e-ISSN: 2722-3558

Sriwijaya Journal of Surgery

[SJS]

https://sriwijayasurgery.com

Chemotherapy and Quality of Life in Breast Cancer Patients: A Case-Series Study in Palembang, Indonesia

Eka Satyani Belina[1]*, Mulawan Umar[2], Theodorus[3]

[1]Department of Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

[2]Department of Oncology Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

[3]Department of Pharmacology, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

ARTICLE INFO

Keywords:
Breast cancer
Chemotherapy
FACT-B
Indonesia
Quality of life

***Corresponding author:**
Eka Satyani Belina

E-mail address:
ekasatyanibella@yahoo.com

All authors have reviewed and approved the final version of the manuscript.

https://doi.org/10.37275/sjs.v8i1.120

ABSTRACT

Introduction: Breast cancer is a prevalent malignancy affecting women worldwide, and its treatment, particularly chemotherapy, can significantly impact patients' quality of life (QoL). This study aimed to assess the QoL of breast cancer patients undergoing chemotherapy in Palembang, Indonesia, and to identify factors associated with their QoL. **Methods:** A cross-sectional study was conducted at the Oncology Unit of Dr. Mohammad Hoesin General Hospital in Palembang, Indonesia, from December 2024 to January 2025. A total of 150 breast cancer patients who met the inclusion criteria were enrolled in the study. Data were collected through medical records and the Functional Assessment of Cancer Therapy - Breast (FACT-B) questionnaire. The FACT-B assesses QoL in five domains: physical, social/family, emotional, functional, and breast cancer-specific concerns. Descriptive statistics, Spearman's correlation, and logistic regression were used to analyze the data. **Results:** The majority of the patients were aged 40-60 years (70%), had low educational levels (41.3%), were married (83.3%), had locally advanced disease (44%), and had completed chemotherapy (41.3%). The mean FACT-B total score was 76.8. A significant negative correlation was found between the intensity of chemotherapy and QoL (r = -0.306, p = 0.000). Logistic regression analysis revealed that patients who had completed chemotherapy had a significantly lower QoL than those who had not undergone chemotherapy (OR = 0.30, 95% CI = 0.15-0.60, p = 0.001). **Conclusion:** Chemotherapy significantly impacts the QoL of breast cancer patients in Palembang, Indonesia. Patients who have completed chemotherapy have a lower QoL than those who have not undergone chemotherapy. These findings highlight the importance of providing comprehensive supportive care to breast cancer patients undergoing chemotherapy to improve their QoL.

1. Introduction

Breast cancer is a significant health concern affecting women worldwide, with an estimated 2.3 million new cases diagnosed in 2020. This disease is characterized by the uncontrolled growth of cells in the breast tissue, leading to the formation of a tumor. Breast cancer is the most common cancer among women globally, accounting for 11.7% of all cancer cases. The incidence of breast cancer increases with age, with the highest incidence occurring in women under 50 years of age. In Indonesia, breast cancer is the most prevalent cancer, accounting for 19.2% of all cancer cases. Advances in breast cancer treatment have led to improved survival rates. However, breast cancer treatment, particularly chemotherapy, can significantly impact patients' quality of life (QoL). Chemotherapy is a systemic treatment that uses drugs to destroy cancer cells. While it can be effective in treating breast cancer, it can also cause a range of side effects that can affect patients' physical, psychological, and social well-being.[1-4]

Chemotherapy can cause a range of side effects, including fatigue, nausea, hair loss, sleep disturbances, pain, and cognitive dysfunction. These side effects can interfere with patients' daily activities and overall well-being. Fatigue is one of the most common side effects of chemotherapy, affecting up to 90% of patients. Nausea and vomiting are also common side effects, affecting up to 80% of patients. Hair loss is another common side effect, affecting up to 65% of patients. Sleep disturbances, pain, and cognitive dysfunction are also common side effects of chemotherapy, affecting up to 50% of patients. QoL is a multidimensional concept that encompasses physical, psychological, social, and spiritual well-being. It is an important outcome measure in cancer care, as it reflects patients' subjective experiences and perceptions of their health. Assessing QoL can help healthcare providers identify patients' needs and provide appropriate supportive care to improve their overall well-being.[5-7]

Several instruments have been developed to assess QoL in breast cancer patients, including the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), the EORTC QLQ-BR23, and the Functional Assessment of Cancer Therapy - Breast (FACT-B). The FACT-B is a 37-item questionnaire that assesses QoL in five domains: physical, social/family, emotional, functional, and breast cancer-specific concerns. It has been validated in various populations and has been shown to be a reliable and valid measure of QoL in breast cancer patients. Several studies have investigated the factors associated with QoL in breast cancer patients. These factors include sociodemographic factors (e.g., age, education, income, marital status), clinical factors (e.g., stage of disease, treatment), and psychological factors (e.g., depression, anxiety). However, the findings of these studies have been inconsistent.[8-10] This study aimed to assess the QoL of breast cancer patients undergoing chemotherapy in Palembang, Indonesia, and to identify factors associated with their QoL.

