

# Anxiety, Stress and Depression in Breast Cancer Patients Undergoing Chemotherapy; a Cross-Sectional Study

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## ABSTRACT

**OBJECTIVE:** The objective of this study was to identify the level of anxiety, stress and depression in breast cancer patients undergoing chemotherapy.

**METHODOLOGY:** This cross-sectional study was conducted in Banda Aceh City, Indonesia. The total population of breast cancer patients undergoing chemotherapy during September 2023 was used as a sample, making the sample size 60 respondents. The data collection tool was the Depression Anxiety and Stress Scale 42 (DASS-42) questionnaire. Independent t-test was used to examine the difference in anxiety scores at the second measurement in the intervention and control groups.

**RESULTS:** Sixty percent were pre-elderly or 45-59 years old, with secondary education 53.3%, Aceh ethnicity 81.7%, married 73.3%, working 66.7%, fifth chemotherapy cycle 38.3%, and 58.3% menopausal women. A total of 43.3% in moderate level anxiety, moderate level stress, 33.3%, and 46.7% mild level depression.

**CONCLUSION:** The most significant frequency of anxiety is moderate level, stress is moderate level, and depression is mild level depression. Recommendation for hospital: a multidisciplinary approach is needed to reduce anxiety, stress and depression. Nurses are expected to develop appropriate interventions, including a culture-based approach.

**KEYWORDS:** anxiety, breast cancer, chemotherapy, depression, stress

## INTRODUCTION

In 2020, about 2.3 million women were diagnosed with breast cancer, causing 685,000 deaths worldwide. By the end of 2020 and five years earlier, about 7.8 million women were living with a breast cancer diagnosis, making breast cancer the most common cancer worldwide. Breast cancer cases are found in all countries of the world, occurring in women of all ages after puberty, but the incidence rate increases in older age groups<sup>1</sup>. The number of deaths from breast cancer is higher in developing countries<sup>2</sup>.

Furthermore, the number of cancer patients in Indonesia in 2020, according to the World Health Organization, is 396,914 new cases, of which 183,368 cases occurred in men and 213,546 cases in women. The number of cancer deaths in Indonesia in 2020 is 234,511 deaths, with 124,698 deaths in men and 109,813 deaths in women. Overall, the number of prevalent cases over five years in Indonesia was 946,088 cases. The highest number of new cancer cases in Indonesia in 2020 by cancer type is also breast cancer, which is 65,858 cases. The death rate from breast cancer in Indonesia is 22,430 cases<sup>3</sup>.

The prevalence of cancer in Aceh province, based on the results of Basic Health Research or Rikesdas in 2018, was 41,596 cases<sup>4</sup>. Based on age group, cancer cases in Aceh are highest in the age group 5-

14 years, namely 8,425 cases. Furthermore, most cancer cases in Aceh are female, namely 20,845 cases; high school/ equivalent education level 9,409 cases; not working 9,842 cases and living in rural areas as many as 28,552 cases<sup>5</sup>. The number of cases of breast cancer patients undergoing chemotherapy at the Regional General Hospital Dr. Zainoel Abidin Banda Aceh in 2022 was 341 people. Improved survival rates began in the 1990s when countries implemented breast cancer screening programs and comprehensive treatment programs that included effective medical therapy<sup>1</sup>. Chemotherapy is one of the effective breast cancer management options. However, on the other hand, chemotherapy regimens can cause various side effects.

Side effects felt during and after chemotherapy include nausea and vomiting, fatigue, changes in body shape, hair loss, numbness in the feet and hands, and difficulty in performing daily activities. These problems are proven to trigger various psychological issues, such as anxiety, stress, and depression<sup>6-8</sup>. The global prevalence of anxiety is 29.93%, which means that almost 1/3 of patients diagnosed with breast cancer experience anxiety<sup>9</sup>. Another study showed that more than 50% of breast cancer patients reported high levels of stress<sup>10</sup>. The global prevalence of depression in patients with breast cancer was 30.2%, with the eastern Mediterranean region having the highest rate of depression (49.7%) than other regions<sup>8</sup>.

A multicenter research conducted on women with breast cancer explained that the side effects of

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chemotherapy in the form of peripheral neuropathy with symptoms of numbness, tingling, needle-like sensation, hyperalgesia and allodynia had a positive correlation with anxiety levels in respondents<sup>11</sup>. Patients who experience more severe neuropathy symptoms have moderate to high levels of anxiety due to the pain felt<sup>11,12</sup>. Research related to the anxiety level of patients undergoing chemotherapy during the COVID-19 pandemic was reported in various countries, including a study conducted in the United States on 107 patients, showing that 39% of patients experienced treatment interruptions and 28% of them experienced mild to severe anxiety<sup>13</sup>.

