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The Quality of Life Breast Cancer Patients Receiving Chemotherapy and The Factors Affecting It in a Regional Hospital in Gianyar

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ABSTRACT

The effects of breast cancer and chemotherapy can impact the quality of life (QOL) of patients. However, QOL can also be influenced by various characteristics directly related to them. This study aimed to analyze the QOL of breast cancer patients undergoing chemotherapy and the factors that can affect it. It was cross-sectional study conducted at a hospital in Gianyar, Bali in May-June 2024, with a sample of 135 breast cancer patients undergoing chemotherapy, selected using the purposive sampling method. The inclusion criteria required patients to have complete medical records and to agree to participate in the study, while those who did not fully complete the questionnaire were excluded. The research instrument used the EORTC QLQ C-30 and EORTC QLQ BR-23 questionnaires to assess QOL, as well as data collection sheets for personal and clinical information. Data were analyzed using Spearman's rho test, Eta test, and Mann-Whitney U-test, (CI 95%). Findings showed the majority of the respondents were <60 years old (84.4%), female (100.0%), had completed elementary school (46.7%), were employed (56.2%), lived far from health facilities (75.6%), had stage 2 cancer (48.1%), received treatment >3 times per month (51.9%), had no comorbidities (96.3%), underwent a combination of injection and oral chemotherapy (37.8%), and had an average QOL score of 93.2±8.9. Type of chemotherapy and comorbidities correlated with the QOL of the patients ($p<0.001$), while sociodemographic characteristics did not. Positive support from health workers, family, and the patient's environment was suspected to contribute to a good QOL.

INTRODUCTION

Breast cancer (*Carcinoma mammae*) is a malignant tumor that forms in breast tissue. This disease occurs almost always in women but can also happen in men (Iqmy et al., 2021). In Indonesia, according to the 2020 report by the Global Burden of Cancer Study (Globocan), breast cancer accounted for 16.6% of all new cancer cases, which constitutes 36.14% of the total newly diagnosed cancers. Meanwhile, the death toll from breast cancer exceeded 22,000 cases (Globocan, 2020). Breast cancer ranks first as a contributor to cancer deaths in Indonesia. Bali Province, alongside the Special Region of Yogyakarta (DIY), West Sumatra, Gorontalo, and the Special Capital Region (DKI) Jakarta, are Indonesia's five highest provinces contributing to breast cancer cases. When viewed from the type of treatment, it was recorded that the prevalence of breast cancer in Bali Province for patients undergoing chemotherapy was 41.8% (Dinkes Denpasar, 2022).

The significant incidence of breast cancer cases places a burden on both health systems and the economy, impacting patients, government bodies, and healthcare providers. This is due to the expensive nature of treatments such as chemotherapy (Aisyah et al., 2020). The

high cost of chemotherapy for breast cancer can particularly impact lower middle-class patients, leading to delays in treatment and worsening of acute symptoms such as continuous bleeding or intensified pain (Perkumpulan PRAKARSA, 2023). Taking into account the challenges posed by breast cancer in terms of morbidity, mortality, and the financial responsibilities of patients, it can greatly influence the psychological and mental health of individuals, consequently impacting their overall quality of life (QOL). (Husni et al., 2015).

The QOL of patients undergoing chemotherapy is a cancer patient's view of their life holistically, including physical, psychological, spiritual, social, and environmental, which is greatly influenced by changes that occur in their life as a result of the effects of cancer itself and additional effects of chemotherapy which are often complaints of cancer patients in carrying out daily activities. One form of decreased QOL that breast cancer patients most often experience is from the psychological dimension because they frequently feel afraid of the possibility of death and worry when they are going to tell their family about their illness (Natasya, 2018). In addition, after undergoing chemotherapy, patients often experience a decreased ability to think, remember, and concentrate (Wulandari et al., 2017).

Alongside the effects of cancer and its treatments, the QOL of individuals with cancer can also be affected by their traits, which encompass sociodemographic factors, psychological aspects, environmental influences, and the availability of social support. Research by Üstündağ and Zencirci (2015) showed that women from different sociodemographic backgrounds, particularly those who are housewives, reported a lower QOL, especially regarding their physical and social well-being, largely because they lack adequate social support. Moreover, the presence of social support is vital for the recovery of individuals with cancer, leading to enhancements in their QOL (Sesrianty et al., 2021).

