RESEARCH ARTICLE

Anxiety Levels in Brazilian Women with Metastatic Breast Cancer Undergoing Palliative Chemotherapy: A Prospective Study

Larissa Marcondes[1]*, Leonel dos Santos Silva[1], Cristiano de Oliveira Ribeiro[1], Natalia Naome Oshiro[1], Luciana de Alcantara Nogueira[2], Paulo Ricardo Bittencourt Guimaraes[3], Luciana Puchalski Kalinke[2]

Abstract

Objective: This study aimed to assess anxiety levels among women with metastatic breast cancer undergoing palliative chemotherapy. **Methods:** A descriptive, prospective study was conducted at an oncology hospital in southern Brazil from September 2021 to October 2022. A total of 123 adult women receiving outpatient palliative chemotherapy were included in the study. Anxiety levels were evaluated using the State-Trait Anxiety Inventory at baseline, the fifth week, and the eleventh week of treatment. Data were analyzed using Kruskal-Wallis, Mann-Whitney, and Multiple General Regression Models. **Results:** Women with advanced breast cancer had an average trait-anxiety score of 48.24±5.92. A progressive improvement in anxiety scores was observed throughout the treatment evaluation stages (44.90±5.89; 43.37±5.34; 42.58±5.75), with a significant difference between the evaluations (p=0.008). Significant correlations were found between trait-anxiety and work situation (p=0.010) and ovarian metastasis (p=0.022). The adjusted general regression model also showed statistical significance for baseline evaluation with offspring (p=0.045) and education level (p=0.041). **Conclusion:** Women with breast cancer undergoing palliative chemotherapy exhibited high trait-anxiety scores, which decreased significantly over the course of treatment.

Keywords: Quality of life- breast neoplasms- oncology nursing

Introduction

Breast cancer remains a significant global health concern, with high incidence rates and being the leading cause of cancer-related mortality among women. In Brazil, the disease accounts for 20.3% of new cancer cases and poses a risk of 16.47 deaths per 100,000 women [1]. Metastatic breast cancer (MBC) is often associated with fatal outcomes, arising after a prolonged period of undetectable disease progression following initial treatments. The average survival duration for individuals with MBC ranges from eight to 36 months, although some exceptional cases exhibit extended survival periods [2].

Palliative therapy plays a crucial role in addressing the complex care needs of women diagnosed with MBC. This therapeutic approach involves the administration of systemic treatments aimed at alleviating symptoms, managing disease progression, and minimizing treatment-related side effects [3]. Chemotherapy (CT) and hormone therapy (HT) remain the primary modalities employed in MBC management, often leading to distressing symptoms reported by affected women due to both the disease and treatment burden [4].

The treatment of metastatic cancer has a widely recognized exhausting effect on patients. Women with MBC experience a negative impact on their mental well-being, which can result in symptoms such as depression, anxiety and stress [5, 6]. Anxiety is an unpleasant emotion resulting from intrusive feelings about the uncertain future and results in psychological and physical manifestations, with different consequences and negative impacts on Health-Related Quality of Life (HRQoL) [7].

The toll of metastatic cancer treatment on patients is well-documented, with women facing significant challenges that impact their mental well-being, potentially resulting in psychological conditions like depression, anxiety, and stress [5, 6]. Anxiety, characterized by intrusive thoughts about an uncertain future, manifests as both psychological and physical symptoms, exerting

[1]Postgraduate Program in Nursing, Federal University of Paraná, Curitiba, Paraná, Brazil. [2]Department of Nursing, Federal University of Paraná, Curitiba, Paraná, Brazil. [3]Department of Statistics, Federal University of Paraná, Curitiba, Paraná, Brazil. *For Correspondence: marcondes.lari@gmail.com

detrimental effects on Health-Related Quality of Life (HRQoL) [7].