Other studies have also shown that anxiety, stress, and depression are the most common psychological problems in patients with breast cancer undergoing chemotherapy, with prevalence of 73.3%, 68.6%, and 78.1%, respectively<sup>14</sup>. Anxiety, described as a subjective reaction of discomfort to a threat, has the highest prevalence in patients with breast cancer, which is 92.5%, followed by the incidence of depression as much as 84.2%<sup>15</sup>. Determinant factors apart from the side effects of chemotherapy are exhausting treatments, persistent pain, and lack of social support<sup>16,17</sup>.

Anxiety, stress, and depression not appropriately handled will also have an impact on the quality of life of breast cancer patients, where quality of life is an essential goal in the treatment of cancer patients. Concerns about physical and psychological disorders and changes in body image need to be anticipated, as well as symptoms that can cause stress. Improving the quality of life of cancer patients will increase patient compliance in care and treatment and provide them with solutions to overcome various symptoms or complaints they experience<sup>18</sup>.

Anxiety and depression felt by patients can undermine treatment adherence and can influence cancer treatment refusal, as well as poor prognosis and survival rates<sup>17</sup>. In addition, a previous meta-analysis study showed that cancer patients with depressive symptoms had a 25% higher mortality rate<sup>8</sup>. Research conducted in Indonesia on 30 breast cancer patients who were undergoing chemotherapy showed that 11 (36.7%) patients were in a state of severe anxiety, which caused 12 of them to delay and temporarily stop chemotherapy<sup>19</sup>. Therefore, psychological problems in cancer patients should be assessed and evaluated further to identify patients who need help because the psychological state of patients is an integral aspect of oncology care<sup>20</sup>.

Research on stress in breast cancer patients undergoing chemotherapy has been conducted in one of the referral hospitals in Aceh Province. However, researchers used the Perceived Stress Scale (PSS) questionnaire. The study recruited respondents from all chemotherapy cycles. The results showed the mean stress score was  $27.82 \pm 4.015$ ; scores 27-40 are high perceived stress<sup>21</sup>. Therefore, it is necessary to

identify patients who have a history of chemotherapy so that the results better describe the psychological problems due to the chemotherapy experience. The purpose of this study was to identify anxiety, stress, and depression in breast cancer patients undergoing chemotherapy.

## METHODOLOGY

### Study Design

This study is a descriptive and cross-sectional study. Data collection in this study began with an explanation to prospective respondents about research information and how to fill out the questionnaire. Furthermore, respondents who agreed to be involved signed an informed consent form in the format provided by the researcher. The researcher gave a questionnaire sheet about anxiety, stress and depression that they experienced due to undergoing chemotherapy to be filled in by the respondents. The time for filling out the questionnaire was about 15-20 minutes.

### Population and Sample

The population in this study were all breast cancer patients who underwent chemotherapy cycles 2 to 6 during September 2023 at one of the referral hospitals that provide chemotherapy services in Aceh province, totalling 72 people. Patients who fit the research criteria were 60, all of whom became research samples. The requirements are those who have not metastasized to the brain and bones.

### Instrument

The measuring instrument used in the study was the Depression Anxiety Stress Scale 42 (DASS 42), developed by Lovibond and Lovibond in 1995. The DASS measurement questionnaire consists of 42 statements relating to a person's stress, anxiety, and depression. Anxiety, stress, and depression are each identified through 14 statements.

The measurement questionnaire uses an ordinal scale. Each statement has four score options, namely 0, 1, 2, and 3. So the maximum value for each anxiety, stress and depression is 42. After obtaining the total measurement results, then each stress, anxiety, and depression will be categorized into several categories, namely normal, mild, moderate, severe and very severe categories. The normal anxiety category is 0-7, mild 8-9, moderate 10-14, severe 15-19 and very severe is 20 or more. The normal stress category is 0-14, mild 15-18, moderate 19-25, severe 26-33, and very severe 34 or more. Standard depression categories are 0-9, mild 10-13, moderate 14-20, severe 21-27 and very severe 28 or more.

The measuring instrument used in this study is a standardized measuring instrument and has been translated into Indonesian. Marsidi SR 2021<sup>22</sup> tested this questionnaire in 2021, and the DASS 42 validity test results show a positive Pearson correlation value of more than 0.532 on all stress, anxiety, and depression items. The reliability test of the measuring

instrument uses Cronbach's alpha, showing stress at 0.951, anxiety at 0.943, and depression at 0.952.