In the province of Bali, various studies have been conducted to assess the QOL for individuals diagnosed with breast cancer. Most of these studies have focused on health facilities in Denpasar as the city center and provincial capital, which have shown a good QOL for patients (Mursyid et al., 2019; Larasati et al., 2021; Sudiasta et al., 2022). This is associated with the improved availability of healthcare, which helps prevent delays in the early detection and treatment alternatives for breast cancer patients. Consequently, it enhances the recovery speed and boosts the QOL for these individuals (Barrios, 2022). However, in other areas of Bali, particularly in rural regions like East Bali, such as Gianyar, where distance from the city center is a challenge, there are also breast cancer patients receiving treatment at local hospitals. But so far, there hasn't been any research assessing the QOL of these patients. Upon reviewing the current body of literature, it was noted that the study conducted by Marangyana et al. (2022) primarily focused on breast cancer patients receiving chemotherapy at a healthcare facility in Gianyar. Nevertheless, this study only described the trends in oral chemotherapy prescriptions and did not evaluate the QOL of the patients. As a result, this research intends to analyze the QOL of breast cancer patients receiving chemotherapy and identify the factors influencing their QOL in a regional hospital in Gianyar, Bali

METHODS

This observational research, characterized by a cross-sectional design, included 135 participants recruited between May and June 2024. Data was collected over a month using purposive sampling methods. The inclusion criteria involved breast cancer patients who were 18 years of age or older and undergoing chemotherapy, had comprehensive medical records and agreed to participate in the study by signing an informed consent form. Conversely, those who completed the questionnaire partially due to communication barriers or were experiencing a compromised condition were excluded from the study.

Research instrument

The research utilized the EORTC QLQ-C30 and the EORTC QOL Breast-23 (BR-23) questionnaires, which were created by the European Organization for Research and Treatment of Cancer (EORTC), to evaluate the quality of life in individuals with breast cancer. The EORTC QLQ C-30 is a tool specifically designed to measure aspects of QOL in cancer patients, comprising 30 questions that evaluate

various dimensions of well-being, including global health status (29 to 30). The functional scales include physical functioning (1 to 5), role functioning (6 to 7), emotional functioning (21 to 24), cognitive functioning (20 and 25), and social functioning (26 to 27). The symptom scales encompass fatigue (10, 12, and 18), nausea and vomiting (14 to 15), pain (9 and 19), dyspnea (8), insomnia (11), loss of appetite (13), constipation (16), diarrhea (17), and financial difficulties (28) (EORTC, 2024[a]). Conversely, the EORTC QLQ-BR23 is a targeted tool containing 23 questions aimed at assessing the QOL for individuals with breast cancer. It includes a functional scale as well as symptom scales tailored specifically for breast cancer patients at various stages of therapy (surgery, chemotherapy, or radiotherapy). Functional scales in EORTC BR-23 consist of body image (39 to 42), sexual functioning (44 to 45), sexual enjoyment (46), and future perspective (43), while symptom scales consist of systematic therapy side effects (31 to 34, 36 to 38), breast symptom (50 to 53), arm symptom (47 to 49), and upset by hair loss (35) (EORTC, 2024[b]). The initial forms of the questionnaire were in English. Nonetheless, this study made use of a translated version in Indonesian.