2. Methods

This study employed a cross-sectional design to investigate the quality of life (QoL) among breast cancer patients undergoing chemotherapy. The research was conducted at the Oncology Unit of Dr. Mohammad Hoesin General Hospital in Palembang, Indonesia. This hospital is a major referral center for cancer treatment in the region, providing care to a diverse population of patients. The study period spanned from December 2024 to January 2025, allowing for data collection during a specific timeframe. Ethical approval for this study was obtained from the Health Research Ethics Committee of the Universitas Sriwijaya Palembang Indonesia, ensuring adherence to ethical guidelines and protecting the rights of the participants.

The study population consisted of all breast cancer patients who visited the Oncology Unit of Dr. Mohammad Hoesin General Hospital during the study period. To be eligible for inclusion in the study, patients had to meet the following criteria; Diagnosed with breast cancer: This ensured that the study focused specifically on individuals with breast cancer; Aged 18 years or older: This age restriction aimed to include only adult patients who could provide informed consent; Undergoing chemotherapy: This criterion ensured that the study participants were actively receiving chemotherapy treatment; Able to provide informed consent: This ensured that participants understood the study's purpose and procedures and voluntarily agreed to participate. Patients were excluded from the study if they met any of the following criteria; Recurrent breast cancer: This exclusion aimed to focus on patients with primary breast cancer, as recurrent disease may have different treatment and QoL considerations; Other medical conditions that could affect QoL: This exclusion aimed to minimize the influence of confounding factors on QoL assessment; Unable to cooperate due to the severity of illness: This exclusion ensured that participants could actively participate in the study procedures; Incomplete medical records: This exclusion ensured that sufficient data were available for each participant; Refusal to provide informed consent: This exclusion respected the autonomy of individuals who did not wish to participate in the study.

A total of 150 breast cancer patients who met the inclusion criteria were enrolled in the study. The sample size was determined based on the estimated prevalence of breast cancer in the region and the desired level of statistical power. Patients were recruited consecutively as they visited the Oncology Unit during the study period. The recruitment process involved providing potential participants with information about the study, including its purpose, procedures, and potential benefits and risks. Informed consent was obtained from each participant before enrollment in the study.

Data were collected through two primary sources: medical records and the Functional Assessment of Cancer Therapy - Breast (FACT-B) questionnaire. Medical records provided information on patients' sociodemographic and clinical characteristics, including age, education level, income, marital status, stage of disease, and chemotherapy regimen. The FACT-B questionnaire was used to assess patients' QoL.

The FACT-B is a widely used instrument for assessing QoL in breast cancer patients. It consists of 37 items that cover five domains; Physical Well-being: This domain assesses physical symptoms and functional limitations related to cancer and its treatment; Social/Family Well-being: This domain assesses the impact of cancer on social and family relationships; Emotional Well-being: This domain assesses emotional distress, such as anxiety and depression; Functional Well-being: This domain assesses the ability to perform daily activities and roles; Breast Cancer Concerns: This domain assesses specific concerns related to breast cancer, such as body image and fear of recurrence. Each item on the FACT-B is scored on a five-point Likert scale, ranging from 0 (not at all) to 4 (very much). Domain scores are calculated by summing the item scores within each domain. The total FACT-B score is calculated by summing the domain scores. Higher scores indicate better QoL.

Data were analyzed using SPSS version 27. Descriptive statistics were used to summarize the sociodemographic and clinical characteristics of the patients. These statistics included measures of central tendency (e.g., mean, median) and measures of dispersion (e.g., standard deviation, range). Spearman's correlation was used to assess the relationship between the sociodemographic and clinical characteristics and the FACT-B scores. This non-parametric correlation coefficient measures the strength and direction of the monotonic association between two variables. Logistic regression was used to identify factors associated with QoL. The dependent variable was QoL, which was categorized as good or poor based on the median FACT-B total score. The independent variables were age, education level, income, marital status, stage of disease, and chemotherapy regimen. Logistic regression is a statistical method used to model the relationship between a categorical dependent variable and one or more independent variables. A p-value of less than 0.05 was considered statistically significant. This threshold indicates that there is less than a 5% probability that the observed results occurred by chance alone.

3. Results

Table 1 provides a comprehensive overview of the sociodemographic and clinical characteristics of the 150 breast cancer patients who participated in the study; Age: The majority of patients (70%) were in the 40-60 age group, which is consistent with the typical age range for breast cancer diagnosis. A smaller proportion of patients were younger than 40 (8.7%) or older than 60 (21.3%); Education Level: A substantial proportion of patients (41.3%) had low educational levels, represented by SD-SMP (primary to lower secondary education). The remaining patients were distributed between SMA (upper secondary education) (36%) and >S1 (higher education) (22.7%); Income: The largest group of patients (50.7%) reported an income of less than Rp. 1,500,000. The remaining patients were distributed between those earning Rp. 1,500,000 - Rp. 3,500,000 (22.7%) and those earning more than Rp. 3,500,000 (26.7%); Marital Status: The majority of patients (83.3%) were married. Smaller proportions were unmarried (3.3%) or widowed (13.3%); Stage of Disease: The largest group of patients (44%) had locally advanced disease. The remaining patients were distributed between those with early-stage disease (19.3%) and those with advanced disease (36.7%); Chemotherapy: The largest group of patients (41.3%) had completed chemotherapy. The remaining patients were distributed between those not undergoing chemotherapy (20%) and those currently undergoing chemotherapy (38.7%).