Preserving HRQoL emerges as a paramount objective in the care of women battling MBC. The anxiety stemming from the dual burden of disease and treatment profoundly affects patients, hindering their daily activities and necessitating targeted interventions [4, 6]. In the pursuit of maintaining HRQoL, strategies emphasizing understanding and coping mechanisms become indispensable in the comprehensive disease management process. This holistic approach recognizes the importance of addressing not only the physical aspects of the disease but also its psychosocial dimensions to deliver effective and patient-centered care.

Therefore, this study aimed to investigate the anxiety levels of women with metastatic breast cancer at the onset and throughout palliative chemotherapy treatment. By evaluating anxiety in this patient population, we sought to enhance our understanding of the psychological impact of MBC treatment and inform tailored interventions to support these individuals effectively.

Materials and Methods

This descriptive, prospective study was conducted at the outpatient chemotherapy service of a national referral oncological hospital located in Southern Brazil. Data collection took place from September 2021 to October 2022.

The study included women with MBC aged 18 years or older who were initiating first or second-line palliative chemotherapy. Participants were screened based on the Authorization for High Complexity Procedure (AHCP) code of the Unified Health System (SUS) in Brazil, ensuring universal access to healthcare services. Hospitalized women were excluded from the study. Exclusion criteria included participants who refused to continue participation, discontinued chemotherapy treatment, or passed away during the study period.

A total of 123 eligible women with MBC initiating first or second-line palliative chemotherapy were invited to participate in the study. Each participant completed a questionnaire developed by the researchers, which included sociodemographic variables (age, marital status, education level, employment status, income, number of children, and religious beliefs) and clinical variables (Karnofsky performance status, comorbidities, number, and location of metastases).

Anxiety levels were assessed using the State-Trait Anxiety Inventory (STAI-T, STAI-S), a self-report instrument developed by Spielberger, Gorsuch, and Lushene in 1970 [8]. The instrument was translated and adapted to Brazil by Biaggio and Natalício in 1979 [9]. The STAI consists of two scales: state-anxiety (STAI-S) and trait-anxiety (STAI-T), each comprising 20 items scored on a scale of 1 to 4. The total score ranges from 20 to 80, with an average population score of 40. Scores below 38 indicate a tendency towards depression, while scores above 42 suggest anxiety, with higher scores indicating greater anxiety levels.

Patients scheduled to initiate palliative chemotherapy were identified through electronic medical records and AHCP codes. Eligible participants were invited to join the study and provided detailed information about the research objectives and procedures. Prior to the first palliative chemotherapy session, participants signed an Informed Consent Form indicating their voluntary participation in the study.

The sociodemographic and clinical data instruments, as well as STAI-T assessment, were administered solely at baseline (1st week), prior to the commencement of palliative chemotherapy. In contrast, STAI-S was administered at baseline (1st week) and during follow-up at the 5th and 11th weeks. The completion time for the questionnaires ranged from approximately 8 to 13 minutes. To ensure confidentiality and privacy, a private room was utilized for data collection.

Data entry was conducted in duplicate, independently, and subsequently validated before being electronically stored in Microsoft Excel Office 365® spreadsheets. The sociodemographic and clinical characteristics were subjected to descriptive analysis, including absolute and relative frequencies, mean, standard deviation, variation distribution, and frequency. The anxiety data analysis was performed using Statistica® software, version 7, with double data entry. Bivariate relationships between sociodemographic and clinical variables and anxiety scores were assessed using the Kruskal-Wallis test for variables with more than two categories and the Mann-Whitney test for variables with only two categories. General Multiple Regression Models were employed to evaluate the relationship between variables and anxiety scores. Statistical significance was determined by a probability value (p) below 0.05. The study received approval from the Research Ethics Committee of the study setting under Opinion number 4.704.263, dated May 11, 2021.

Results

A total of 123 women with MBC began first or second-line palliative chemotherapy and were enrolled in the study, all receiving outpatient treatment. Out of the initial cohort, 120 participants (97.56%) completed all three stages of data collection, while three participants discontinued due to mortality during the final assessment.