Every questionnaire was subjected to validity and reliability tests within a substantial population in Indonesia, as demonstrated in prior research conducted by Perwitasari et al. (2011) and Adli et al. (2020). The EORTC QLQ-C30 questionnaire shows strong reliability, with an internal consistency value (measured by Cronbach's alpha) exceeding 0.70. Additionally, this questionnaire has been validated using several approaches, such as assessments for convergent validity, discriminant validity, known-groups validity, factor analysis, and external convergent validity ($r \geq 0.40$ and $p < 0.05$) (Perwitasari et al., 2011). The EORTC BR-23 questionnaire demonstrates strong validity, as shown by construct validity evaluated through multi-trait scaling analysis. This analysis reveals a strong correlation ($r \geq 0.40$) between the scores of individual questions and the overall domain scores. In addition, the survey demonstrates consistent performance, as shown by a Cronbach's alpha value exceeding 0.70 (Adli et al., 2020). This study also conducted a re-validation process, which included an assessment of face validity. The findings showed that the items on the EORTC QLQ C-30 and BR-23 surveys exceeded the validity benchmark of 80%. The products were thoughtfully crafted, easy to understand, and devoid of any confusion, vagueness, or unnecessary length. Additionally, data collection forms were employed to verify and establish patient identities using medical records, which included information on cancer stage, type of chemotherapy, monthly chemotherapy frequency, and any existing comorbid conditions.

Data analysis

The QOL for individuals with breast cancer begins with translating qualitative answers on the Likert Scale into numerical scores ranging from 0 to 100. A higher score indicates a more intense response. Therefore, a high score on a functional scale represents better functioning; a high score on the global health status signifies an enhanced QOL, while a high score on a symptom scale indicates more serious problems. The transformation process follows the following main steps from the scoring manual guideline of EORTC QLQ:

1. Determining the raw score requires calculating the mean of the items for every scale.
2. Using a linear transformation to standardize raw scores ensures that they are scaled to a range of 0 to 100. Formulas that can be used for score transformation on EORTC QLQ C30 and EORTC QLQ BR-23:
   a. Global health status/ QOL
      = (raw score -1/range) x 100 …….. (1)
   b. Functional scale
      = (1- (raw score – 1/range) x 100 …… (2)
   c. Symptom scale
      = (raw score -1/range) x 100 …….. (3)

The range of values for the formula indicates the gap between the highest and lowest answers for each item (EORTC, 2024[c]).

The patients' characteristics were evaluated to outline the socio-demographic and clinical profiles of the participants, along with their QOL, utilizing percentage frequency and mean ± standard deviation (SD). Statistical analyses were performed at a 95% confidence level, employing tests such as Spearman's rho for ordinal-ratio data and the Eta test for nominal-ratio data. In addition, the Mann-Whitney U test

assesses the relationship between patient characteristics and QOL, providing a significance value (p-value) that complements the Eta test, which is limited to yielding only a correlation coefficient value (r-value).

RESULT AND DISCUSSION

Overview of Patient Characteristics

The study's respondents were predominantly women who had undergone the entire series of chemotherapy covered by BPJS Kesehatan. Additionally, the majority of the respondents were aged 41-60 years (62.2%), had completed elementary school (46.7%), were still employed (56.2%), and lived far from health facilities (75.6%) (Table 1). Rahmiwati et al. (2022) backed up these results, indicating that all of their participants were women, with most being under 60 years old (73.3%) and having completed only elementary school (80%). In a similar vein, an earlier study by Juwita et al. (2018) revealed that a significant number of respondents were still employed (32.4%) and resided in rural areas (33.9%).

When analyzing the age and gender factors related to breast cancer incidence, the likelihood of developing breast cancer rises for those over 40 years of age, and it predominantly affects women (WHO, 2024). Hormones influence breast cancer and depend on estrogen's stimulating effects to facilitate tumor development and growth. Around 80% of human breast cancers exhibit notable estrogen receptor (ERα) expression levels, while approximately 55% display progesterone receptor expression (Massardi, 2021). However, individuals under 40 may have higher risk factors and tend to be more aggressive than those in older age groups. This is attributed to various other risk elements, including the presence or absence of genetic factors and unhealthy lifestyle choices. Generally, breast cancer patients who are diagnosed at a young age tend to have larger tumor sizes and more advanced metastases, making treatment more difficult as they have to minimize the side effects of treatment, such as early menopause and osteoporosis (Johnson et al., 2018).