Table 1. Sociodemographic and clinical characteristics of breast cancer patients.

Characteristic	Frequency (n)	Percentage (%)
Age (years)		
<40	13	8.7
40-60	105	70.0
>60	32	21.3
Education level		
Primary school - Junior high school	62	41.3
Senior high school	54	36.0
>Bachelor’s degree	34	22.7
Income		
< Rp. 1,500,000	76	50.7
Rp. 1,500,000 - Rp. 3,500,000	34	22.7
> Rp. 3,500,000	40	26.7
Marital status		
Married	125	83.3
Unmarried	5	3.3
Widowed	20	13.3
Stage of disease		
Early	29	19.3
Locally Advanced	66	44.0
Advanced	55	36.7
Chemotherapy		
Not undergoing	30	20.0
Undergoing	58	38.7
Completed	62	41.3

Table 2 presents the mean scores for each of the five domains of the Functional Assessment of Cancer Therapy - Breast (FACT-B) questionnaire among the 150 breast cancer patients in the study. The FACT-B is designed to assess various aspects of quality of life (QoL) in breast cancer patients, with higher scores indicating better QoL; Social/Family Well-being: This domain had the highest mean score (23.8 out of 28), suggesting that patients generally reported positive social and family support. This strong social network may be a valuable resource for coping with the challenges of breast cancer treatment; Emotional Well-being: This domain had the lowest mean score (10.1 out of 28), indicating that patients experienced significant emotional distress. This finding highlights the importance of addressing the emotional well-being of breast cancer patients alongside their physical treatment; Physical Well-being: The mean score for this domain was 9.6 out of 28, suggesting that patients experienced moderate levels of physical discomfort and functional limitations. This is not surprising given the side effects often associated with chemotherapy; Functional Well-being: The mean score for this domain was 21.5 out of 28, indicating that patients retained a reasonable level of ability to perform daily activities and roles. This suggests that while physical well-being may be impacted, patients are generally able to maintain some level of independence; Breast Cancer Concerns: The mean score for this domain was 14.0 out of 28, suggesting that patients had specific concerns related to breast cancer, such as body image and fear of recurrence. These concerns are important to address as part of comprehensive cancer care.

Table 2. Mean scores for FACT-B domains.

Domain	Mean	SD (Standard Deviation)
Physical Well-Being	9.6	6.6
Social/Family Well-Being	23.8	4.2
Emotional Well-Being	10.1	5.2
Functional Well-Being	21.5	6.2
Breast Cancer Concerns	14.0	6.4

Table 3 presents the results of a logistic regression analysis, which was conducted to identify factors associated with quality of life (QoL) among breast cancer patients undergoing chemotherapy. In this analysis, QoL was categorized as "good" or "poor" based on the median FACT-B total score. The only factor that was significantly associated with QoL was chemotherapy status. Patients who had completed chemotherapy had a significantly lower QoL than those who had not undergone chemotherapy (OR = 0.30, 95% CI = 0.15-0.60, p = 0.001). This suggests that completing chemotherapy, while potentially beneficial for disease control, may have a negative impact on QoL. This could be due to the cumulative effects of treatment, long-term side effects, or emotional distress related to the completion of treatment and fear of recurrence. The analysis did not find any significant associations between QoL and the following factors; Age: Age was not a significant predictor of QoL in this study. This suggests that younger and older patients experienced similar levels of QoL; Education Level: Education level was not significantly associated with QoL. This may indicate that access to information and resources related to cancer care is similar across different education levels; Income: Income level was not significantly associated with QoL. This could suggest that financial resources do not play a major role in determining QoL in this population; Marital Status: Marital status was not significantly associated with QoL. This may indicate that social support from a spouse or partner does not have a major impact on QoL; Stage of Disease: Stage of disease was not significantly associated with QoL. This may suggest that patients with different stages of breast cancer experience similar levels of QoL.

Table 3. Logistic regression analysis of factors associated with quality of life.

