninvasive carcinoma	11	8.46
Clinical stage of TMN		
Stage I	33	25.38
Stage II	70	53.85
Stage III	27	20.77
Type of the surgery		
Simple mastectomy	30	23.08
Breast conserving operation	25	19.23
Modified radical operation	66	50.77
Reconstruction of breast	9	6.92
Type of chemotherapy		
Anthracycline-based	45	34.6
Taxane-based	30	23.1
Anthracycline + Taxane	40	30.8
Other regimens / CMF / Unknown	15	11.5
Current chemotherapy cycle		
2nd	16	12.32
3rd	22	16.92
4th	34	26.15
5th	20	15.38
Sixth and above	38	29.23

A total of 130 breast cancer patients were eligible and consented to participate in this study. Table 2 shows the patients' demographic information. The mean age of breast cancer patients was 47.5 years old (SD = 9.03), and 16.15% of participants were younger than 40 years old. 23.08% had primary school education, 40% received secondary school education and 36.92% had tertiary or higher level of education. Regarding marital status, 88.46% were married and 96.92% of patients live with others. Concerning monthly family income, 1.54% of patients had income less than 1000 RMB, 10% had income between 1000-2999 RMB, 23.08% had income between 3000-4999 RMB and 20.77% had income between 5000-9999 RMB. It is worth noting that 25.38% of patients have religious beliefs. At the same time, 11.54% of patients have a family history of breast cancer.

Table 3 illustrates the health information of the participants, according to the BMI for Asian population (Gill, 2006), 30.8% were overweight and the remaining 4.6% were obese. Invasive cancer accounted for 91.54% of cases and non-invasive cancer accounted for 8.46%. Stage I breast cancer accounted for 25.38%, stage II breast cancer accounted for 53.85%, and stage III breast cancer accounted for 20.77%. Simple mastectomy accounted for 23.08%, breast conserving operation 19.23%, modified radical mastectomy 50.77%, and breast reconstruction 6.92%. For type of chemotherapy, 34.6% of participants received Anthracycline-based regimen, 23.1% received Taxane-based regimen, and 30.8% received Anthracycline + Taxane regimen.

Part 2 Description of symptom experience, social support, and health-related quality of life among postoperative breast cancer patients receiving chemotherapy

Description of symptom experience

The Chinese version of the MSAS translated by Cheng et al. (2009) was used to measure the symptom experience of breast cancer patients receiving postoperative chemotherapy. The scale includes three subscales: the physical symptom score (PHYS), the psychological symptom score (PSYCH), and the global distress index (GDI). Table 4 showed the results of the MSAS symptom inventory scale in this study.

Table 4 Number-percentage, mean, standard deviation, median of all the symptom frequency, severity, distress (n = 130)

Symptoms	n (%)	Total	Frequency	Severity	Distress
Lack of appetite	45 (34.6)	0.64±0.99	0.78±1.19	0.62±0.94	0.52±0.92
Lack of energy	83 (64.8)	1.24±1.09	1.52±1.29	1.18±1.05	1.03±1.06
Pain	69 (53.1)	0.90±0.94	1.09±1.16	0.85±0.92	0.76±0.85
Feeling drowsy	50 (38.5)	0.61±0.87	0.77±1.08	0.65±0.90	0.42±0.75
Constipation	23 (17.7)	0.35±0.85	-	0.38±0.87	0.33±0.86
Dry mouth	66 (50.8)	0.85±0.98	1.08±1.21	0.88±1.00	0.58±0.89
Nausea	31 (23.8)	0.39±0.80	0.43±0.85	0.40±0.82	0.35±0.80
Vomiting	20 (15.4)	0.29±0.74	0.28±0.73	0.30±0.76	0.28±0.81
Changes in the way food tastes	47 (36.2)	0.66±1.02	-	0.75±1.11	0.57±0.97
Weight loss	20 (15.4)	0.17±0.46	-	0.24±0.61	0.09±0.36
Feeling bloated	33 (25.4)	0.47±0.89	0.58±1.06	0.44±0.85	0.41±0.83
Dizziness	37 (28.5)	0.43±0.76	0.51±0.91	0.45±0.78	0.34±0.70
Feeling sad	41 (31.5)	0.48±0.79	0.59±0.95	0.48±0.80	0.37±0.70
Worrying	47 (36.2)	0.64±0.93	0.75±1.08	0.59±0.89	0.57±0.90
Feeling irritable	51 (39.2)	0.67±0.92	0.75±1.02	0.69±0.98	0.57±0.85
Feeling nervous	42 (32.3)	0.52±0.82	0.61±0.95	0.53±0.84	0.42±0.73
Difficulty sleeping	80 (61.5)	1.40±1.23	1.55±1.35	1.35±1.19	1.30±1.31
Difficulty concentrating	36 (27.7)	0.47±0.81	0.58±0.99	0.46±0.82	0.37±0.73
Cough	14 (10.8)	0.11±0.34	0.16±0.50	0.12±0.34	0.06±0.24
Numbness/tingling in hands/feet	56 (43.1)	0.79±1.03	0.95±1.20	0.77±1.01	0.65±0.99
Problems with urination	3 (2.3)	0.06±0.43	0.06±0.43	0.06±0.43	0.06±0.43
Shortness of breath	28 (21.5)	0.32±0.67	0.38±0.78	0.33±0.68	0.26±0.60
Diarrhea	40 (30.8)	0.54±0.90	0.65±1.08	0.55±0.93	0.42±0.79
Sweats	69 (53.1)	0.98±1.10	1.28±1.35	0.93±1.05	0.72±1.09
Problems with sexual interest or activity	22 (16.9)	0.27±0.65	0.34±0.83	0.32±0.76	0.16±0.51

Table 4 (Continued)

Symptoms	n (%)	Total	Frequency	Severity	Distress
Itching	38 (29.2)	0.52±0.89	0.65±1.09	0.49±0.86	0.41±0.82
Difficulty swallowing	17 (13.1)	0.22±0.59	0.26±0.73	0.21±0.61	0.18±0.53
Mouth sores	44 (33.8)	0.57±0.92	-	0.59±0.95	0.55±0.94
Hair loss	61 (46.9)	1.12±1.37	-	1.26±1.50	0.97±1.34
Swelling of arms or legs	35 (26.9)	0.41±0.82	-	0.45±0.86	0.37±0.82
I don't look like myself	20 (15.4)	0.27±0.71	-	0.28±0.72	0.25±0.74
Changes in skin	67 (51.5)	0.89±1.03	-	0.95±1.07	0.83±1.07

Table 5 Range, mean, standard deviation of substance of symptom experience (n = 130)

Scale/subscale	Range		*M*	*SD*
	Possible	Actual		
Total MSAS score (TMSAS)	0-4	0-1.61	0.57	0.38
PHYS	0-4	0-2.13	0.35	0.32
PSYCH	0-4	0-3.3	0.70	0.63
GDI	0-4	0-2.2	0.64	0.54

Table 4 shows that among the physical symptoms, the average score for lack of energy symptoms was the highest (M = 1.24, SD = 1.09). The second and third symptoms were pain and dry mouth, with average scores of 0.9 (SD = 0.94) and 0.85 (SD = 0.98), respectively. In the psychological symptom subscale, the symptom with the highest mean score was difficulty sleeping (M = 1.40, SD = 1.23). The second and third symptoms were feeling irritable and worrying, with mean scores of 0.67 (SD = 0.92) and 0.64 (SD = 0.93), respectively.

Table 5 shows that the mean score for Total MSAS score was 0.57 (SD = 0.38), the mean score for the physical symptom subscale was 0.35 (SD = 0.32), and the mean score for the ppsychological symptom subscale was 0.70 (SD = 0.63). For the Global Distress Index (GDI) Index, the mean score was 0.64 (SD=0.54).

Description of social support

This study used the Perceived Social Support Scale translated by Huang et al. (1996), which consists of 12 items divided into three subscales: family support, friend support, and important other support. The social support scores of the participants were presented in table 6.

Table 6 Range, mean, standard deviation, and level of social support (n = 130)

Social support	**Range**		***M***	***SD***	***Level***
	Possible	**Actual**			
Over all score (12 items)	12~84	37~84	64.84	11.56	High
Family support (4 items)	4~28	10~28	23.06	4.23	High
Friends support (4 items)	4~28	5~28	20.65	4.92	Moderate
Significant other (4 items)	4~28	10~28	21.12	4.29	High

Table 6 showed that the total score of social support of the participants was (M = 64.84, SD = 11.56), and the score of three subscales were family (M = 23.06, SD = 4.23), friends (M = 20.65, SD = 4.92), and significant other (M = 21.12, SD = 4.29). Among them, the family scale has the highest score.

Description of health-related quality of life

The Chinese version of FACT-B was used in this study to measure the HRQoL of breast cancer patients receiving postoperative chemotherapy (Cheng et al., 2009). The scale had 5 dimensions and 36 items, including physical well-being, social/family well-being, emotional well-being, functional well-being and BCS additional concerns. Table 7 shows the HRQoL status and scores of each dimension for the patients in this study.

