



PSYCHOLOGICAL RESPONSE TO CHEMOTHERAPY: THE ASSOCIATION BETWEEN TREATMENT RELATED SIDE EFFECTS AND ANXIETY IN BREAST CANCER PATIENTS

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Abstract

Anxiety is a common emotional response among patients undergoing chemotherapy and may influence treatment adherence and quality of life. Understanding the association between chemotherapy side effects and anxiety is essential to support comprehensive cancer care. This study aimed to analyze the relationship between chemotherapy side effects and anxiety in breast cancer patients undergoing chemotherapy. This study employed a quantitative correlational method with a cross-sectional design. The research was conducted at Bangil Regional Hospital from November to December 2022. A total of 104 female breast cancer patients undergoing chemotherapy were selected using purposive sampling based on inclusion and exclusion criteria. Data were collected using two instruments: a chemotherapy side effects questionnaire adapted from Portenoy et al. (1994), and the Zung Self-Rating Anxiety Scale (SAS). The data were analyzed using Spearman's rank correlation. Chemotherapy side effects were predominantly classified in the mild category, with 66 respondents (63.5%) meanwhile, anxiety levels were mostly within the normal range, as reported by 68 respondents (65.4%). Spearman rank correlation analysis demonstrated a statistically significant positive relationship between chemotherapy side effects and anxiety ($\rho = 0.335, p = 0.001$). There is a statistically significant positive relationship between chemotherapy side effects and anxiety levels among breast cancer patients undergoing chemotherapy, indicating that greater severity of chemotherapy side effects is associated with higher levels of patient anxiety.

Keywords: Kanker Payudara; Kemoterapi; Efek Samping Kemoterapi; Kecemasan; Zung Self-Rating Anxiety Scale (SAS)

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INTRODUCTION

Patients suffering from cancer may have severe negative effects on their physical, mental, and social health as a result of anxiety (Naser et al., 2021). Anxiety may physically impair the immune system, increasing susceptibility to infections and complications (Naser et al., 2021; Obispo et al., 2022). It may also result in sleep disruptions, increased blood pressure, and gastrointestinal issues, all of which may aggravate the patient's medical state (Büttner-teleag et al., 2021; Gu et al., 2023; Morys et al., 2023). These physiological manifestations might impede patients' ability to manage their condition and therapy. Anxiety often engenders emotions of dread, worry, and melancholy, resulting in patients experiencing sensations of overwhelm and isolation (Ban et al., 2021; Wang et al., 2024). This emotional burden might diminish their overall quality of life and impair their capacity to interact with family and friends (Ban et al., 2021).

Anxiety may profoundly affect a person's capacity to make informed choices about their treatment (Arch et al., 2023). Excessive anxiety may hinder an individual's capacity to make suitable decisions about their medical treatment (Rivers & Sanford, 2021).

Anxiety may lead patients to hesitate in pursuing essential therapies for recovery or to avoid adhering to the prescribed treatments recommended by healthcare providers (Hansen et al., 2023). Consequently, therapies that need prompt administration may be postponed or overlooked. (Frosch et al., 2024). This not only risks extending recovery time but may also reduce the treatment's efficacy (Sharpley et al., 2024). Improper adherence to therapy results in the body lacking essential care for recovery (Id et al., 2023). Moreover, chronic worry may aggravate both physical and mental ailments, eventually impeding the whole healing process. Uncontrolled anxiety may establish a detrimental loop, whereby the patient experiences heightened overwhelm and encounters more difficulty in accepting or undergoing therapy.

There are about 2.3 million new instances of breast cancer in women, which accounts for 11.6% of all cancer cases worldwide in 2022 (Ferlay et al., 2024). This makes breast cancer the second biggest cause of cancer incidence worldwide in addition to being the primary cause of cancer in females. Breast cancer was responsible for 670,000 deaths around the world. Out of 185 nations, breast cancer was the most prevalent form of cancer in females in 157 of those countries. The incidence of breast cancer in males ranges from around 0.5 to 1% (WHO, 2024). In Indonesia, around 66,271 new breast cancer cases were reported in 2022, making it the most prevalent cancer among

women. Indonesia recorded around 22,598 fatalities attributed to breast cancer, positioning it as the third leading cause of cancer-related deaths, behind lung cancer in first place and liver cancer in second place (Ferlay et al., 2024). From January to August 2022, Bangil Regional Hospital recorded 229 breast cancer cases. Interviews with the head of the chemotherapy unit revealed that in the last three months, 1-2 breast cancer patients discontinued their treatment. A number of breast cancer patients who discontinued the chemotherapy regimen subsequently resumed it under worse health circumstances.