Variable	OR	95% CI	p-value
Age (years)			
<40	1.00	-	-
40-60	0.88	0.40-1.94	0.754
>60	0.76	0.32-1.80	0.538
Education level			
Primary school - Junior high school	1.00	-	-
Senior high school	1.12	0.54-2.32	0.769
>Bachelor's degree	0.85	0.38-1.91	0.695
Income			
< Rp. 1,500,000	1.00	-	-
Rp. 1,500,000 - Rp. 3,500,000	0.76	0.35-1.66	0.492
> Rp. 3,500,000	01.08	0.48-2.43	0.854
Marital status			
Married	1.00	-	-
Unmarried	1.43	0.28-7.32	0.671
Widowed	0.89	0.38-2.09	0.785
Stage of disease			
Early	1.00	-	-
Locally Advanced	0.85	0.38-1.91	0.695
Advanced	1.12	0.49-2.56	0.781
Chemotherapy			
Not undergoing	1.00	-	-
Undergoing	1.35	0.58-3.15	0.485
Completed	0.30	0.15-0.60	0.001

4. Discussion

Chemotherapy, while a cornerstone of breast cancer treatment, exerts a profound and multifaceted impact on patients' quality of life (QoL). This impact, well-documented in the scientific literature, stems from the array of side effects that often accompany this aggressive treatment modality. These side effects can disrupt patients' daily lives, compromise their physical and emotional well-being, and challenge their sense of self. Chemotherapy's assault on rapidly dividing cancer cells often leads to collateral damage to healthy cells, resulting in a range of side effects that can vary in severity and duration. Fatigue is a pervasive sense of exhaustion and lack of energy is one of the most frequently reported side effects of chemotherapy, affecting a significant proportion of patients. Fatigue can interfere with daily activities, limit social interaction, and contribute to emotional distress. Nausea and vomiting is a gastrointestinal disturbances that can be debilitating, affecting patients' ability to eat, drink, and maintain adequate nutrition. Nausea and vomiting can also lead to dehydration and electrolyte imbalances, further compromising patients' health. Hair loss is a visible side effect that can be particularly distressing for patients, as it affects their sense of identity and femininity. Hair loss can lead to feelings of self-consciousness and social isolation. Chemotherapy can disrupt sleep patterns, leading to insomnia, frequent awakenings, and poor sleep quality. Sleep disturbances can exacerbate fatigue, impair cognitive function, and contribute to mood disorders. Chemotherapy can cause pain in various parts of the body, including the mouth, throat, abdomen, and joints. Pain can interfere with daily activities, limit mobility, and contribute to emotional distress. Often referred to as "chemo brain," this constellation of cognitive impairments can include difficulty with memory, concentration, and decision-making. Cognitive dysfunction can affect patients' ability to work, manage their finances, and maintain their independence. Mucositis is an inflammation of the mucous membranes lining the digestive tract that can cause painful sores in the mouth and throat, making it difficult to eat, drink, and swallow. Mucositis can also increase the risk of infection. Neutropenia, a decrease in white blood cells can increase the risk of infection. Patients with neutropenia may need to take precautions to avoid exposure to germs, such as staying away from crowds and washing their hands frequently. Thrombocytopenia, a decrease in platelets can increase the risk of bleeding. Patients with thrombocytopenia may need to avoid activities that could cause injury, such as contact sports. Anemia, a decrease in red blood cells can cause fatigue, shortness of breath, and dizziness. Patients with anemia may need to take iron supplements or receive blood transfusions. Peripheral neuropathy damage to the nerves in the hands and feet can cause numbness, tingling, and pain. Peripheral neuropathy can interfere with daily activities, such as walking and buttoning clothes. Some chemotherapy drugs can damage the heart, leading to heart failure or other heart problems. Some chemotherapy drugs can damage the liver, leading to liver failure or other liver problems. Some chemotherapy drugs can damage the kidneys, leading to kidney failure or other kidney problems. Some chemotherapy drugs can damage the ears, leading to hearing loss or tinnitus (ringing in the ears). The severity and duration of these side effects can vary depending on the specific chemotherapy regimen, the individual patient's health status, and other factors such as age, comorbidities, and lifestyle. Some patients may experience only mild side effects, while others may experience severe side effects that significantly impair their QoL. The impact of chemotherapy on QoL can extend beyond the acute treatment phase. Some patients experience long-term side effects, such as fatigue, cognitive dysfunction, and peripheral neuropathy, which can persist for months or even years after treatment completion. These long-term effects can continue to affect patients' daily lives and overall well-being. In addition to physical side effects, chemotherapy can also take a toll on patients' emotional well-being. The diagnosis of cancer and the experience of undergoing chemotherapy can be emotionally challenging, leading to anxiety, depression, and fear of recurrence. Patients may also experience feelings of loss of control, uncertainty about the future, and changes in their body image. The emotional distress associated with chemotherapy can significantly impact patients' QoL. It can interfere with their ability to cope with treatment, maintain relationships, and enjoy life. It is essential for healthcare providers to recognize and address the emotional needs of patients undergoing chemotherapy. The findings of this study underscore the importance of providing comprehensive supportive care to breast cancer patients undergoing chemotherapy. Supportive care aims to prevent and manage the side effects of treatment, improve patients' physical and emotional well-being, and enhance their QoL. Providing patients with information about the potential side effects of chemotherapy and strategies for managing these side effects can help them to cope with the challenges of treatment. Counseling can also help patients to address their emotional distress and develop coping mechanisms. Healthcare providers should proactively assess and manage patients' symptoms, such as fatigue, nausea, pain, and sleep disturbances. This may involve medication, lifestyle modifications, and complementary therapies. Patients may benefit from psychosocial support, such as individual therapy, support groups, and stress management techniques. Psychosocial support can help patients to cope with the emotional challenges of cancer treatment and maintain their social connections. Rehabilitation services, such as physical therapy and occupational therapy, can help patients to regain their physical function and independence after chemotherapy. Palliative care focuses on improving the quality of life for patients with serious illnesses, such as cancer. Palliative care can help to manage symptoms, provide emotional support, and coordinate care. By providing comprehensive supportive care, healthcare providers can help patients to maintain a good QoL during and after chemotherapy. Supportive care should be integrated into all aspects of cancer care, from diagnosis to treatment and beyond. Healthcare providers play a crucial role in supporting patients through the challenges of chemotherapy. They should be knowledgeable about the potential side effects of chemotherapy and the available supportive care interventions. They should also be skilled in communicating with patients about their QoL and addressing their concerns. Healthcare providers should adopt a patient-centered approach to care, recognizing that each patient's experience of chemotherapy is unique. They should work collaboratively with patients to develop individualized care plans that address their specific needs and preferences. By providing compassionate and comprehensive care, healthcare providers can help patients to navigate the challenges of chemotherapy and maintain a good QoL. The psychosocial impact of chemotherapy can be significant, affecting patients' emotional well-being, body image, relationships, and overall QoL. Healthcare providers should be sensitive to these issues and provide appropriate support and interventions. Patients may experience a range of emotions during chemotherapy, including anxiety, depression, fear, and anger. Healthcare providers should provide emotional support and counseling to help patients cope with these challenges. Chemotherapy can cause changes in body image, such as hair loss, weight gain or loss, and skin changes. These changes can affect patients' self-esteem and confidence. Healthcare providers should address body image concerns and provide resources to help patients cope with these changes. Chemotherapy can affect patients' relationships with their family, friends, and significant others. Healthcare providers should encourage patients to communicate openly with their loved ones and provide support to help them maintain healthy relationships. Chemotherapy can affect patients' sexual health and function. Healthcare providers should address sexual concerns and provide resources to help patients maintain a healthy sexual life. Chemotherapy can affect patients' ability to work. Healthcare providers should help patients to plan for their return to work and provide support to help them transition back into the workplace. It is important to recognize that each patient's experience of chemotherapy is unique. Healthcare providers should adopt a patient-centered approach to care, tailoring their interventions to the individual needs and preferences of each patient. Different chemotherapy regimens have different side effect profiles. Patients with underlying health conditions may be more vulnerable to side effects. Younger patients may be more concerned about body image changes, while older patients may be more concerned about fatigue and cognitive dysfunction. Patients with strong social support may be better able to cope with the challenges of chemotherapy. Patient's cultural and religious beliefs can influence patients' perceptions of chemotherapy and their coping mechanisms. By taking these factors into account, healthcare providers can develop individualized care plans that address the specific needs of each patient.[11-14]