Table 7 Range, mean, standard deviation of healthy-related quality of life (n = 130)

Variables	**Range**		***M***	***SD***
	Possible	**Actual**		
Overall HRQoL	0-144	44-135	93.45	19.56
Physical well-being	0-28	6-28	20.07	4.69
Social/family well-being	0-28	0-28	17.44	6.20
Emotional well-being	0-24	4-24	18.59	4.31
Functional well-being	0-28	0-28	14.52	5.92
Additional concerns	0-36	7-31	22.83	5.07

Table 7 showed that the mean score of health-related quality of life was 93.45 out of 144 (*SD* = 19.56). For the subscale, the average scores of each mode included the physical well-being (M=20.07, SD=4.69), social/family well-being (M=17.44, *SD* = 6.20), emotional well-being (M=18.59, SD=4.31), functional well-being (M=14.52, SD=5.92). The mean score of the BCS additional concerns was 22.83 out of 36 (*SD* = 5.07).

Part 3 Relationship between symptom experience, social support with health-related quality of life among breast cancer patients

The assumptions testing of Pearson's product moment correlation coefficient was examined. All sample were random sampling, and all variables were at interval level of measurement. In this study, Kolmogorov-Smirnov test was used to verify that symptom experience, social support, and health-related quality of life obeyed normal distribution. The method of drawing scatter plot verifies that there is a linear relationship between independent variables and dependent variables. The Pearson's product moment correlation coefficient was used to examine relationship between symptom experience and social support with health-related quality of life.

Table 8 Relationships between Symptom experience, Social Support and Health-Related Quality of Life (*n* =130)

Variables	Pearson's correlation coefficients of HRQOL
Symptom experience	-.558**
- PHYS	-.396**
- PSYCH	-.593**
- GDI	-.642**
Social support	.556**

* $p < .05$, ** $p < .01$

Table 8 showed there was a strong negative association between symptom experience and health-related quality of life (r = -.558, $p < .01$). In the subscale, there was a moderate negative correlation between physical symptom and health-related quality of life (r = -.396, $p < .01$) and a high negative correlation between psychological symptoms and health-related quality of life (r = -.593, $p < .01$), also there was a high negative correlation between GDI and health-related quality of life (r = -.642, $p < .01$). There was a strong positive association between social support and health-related quality of life (r = .556, p <.01).

CHAPTER 5
CONCLUSION AND DISCUSSION

This chapter presents the summary and discussion of the study results. The implication of the study findings in nursing practice and research is also discussed. Finally, recommendations for future research are presented.

Summary of study

The purpose of this correlational study was to describe the health-related quality of life of postoperative breast cancer patients receiving chemotherapy in Hangzhou, and to explore the relationships between symptom experience, social support and HRQoL. The conceptual framework of this study was based on the symptom management theory and literature review. A simple random sampling method was used to recruit 130 participants who were treated in the Breast Surgery Department of Sir Run Run Shaw Hospital from November to December 2023. Data were collected using four research tools, including a demographic questionnaire, the Chinese version of the Memorial Symptom Assessment Scale, the Chinese version of Perceived Social Support Scale, and the Chinese version of the Functional Assessment of Cancer Therapy-Breast. The reliability of these instruments was tested in 30 breast cancer patients who underwent postoperative chemotherapy. Cronbach's alpha coefficients of the Memory Symptom Assessment Scale, the multidimensional scale of the perceived social support, and the functional assessment of cancer therapy in breast cancer were .958, .940, .939, respectively. Data was analyzed using descriptive statistics and Pearson's product-moment correlation.

Research findings

The mean age of breast cancer patients was 47.5 years old (SD = 9.03), and 16.15% of participants were younger than 40 years old. Married people accounted for 88.46% of the total sample, and 96.92% of the patients lived with others. 100% of the participants had medical insurance. 25.38% of patients have religious beliefs. At the same time, 11.54% of patients have a family history of breast cancer. It is worth

noting that 30.8% of the cases were overweight (BMI 25-29.9), and 4.6% of the patients were obese (BMI > 30).

The results showed that the average symptom score for breast cancer patients was 0.57 (*SD* = 0.38), Among the physical symptoms, the one with the highest score was lack of energy (*M* = 1.24, *SD* = 1.09), the second and third symptoms were pain and dry mouth, with average scores of 0.9 (*SD* = 0.94) and 0.85 (*SD* = 0.98). In the psychological symptom subscale, the symptom with the highest mean score was difficulty sleeping (*M* = 1.40, *SD* = 1.23). The second and third symptoms were feeling irritable and worrying, with mean scores of 0.67 (*SD* = 0.92) and 0.64 (*SD* = 0.93).

The total score of social support of the participants was 64.84 (*SD* = 11.56), the family scale has the highest score. The mean score for health-related quality of life was 93.45 out of 144 (*SD* = 19.56). Considering the subscale, the social/family well-being had mean score of 17.44 out of 28 (*SD* = 6.20). The mean score of the additional concerns was 22.83 out of 36 (*SD* = 5.07).

There was a strong negative association between symptom experience and health-related quality of life (r = -.558, p < .01). There was a moderate negative correlation between physical symptoms and health-related quality of life (r = -.396, p < .01) and a strong negative correlation between psychological symptoms and health-related quality of life (r = -.593, p < .01). Also, there was a high negative correlation between GDI and health-related quality of life (r = -.642, p < .01). Meanwhile, there was a strong positive association between social support and health-related quality of life (r = .556, p <.01).

Discussion

The findings of this study were discussed based on the research objectives. The first objective was to describe health-related quality of life in postoperative breast cancer patients receiving chemotherapy in Hangzhou, China. The second objective was to determine the relationships between symptom experience and social support with health-related quality of life among postoperative breast cancer patients receiving chemotherapy.

Health-related quality of life in postoperative breast cancer patients receiving chemotherapy in Hangzhou, China

The finding showed that the mean score for health-related quality of life was 93.45 out of 144 (*SD* = 19.56), which is not too high and not too low level. When compared internationally, this score is slightly lower than that reported in higher-income countries. For instance, a study conducted in the United States reported the mean HRQoL score was 104.12±14.77 (Milbury et al., 2017). It was reported that the mean score for HRQoL in Germany in 2019 was 102.66±22 (Matthies et al., 2019). However, our survey was closer to the situation in Asia: the mean HRQoL score in South Korea is 91.26±20.08 (Park et al., 2019). The current study's findings align well with existing literature on HRQoL among Chinese breast cancer patients receiving chemotherapy. For instance, a study by Cui et al. (2021) involving 136 Chinese women reported a mean FACT-B score of 96.05 (SD = 18.70), indicating not too high and too low HRQoL levels. The results of this study can be explained as follows:

According to the theory of symptom management, age can be regarded as a component in the field of nursing science, meaning that breast cancer patients of different ages may have different symptom experiences and symptom status outcomes. The finding showed that the mean age of the 130 breast cancer patients was 47.5 years (SD = 9.03). Among them, 16.15% of participants were younger than 40 years old, and the youngest patient was 27 years old. It conforms to the epidemiological characteristics of breast cancer in China, that is, the age of onset of breast cancer is trending younger (Esteva et al., 2019). In contrast, patients with breast cancer in high-income countries such as the United States and Western Europe are often older at diagnosis. The median age at diagnosis in the United States is approximately 62 years old, and similar trends have been observed in countries such as Germany and the United Kingdom, where the majority of breast cancer cases occur in women aged 50 and older (DeSantis et al., 2019). On the other hand, younger women who are diagnosed with BC have been shown to correlate with poorer body image than older survivors, which is closely related to the onset of early menopause, possible infertility and greater concern about appearance and external judgements. These changes appear to be more evident in women under 50 years of age linked to greater dissatisfaction and negative self-esteem predicting lower levels of HRQoL and

higher levels of anxiety and depression, greater preoccupation with sexual and intimate appearance and poorer survival (Paterson et al., 2016).

In this study, 30.8% of participants were classified as overweight (BMI 25–29.9), and 4.6% were classified as obese (BMI ≥ 30). Compared to national data from China (Zhang et al., 2020), where the prevalence of overweight and obesity among adult women is approximately 28.1% and 5.2% respectively, the proportion of overweight individuals in this sample is slightly higher. Elevated BMI is a clinically significant factor that can adversely affect health-related quality of life (HRQoL) in several ways. Overweight and obese individuals often experience increased fatigue, reduced physical function, and a higher symptom burden, which can impair both physical and emotional well-being (Nyrop et al., 2023). Moreover, chemotherapy dosing is often adjusted based on body surface area, and higher BMI may necessitate larger doses, potentially leading to more severe side effects and a heavier symptom load (Griggs et al., 2012). These factors may collectively contribute to reduced HRQoL scores in this subgroup.