Cancer patients often face considerable anxiety due to a mix of biological, psychological, social, and cancer-related factors. Biologically, changes in metabolism and hormones, ongoing pain, and side effects from treatments like chemotherapy and radiotherapy play a role in increasing anxiety (Băncilă et al., 2012; Mazoochi, 2016; Saxena et al., 2018). Psychologically, concerns about cancer recurrence, intrusive negative thoughts, and unhealthy coping mechanisms such as rumination and avoidance can worsen the emotional strain (Ahmadiqaragezlou et al., 2020; Monahan et al., 2021; Perez-Tejada et al., 2019). Socially, the availability of a strong support system and sociodemographic factors like age, gender, and education influence anxiety levels, with certain groups being more susceptible (Naser et al., 2021; Truong et al., 2019). Furthermore, factors like the cancer's stage, type, and duration of illness can amplify anxiety, though some patients may become more accustomed to their condition over time (Saxena et al., 2018; Truong et al., 2019).

Chemotherapy, a standard cancer treatment, often leads to side effects that can significantly affect a patient's mental well-being, especially by increasing anxiety. Side effects such as nausea, mucositis, and peripheral neuropathy not only cause physical discomfort but also interfere with basic activities like eating and sleeping, which are essential for mental health. The intensity of these side effects can amplify anxiety, as patients worry about them returning or worsening with each treatment cycle. This creates a heightened sense of fear and stress, making it harder to manage the emotional impact of the illness. As a result, the physical discomfort caused by chemotherapy can worsen patients' psychological state (Lauren, 2022; Osawa et al., 2019).

Psychological factors play a major role in how chemotherapy side effects influence anxiety levels in patients. Expectations and perceptions about the side effects of chemotherapy significantly shape how anxious a patient feels. Those with higher anxiety before treatment are more likely to experience more

intense side effects, which creates a harmful cycle of anxiety and physical distress (Verhoeff et al., 2022; Whitford & Olver, 2012). Additionally, negative illness perceptions and dysfunctional metacognitive beliefs are strongly linked to higher levels of anxiety. Addressing these psychological aspects, alongside managing physical symptoms, is crucial for supporting cancer patients undergoing chemotherapy (Verhoeff et al., 2022; Whitford & Olver, 2012).

Researching the relationship between chemotherapy side effects and anxiety in breast cancer patients undergoing chemotherapy is important because side effects such as nausea, fatigue, and peripheral neuropathy can worsen the patient's physical condition and increase their anxiety. A better understanding of this relationship helps identify patients at high risk of experiencing severe anxiety, allowing for more appropriate psychological support. Increased anxiety can affect the patient's quality of life and adherence to treatment, which influences the success of long-term therapy. This research also provides insights into how patients' perceptions of chemotherapy side effects can affect their anxiety levels. Therefore, the findings from this research can open opportunities for developing more effective interventions, both in managing side effects and reducing anxiety during treatment.

METHODS

2.1 Research design

This study employs a quantitative correlational approach with a cross-sectional research design.

2.2 Setting and Sample/Participants

The study was conducted from November – December 2022 at General Hospital Bangil. The population of this study consisted of all women with breast cancer who were undergoing chemotherapy. The sample in this study consisted of women with breast cancer who were undergoing chemotherapy and met the research qualifications according to the sample criteria. The sample criteria were as follows: breast cancer patients aged 26–65 years, breast cancer patients in stages I, II, and III with good general health, and breast cancer patients who had undergone at least one round of chemotherapy. The exclusion criteria were: patients who experienced a decrease in consciousness and patients who were unwilling to participate as respondents. In this study, purposive sampling was used, which involved selecting a sample based on specific criteria and resulting 104 respondents.

2.3 Measurement and Data Collection

Research data was collected directly from the respondents by using questionnaires about side effects of chemo therapy and anxiety. The chemotherapy side effect questionnaire utilized in this study was originally developed by Portenoy et al., (1994), translated into Indonesian by the researcher, and adapted to fit the needs of the study. The questionnaire consisted of 32 items and assessed aspects such as the digestive system, respiratory system, neurological function, integumentary system, vision, reproductive health, and psychological well-being. Anxiety was assessed using The Zung Self-Rating Anxiety Scale (SAS) (Zung, 1971). The questionnaire included 20 items and evaluated aspects such as physiological, cognitive, behavioral, and affective responses.

2.4 Data analysis

The data were analyzed using spearman's rank correlation

RESULTS AND DISCUSSION

Table 1. Frequency Distribution Of Chemotherapy Side Effects

Chemotherapy Side Effects	Frequency (n)	Percentage (%)
Mild	68	65.4
Moderate	34	32.7
Severe	2	1.9
Total	104	100

Table 1 Shows the distribution of chemotherapy side effects indicated that the majority of respondents experienced mild side effects, with 68 individuals (65.4%). A total of 34 respondents (32.7%) reported moderate side effects, while only 2 respondents (1.9%) experienced severe side effects.

Table 2. Frequency Distribution Of Anxiety

Anxiety	Frequency (n)	Percentage (%)
Normal	68	65.4
Mild	33	31.7
Moderate	0	0
Severe	3	2.9
Total	104	100

Table 2 Shows The distribution of anxiety levels showed that the majority of respondents were in the normal category, with 68 individuals (65.4%). A total of 33 respondents (31.7%) experienced mild anxiety, while 3 respondents (2.9%) experienced severe anxiety. No respondents were classified as having moderate anxiety (0%).