While this study primarily focused on the impact of chemotherapy on the quality of life (QoL) of breast cancer patients, it also sought to explore the potential influence of various sociodemographic and clinical characteristics on QoL. Surprisingly, the findings revealed that factors such as age, education level, income, marital status, and stage of disease were not significantly associated with QoL in this particular cohort. This observation contrasts with some previous research that has suggested a relationship between these factors and QoL in breast cancer patients. Contrary to expectations, age did not emerge as a significant predictor of QoL in this study. This suggests that younger and older patients experienced similar levels of QoL, despite the potential for age-related differences in physical and emotional resilience, social support networks, and coping mechanisms. However, it is important to note that age can influence the type and severity of chemotherapy side effects experienced, as well as the overall treatment approach. Younger patients may be more likely to receive aggressive treatment regimens, which can lead to more severe side effects and a greater impact on QoL. Older patients, on the other hand, may have more comorbidities and age-related decline in physical function, which can also affect their QoL during and after chemotherapy. Furthermore, age can influence a patient's perspective on their diagnosis and treatment. Younger women may be more concerned with body image issues, fertility preservation, and the long-term implications of their diagnosis on their lives and careers. Older women may have different priorities, such as maintaining independence and managing existing health conditions alongside their cancer treatment. These differing concerns and priorities can influence how age affects QoL in the context of breast cancer. Similarly, education level was not significantly associated with QoL. This finding may indicate that access to information and resources related to cancer care is relatively equitable across different education levels in this population, or that other factors, such as personal resilience and social support, play a more significant role in determining QoL. However, education level can influence patients' understanding of their illness and treatment options, as well as their ability to navigate the healthcare system and advocate for their needs. Patients with higher education levels may be more likely to seek out information and support, which can help them to cope with the challenges of cancer treatment and maintain a good QoL. Furthermore, education level can be linked to socioeconomic status and access to resources, which can indirectly affect QoL. Patients with lower education levels may face greater challenges in accessing quality healthcare, affording medications and supportive care services, and managing the financial burden of cancer treatment. These challenges can contribute to stress and negatively impact QoL. Income level also did not show a significant association with QoL. This observation could suggest that financial resources do not play a major role in determining QoL in this population, perhaps due to the availability of subsidized healthcare or strong community support networks. However, it is important to acknowledge that financial hardship can create significant stress and potentially impact QoL, even if this was not evident in the current study. Financial concerns can affect patients' access to treatment, medications, and supportive care services, which can in turn affect their QoL. Moreover, financial strain can limit patients' ability to engage in activities that promote well-being, such as healthy eating, exercise, and stress-reducing activities. It can also affect their ability to maintain social connections and participate in meaningful activities, which are important for QoL. Marital status was not significantly associated with QoL in this study. This may indicate that social support from a spouse or partner does not have a major impact on QoL, or that patients receive adequate support from other sources, such as family, friends, or support groups. However, it is important to note that the quality of marital relationships can vary significantly, and a supportive partner can be a valuable source of comfort and strength during cancer treatment. Marital distress, on the other hand, can add to the emotional burden of cancer and negatively impact QoL. Furthermore, marital status can influence patients' access to practical and emotional support. Married patients may have a partner to help with household chores, transportation, and childcare, which can reduce stress and improve QoL. However, unmarried patients may have strong social support networks from other sources, such as family, friends, and community organizations, which can also contribute to their well-being. Interestingly, the stage of disease was not significantly associated with QoL in this study. This may suggest that patients with different stages of breast cancer experience similar levels of QoL, perhaps due to the availability of effective treatments and supportive care interventions for all stages of the disease. However, it is also possible that the study did not capture the full range of challenges faced by patients with advanced disease, such as increased symptom burden, treatment complications, and existential distress. Patients with advanced disease may also face more difficult treatment decisions and a greater uncertainty about the future, which can affect their QoL. Furthermore, the stage of disease can influence the intensity and duration of treatment, which can in turn affect QoL. Patients with early-stage disease may undergo less aggressive treatment with fewer side effects, while patients with advanced disease may require more intensive treatment with a greater impact on their physical and emotional well-being. The sample size of 150 patients may have been too small to detect subtle differences in QoL between groups. Larger studies with greater statistical power may be needed to identify significant associations between these factors and QoL. The study population may have been relatively homogeneous in terms of sociodemographic and clinical characteristics, limiting the ability to detect significant differences between groups. Studies with more diverse populations may be more likely to identify factors associated with QoL. The study may not have measured all of the relevant factors that can affect QoL. For example, the study did not assess psychological factors, such as depression, anxiety, and coping mechanisms, which have been shown to influence QoL in cancer patients. Future studies should include a broader range of variables to capture the complexity of factors affecting QoL. Cultural factors may also play a role in the relationship between sociodemographic and clinical characteristics and QoL. For example, in some cultures, there may be a stigma associated with cancer or mental health issues, which could prevent patients from seeking help or disclosing their symptoms. Future studies should consider the cultural context in which the research is conducted. Despite the lack of significant associations between sociodemographic and clinical characteristics and QoL in this study, it is important to note that these factors may still play a role in individual patients' experiences. Healthcare providers should consider these factors when assessing and addressing the needs of individual patients. For example, a young woman with early-stage breast cancer who is experiencing significant hair loss may benefit from counseling and support to address body image concerns. An older woman with advanced breast cancer who is experiencing fatigue and cognitive dysfunction may benefit from rehabilitation services and palliative care. Healthcare providers should adopt a holistic approach to care, considering the patient's physical, emotional, social, and spiritual needs. They should work collaboratively with patients to develop individualized care plans that address their specific needs and preferences.[15-17]