For the subscale, physical well-being had the highest average score (M = 20.07 out of 28, SD = 4.69), suggesting that many patients retained a moderate level of physical functioning during chemotherapy, this may be attributed to the integration of supportive care strategies such as effective pain management, antiemetic regimens, physical rehabilitation, and nutritional counselling, which are commonly employed to mitigate treatment-related side effects (Henry et al., 2008; Jones et al., 2008)

Emotional well-being (M = 18.59, SD = 4.31) was relatively preserved, which could reflect psychological resilience, family support, or access to mental health services. Nevertheless, this domain remains vulnerable to distress, uncertainty, and fear of recurrence—common psychological challenges in breast cancer care. In contrast, social/family well-being (M = 17.44, SD = 6.20) and especially functional well-being (M = 14.52, SD = 5.92) scored lower, suggesting greater disruptions in patients' social roles, relationships, and daily functioning. These findings are consistent with prior research indicating that social and functional domains often lag behind other HRQoL aspects during chemotherapy due to fatigue, role strain, and treatment-related disruptions to work or caregiving duties (Ai et al., 2017).

The Breast Cancer Subscale (BCS) additional concerns score (M = 22.83, SD = 5.07) highlights the ongoing burden of cancer-specific issues, such as body image changes, arm morbidity, and sexual health concerns, which are not only physically distressing but also emotionally and socially disruptive.

Breast cancer recovery is a long and drawn-out process that requires long-term treatment and regular follow-ups. Patients with relatively short diagnosis time need some time to adapt to the impact and changes of cancer on all aspects of their lives, including their body and mind, work, family, and social life (Burgess et al., 2005; Ganz et al., 2002). They have an inadequate level of psychosocial adaptation (Ristvedt & Trinkaus, 2005). In addition, most patients with a relatively recent diagnosis are in the treatment and rehabilitation stages, with more severe disease symptoms and side effects from various treatments, resulting in a lower quality of life related to physical health. Interpreting these findings through the lens of Symptom Management Theory (SMT), the varied HRQoL scores across domains reflect how individual symptom experiences and management strategies influence different outcome dimensions (Dodd et al., 2001). The relatively higher scores in physical and emotional domains may suggest more effective symptom control in those areas, while lower functional and social scores indicate a gap in addressing broader consequences of illness, such as role limitations and social reintegration. SMT emphasizes that outcomes like HRQoL are shaped not only by symptoms themselves but also by the context (e.g., personal, environmental) and strategies employed to manage them. Thus, the observed HRQoL profile points to a need for more holistic and integrated care—targeting not just symptom relief but also emotional, social, and functional rehabilitation.

Factors associated with health-related quality of life among breast cancer patients receiving postoperative chemotherapy

In this study, the results showed that there was a high negative association between symptom experience and health-related quality of life (r = -.558, p < .01). There was a moderate negative correlation between physical symptoms and health-related quality of life (r = -.396, p < .01) and a high negative correlation between psychological symptoms and health-related quality of life (r = -.593, p < .01), also there was a high negative correlation between GDI and health-related quality of life (r

= -.642, $p < .01$). Meanwhile, there was a high positive association between social support and health-related quality of life ($r = .556$, $p < .01$).

These results can be discussed as follows

Symptom experience

The findings revealed that there was a strong negative association between symptom experience and health-related quality of life (HRQoL) (r = -.558, $p < .01$). The mean symptom score of participants was 0.57 out of 4 (SD = 0.38). There is no official, universally accepted cutoff for interpreting Memorial Symptom Assessment Scale (MSAS) scores, as supported by prior MSAS-based studies in oncology populations where similar ranges were interpreted as moderate (Chang et al., 2000). This supports the premise of Symptom Management Theory (SMT), which suggests that the characteristics of the symptom experience, including frequency, severity, and distress—are closely linked to patient outcomes such as perceived well-being and functioning (Dodd et al., 2001). Although causality cannot be inferred from this correlational study, the observed associations provide important insights into how symptom experience may be linked with HRQoL in this population.

Breast cancer patients receiving chemotherapy experience several symptoms, both physical and psychological, due to the disease, the surgery and the side effects of chemotherapy. Physical symptoms were frequently reported, with lack of energy (M = 1.24), pain (M = 0.90), and dry mouth (M = 0.85) having the highest average scores. “Lack of energy” is generally synonymous with fatigue in clinical and research contexts, especially in oncology. In the Memorial Symptom Assessment Scale (MSAS) and many other symptom inventories, “lack of energy” is often used as a plain-language equivalent to “fatigue” to ensure better patient understanding (Hinds et al., 2007). Meanwhile, in the GDI subscale, lack of energy had the highest distress score (M = 1.03, SD = 1.06). Fatigue in cancer patients is more than just tiredness—it's a persistent, subjective sense of exhaustion related to cancer or its treatment that interferes with usual functioning, even after rest. The mechanism of fatigue is as follows: Chemotherapy causes toxicity to the cells, and the resulting inflammatory response can cause fatigue due to excessive cytokine production (Vardy & Tannock, 2007). Fatigue is known to interfere with basic daily activities, reduce motivation, and

contribute to a diminished sense of physical competence, which may be related to lower HRQoL scores (Mustian et al., 2024).

Unlike pain or nausea, which may be managed episodically with medication, fatigue tends to be constant, less responsive to intervention, and multifactorial in origin—linked to anemia, metabolic changes, psychological strain, and disrupted sleep (Morrow et al., 2005; Ryan et al., 2007). Its high distress level may stem from its impact across multiple life domains: it limits physical mobility, interferes with self-care, reduces capacity to work or fulfil family roles, and contributes to emotional symptoms like frustration and hopelessness. Because fatigue lacks a quick fix and often persists throughout treatment, patients may experience a sense of helplessness, which amplifies the emotional distress it causes. Moreover, its invisibility as a symptom may lead to under-recognition by healthcare providers and caregivers, leaving patients feeling invalidated or unsupported (Laugsand et al., 2010), further contributing to its distress.

This study showed that the psychological symptoms ($r = -.593$, $p < .01$) are more strongly correlated with HRQOL than the physical symptoms ($r = -.396$, $p < .01$). This conclusion is supported by previous studies on women with breast cancer (Whisenant et al., 2022). Psychological symptoms with the highest scores include difficulty sleeping, feeling irritable, and worrying. Compared with previous study (Rogers et al., 2017), patients with breast cancer may experience depression, and/or anxiety, and fatigue months to years post diagnosis beside these symptoms were correlated with low HRQoL. The reason for this difference may be that the breast cancer patients in this study were diagnosed relatively recently and were still in the treatment interval. They were affected by the side effects of chemotherapy and had difficulty sleeping. At the same time, they were worried about the prognosis and treatment effect, which caused them to feel worried. This finding suggests that healthcare providers treating female breast cancer should address the psychoeducational needs of patients regarding the nature of breast cancer as a disease, the impact of treatment, side effects, and psychological issues. As a result, doctors and researchers can work together to explore ways to combat breast cancer, which can improve the psychosocial well-being of women diagnosed with breast cancer.

With the emergence of psychological symptoms such as feeling sad and worry, these symptoms affect the patient's mental state or the psychological dimension of their HRQoL, causing the patient to experience great stress, such as insomnia. In short, the patient's symptom experience affects all dimensions of HRQoL. In addition, the occurrence of one symptom may trigger other symptoms, thereby reducing the patient's HRQoL. Not only that, most patients have multiple symptoms at the same time, so patients not only have to bear physical pain, but also the mental stress and decline in social quality of life caused by the disease, all of which can lead to a decline in the patient's HRQoL.

The strong negative correlation between the Global Distress Index (GDI) and health-related quality of life (HRQoL) (r = -.642, p < .01) suggests that greater symptom-related distress is significantly associated with lower HRQoL among postoperative breast cancer patients receiving chemotherapy. This finding is consistent with prior research indicating that higher levels of psychological and physical symptom burden—such as fatigue, pain, anxiety, and depression—are linked to poorer HRQoL in cancer populations (Barsevick et al., 2006; Henry et al., 2008). The GDI, which captures a broad range of emotional and physical symptoms, serves as a meaningful indicator of overall distress. Within the framework of Symptom Management Theory (SMT), the symptom experience is a central component influencing patient outcomes (Dodd et al., 2001). Thus, this result reinforces the theoretical proposition that unmanaged or poorly managed symptoms can adversely affect patients' daily functioning and well-being. It also highlights the importance of early identification and holistic management of distress to improve HRQoL.

According to the Symptom Management Theory, the experience of a symptom is the perception, evaluation and reaction to a change in one's usual sensations. Improvement of symptoms can improve physical and mental function, quality of life, reduce length of hospital stay, speed return to work and increase productivity, all of which can reduce costs to the individual, family, and healthcare system.

Social Support

In this study, there was a high positive association between social support and health-related quality of life (r = .556, p <.01). The total score of social support of

the participants was (*M* = 64.84, *SD* = 11.56), and the score of three subscales were family (*M* = 23.06, *SD* = 4.23), friends (*M* = 20.65, *SD* = 4.92), and significant other (*M* = 21.12, *SD* = 4.29). Among them, the family scale has the highest score. This result shows that participants who perceived high levels of social support also perceived higher HRQoL.