The results of the Spearman rank correlation analysis indicate a statistically significant positive association between chemotherapy side effects and anxiety ($\rho = 0.335$, $p = 0.001$).

Discussion

The findings of this study indicate that the majority of respondents experienced chemotherapy side effects in the mild category,

suggesting that patients were generally able to tolerate chemotherapy relatively well. Commonly reported side effects included nausea, vomiting, fatigue, pain, and constipation. In addition, some patients also reported shortness of breath, diarrhea, hair loss, and changes in taste or appetite. The results of this study are consistent with previous research indicating that one of the most common symptoms is chemotherapy-induced nausea and vomiting (CINV). Even in its mild form, this symptom can significantly affect patient comfort (Badarudin et al., 2024). Fatigue is also a frequently reported complaint; although not always severe, this symptom can affect patients' ability to carry out daily activities (Álvarez-bustos et al., 2021). Hair loss (alopecia), although not physically painful, is one of the most visible side effects and often causes psychological distress, as it affects patients' self-image and confidence. Dermatological reactions such as skin rashes, photosensitivity, and pigmentation changes are also considered mild but can still cause considerable discomfort (Almeida et al., 2023). Although these symptoms were classified as mild, their cumulative effects may still interfere with daily functioning and psychological well-being. Mild yet persistent symptoms can lead to discomfort, reduced appetite, sleep disturbances, and increased emotional stress, particularly in patients undergoing repeated cycles of chemotherapy.

The anxiety levels experienced by the majority of respondents remained within the normal range. This indicates that not all breast cancer patients undergoing chemotherapy automatically experience significant anxiety disorders. Several studies have shown that although a cancer diagnosis and treatments such as chemotherapy can be emotionally distressing, many patients are still able to maintain psychological stability. A study by Suskin et al., (2022) examined the trajectory of anxiety in breast cancer patients and found that most patients demonstrated adaptive emotional responses over time, with anxiety levels remaining within the normal range throughout the treatment process. This suggests that a cancer diagnosis does not necessarily lead to severe anxiety disorders, particularly when physical symptoms are mild or manageable. This is in line with the clinical practice guidelines of the European Society for Medical Oncology (ESMO), which indicate that the prevalence of clinically significant anxiety disorders among adult cancer patients is relatively low, with the majority of patients falling within the normal or subclinical range of anxiety (Grassi et al., 2023).

The findings of this study demonstrate a significant positive association between

chemotherapy side effects and patients' levels of anxiety. Patients who experienced more severe side effects during chemotherapy tended to report higher levels of anxiety. Conversely, those who experienced milder side effects were more likely to exhibit lower levels of anxiety. This finding aligns with literature indicating that chemotherapy-induced physical symptoms are closely associated with psychological distress in breast cancer patients. For example, Hajj et al., (2021) conducted a cross-sectional study among women undergoing chemotherapy and found that anxiety was significantly related to factors such as insomnia, cognitive impairment, and the COMT gene polymorphism. Their results underscore the substantial psychological burden faced by patients even during early treatment stages. The minimal anxiety observed among those experiencing only mild side effects supports previous research suggesting a proportional relationship between symptom severity and emotional outcomes (Nakamura et al., 2021). According to Omran & Mcmillan (2018), cancer patients who experienced lower levels of physical symptoms such as pain, fatigue, and sleep disturbances also reported significantly lower levels of anxiety and depression, and better overall quality of life. The study emphasized that symptom severity directly and indirectly affects emotional states through mediators like self-efficacy and emotional distress. Similar findings were reported by Song et al., (2024) in a multicenter cross-sectional study on patients with advanced colorectal cancer. The researchers found that anxiety levels were markedly higher in patients with moderate to severe symptom burden compared to those with minimal symptoms, with statistically significant differences. These results further support the notion that lighter symptom burdens are associated with more stable emotional conditions. Overall, this study confirms that when physical symptoms are perceived as tolerable, patients are more likely to maintain emotional stability, experience lower levels of anxiety, and demonstrate better coping abilities in dealing with their illness and treatment.

CONCLUSION

This study highlights a statistically significant association between the severity of chemotherapy side effects and anxiety levels among breast cancer patients undergoing treatment. Most respondents experienced mild side effects and reported anxiety within the normal range, indicating that tolerable physical symptoms may help preserve emotional stability. These findings are consistent with previous research suggesting that less intense physical symptoms are associated with lower

psychological distress. The results emphasize the importance of early identification and management of chemotherapy side effects not only to improve physical well-being but also to reduce anxiety levels and enhance patients' overall quality of life. By acknowledging the interplay between physical and emotional health, healthcare professionals can implement more comprehensive and patient-centered care strategies throughout the cancer treatment process.

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