The findings of this study have significant implications for healthcare providers in Indonesia who are involved in the care of breast cancer patients undergoing chemotherapy. The study highlights the importance of providing comprehensive supportive care to these patients to improve their quality of life (QoL). This supportive care should address both the physical and psychological side effects of chemotherapy, recognizing that these side effects can significantly impact patients' daily lives, emotional well-being, and overall sense of self. Comprehensive supportive care encompasses a wide range of interventions aimed at preventing and managing the side effects of cancer treatment, improving patients' physical and emotional well-being, and enhancing their QoL. It should be an integral part of cancer care, from diagnosis to treatment and beyond. Chemotherapy can cause a multitude of physical side effects, including fatigue, nausea, hair loss, sleep disturbances, pain, and cognitive dysfunction. These side effects can interfere with patients' daily activities, limit their ability to work and socialize, and contribute to emotional distress. Healthcare providers should be proactive in assessing and managing these side effects, using a combination of pharmacological and non-pharmacological interventions. Healthcare providers should be knowledgeable about the various medications available to manage chemotherapy-induced side effects. These medications may include antiemetics for nausea and vomiting, analgesics for pain, and sleep aids for insomnia. In addition to medication, healthcare providers should encourage patients to adopt lifestyle modifications that can help to manage side effects. These modifications may include regular exercise, a healthy diet, stress management techniques, and adequate sleep. Complementary therapies, such as acupuncture, massage, and yoga, may also be helpful in managing side effects and improving QoL. The psychological impact of cancer and its treatment can be just as significant as the physical impact. Patients may experience anxiety, depression, fear of recurrence, and body image concerns. Healthcare providers should be sensitive to these issues and provide appropriate support and interventions. Healthcare providers should provide emotional support and counseling to patients, helping them to cope with the emotional challenges of cancer treatment. This may involve active listening, empathy, and validation of patients' feelings. Patients may benefit from psychosocial support, such as individual therapy, support groups, and stress management techniques. These interventions can help patients to develop coping mechanisms, maintain social connections, and improve their overall well-being. Healthcare providers should address body image concerns, providing resources and support to help patients cope with changes in their appearance. This may involve referral to a support group or counselor specializing in body image issues. Healthcare providers should empower patients by providing them with information about their illness, treatment options, and potential side effects. This information should be presented in a clear and understandable manner, tailored to the individual patient's needs and preferences. Healthcare providers should educate patients about the goals of chemotherapy, the expected duration of treatment, and the potential benefits and risks. This education can help patients to make informed decisions about their care and to feel more in control of their situation. Healthcare providers should educate patients about the potential side effects of chemotherapy and provide strategies for managing these side effects. This education can help patients to anticipate and cope with side effects, reducing their impact on QoL. Healthcare providers should encourage patients to adopt self-care strategies, such as healthy eating, regular exercise, and stress management techniques. These strategies can help patients to maintain their physical and emotional well-being during and after chemotherapy. Healthcare providers should encourage patients to participate in activities that can improve their QoL, such as exercise, relaxation techniques, and support groups. Regular exercise has been shown to improve physical and emotional well-being in cancer patients. Healthcare providers should encourage patients to engage in moderate-intensity exercise, such as walking, swimming, or cycling, for at least 30 minutes most days of the week. Relaxation techniques, such as deep breathing, meditation, and yoga, can help to reduce stress and improve emotional well-being. Healthcare providers should encourage patients to practice relaxation techniques regularly. Support groups provide a safe and supportive environment for patients to share their experiences, connect with others who understand what they are going through, and learn coping strategies. Healthcare providers should encourage patients to participate in support groups. Healthcare providers should ensure continuity of care for breast cancer patients undergoing chemotherapy. This may involve coordinating care with other healthcare professionals, such as oncologists, nurses, social workers, and dieticians. Healthcare providers should work collaboratively with other healthcare professionals to provide comprehensive care to patients. This may involve regular communication and coordination of care plans. Healthcare providers should provide follow-up care to patients after they have completed chemotherapy. This may involve monitoring for late effects of treatment, providing ongoing support, and addressing any concerns that patients may have. Healthcare providers should be culturally sensitive when providing care to breast cancer patients. This may involve understanding patients' cultural beliefs and practices, communicating in a culturally appropriate manner, and respecting patients' values and preferences.[18-20]