The occurrence of breast cancer is affected by a range of sociodemographic factors, including educational attainment and geographical location. Individuals with lower levels of

Table 1. Attributes of breast cancer patients in a regional hospital in Gianyar

Characteristic	n (135)	%
Age (years old)		
18-21	1	0.74
22-40	29	21.5
41-60	84[a]	62.2
>60	21	15.6
Education level		
Elementary school	63[a]	46.7
Junior high school	20	14.9
Senior high school	30	22.2
High education	22	16.2
Employment status		
Employed	76[a]	56.2
a. Teacher	20	14.8
b. Entrepreneur	15	11.1
c. Farmer	25	18.5
d. Private sector	10	7.40
e. Public sector	6	4.44
Unemployed	59	43.7
Residency		
Far > 5 km	102[a]	75.6
Nearby < 5 km	33	24.4
Stage of cancer		
1	15	11.1
2	65[a]	48.1
3	51	37.8
4	4	2.9
Frequency of chemotherapy in a month		
< 3	65	48.1
> 3	70[a]	51.9
Comorbidity		
Yes	5	3.70
a. Hypertension	3	2.22
b. Diabetes mellitus	2	1.48
No	130[a]	96.3
Type of chemotherapy		
Oral (Capecitabine)	35	25.9
Injection-injection		
a. Zoledronic acid, Trastuzumab, Paclitaxel, Doxorubicin	30	22.2
b. Gemzical, Carboplatin	19	14.1
Injection-oral	51[a]	37.8
a. Doxorubicin, Cyclophosphamide, Capecitabin		

Abbreviation: (a) most frequent

education may have limited knowledge and health behaviors, leading to delayed visits to health facilities and preventive measures for breast cancer. Additionally, the location of a person's residence can impact their access to healthcare facilities and affect their daily activities (Rahmiwati et al., 2022). The closeness and duration of travel to healthcare facilities significantly influence the early detection and treatment of breast cancer (Fitriani et al., 2021). Additionally, it has been observed that women residing in rural regions face a greater risk of being diagnosed with late-stage breast cancer compared to those living in urban settings (Sprague et al., 2021). Moreover, breast cancer patients who continue to work may experience a better QOL due to increased social interaction (Juwita et al., 2018; Anggreni et al., 2022).

Table 1 also showcases the clinical characteristics of breast cancer patients who are undergoing chemotherapy, indicating that most respondents were at stage 2 (48.1%), receiving chemotherapy treatment more than three times a month (51.9%), and had no comorbid conditions (96.3%). Earlier studies conducted by Juwita et al. (2018) support these results, revealing that most patients received a diagnosis of stage 2 breast cancer. Advanced stages of breast cancer often result from delayed self-checking for symptoms, such as painless lumps in the breast being ignored, which leads to delayed medical attention. Identifying the indications and manifestations of breast cancer is essential for timely diagnosis and intervention (Juwita et al., 2018). The other clinical profile is the frequency of oral chemotherapy treatment, which depends on the patient's condition and response to treatment. For instance, the oral chemotherapy drug capecitabine is typically administered twice a day for two weeks, with the option to repeat the same dose after one week based on the patient's response and tolerance to therapy (Habib et al., 2021). Combination chemotherapy drugs are usually given in a 21-day cycle with six administrations. In contrast, injection chemotherapy is administered in several cycles, followed by a rest period to allow for recovery from the side effects (American Cancer Society, 2021).

Most of the participants underwent treatment in the oral-injection combination chemotherapy group (37.78%), followed by the injection-injection combination chemotherapy group (36.29%). Combination chemotherapy regimens are consistently favored over single agents for treating metastatic breast cancer to achieve superior tumor response rates (Abotaleb et al., 2018). This is supported by Cardoso et al., who assert that combination regimens are correlated with quicker and higher objective responses, particularly for patients with rapidly growing and life-threatening tumors or highly symptomatic metastases (Cardoso et al., 2016).