In the comparison of the scores for each dimension of social support, the family support dimension scored the highest, while the friend support dimension scored the lowest. On the other hand, influenced by traditional Chinese culture, the family is often regarded as the primary source of support for individuals (Li & Loke, 2014). Breast cancer patients are mainly cared for by their family members during hospitalization and rehabilitation. In the process of care, patients can experience material and spiritual support from family members. On the other hand, most of the breast cancer patients in this study are married, and the focus of their lives has shifted from work to family level, with relatively few social activities. The disease will inevitably lead to less face-to-face communication and contact with friends. Therefore, when they face adversity, they most often choose to talk to and seek help from their families.

Social support is described as all kinds of help or assistance from family, friends and other people (Huang et al., 1996). It has been shown to buffer the adverse effects of stress and is linked to numerous positive health outcomes, including improved recovery, better stress coping, reduced depression, and enhanced life satisfaction—all of which contribute to higher HRQoL (Uchino, 2009). According to the Symptom Management Theory (Dodd et al., 2001), social support is part of the social environment domain, which influences both the selection of symptom management strategies and outcomes such as HRQoL.

Furthermore, all patients in this study received chemotherapy in an outpatient Cancer Daycare Center, which means they spent less time in the hospital compared to patients receiving inpatient treatment. This model may limit their access to professional symptom guidance and support from healthcare providers. According to SMT, inadequate symptom management strategies may lead to more severe symptom experience and negative impact symptom status outcomes. In this context, social support as an environmental factor plays a compensatory role by potentially

alleviating symptom burden and enhancing HRQoL through emotional reassurance, practical assistance, and shared decision-making (Miaskowski et al., 2017). Therefore, strengthening patients' social support systems, especially familial support, may serve as an effective means to improve their overall well-being during chemotherapy.

Conclusion

This study employed a descriptive correlational design to examine the relationships between symptom experience, social support, and health-related quality of life (HRQoL) among postoperative breast cancer patients receiving chemotherapy in Hangzhou, China. A total of 130 patients receiving chemotherapy at the Cancer Daycare Center of Sir Run Run Shaw Hospital, affiliated with Zhejiang University, participated in the study. Overall, the level of HRQoL among participants was moderate, not too high or too low.

As hypothesized, symptom experience was negatively associated with HRQoL, with psychological symptoms showing a stronger negative correlation than physical symptoms. Additionally, the Global Distress Index (GDI) demonstrated a strong negative correlation with HRQoL, indicating that higher distress levels were linked to poorer HRQoL. Conversely, social support was positively associated with HRQoL, suggesting that patients who perceived greater support from their social networks reported better overall well-being.

These findings underscore the importance of addressing both symptom experience and social support in clinical care. Nurses and nursing educators should utilize these insights to develop and implement targeted interventions that manage symptom experiences, particularly psychological distress and strengthen social support systems, thereby promoting improved HRQoL among breast cancer patients receiving chemotherapy.

Implications

This study enhances nursing knowledge by identifying key factors associated with health-related quality of life (HRQoL) in postoperative breast cancer patients receiving chemotherapy. Specifically, it highlights the associations between

symptom experience, social support, and HRQoL. The implications for the nursing profession can be described as follows:

Nursing practice: The results of this study can be used to guide nursing practice by emphasizing the importance of routine assessment and monitoring of symptom experience—particularly psychological symptoms—and levels of social support. Understanding these related factors can help nurses identify patients at risk for lower HRQoL and provide more individualized care. Establishing a strong patient-nurse relationship and integrating social support resources, such as breast cancer outpatient clinics, rehabilitation centers, and cancer support groups, may assist patients in developing adaptive coping strategies and improving their overall well-being.

Nursing research: this study provides a foundation for future nursing research aimed at exploring the relationships among symptom experience, social support, and HRQoL in various cancer populations. While causality cannot be inferred, the identified associations offer valuable insights that can inform the design of future intervention studies. Researchers may build upon these findings to examine how enhancing social support and managing symptom experiences might improve HRQoL across different clinical settings.

Nursing education: nursing educators should incorporate the study's findings into oncology nursing curricula by highlighting the importance of assessing HRQoL and its related factors. Nursing students should be taught to recognize the complex interplay between physical symptoms, psychological distress, and social resources in cancer care. Clinical education should also encourage students to apply this knowledge in practice by developing holistic care plans that address both physical and psychosocial patient needs.

Health/hospital policy: the study's findings support the development of hospital policies that emphasize the importance of comprehensive, patient-centered care for breast cancer patients receiving chemotherapy. Healthcare institutions should consider implementing structured psychosocial support programs and interdisciplinary care models that address symptom management and social resource utilization. These efforts may improve patient satisfaction and quality of life, even if they are not direct interventions.

Recommendations

1. This study is a cross-sectional study, which cannot fully reflect the dynamic changes in symptom experience and health related quality of life of breast cancer patients. In the future, qualitative and longitudinal studies can be combined to further explore the status of breast cancer patients' health related quality of life, the trajectory of changes at different stages, and the influencing factors at each stage. Intervention studies on health-related quality of life can also be conducted to provide a theoretical basis for the development of health-related quality of life measures for this population.

2. Due to the limitations of research time and human and financial resources, this study was only conducted in one hospital, and the representativeness of the sample may be insufficient. The next step should be to expand the sample size and conduct a multi-center study to further clarify the health-related quality of life status of breast cancer patients in China and related factors.

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APPENDICES

APPENDIX A

Participant's information sheet and consent form

PARTICIPANT'S INFORMATION SHEET

Dear participants

I am Ms. Ye Song, a student in Master of Nursing Science (International Program) Faculty of Nursing, Burapha University Thailand. **My study is** "Factors associated with health-related quality of life among breast cancer patients receiving postoperative chemotherapy in Hangzhou, China". The objectives are to describe health-related quality of life in postoperative breast cancer patients receiving postoperative chemotherapy in Hangzhou, China.; and to examine relationships between symptom experience and social support with health-related quality of life in postoperative breast cancer patients receiving postoperative chemotherapy in Hangzhou, China.

This study will be a survey study. Participating in this study is voluntary. If you agree to participate in this study, please answer the following questionnaires. There are 4 parts of the questionnaire including:

Part 1. The Demographic data questionnaire with 11 items.

Part 2. The Chinese version of Memory Symptom Assessment Scale (MSAS) with 32 items.

Part 3. The Chinese version of perceived social support scale (PSSS) questionnaire with 12 items.

Part 4. The Chinese version of Functional Assessment of Cancer Therapy – Breast (FACT-B) with 36 items.

Total 91 items which will take approximately 20-40 minutes. During the data collection period, the researcher will clarify any questions posed by the participants for clarity regarding the language or content. You will not get any direct

benefits by participating in this study. However, the information you provide will be valuable to identify factors associated with health-related quality of life among breast cancer patients receiving postoperative chemotherapy. By understanding the factors that related to health-related quality of life among breast cancer patients receiving postoperative chemotherapy, nurses and healthcare provider can develop provide theoretical basis for targeting nursing measures, provide practical guidance for carrying out targeted health education for postoperative breast cancer patients who undergoing outpatient chemotherapy, and provide scientific basis for further improving the HRQoL of postoperative breast cancer outpatient chemotherapy patients and formulating scientific, convenient and effective overall nursing programs. There will be no identified physical and psychological risk to the person participating in the study and no risk to the society.

During the study, you have the right not to answer questions, and you also have the right to change your mind and refuse to participate in the project at any time, and the refusal would not affect the medical services you received. Any information collected from this study, including your identity, will be kept confidential. A coding number will be assigned to you and your name will not be used. Findings from the study will be presented as a group of participants and no specific information from any individual participant will be disclosed. All data will be accessible only to the researcher which will be destroyed one year after publishing the findings. You will receive a further explanation of the nature of the study upon its completion, if you wish.

The research will be conducted by Ms. YeSong under the supervision of my major-advisor, Assistant Professor Dr. Khemaradee Masingboon. If you have any questions, please contact me at mobile number: + 86 18768422663 or by email 251426627@qq.com and/or my advisor’s e-mail address khemaradee@nurse.buu.ac.th. Or you may contact Burapha University Institutional

Review Board (BUU-IRB) telephone number 038 102 620. Your cooperation is greatly appreciated. You will be given a copy of this consent form to keep.

YeSong

INFORMED CONSENT

Title: Factors associated with health-related quality of life among breast cancer patients receiving postoperative chemotherapy in Hangzhou, China

Date of data collection ……..... November 2023

Before giving my signature below, I have been informed by researcher, Ms. YeSong*, that this study is try to understand the factors associated with health-related quality of life in patients after breast cancer surgery, and I will spend my time to fill the questionnaires the researcher required*. I also been informed the method, procedures, benefits, *I will not get any direct benefits by participating in this study. However, the information collected from this study may be used in developing interventions which can help the nurses and the other health care workers to provide advanced and better care to person with breast cancer patients receiving postoperative chemotherapy.* I understood all of the explanations. I consent voluntarily to participate in this study. I understand that I have the right to leave the study any time I want, without fearing that it might affect the medical services I will receive.