5. Conclusion

This study found that chemotherapy significantly impacts the QoL of breast cancer patients in Palembang, Indonesia. Patients who had completed chemotherapy had a significantly lower QoL than those who had not undergone chemotherapy. The intensity of chemotherapy was also significantly associated with QoL, with patients receiving more intense chemotherapy reporting lower QoL. These findings highlight the importance of providing comprehensive supportive care to breast cancer patients undergoing chemotherapy to improve their QoL. Supportive care should address both the physical and psychological side effects of chemotherapy. Physical side effects, such as fatigue, nausea, hair loss, sleep disturbances, pain, and cognitive dysfunction, can be managed with medication, lifestyle modifications, and complementary therapies. Psychological side effects, such as anxiety, depression, fear of recurrence, and body image concerns, can be addressed with counseling, psychosocial support, and patient education. Healthcare providers should adopt a patient-centered approach to care, recognizing that each patient's experience of chemotherapy is unique. They should work collaboratively with patients to develop individualized care plans that address their specific needs and preferences. By providing compassionate and comprehensive care, healthcare providers can help patients to navigate the challenges of chemotherapy and maintain a good QoL. This study has several limitations, including its small sample size and its focus on a single hospital in Indonesia. Future research should be conducted with larger and more diverse samples to confirm these findings and to explore the impact of other factors on QoL in breast cancer patients undergoing chemotherapy.