The mean age of the participants was 53.25 years (SD=11.27), ranging from 25 to 83 years. The Karnofsky Performance Status index had a mean value of 67.56% (SD=17.38), with a range from 40% to 90%. In terms of marital status, 54.47% (n=67) were married, 51.22% (n=63) had an education level up to elementary school, 53.66% (n=66) were employed, 81.3% (n=100) had an income between US$220.00 and US$660.00, and 46.34% (n=57) had only one child. Among the clinical characteristics, the presence of comorbidities and at least two metastases were notable, with common sites being lymph nodes (53.66%; n=66), lungs (53.66%; n=66), and bones (30.08%; n=37) (Table 1).

A significant difference in trait anxiety scores was observed among different work situations. In the bivariate analysis, women categorized as "Housewives" had

Table 1. Relationship between Anxiety Scores and Sociodemographic and Clinical Characteristics of Women Undergoing Palliative Chemotherapy for Metastatic Breast Cancer. Curitiba/ Paraná, Brazil, 2022

Variable	Total	Trait-Anxiety	State-Anxiety (1st week)	State-Anxiety (5th week)	State-Anxiety (11th week)
	n (%)		Mean		
Age in years (mean, SD)	53.25±11.27				
Karnofisky (mean, SD)	67.56±17.38				
Marital situation					
Single	37 (30.08)	48.51±5.79	43.46±4.64	43.16±4.61	42.46±5.64
Married/stable union	67 (54.47)	48.76±5.71	45.82±6.05	43.70±5.57	42.39±5.54
Separated/divorced	13 (10.57)	44.77±4.82	45.15±7.70	42.92±5.94	42.46±7.53
Widow	6 (4.88)	48.17±9.58	43±5.93	41.83±6.52	45.67±4.80
Education level					
Functionally illiterate	4 (3.25)	50.25±5.97	38.50±7.05	41±3.74	46.50±4.65
4 - 7 years of schooling	59 (47.97)	47.92±5.93	45.20±5.59	43.81±5.24	41.41±5.93
8 - 10 years of schooling	45 (36.59)	49.24±6.38	45.04±5.94	42.71±5.85	43.93±5.73
11 and more years of schooling	15 (12.20)	45.93±3.65	45±6.31	44.20±4.38	42.20±4.35
Work situation					
Active	66 (53.66)	47.67±4.25	44.26±5.60	43.59±4.96	42.48±5.71
Retired	20 (16.26)	45.60*±6.19	45.65±7.43	43.05±5.68	43.74±6.20
Housewife	16 (13.01)	53.50±8.50	46.13±4.06	43.56±5.81	42.63±5.63
Unemployed	21 (17.07)	48.52±5.83	45.29±6.47	42.81±6.12	41.80±5.81
Income**					
No Income	3 (2.44)	45±0	50±3.61	41.67±6.43	43.33±4.62
Up to US$ 220.00	7 (5.69)	45.71±3.64	42.71±6.16	41.86±2.97	39.50±4.51
US$220.00 - US$660.00	100 (81.30)	48.84±6.21	44.87±5.89	43.31±5.54	42.71±6.06
US$880.00 - US$2200.00	11 (8.94)	45.18±4.02	44.73±5.33	44.64±4.67	42.64±3.50
US$2420.00 - US$4400.00	2 (1.63)	48.50±0.71	47.50±12.02	47±4.24	44±5.66
N. of offspring					
No offspring	18 (14.63)	47.28±6.36	44.06±5.86	43.22±4.54	41.22±5.93
Only 1 offspring	57 (46.34)	48.75±5.70	44.98±4.73	43.02±4.74	42±5.42
2 - 3 offspring	38 (30.89)	47.79±6.38	45.84±7.42	42.89±6.08	44.26±5.76
Over 3 offspring	10 (8.13)	48.70±4.95	42.40±5.32	47.40±5.99	42.50±6.75
Religious Belief					
Yes	118 (95.93)	48.37±5.98	45.03±5.97	43.38±5.28	42.58±5.84
No	5 (4.07)	45±2.74	41.80±2.17	43±5.41	42.60±3.05
Comorbidities					
Yes	51 (41.46)	49.08±6.46	45.14±6.37	42.43±5.41	41.94±5.98
No	72 (58.54)	47.64±5.48	44.74±5.57	44.03±5.22	43.04±5.58
Number of Metastases					
1	43 (34.96)	47.12±4.80	45.07±5.18	42.47±4.69	43.36±6.62
2	52 (42.28)	48.42±6.56	44.40±6.05	43.48±5.34	41.80±5.19
3	25 (20.33)	49.96±6.27	45.44±6.98	44.44±6.46	43.28±5.02
4	3 (2.44)	46.67±3.79	46.67±4.62	45.33±3.21	39±7.21
Type of metastasis***					
Lymph node	66 (53.66)	48.77±6.47	45.70±6.29	43.55±5.65	42.17±5.46
Lung	66 (53.66)	48.70±6.29	45.44±6.12	44.03±5.30	42.18±5.55
Bone	37 (30.08)	47.65±5.19	44.08±5.44	43.86±5.08	42.46±5.61
Liver	20 (16.26)	48.75±5.50	45.05±6.69	42.90±6.58	42.74±4.11
Brain	15 (12.20)	48.07±6.63	44.93±4.82	43.80±3.38	43.87±7.37
Ovary	5(4.07)	55*±7.28	43.80±3.56	43.60±9.86	42±2.12
Uterus	5(4.07)	50.8±6.65	44.20±9.36	44.60±2.19	43±3.16
n: number of participants	123(100)	123	123	123	120