**Data Analysis**

Data were analyzed using univariate analysis that described frequencies and percentages.

**Ethical Statement**

The entire process in this study was carried out after passing the ethical test for health research on human subjects with the number 179/ETIK-RSUZA/2023.

**RESULTS**

**Characteristics of Respondents**

Sixty percent were pre-elderly or 45-59 years old, secondary education 53.3%, Aceh ethnicity 81.7%, married 73.3%, working 66.7%, fifth chemotherapy cycle 38.3%, and 58.3% menopausal women. **Table I**

**Table I: Characteristics of respondents (n=60)**

Characteristics	n (%)
<b>Age, years</b>	
Adult	17 (28.3)
Pre-elderly	36 (60.0)
Elderly	7 (11.7)
<b>Education</b>	
Basic	5 (8.3)
Junior & Senior school	32 (53.3)
High	23 (38.4)
<b>Ethnicity</b>	
Aceh	49 (81.7)
Jawa	4 (6.7)
Gayo	7 (11.7)
<b>Marital status</b>	
Married	44 (73.3)
Widow	16 (26.7)
<b>Occupational status</b>	
Employed	40 (66.7)
No employed	20 (33.3)
<b>Chemotherapy cycles</b>	
Second	20 (33.3)
Third	7 (11.7)
Fourth	10 (16.7)
Fifth	23 (38.3)
<b>Menopausal status</b>	
Yes	35 (58.3)
No	25 (41.7)

A total of 43.3% of respondents were in moderate level anxiety, moderate level stress, 33.3%, and 46.7% mild level depression. Data is shown in **Table II**.

Level of anxiety based on chemotherapy cycle. As many as 35% of respondents in the second chemotherapy cycle experienced severe anxiety, and 60% experienced moderate anxiety. While respondents in the fifth cycle, as many as 17.4% had moderate anxiety, and 47.8% had mild anxiety. Data is shown in **Table III**.

Level of stress based on chemotherapy cycle. As many as 35% of respondents in the second cycle of chemotherapy experienced severe stress, and 65% experienced moderate stress. Meanwhile, respondents in the fifth cycle were as much as 0% in moderate stress and 39.1% in mild stress. Data is shown in **Table IV**.

Level of depression based on chemotherapy cycle of respondents. As many as 20% of respondents in the second cycle of chemotherapy experienced moderate depression, and 80% experienced mild depression. While respondents in the fifth cycle, as many as 4.3% in moderate depression and 13.0% in mild depression. Data is shown in **Table V**.

**Table II: Distribution of anxiety, stress and depression (n=60)**

Variable	Level				Total n (%)
	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	
Anxiety	9 (15.0)	17 (28.3)	26 (43.3)	8 (13.3)	60 (100.0)
Stress	14 (23.3)	19 (31.7)	20 (33.3)	7 (11.7)	60 (100.0)
Depression	27 (45.0)	28 (46.7)	5 (8.3)	0 (0.0)	60 (100.0)

**Table III: Level of anxiety based on chemotherapy cycle of respondents (n=60)**

Chemo-therapy cycle	Level of Anxiety				Total n (%)
	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	
Second	0 (0.0)	1 (5.0)	12 (60.0)	7 (35.0)	20 (100.0)
Third	0 (0.0)	2 (28.6)	5 (71.4)	0 (0.0)	7 (100.0)
Fourth	1 (10.0)	3 (30.0)	5 (50.0)	1 (10.0)	10 (100.0)
Fifth	8 (34.8)	11 (47.8)	4 (17.4)	0 (0.0)	23 (100.0)

**Table IV: Level of stress based on chemotherapy cycle of respondents (n=60)**

Chemo-therapy cycles	Level of stress				Total n (%)
	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	
Second	0 (0.0)	0 (0.0)	13 (65.0)	7 (35.0)	20 (100.0)
Third	0 (0.0)	3 (42.9)	4 (57.1)	0 (0.0)	7 (100.0)
Fourth	0 (0.0)	7 (70.0)	3 (30.0)	0 (0.0)	10 (100.0)
Fifth	14 (60.9)	9 (39.1)	0 (0.0)	0 (0.0)	23 (100.0)

**Table V: Level of depression based on chemotherapy cycle of respondents (n=60)**

Chemo-therapy cycle	Level of stress				Total n (%)
	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	
Second	0 (0.0)	16(80.0)	4 (20.0)	0 (0.0)	20 (100.0)
Third	1 (14.3)	6(85.7)	0 (0.0)	0 (0.0)	7 (100.0)
Fourth	7 (70.0)	3(30.0)	0 (0.0)	0 (0.0)	10 (100.0)
Fifth	19(82.6)	3(13.0)	1 (4.3)	0 (0.0)	23 (100.0)