Throughout the study, researchers noticed that patients attended the hospital for treatment with their families. Relatives of breast cancer patients are essential in offering support during chemotherapy, as this familial assistance significantly contributes to emotional backing and recognition, helping patients feel valued and loved. This support can provide psychological benefits, namely better life expectancy and reduced risk of anxiety, stress, and depression (Aprilianto et al., 2021). In addition, the high cost of chemotherapy treatment can further burden patients and their families, thus impacting the QOL of breast cancer patients. According to Muralidharan et al. (2023), insufficient health insurance coverage and restricted access to publicly funded healthcare services exacerbate the challenges associated with cancer. The presence of BPJS Kesehatan, Indonesia's national health insurance, helps alleviate the financial stress and anxiety associated with cancer treatment costs since the government covers these expenses (Nancy et al., 2023). This support offers breast cancer patients a sense of security and peace, positively influencing their QOL during chemotherapy. In the study conducted by Nancy et al. (2023), it was found that breast cancer patients enrolled in BPJS Kesehatan experienced a higher QOL regarding their overall health status.

Respondent's QOL overview

Based on The EORTC QLQ C-30 questionnaire

The measurement of QOL based on the EORTC QOL C-30 questionnaire reveals an average score of 87.6 ± 6.4 on the functional scale. The highest score is in cognitive function (90.6 ± 13.6), and the lowest is in emotional function (81.4 ± 13.3) (Table 2). The score is close to the maximum value (100), indicating a good functional scale for the average respondent. Rahayu and Suprapti (2020)

Table 2. Overview of the QOL for breast cancer patients at a regional hospital in Gianyar

Type of questionnaire	Scale	x̄ ± SD
EORTC QLQ C-30	**Functional scale**	
	Physical	90.3 ± 10.0
	Role	88.4 ± 15.0
	Emotional	81.4 ± 13.3
	Cognitive	90.6 ± 13.6[a]
	Social	88.9 ± 11.3
	x̄ ± SD	87.6 ± 6.4
	Symptom scale	
	Fatigue	27.5 ± 16.6[a]
	Nausea and vomiting	13.1 ± 16.7
	Pain	16.1 ± 13.3
	Dyspnoea	1.4 ± 0.8
	Insomnia	2.3 ± 1.1
	Appetite lose	1.5 ± 0.7
	Constipation	1.3 ± 0.6
	Diarrhea	1.1 ± 0.3
	Financial difficulties	1.5 ± 0.8
	x̄ ± SD	18.6 ± 9.0
	Global health status/ QOL	93.2 ± 8.9
EORTC QLQ BR-23	**Functional scale**	
	Body image	57.6 ± 23.0[a]
	Sexual functional	55.4 ± 25.1
	Sexual enjoyment	2.5 ± 0.8
	Future perspective	2.4 ± 0.9
	x̄ ± SD	55.6 ± 13.9
	Symptom scale	
	Systemic therapy side effects	37.7 ± 15.2[a]
	Breast symptom	10.7± 15.6
	Arm symptom	20.9 ± 19.2
	Upset by hair loss	2.6 ± 1.2
	x̄ ± SD	37.7 ± 12.2

Abbreviation: (a) most frequency; SD,

suggest that patients receiving information on health maintenance and support from fellow cancer sufferers with good QOL may boost immunity and resilience in cancer patients (Rahayu and Suprapti, 2020). This study's findings align with research by Juwita et al., which notes that cognitive function has the highest average score. Cognitive function includes questions related to a patient's ability to concentrate on activities and remember things (Juwita et al., 2018).

Chemotherapy treatment can accelerate aging and increase susceptibility to cognitive decline or dementia later in life, typically beginning around age (Gregorowitsch et al., 2019). Symptoms may include memory loss, difficulty concentrating, and impaired thinking, which can negatively impact the QOL for breast cancer patients. Some patients experience temporary symptoms of cognitive decline due to chemotherapy, while for others, the impact on their QOL may be more severe (Gregorowitsch et al., 2019). Respondents in this study reported minimal changes in cognitive function after undergoing chemotherapy. Emotional function is linked to emotional intelligence, where good emotional self-control can lead to higher emotional intelligence, enabling individuals to manage emotions, motivate themselves, and be more productive. Lower emotional intelligence may lead to feelings of anxiety, isolation, fear, sadness, and increased vulnerability to depression, ultimately affecting QOL (Kulkarni and Velhal, 2023).