The researcher Ms. YeSong has explained to me that all data and information of the participants will be kept confidential and only be used for this study. I have read and understood the information related to participation in this study clearly and I am signing this consent form.

Signature ……..……Participant

(…….)

APPENDIX B

Questionnaires in English and Chinese version

Dear ladies,

I am a graduate student of Burapha University & Wenzhou Medical University, am conducting research entitled “Factors associated with health-related quality of life among breast cancer patients receiving postoperative chemotherapy in Hangzhou, China”. Breast cancer is a major public health problem for women throughout the world. Breast cancer has the second highest incidence rate in the world. With the improvement of the diagnosis and treatment of breast cancer, the survival time of patients has been significantly prolonged, and survival with tumor has become a reality. Therefore, more and more attention has been paid to the factors associated with health-related quality of life of breast cancer patients. In order to better understand the factors associated with health-related quality of life in patients after breast cancer surgery, we will conduct a correlation study. Now, you are required to fill out four questionnaires, which will take about 20-40 minutes of your precious time. These questionnaires include:

1. The Demographic data questionnaire
2. The Chinese version of Memory Symptom Assessment Scale (MSAS)
3. The Chinese version of Perceived Social Support Scale (PSSS)
4. The Chinese version of Functional Assessment of Cancer Therapy – Breast (FACT-B)

Ye Song
Master’s degree student
Adult Nursing Pathway
Faculty of Nursing, Burapha University, Thailand in collaboration with
School of Nursing, Wenzhou Medical University, China

Questionnaire number: .....

Questionnaires

Factors associated with health-related quality of life among breast cancer patients receiving postoperative chemotherapy in Hangzhou, China

The questionnaires include 4 parts as follows:

Part 1. The Demographic data questionnaire with 17 items.

Part 2. The Chinese version of Memory Symptom Assessment Scale (MSAS) with 32 items.

Part 3. The Chinese version of perceived social support scale (PSSS) questionnaire with 12 items.

Part 4. The Chinese version of Functional Assessment of Cancer Therapy – Breast (FACT-B) with 36 items.

Please read each question carefully and then choose the answer that you think is suitable on your conditions.

Part 1: The Demographic data questionnaire

The demographic questionnaire will be developed by the researcher, and it includes two parts: General information and health information. The general information will be obtained by participants self-report, and the health information will be obtained from the medical record.

General information

Direction: In order to understand your health status, please take a few minutes to fill out the questionnaire. The questionnaire is anonymous, and the content of the answers will be kept confidential. Thank you for your cooperation and support! First, we would like to know about your personal situation. (Please tick " √ " on the option or fill in the blank)

1. Your age *is:*_____*years*_____*month*
2. Your ethnicity:

☐ Han

☐ Minority

3. Your marital status:

☐ Single

☐ Married

☐ Divorced/Widowed/other

4. Your education level:

☐ Primary school

☐ Secondary school

☐ Tertiary or higher level of education

5. Your place of residence:

☐Rural

☐Urban

6. Your current working status:

☐ Working

☐ Not working

7. How many people in your family live together:

☐ Live alone

☐ Live with others

8. The average monthly income of your family:

☐Less than 1000 RMB

☐1000-2999 RMB

☐3000-4999 RMB

☐5000-9999 RMB

☐More than 10000 RMB

☐Don't know

9. Your type of medical insurance:

☐Urban employed medical insurance

☐Urban resident medical insurance

☐New rural cooperative medical insurance

☐Other medical insurance

☐No medical insurance

10. Do you have religious beliefs?

☐Yes

☐No

11. Does anyone else in your family have breast cancer?

☐Yes

☐No

☐Don't know

Health information (collected by the researcher)

12. *Weight:* _____*kg. Height:* _____*cm. BMI:*_____

13. Breast cancer type:_____

14. Clinical stage of TMN: _____

15. Type of the surgery: _____

16.Type of chemotherapy: _____

17. Current chemotherapy cycle: _____

Part 2: The Chinese version of Memory Symptom Assessment Scale (MSAS)

Direction: *There are the list of 32 symptoms below. Please read each one carefully. If you have had the symptom during this past week, let us know how OFTEN you had it how SEVERE it was usually and how much it DISTRESSED or BOTHERED you by circling the appropriate number. If you DID NOT HAVE the symptom, make an "X" in the box marked "DID NOT HAVE."*

MEMORIAL SYMPTOM ASSESSMENT SCALE														
Name Date														
Section 1														
DURING THE PAST WEEK Did you have any of the following symptoms?	DID NOT HAVE	IF YES How OFTEN did you have it?				IF YES How SEVERE was it usually				IF YES How much did it DISTRESS or BOTHER you?				
		Rarely	Occasionally	Frequently	Almost	Slight	Moderate	Severe	Very	Not at all	A little	Somewh	Quite a	Very
Difficulty concentrating		1	2	3	4	1	2	3	4	0	1	2	3	4
……		1	2	3	4	1	2	3	4	0	1	2	3	4
Feeling bloated		1	2	3	4	1	2	3	4	0	1	2	3	4

Section 2										
DURING THE PAST WEEK Did you have any of the following symptoms?	DID NOT HAVE	If YES, how SERVERE was it usually?				If YES, how much did it DISTRESS or BOTHER you?				
		Slight	MODERATE	Severe	Very severe	Not at all	A little bit	Somewhat	Quite a bit	Very much
Mouth sores		1	2	3	4	0	1	2	3	4
…….		1	2	3	4	0	1	2	3	4
Changes in skin		1	2	3	4	0	1	2	3	4

Part 3: The Chinese version of Perceived Social Support Scale (PSSS)

Direction: There are 12 sentences, each question has 7 answer. Please choose an answer after each sentence according to your actual situation.

For example, choose "1" means you really strongly disagree with this sentence, which state that your actual situation does not agree with this sentence; choose "7" means your actual situation does agree with this sentence; choose "4" means in the middle of state; and so on.

	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
1.There is a special person who is around when I am in need.	1	2	3	4	5	6	7
……	1	2	3	4	5	6	7
……	1	2	3	4	5	6	7
……	1	2	3	4	5	6	7
……	1	2	3	4	5	6	7

Part 4: The Chinese version of Functional Assessment of Cancer Therapy – Breast (FACT-B)

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

	PHYSICAL WELL-BEING	**Not at all**	**A little bit**	**Some-what**	**Quite a bit**	**Very much**
GP1	I have a lack of energy	0	1	2	3	4
GP6	……..	0	1	2	3	4

	SOCIAL/FAMILY WELL-BEING	**Not at all**	**A little bit**	**Some-what**	**Quite a bit**	**Very much**
GS1	I feel close to my friends	0	1	2	3	4

	EMOTIONAL WELL-BEING	**Not at all**	**A little bit**	**Some-what**	**Quite a bit**	**Very much**
GE1	I feel sad	0	1	2	3	4
GE2	……..	0	1	2	3	4
GE3	……..	0	1	2	3	4
GE4	……..	0	1	2	3	4
GE5	……..	0	1	2	3	4
GE6	I worry that my condition will get worse	0	1	2	3	4
	FUNCTIONAL WELL-BEING	Not at all	A little bit	Some-what	Quite a bit	Very much
GF1	I am able to work (include work at home)	0	1	2	3	4
GF2	……..	0	1	2	3	4

亲爱的女士，

我是泰国东方大学和温州医科大学的研究生。正在进行题为“中国杭州市接受术后化疗的乳腺癌患者健康相关生活质量的相关因素”的研究。乳腺癌是全世界女性面临的主要公共卫生问题。女性乳腺癌现已超过肺癌成为全球癌症发病率的主要原因。随着乳腺癌的诊断以及治疗水平的提高，患者生存时间已明显延长，带瘤生存已成现实。 因此，对于乳腺癌患者健康相关生活质量的相关因素越来越受到关注。为了更好的了解乳腺癌术后患者健康相关生活质量的相关因素，我们将对此进行相关调查。现在，需要您填写四个问卷，大约需要占用您20-40分钟宝贵的时间。

1. 人口学问卷
2. 记忆症状评估量表
3. 感知社会支持量表
4. 癌症治疗功能评估-乳腺

宋烨
研究生
成人护理专业
泰国东方大学联合温州医科大学

问卷编号: .....