## DISCUSSION

Breast cancer ranked first in terms of number of cases and deaths in most countries of the world in 2020, accounting for about 24.5% of all cancer cases and 15.5% of cancer deaths among women<sup>2</sup>. Anxiety, stress, and depression are some of the most common psychiatric problems present among breast cancer patients<sup>23</sup>. Psychological problems are risk factors that contribute to non-adherence to cancer treatment. In addition to lowering adherence to treatment, failure to recognize and manage stress can lead to several other problems. Patients may have difficulty making treatment decisions and may make additional visits to the doctor's office and emergency room, which takes more time and increases stress for the patient<sup>24</sup>.

The results of this study showed that 43.3% of respondents were at a moderate anxiety level. This result is in line with studies conducted in Java (33.3%), in the Netherlands (23%), in Cyprus (37.7%), and in China (24.4%)<sup>6,12,24,25</sup>. However, this result is higher than the study found in Egypt, where the level of anxiety in the moderate category was only 9.4%, even though an accumulated 31.25% of patients experienced anxiety and depression. In this study, patients who had just started chemotherapy had higher anxiety scores than those who had experienced it several times. Respondents with the second cycle of chemotherapy were 33.3%, resulting in a more significant number of moderate levels. Whereas in the Egyptian study, it was found that patients with longer diagnoses and higher stages had higher anxiety scores, so other factors of difference could occur due to the cultural diversity of respondents. The results showed that 33.3% of respondents were at a moderate stress level, which aligns with Research conducted in Egypt, where the moderate stress level in patients reached 68.8%<sup>14</sup>. The findings in this study have a higher value than those in China, which is only 9.7%. This difference in value may be due to the more significant number of respondents in the study and related factors that can affect the level of anxiety, namely marital status, where patients with married status experience less stress than those who are not; this was also conveyed by Guo YQ et al.<sup>25</sup> where poor marital status can affect psychologically due to inadequate social support needs from the family.

Of respondents in the second cycle, about 60% were at a moderate level of anxiety, and 35% were at a severe level of anxiety; this is very different from respondents in the fifth cycle, with as many as 47.8% in mild level anxiety and 34.8% in normal level anxiety. The more frequent chemotherapy, the lower the tendency of anxiety. In a study conducted in Medan where the majority of patients did not experience stress, anxiety and depression (73.2%, 58.5%, and 80.5%, respectively); this could be due to the majority of patients being on chemotherapy cycles 4-6 (53.7%)<sup>26</sup>.

Among respondents in the second cycle, 65% were at a moderate stress level, and 35% were at a severe one; this is very different from respondents in the fifth cycle, with as many as 39.1% at mild stress levels and 60.9% at normal stress levels. The more frequent chemotherapy, the lower the tendency of stress; this is in line with research by Wahyuni SE et al<sup>26</sup>, where the stress level in patients with chemotherapy cycles 4-6 was moderate (9.8%), and the majority did not experience stress. As chemotherapy progresses, most patients adapt both physically and psychologically to chemotherapy and the chemotherapy service environment. This positive adaptation can help reduce anxiety, stress, and depression experienced by patients.

### Implication for Nurses

Among respondents in the second cycle, about 65% were at a moderate stress level, and 35% were at a severe one; this is very different from respondents in the fifth cycle, with as many as 39.1% at mild stress levels and 60.9% at normal stress levels. The more frequent chemotherapy, the lower the tendency of stress; this is in line with research by Wahyuni SE et al<sup>26</sup> where the stress level in patients with chemotherapy cycles 4-6 was moderate (9.8%), and the majority did not experience stress.

## CONCLUSION

The most significant frequency of anxiety in breast cancer patients undergoing chemotherapy is moderate level, stress is moderate level, and depression is mild level depression.

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**Ethical permission:** The entire process in this study was carried out after passing the ethical test for health research on human subjects with letter number 179/ETIK-RSUZA/2023.

**Conflict of Interest:** The authors declare we have *no conflicts of interest* to disclose.

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**Data Sharing Statement:** The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publically.

## AUTHOR CONTRIBUTIONS

Syarif H: Conceived of the presented idea, corresponding author, and supervised the findings of this work.

Jufrizal: Developed the theory and performed the computations.

Halifah E: Verified the analytical methods. All authors discussed the results and contributed to the final manuscript

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