Based on **Table 2**, the average respondent score on the symptom scale was 18.6±9.0. The lower score on the symptom scale indicates that the patient feels fewer symptoms. A low score on the symptom scale suggests that cancer patients undergoing chemotherapy have high spirits, resulting in fewer excessive symptoms, which may lead to feelings of helplessness and a lack of enthusiasm to survive (Rahayu and Suprapti, 2020). The study also found that fatigue had the highest symptom score (27.5±16.6), while diarrhea had the lowest (1.1±0.3) (Table 2). According to Epstein et al. (2021), the most frequently reported side effect of chemotherapy was fatigue. Patients with advanced cancer are more likely to experience severe physical problems due to metastasis (Wang et al., 2018). Chemotherapy may also lead to side effects, including diarrhea. However, this can be overcome by consuming fiber-rich bananas that can help overcome diarrhea after undergoing chemotherapy (Tunas et al., 2016).

The average QOL score for all respondents, based on their general health status, was 93.2±8.9 (Table 2). This assessment includes two questions about the patient's overall health condition and QOL (Wahyuni et al., 2020). The

Table 3. The relationship between the characteristics of patients and their QOL in breast cancer individuals undergoing chemotherapy at a regional hospital in Gianyar

Characteristic (n=135)	QOL scoring ($\bar{x}$ ± SD)	p-value	r-value
Age (years old)			
18-21	75.0 ± 0.0		
22-40	91.2 ± 16.7	0.547[a]	0.052[a]
41-60	91.6 ±1 9.3		
>60	85.8 ± 21.1		
Educational level			
Elementary school	88.6 ± 14.7		
Junior high school	89.1 ± 22.5	0.055[a]	0.165[a]
Senior high school	91.9 ± 19.6		
High education	92.8 ± 22.1		
Employment status			
Employed	93.1 ± 3.0	0.177[c]	0.146[b]
Unemployed	91.5 ± 9.5		
Residency			
Far > 5 km	92.4 ± 12.8	0.701[c]	0.085[b]
Nearby< 5 km	88.6 ± 18.2		
Type of chemotherapy			
Oral (Capecitabin)	92.4 ± 17.1		
Injection-injection	79.6 ± 18.2	0.035[c]*	0.216[b]
Injection-oral	68.0 ± 35.4		
Stadium of cancer			
1	92.7 ± 25.1		
2	91.2 ± 14.9	0.581[a]	0.048[a]
3	90.7 ± 15.5		
4	73.2 ± 41.8		
Comorbidity			
Yes	73.5 ± 37.4	0.038[c]*	0.188[b]
No	93.2 ± 8.9		
Frequency of chemotherapy in a month			
< 3	91.9 ± 9.6	0.097[a]	0.143[a]
> 3	94.1 ± 8.3		

Abbreviation: (*) significance (p <0.05); (a) Spearman-ρ test; (b) η test; (c) Mann-Whitney U test

study classified the average QOL score as good because it was close to the maximum value of 100. Similarly, Juwita et al. reported that the average QOL score of the respondents was also classified as good (93.2) due to good functional scale scores and low symptom scale scores (Juwita et al., 2018). A good QOL for breast cancer patients can increase life expectancy and reduce psychological problems such as anxiety, stress, and depression. Additionally, it can increase motivation to recover despite potential side effects that may interfere with daily activities (Sari et al., 2019). A good QOL also will allow individuals with breast cancer to fulfill their family roles, work, and participate in social activities (Tunas et al., 2016).