问卷表格

中国杭州市接受术后化疗的乳腺癌患者健康相关生活质量的相关因素

问卷调查包括以下四个部分:

第一部分：人口数据问卷，共17个项目。

第二部分：中文版记忆症状评估量表，共32题。

第三部分：感知社会支持量表中文版，共12项。

第四部分：中文版癌症治疗功能评估-乳腺，共36项。

请仔细阅读每个问题，然后根据自己的情况选择合适的答案。

第一部分: 人口数据问卷

人口数据问卷分为一般信息和健康信息，一般信息将通过参与者自我报告获得，健康信息将从病历中获得。

说明：为了了解您的健康状况，请您花几分钟填写该问卷，问卷采取不记名方式，并对回答内容给予保密，敬请放心。感谢您的合作和支持！ 首先，我们想了解一下您的个人情况。（请在选项上打“ √ ”或在空格处填写）

一般信息

1.您今年　　周岁

2.您的民族：

☐汉族

☐少数民族（　　）

3.您的婚姻状况：

☐未婚

☐已婚

☐离异/丧偶/其他

4.您的文化程度：

☐小学

☐中学

☐大学及以上

5.您的居住地：

☐农村

☐城镇

6.您目前的工作状态：

☐在职

☐不在职

7.您家里几个人一起居住：

☐独居

□非独居

8.您全家的平均月收入：

□＜1000 元

□1000～2999 元

□3000～4999 元

□5000～9999 元

□10000 元以上

□不知道

9.您的医保类型：

□城镇职工医保

□城镇居民医保

□新农合

□其他医保

□没有医保

10.您是否有宗教信仰？

□有

□没有

11. 您家族中是否还有其他人患有乳腺癌？

□有

□没有

□不知道

疾病特征调查表

12. 体重：　身高：　BMI：

13. 乳腺癌类型:

14.乳腺癌分期：

15.手术方式：

16.化疗类型：

17.本次化疗周期：第　　周期

第二部分: 记忆症状评估量表

说明:我们在下面列出了二十四种症状，请细阅每一项。如果您在刚过去的一星期曾出现过这些症状，请选择适当的数字，来让我们知道这些症状出现的有多频繁，通常有多严重以及给您带来多少痛苦或困扰。如果您没有这些症状，请在“没有”一栏填上“√”，若“有”，请在后面相应的栏上打“√”。

在过去一星期，您有否出现过下列任何一种症状？	没有	如果有，它出现有多频繁？				如果有，它通常有多严重？				如果有，它给您带来多少痛苦或困扰				
		很少	偶尔	经常	几乎是持续性的	轻微	一般	严重	非常严重	完全没有	少许	一些	颇多	非常多
1、难以集中精神		1	2	3	4	1	2	3	4	0	1	2	3	4
…….		1	2	3	4	1	2	3	4	0	1	2	3	4
11、感到腹胀		1	2	3	4	1	2	3	4	0	1	2	3	4

在过去一星期，您有否出现过下列任何一种症状	没有	如果有，它通常有多严重？				如果有，它给您带来多少痛苦或困扰？				
		轻微	一般	严重	非常严重	完全没有	少许	一些	颇多	非常多
25、口腔溃疡		1	2	3	4	0	1	2	3	4
…….		1	2	3	4	0	1	2	3	4
32、皮肤改变 (例如：色素改变，粗糙等)		1	2	3	4	0	1	2	3	4

第三部分: 感知社会支持量表

导语：以下有12个句子，每一句子后面各有7个答案，请您根据自己的实际情况在每句后选择一个答案。例如，选择“1”表示您极不同意，即说明您的情况与这一句子极不相符；选择“7”表示您极同意，即说明您的实际情况与这一句子极相符；选择“4”表示中间状态。余类推。

	极不同意	很不同意	稍不同意	中立	稍同意	很同意	极同意
1.在我遇到问题时有些人会出现在我身旁	1	2	3	4	5	6	7
…….	1	2	3	4	5	6	7
…….	1	2	3	4	5	6	7
…….	1	2	3	4	5	6	7
5.当我有困难时有些人是安慰我的真正源泉	1	2	3	4	5	6	7

第四部分: 癌症治疗功能评估-乳腺

指导语：该量表是为了了解您当前的身心健康状态，请根据您的实际情况，逐项回答每一问题，并请在相应的数字上划“√”。0=一点也不，1=有一点，2=有些，3=相当，4=非常。

领域 (各具体条目)						
生理状况						
GP1	我精力不济	0	1	2	3	4
GP2	…….	0	1	2	3	4
GP3	…….	0	1	2	3	4

GP4	…….	0	1	2	3	4
GP5	…….	0	1	2	3	4
GP6	…….	0	1	2	3	4
GP7	我不得不卧床	0	1	2	3	4
社会/家庭情况						
GS1	我和朋友们很接近	0	1	2	3	4
GS2	…….	0	1	2	3	4
GS3	…….	0	1	2	3	4
GS4	…….	0	1	2	3	4
GS5	…….	0	1	2	3	4
GS6	我与自己的配偶 (或给我主要支持的人) 很亲近	0	1	2	3	4
Q1 不管您近期的性生活的程度如何，麻烦您回答以下的问题，谢谢合作。						
GS7	我对自己的性生活感到满意	0	1	2	3	4
情感状况						
GE1	我感到悲伤	0	1	2	3	4
GE2	…….	0	1	2	3	4
GE3	…….	0	1	2	3	4
GE4	…….	0	1	2	3	4
GE5	…….	0	1	2	3	4
GE6	我担心自己的病情会更糟	0	1	2	3	4
功能状况						
GF1	我能够工作	0	1	2	3	4
GF2	…….	0	1	2	3	4

APPENDIX C

IRB Approval,

Permission letter for data collection,

Permission letter of using the instruments

สำเนา

ที่ IRB3-081/2565

เอกสารรับรองผลการพิจารณาจริยธรรมการวิจัยในมนุษย์
มหาวิทยาลัยบูรพา

คณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา ได้พิจารณาโครงการวิจัย

รหัสโครงการวิจัย : G-HS036/2565

โครงการวิจัยเรื่อง : Factors related to health-related quality of life among breast cancer patients receiving postoperative chemotherapy in Hangzhou, China

หัวหน้าโครงการวิจัย : MISSYE SONG

หน่วยงานที่สังกัด : คณะพยาบาลศาสตร์

BUU Ethics Committee for Human Research has considered the following research protocol according to the ethical principles of human research in which the researchers respect human's right and honor, do not violate right and safety, and do no harms to the research participants.

Therefore, the research protocol is approved (See attached)

1. Form of Human Research Protocol Submission Version 2 : 15 August 2022
2. Research Protocol Version 2 : 15 August 2022
3. Participant Information Sheet Version 2 : 15 August 2022
4. Informed Consent Form Version 2 : 15 August 2022
5. Research Instruments Version 2 : 15 August 2022
6. Others (if any) Version - : -

วันที่รับรอง : วันที่ 22 เดือน สิงหาคม พ.ศ. 2565
วันที่หมดอายุ : วันที่ 22 เดือน สิงหาคม พ.ศ. 2566

ลงนาม *นางสาวรมร แย้มประทุม*
(นางสาวรมร แย้มประทุม)
ประธานคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยบูรพา
ชุดที่ 3 (กลุ่มคลินิก/ วิทยาศาสตร์สุขภาพ/ วิทยาศาสตร์และเทคโนโลยี)

MHESI 8137/1281

Graduate School, Burapha University
169 Longhaad Bangsaen Rd.
Saensuk, Muang, Chonburi
Thailand, 20131

September 8th, 2022

To The president of the Sir Run Run Shaw Hospital Affiliated to Zhejiang University,

Enclosure: 1. Certificate ethics document of Burapha University
2. Research Instruments (Try out)

On behalf of the Graduate School, Burapha University, I would like to request permission for Ms. Ye Song to collect data for testing the reliability of the research instruments.

Ms. Ye Song, ID 63910127, a graduate student of the Master of Nursing Science program (International Program) in Adult Nursing Pathway, Faculty of Nursing, Burapha University, Thailand, was approved her thesis proposal entitled: "Factors related to health-related quality of life among breast cancer patients receiving postoperative chemotherapy in Hangzhou, China" under supervision of Assist. Prof. Dr. Khemaradee Masingboon as the principle advisor. She proposes to collect data from 30 postoperative breast cancer patients who come to the Cancer Daycare Center for receiving chemotherapy at the Sir Run Run Shaw Hospital in Hangzhou, Zhejiang province, China. The participants will be recruited from women who newly diagnosed with stage I, II or IIIA of breast cancer, aged at least 18 years old, have received at least one cycle of chemotherapy, have good orientation to place and time, and has no history of mental illness. Participants who combined with other malignant tumors or serious physical disease and breast cancer recurrence are not included in this research.

The data collection will be carried out from September 12 - 30, 2022. In this regard, you can contact Ms. Ye Song via mobile phone +86-1876-8422-663 or E-mail: 251426627@qq.com

Please do not hesitate to contact me if you need further relevant queries.

Sincerely yours,

(Assoc. Prof. Dr. Nujjaree Chaimongkol)
Dean of Graduate School, Burapha University

Graduate School Office
Tel: +66 3810 2700 ext. 701, 705, 707
E-mail: grd.buu@go.buu.ac.th
http://grd.buu.ac.th

MHESI 8137/1282

Graduate School, Burapha University
169 Longhaad Bangsaen Rd.
Saensuk, Muang, Chonburi
Thailand, 20131

September 8th, 2022

To The president of the Sir Run Run Shaw Hospital Affiliated to Zhejiang University,

Enclosure: 1. Certificate ethics document of Burapha University
2. Research Instruments

On behalf of the Graduate School, Burapha University, I would like to request permission for Ms. Ye Song to collect data for conducting research.