Legend - n: number of participants; SD: Standard Deviation; * p: <0.05 statistical significance; **US$ 220.00 is the approximate amount referring to the Brazilian minimum wage during the research period; *** The sum of the values may exceed 100%, as the same participant may have more than one metastasis.

Table 2. Assessment of Trait-Anxiety and Comparison between Stages of State-Anxiety Scores. Curitiba/Paraná, Brazil, 2022

	n	Mean±SD	Minimum	Maximum	p
Trait-Anxiety	123	48.24±5.92	36	65	
STATE-Anxiety (1st week)	123	44.90±5.89	30	60	0.008
STATE-Anxiety (5th week)	123	43.37±5.34	31	57	
STATE-Anxiety (11th week)	120	42.58±5.75	30	55	

n, number of participants; p, p-value <0.05 statistical significance; SD, Standard Deviation.

Table 3. Adjusted General Regression Model Analysis Examining the Correlation of Sociodemographic and Clinical Variables and Trait-Anxiety Scores. Curitiba/Paraná, Brazil, 2022

Effect	SS	MS	F	p
Marital status	48.6	16.2	0.498	0.685
Offspring	137.3	45.8	1,406	0.246
Education level	55.9	18.6	0.573	0.635
Employment Status	441.5	147.2	4,521	0.005*
Family income	88.8	22.2	0.682	0.606
INSS financial aid	1.9	1.9	0.059	0.809
Comorbidities	1.9	1.9	0.060	0.807
Smoking	0.1	0.1	0.003	0.959
Continuous medication	32	32	0.984	0.324
Karnofsky performance status	70.9	14.2	0.436	0.822
Number of metastases	9.2	4.6	0.141	0.869

F, Snedecor's F statistic; INSS, National Institute of Social Security; MS, Mean Square; p, p-value; SS: Sum of square; * p: <0.05 statistical significance.

significantly higher STAI-T scores compared to other categories (p=0.010) (Table 1).

Regarding clinical variables, a significant difference in trait anxiety scores was found between women with and without metastasis in the ovary. Women with ovarian metastasis had significantly higher trait anxiety scores than those without such metastasis (p=0.022) (Table 1).

The results for Trait-Anxiety indicated that women exhibited anxiety scores at baseline, with a mean of 48.24 (SD = 5.92). State-Anxiety scores showed a significant difference across evaluations (p=0.008), with a notable reduction in scores from baseline to the 3rd evaluation (baseline > 2nd eval. > 3rd eval.) (Table 2). The regression model identified that only the variable of work situation significantly influenced the STAI-T score (Table 3).