Based on The EORTC QLQ BR-23 Questionnaire

In the EORTC QLQ BR-23 questionnaire, the average score on the symptom scale was 55.6±13.9 (Table 2). This is similar to the average functional scale score found in a study by Ganesh et al. (48.75±27.27) (Ganesh et al., 2016). The functional scale in the EORTC QLQ BR-23 questionnaire is closely linked to the patient's body image and self-confidence regarding their sexual orientation. This is especially true after undergoing general treatments such as surgery, radiotherapy, and chemotherapy, which can significantly impact the patient's QOL (Anggreni et al., 2022). On the functional scale, the highest score was in the body image (57.6±23.0), while the lowest was in the future views (2.4±0.9) (Table 2). This aligns with the findings of Chen et al. (2018), which indicated that the future view domain had the lowest average score (51.5±31.4), followed by the body image domain (64.9±25.0). For breast cancer patients, self-image, particularly body image, may be a concern that can diminish their QOL due to physical changes that affect their self-confidence. Research by Shafaee et al. (2018) supports this by stating that a person's self-confidence significantly impacts the QOL for breast cancer patients. Similarly, Subagya et al. (2018) found that higher levels of self-confidence are associated with a better QOL. Mahmuddin et al. (2019) also noted that while body image struggles may reduce a patient's QOL, maintaining a positive mindset can improve body image and subsequently boost self-confidence for individuals facing breast cancer.

The average symptom scale score in this study was 37.7±12.2 (**Table 2**). This aligns with the findings of Chen et al. (2018), whose research using the EQRTC QLQ BR-23 questionnaire reported an average symptom scale score of 25.15±21.65. The symptom scale reflects the impact of chemotherapy drugs on the physical condition of the patient, but individual responses to chemotherapy drugs vary (Ambarwati and

Wardani, 2014). From a symptom classification perspective, the highest symptom score observed was for therapeutic effects (37.7±15.2), while the lowest was for hair loss (2.6±1.2) (Table 2). According to research by Shinta and Surarso (2016), therapeutic effects are the most significant problem experienced by breast cancer patients, impacting their QOL through issues like nausea and vomiting. If left untreated, nausea and vomiting can lead to physical weakening, reduced appetite and fluid intake, dehydration, electrolyte imbalances, and diminished nutritional status (Sudiasta et al., 2022). A notable side effect of chemotherapy is the loss of hair. Chemotherapy impacts healthy cells in the body, which includes hair follicles, resulting in hair loss. Although hair loss is emotionally challenging, some patients view it positively and do not feel disappointed (Mahmuddin et al., 2019). Notably, hair loss due to chemotherapy is usually temporary, with hair regrowth commencing after treatment. However, some patients may experience depression due to difficulties in adjusting to their condition, ultimately impacting their QOL and mental health, potentially leading to suicide attempts (Sudiasta et al., 2022).

The Correlation Between Patient Attributes and QOL

Table 3 demonstrates that the analysis of correlations between patient characteristics and QOL showed no notable association between the sociodemographic factors of the patients and their QOL ($p > 0.05$). However, in the patient's clinical history, there was a notable correlation with QOL, particularly regarding the type of chemotherapy ($r=0.216$; $p=0.035$) and the presence of comorbidities ($r=0.188$; $p=0.038$).

Several previous studies have similar results about the QOL not affected by sociodemographic characteristics, including one conducted by Afifah and Sarwoko (2020), which reported that age did not affect the QOL of cancer patients undergoing chemotherapy ($p=0.780$). Juwita et al. (2018) and Nomiko (2020) also have results in line with this study that QOL was not affected by educational background and employment status ($p>0.05$). It could be said that patients undergoing chemotherapy often receive crucial health information from nurses and other healthcare professionals at the hospital (Rahayu and Suprapti, 2020). These healthcare workers play a key role in supporting patients as they navigate the challenges brought on by changes in their lives. They provide education, help solve problems, offer support, validate the patient's feelings, and encourage a positive outlook on their illness. As a result, patients may make more informed decisions and become more resilient with each chemotherapy treatment, ultimately leading to an improved QOL (Astarini et al., 2020).

Other factors, both employed and unemployed patients, can have a good QOL. This is because unemployed patients may use their free time to engage in positive activities, such as joining a cancer survivor community and participating in calming activities like knitting. These activities can help reduce anxiety and increase peace of mind and heart, ultimately improving their QOL (Larasati et al., 2020). According to the study conducted by Marada et al. (2024), it was determined that there is no notable correlation between the distance from patients' residences and their use of health services, which might affect their QOL ($p=1.000$). It estimated that all participants in the study were enrolled in national health insurance and utilized it for chemotherapy, indicating that even those living far from health facilities still accessed services due to limited alternatives (Irawan et al., 2021). Patient's improved QOL, despite living far from health facilities, can also be attributed to counseling, education, and information provided to breast cancer patients by healthcare professionals, such as nurses and doctors, to boost the patient's morale for a prompt recovery (Tunas et al., 2016).