Ms. Ye Song, ID 63910127, a graduate student of the Master of Nursing Science program (International Program) in Adult Nursing Pathway, Faculty of Nursing, Burapha University, Thailand, was approved her thesis proposal entitled: "Factors related to health-related quality of life among breast cancer patients receiving postoperative chemotherapy in Hangzhou, China" under supervision of Assist. Prof. Dr. Khemaradee Masingboon as the principle advisor. She proposes to collect data from 130 postoperative breast cancer patients who come to the Cancer Daycare Center for receiving chemotherapy at the Sir Run Run Shaw Hospital in Hangzhou, Zhejiang province, China. The participants will be recruited from women who newly diagnosed with stage I, II or IIIA of breast cancer, aged at least 18 years old, have received at least one cycle of chemotherapy, have good orientation to place and time, and has no history of mental illness. Participants who combined with other malignant tumors or serious physical disease and breast cancer recurrence are not included in this research.

The data collection will be carried out from October 1, 2022 to March 31, 2023. In this regard, you can contact Ms. Ye Song via mobile phone +86-1876-8422-663 or E-mail: 251426627@qq.com

Please do not hesitate to contact me if you need further relevant queries.

Sincerely yours,

(Assoc. Prof. Dr. Nujjaree Chaimongkol)
Dean of Graduate School, Burapha University

Graduate School Office
Tel: +66 3810 2700 ext. 701, 705, 707
E-mail: grd.buu@go.buu.ac.th
http://grd.buu.ac.th

浙江大学医学院附属邵逸夫医院伦理审查批件

Ethics Committee Approval Letter of Sir Run Run Shaw Hospital, Zhejiang University School of Medicine

批件号 Approval NO.：邵逸夫医院伦审 2023 研第 0574 号

项目名称 Study Title	杭州市乳腺癌术后化疗患者健康相关生活质量相关因素分析		
申办方 Sponsor	无		
受理号 Acceptance Number	2023-833-01		
主要研究者 Principal Investigator	宋烨	承担科室 Responsible Department	护理部
审查类别 Category of Review	初始审查	审查方式 Type of Review	快速审查
审查日期 Date of Review	2023.10.6	审查地点 Location of Review	/
审查文件清单 Items Reviewed	见附件		
审评意见 Evaluation	本伦理委员会认为递交的审查材料符合伦理规范，同意开展临床研究。		
审查决定 Decision	委员会对该项目的审查决定为： 同意		
主任/副主任委员签字 Chair Signature			
签发日期 Date of issue	2023.10.6		
伦理审查委员会 Stamp of EC	伦理审查委员会盖章		
批件有效期 Period of Validity	自本伦理审查委员会初始审查批准之日起一年内，本临床研究应在本院启动。逾期未启动的，本批件自行废止。		
年度/定期跟踪审查 Continue Review	审查频率为该研究批准之日起每 12 个月一次，首次 2024 年 10 月 05 日，请于批件到期前 1 个月递交研究进展报告。 伦理审查委员会有根据实际进展情况改变跟踪审查频率的权利。		
声明 Statement	本伦理审查委员会的职责、人员组成、操作程序及记录遵循《涉及人的生物医学研究伦理审查办法》、《涉及人的健康相关研究国际伦理准则》、《赫尔辛基宣言》、GCP 和 ICH-GCP 等国际伦理指南和国内相关法律法规。		
注意事项：			

1. 请遵循我国相关法律、法规和规章中的伦理原则。
2. 请遵循经本伦理审查委员会批准的临床研究方案、知情同意书、招募材料等开展本研究，保护受试者的健康与权利。对研究方案、知情同意书和招募材料等的任何修改，均须得到本伦理审查委员会审查同意后方可实施。
3. 在本院发生的 SAE/SUSAR 以及研发期间安全性更新报告须按照 NMPA/GCP 最新要求及时递交本伦理审查委员会，国内外其它中心发生的 SAE/SUSAR 需定期汇总、评估后递交本伦理审查委员会。
4. 根据报告情况，本伦理审查委员会有权对其评估做出新的决定。
5. 无论研究开始与否，请在跟踪审查日到期前 1 个月提交研究进展报告。
6. 申办方应当向组长单位伦理审查委员会提交中心研究进展报告汇总；当出现任何可能显著影响研究进行或增加受试者危险的情况时，请申请人及时向本伦理审查委员会提交书面报告。
7. 研究纳入了不符合纳入标准或符合排除标准的受试者，符合中止研究规定而未让受试者退出研究，给予错误治疗或剂量，给予方案禁止的合并用药等没有遵从方案开展研究的情况；或可能对受试者的权益或健康以及研究的科学性造成不良影响等违背 GCP 原则的情况，请申办方、监查员或研究者提交违背方案报告。
8. 申请人暂停或提前终止临床研究，请及时提交暂停或终止研究报告。
9. 完成临床研究，请申请人提交结题报告。
10. 凡涉及中国人类遗传资源采集标本、收集数据等研究项目，必须获得中国人类遗传资源管理办公室批准后方可在本中心开展研究。
11. 凡经本伦理审查委员会批准的研究项目在实施前，申请人应按相关规定在国家卫健委、药审中心等的临床研究登记备案信息系统平台登记研究项目相关信息。

附件（审查文件清单）：

1.初始审查申请表（科研专用）

2.主要研究者责任声明

3.主要研究者履历

4.研究方案（V1.0；2023.08.12）

5.知情同意书（V1.0；2023.08.12）

LETTER ASK PERMISSION USED QUESTIONNAIRE

(Perceived social support scale)

Dear professor,

How are you, I'm Ye Song. I'm a graduate student at Wenzhou Medical University which is located in Zhejiang, China, and I am preparing my graduation thesis. The name of my thesis is "Factors related to health-related quality of life among post-operative breast cancer patient receiving outpatient chemotherapy in Hangzhou, China

Can I use your instrument "Perceived social support scale " to measure social support for Chinese persons with breast cancer?

Could you give me the permission for using the instrument of "Perceived social support scale"? I will cite your article as a reference in my thesis and any subsequent publications. If yes, I will be very appreciative, thanks very much!

Ye Song (Amber)

Dear Ye Song,

You have my permission to use the Multidimensional Scale of Perceived Social Support (MSPSS) in your research. I have attached the original English language version of the scale (with scoring information on the 2nd page), a document listing several of the articles that have reported on the reliability and validity of the MSPSS, and a chapter that I wrote about the scale.

Also attached is a simplified Chinese translation, which you may find helpful.

I hope your research goes well.

Best regards,

Greg Zimet

LETTER ASK PERMISSION USED QUESTIONNAIRE

(The Memorial Symptom Assessment Scale, MSAS)

Dear professor,

How are you, I'm Ye Song. I'm a graduate student of Wenzhou Medical University which is located in Zhejiang, China, and I am preparing my graduation thesis. The name of my thesis is "Factors related to health-related quality of life among post-operative breast cancer patient receiving outpatient chemotherapy in Hangzhou, China ". Can I use your instrument " The Memorial Symptom Assessment Scale, MSAS" to measure symptom experience for Chinese persons with breast cancer?
Could you give me the permission for using the instrument of "The Memorial Symptom Assessment Scale, MSAS"? I will cite your article as a reference in my thesis and any subsequent publications. If yes, I will be very appreciate, thanks very much!
Ye Song

Dear Ye Song,

From my perspective, you are free to use the MSAS as you wish for your research. I wish you the best.

R. Portenoy MD

Russell Portenoy MD
Chief Medical Officer
MJHS Hospice and Palliative Care

LETTER ASK PERMISSION USED QUESTIONNAIRE
(Functional Assessment of Cancer Therapy in breast cancer)

Hello Doctor David F. Cella：

How are you, I'm Ye Song. I'm a graduate student of Wenzhou Medical University which is located in Zhejiang, China, and I am preparing my graduation thesis. The name of my thesis is "Factors related to health-related quality of life among post-operative breast cancer patient receiving outpatient chemotherapy in Hangzhou, China ". Can I use your instrument " Functional Assessment of Cancer Therapy in breast cancer " to measure HRQoL for Chinese persons with breast cancer?

Could you give me permission for using the instrument of ‘Functional Assessment of Cancer Therapy in breast cancer’? I will cite your article as a reference in my thesis and any subsequent publications. If yes, I will be very appreciated, thanks very much!

Ye Song

Hi Ye Song,

The FACT-B measure in Simplified Chinese is attached. The English version can be downloaded from our website.