6. References

1. Keshtpour Amlashi Z, Bazrafshan M, Shariat Panahi S, Javadi M, Aghababaei Z, Tapak L, et al. Assessment of quality of life and its associated factors in nonmetastatic breast cancer patients. Iran J Breast Dis. 2024; 17(1): 102–15.
2. Wang JH-Y, Brown RL, Huang E, Schwartz MD. Mediational roles of stress-coping factors in the relationship between patient-perceived communication quality and physical functioning: racial difference between Chinese and Non-Hispanic White American breast cancer survivors. Qual Life Res. 2024; 33(1): 253–65.
3. Wan C, Zhang D, Yang Z, Tu X, Tang W, Feng C, et al. Validation of the simplified Chinese version of the FACT-B for measuring quality of life for patients with breast cancer. Breast Cancer Res Treat. 2007; 106(3): 413–8.
4. Hahn EA, Segawa E, Kaiser K, Cella D, Smith BD. Health-related quality of life among women with ductal carcinoma *in situ* or early invasive breast cancer: validation of the FACT-B (version 4). Expert Rev Qual Life Cancer Care. 2016; 1(1): 99–109.
5. Yang Q, Yu XX, Zhang W, Li H. Mapping function from FACT-B to EQ-5D-5 L using multiple modelling approaches: data from breast cancer patients in China. Health Qual Life Outcomes. 2019; 17(1): 153.
6. Li S, Li X, Li D, Zhao Q, Zhu L, Wu T. A meta-analysis of randomized controlled trials comparing breast-conserving surgery and mastectomy in terms of patient survival rate and quality of life in breast cancer. Int J Qual Health Care. 2024; 36(2).
7. Touré M, Sfairy S-M, Bédard SK, McFadden N, Hanel R, Lemay F, et al. Cancer population

norms using a new value set for the SF-6Dv2 based on the preferences of patients with breast or colorectal cancer in Quebec. Qual Life Res. 2024; 33(6): 1605–19.

8. Suzuki K, Morishita S, Nakano J, Okayama T, Inoue J, Tanaka T, et al. Association between quality of life and mortality risk in patients with breast cancer: a systematic review and meta-analysis. Breast Cancer. 2024; 31(4): 552–61.
9. Stafford L, Sinclair M, Butow P, Hughes J, Park A, Gilham L, et al. Quality of life outcomes associated with optimization of treatment by omitting radiotherapy in early breast cancer. Clin Breast Cancer. 2024; 24(5): 447-456.e2.
10. Kapoor R, Dey T, Khosla D, Laroiya I. A prospective study to assess the quality of life (QOL) in breast cancer patients and factors affecting quality of life. Innovative Practice in Breast Health. 2024; 2(100004): 100004.
11. Salman Saraç F, Erkal İlhan S, Kutun S, Kutlutürkan S. The effect of informative mobile app use on anxiety, distress, and quality of life of women with breast cancer. Eur J Breast Health. 2024; 20(3): 207–14.
12. Bolliger M, Gambone L, Haeusler T, Mikula F, Kampf S, Fitzal F. Patient satisfaction, esthetic outcome, and quality of life in oncoplastic and reconstructive breast surgery: a single center experience. Breast Care (Basel). 2024; 19(4): 215–22.
13. Mur-Gimeno E, Coll M, Yuguero-Ortiz A, Navarro M, Vernet-Tomás M, Noguera-Llauradó A, et al. Comparison of water- vs. land-based exercise for improving functional capacity and quality of life in patients living with and beyond breast cancer (the AQUA-FiT study): a randomized controlled trial. Breast Cancer. 2024; 31(5): 815–24.
14. Duran S, Varol U, Tekir Ö, Soytürk AH. Resilience's impact on quality of life and post-traumatic growth in breast cancer patients during treatment. Breast Cancer. 2024; 31(5): 807–14.
15. Okuyama H, Takada F, Taira N, Nakamura S. A randomized trial of the impact of symptom monitoring using an electronic patient-reported outcome app on health-related quality of life in postmenopausal breast cancer patients receiving adjuvant endocrine therapy. Breast Cancer. 2024; 31(5): 787–97.
16. Pinelli F, Barbani F, Defilippo B, Fundarò A, Nella A, Selmi V, et al. Quality of life in women with breast cancer undergoing neoadjuvant chemotherapy: comparison between PICC and PICC-port. Breast Cancer. 2024; 31(5): 945–54.
17. Henneghan AM, Van Dyk KM, Haywood D, Patel M, Franco-Rocha OY, Bang S, et al. Characterizing cancer-related cognitive impairments and impact on quality of life in women with metastatic breast cancer. Breast Cancer Res Treat. 2024.
18. Irzaldy A, Otten JDM, Kregting LM, van der Molen DRM, Verkooijen HM, van Ravesteyn NT, et al. Quality of life of women with a screen-detected versus clinically detected breast cancer in the Netherlands: a prospective cohort study. Qual Life Res. 2024.
19. Ansari T, Rai P, Singh A, Srivastava R, Singh S, Gopal VR. Effect of flaxseed on pain relief and quality of life in patients with mastalgia: a single arm interventional study. Eur J Breast Health. 2024; 20(4): 303–8.
20. Morse RT, Bean NW, Hall J, Deal A, Nyrop KA, Abdou Y, et al. Quality of life outcomes in breast cancer patients receiving chemotherapy with or without radiation therapy. Clin Breast Cancer. 2025; 25(1): e86–93.