Several patient clinical histories in this study, such as cancer stage and frequency of chemotherapy in a month, did not affect the QOL ($p>0.05$). In line with the previous study from Ratna and Yuniarti (2021) reported that there is no correlation between cancer stadium and patient's QOL ($p=0.091$). This is because the patient has accepted the fact that they have cancer, which can stabilize their emotional state, improve the patient's QOL, and potentially increase their life expectancy (Tunas et al., 2016). Afifah and Sarwoko (2020) discovered that there is no notable correlation between how often chemotherapy is administered and the QOL of patients undergoing chemotherapy. Additionally, it was observed that as the duration of chemotherapy increases for cancer patients,

their QOL tends to improve. This is because the patient adapts to the physical disorders experienced due to the effects of chemotherapy through frequent sessions (Paji et al., 2021).

The significant correlation between chemotherapy type and QOL in this study is shown by the fact that patients undergoing combination chemotherapy treatment showed lower QOL compared to the group of respondents undergoing single chemotherapy. This low QOL score can be caused by the high intensity of side effects caused by the use of combination chemotherapy drugs, such as nausea and vomiting. In addition, the low QOL score in patients with combination chemotherapy can be caused by more treatment-related toxicity than in patients receiving single chemotherapy (Juwita et al., 2018). The other significant was comorbidity. Sebastian et al. (2023) in their study also found that generally, the interaction of comorbidities such as diabetes mellitus, hypertension, hyperlipidemia, and other non-communicable diseases is one of the main challenges in cancer treatment that can affect the QOL and survival of cancer patients because the large burden of comorbidities among cancer patients can increase the burden of cancer care and management which has an impact on the response to therapy. However, it is possible that cancer patients who have comorbidities can have a good QOL just like cancer patients without comorbidities if they apply a healthy lifestyle, continues to think positively about the disease they are facing, and accept the situation that they have cancer can cause emotional levels to become more stable. This can affect the patient's QOL to be better and can increase a person's life expectancy (Tunas et al., 2016).

The results of our research lead us to acknowledge certain limitations that may introduce bias into this study. For instance, we recognize the presence of other variables, such as family support and national health insurance, which we observed but have constant values. These variables cannot be examined for correlation with patient QOL despite potentially playing a significant role in it. Additionally, the limited time for data collection restricted the number of samples obtained, preventing the observation of long-term changes in QOL. Therefore, a more rigorous research design, such as a cohort study, could not be employed. Additionally, the study utilized an old research instrument, the EORTC QLQ BR-23. The latest instrument, the EQRTC QLQ BR-42, was still in the validation process at the time of data collection. As the questionnaire is qualitative, there is potential for bias from respondents' answers that rely on memory, perception, and personal beliefs. Future research should use the latest EORTC QLQ BR-42 questionnaire to better and comprehensively understand the QOL of breast cancer patients (EORTC, 2024d).

CONCLUSIONS

It was concluded that the sociodemographic characteristics of the patients did not impact their QOL. However, the clinical history revealed a significant correlation between QOL and factors such as the type of chemotherapy administered and existing comorbidities ($p<0.05$). It is believed that a positive QOL for patients is largely influenced by support from healthcare professionals, family members, and the surrounding environment.

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AUTHORS' CONTRIBUTIONS

ANY oversaw the design of the study, the methodology, the management of data, and statistical analysis, then drafted the initial version of the manuscript NPND took care of obtaining access permissions for data retrieval, validated the instruments, collected the data, and contributed to the writing of the original draft. PMDR was responsible for managing the data, creating visual representations, and overseeing the editing process

CONFLICT OF INTERESTS

The authors declare that they have no conflicts of interest

ETHICAL CONSIDERATION

This research received ethical review approval from Sanjiwani Hospital, Gianyar, Bali, with certificate No. 48/PEPK/IV/2024 on May 2, 2024.

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