Kind regards,

Sharon Debb, M.Ed

Licensing Support Specialist

APPENDIX D

Other results of the study

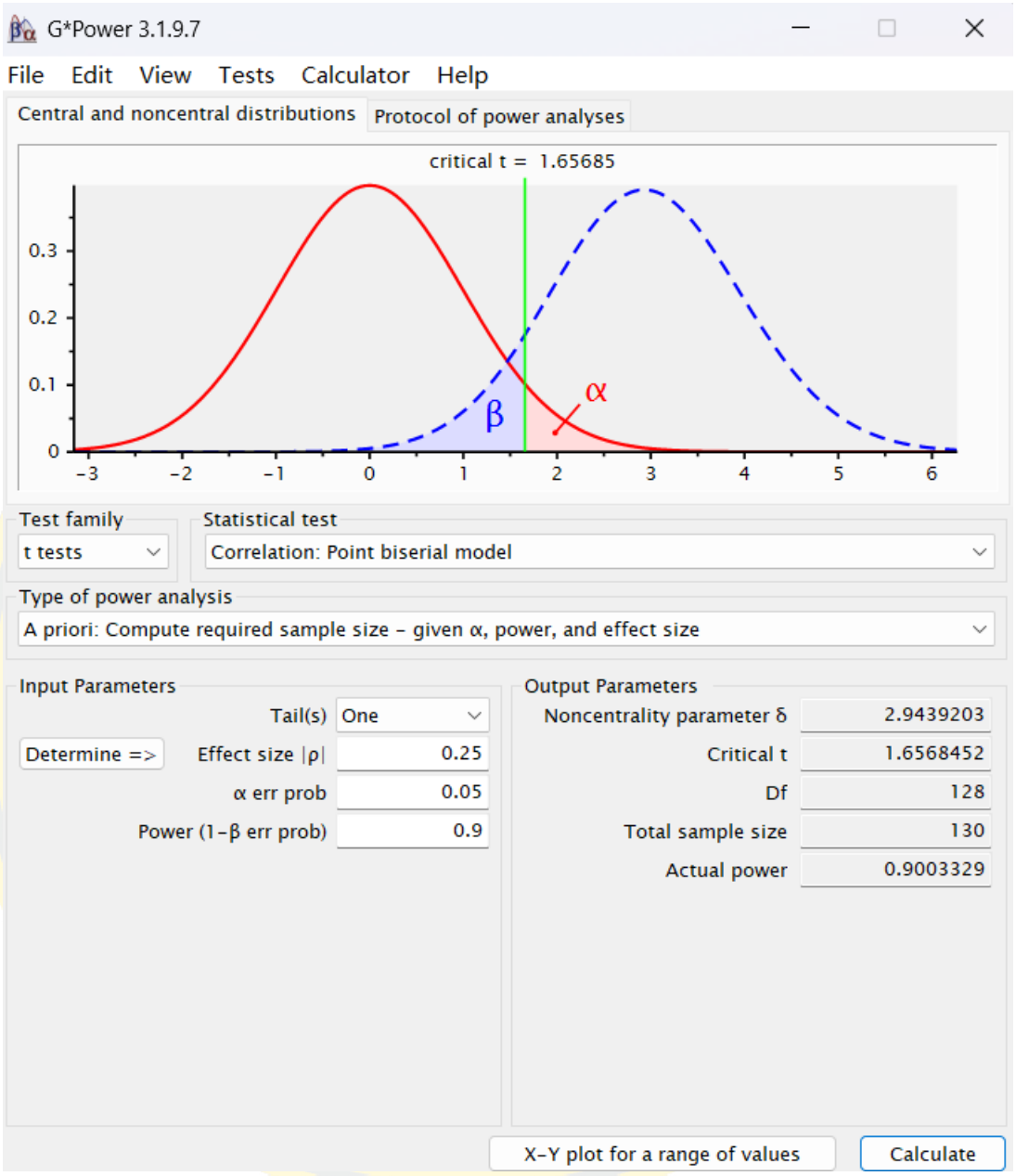

Figure 2 The Calculation results based on G*Power 3.1.9.7

Data distribution characteristics of research variables

The scores of symptom experience, social support and health-related quality of life (HRQoL) of the study subjects were tested by P-P diagrams, and the scattered points were approximately on the diagonal, all of which were in line with an approximate normal distribution, as shown in Figures 3, 4, and 5.

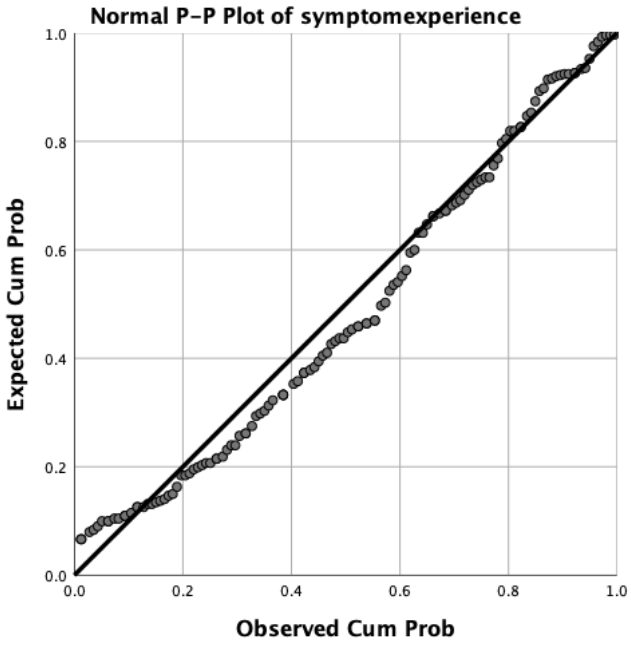

Figure 3 The normal distribution of symptom experience

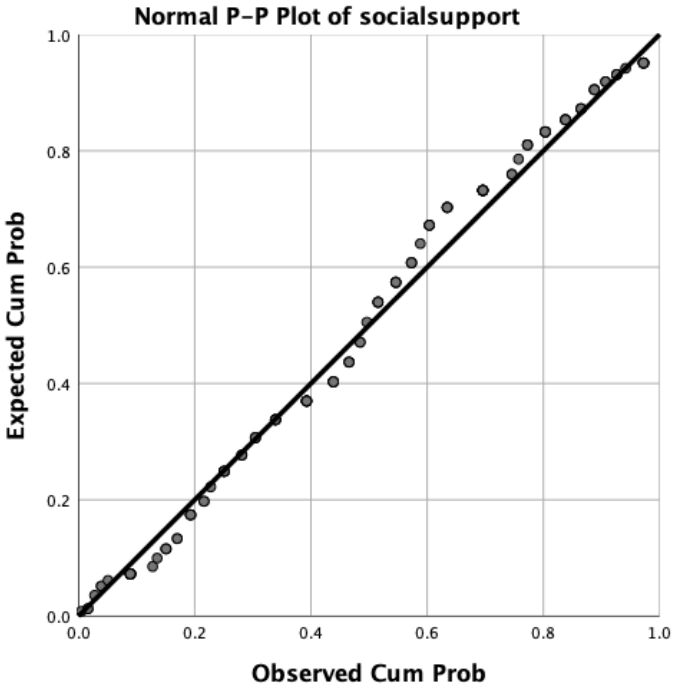

Figure 4 The normal distribution of social support

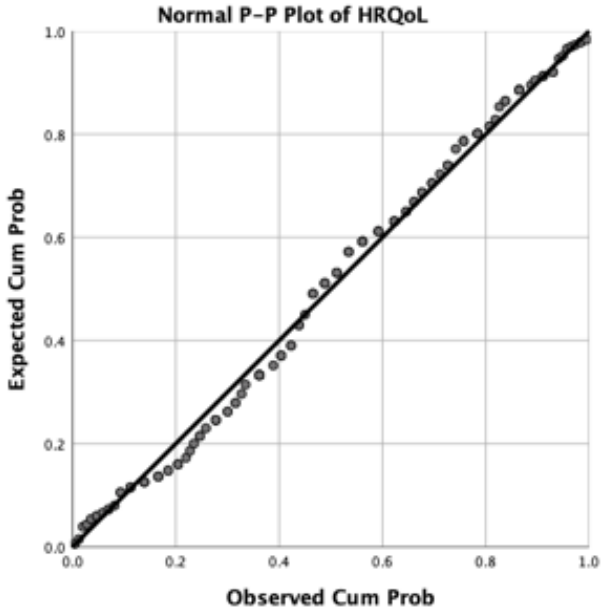

Figure 5 The normal distribution of HRQoL

BIOGRAPHY

NAME	Ye Song
DATE OF BIRTH	18 March 1993
PLACE OF BIRTH	Hangzhou, Zhejiang, China
PRESENT ADDRESS	5-513, Gunhara Blue Lake International, Hangzhou, Zhejiang, China
POSITION HELD	2015–Present Registered Nurse, Surgical Oncology Ward, Sir Run Run Shaw Hospital
EDUCATION	2011-2015 Bachelor of Nursing (B.S.N), Wenzhou Medical University, Wenzhou, China 2020-2022 Master of Nursing Science (International Program) (M.N.S), Faculty of Nursing, Burapha University, Chonburi, Thailand