In terms of the relationship between sociodemographic and clinical variables and state-anxiety scores, the adjusted general regression model demonstrated statistical significance at baseline (1st week) for the variables of children (p=0.045) and education level (p=0.041), potentially influencing baseline anxiety levels. At the 2nd evaluation (5th week), the presence of comorbidities significantly impacted state-anxiety scores (p=0.047). By the 11th week (3rd evaluation), no variable was deemed significant in influencing state-anxiety (STAI-S) scores, although the education level variable was nearly significant, with higher scores observed for functionally illiterate individuals (Table 4).

Women with MBC commencing palliative chemotherapy and having more than three children (42.40±5.32) exhibited lower baseline anxiety levels compared to other participants, while functionally illiterate individuals had significantly lower baseline STAI-S scores than other educational categories. Additionally, at the 2nd evaluation (5th week), the presence of comorbidities was associated with significantly higher anxiety scores (Table 4).

Table 4. Adjusted General Regression Model Analysis Examining the Correlation of Sociodemographic and Clinical Variables and State-Anxiety Scores. Curitiba/Paraná, Brazil, 2022

Stages	(1st week)				(5th week)				(11th week)			
Effect	SS	MS	F	p	SS	MS	F	P	SS	MS	F	p
Marital status	227.8	75.9	2,275	0.086	15.9	5.3	0.174	0.914	64.9	21.62	0.606	0.613
Offspring	287	95.7	2,866	0.041*	126.2	42.1	1,379	0.254	58.6	19.52	0.547	0.651
Schooling level	280.6	93.5	2,802	0.045*	47.2	15.7	0.516	0.672	280.4	93.47	2,621	0.056
Employment Status	120.1	40	1,199	0.315	25.7	8.6	0.281	0.839	27.6	9.21	0.258	0.855
Family income	48	12	0.359	0.837	74.8	18.7	0.613	0.654	92.8	23.21	0.651	0.628
INSS financial aid	12.6	12.6	0.378	0.540	78.1	78.1	2,561	0.113	10.7	10.67	0.299	0.586
Comorbidities	57.9	57.9	1,734	0.191	124.2	124.2	4,072	0.047*	21.3	21.25	0.596	0.442
Smoking	58.3	58.3	1,746	0.190	1.5	1.5	0.050	0.823	48.6	48.65	1,364	0.246
Continuous medication	128.1	128.1	3,839	0.053	14.5	14.5	0.475	0.492	14.2	14.16	0.397	0.530
Karnofsky performance status	228.9	45.8	1,372	0.243	197.2	39.4	1,293	0.274	71.8	14.35	0.402	0.846
Number of metastases	194.4	97.2	2,912	0.060	17	8.5	0.279	0.757	56.9	28.44	0.797	0.454

F, Snedecor's F statistic; INSS, National Institute of Social Security; MS, Mean Square; p, p-value; SS, Sum of squares; * p, <0.05 statistical significance.

Discussion

Women diagnosed with MBC face a multitude of challenges stemming from disease progression and the side effects of palliative chemotherapy, leading to disruptions in their daily lives and heightened levels of anxiety throughout their treatment journey. It is imperative for healthcare teams to integrate routine assessments to address these concerns, implement strategies to alleviate anxiety, and emphasize the importance of continuing palliative therapy.

The findings of this study align with the demographic profile of women with breast cancer reported in various international studies conducted in countries such as China, Brazil, and Spain. For instance, research in China revealed that women had a mean age of 49.7 years, were typically married, had limited educational attainment up to elementary or junior school levels, were free of comorbidities, and were actively engaged in the workforce [10]. Similarly, studies in Brazil indicated that women had a mean age of 53.5 years, were predominantly married with children [11], and exhibited severe anxiety levels at the onset of treatment [12]. While cancer treatment can negatively impact socioeconomic and marital aspects, studies emphasize that having a supportive family structure, including a spouse and children, can significantly aid in coping with cancer and its treatment, providing a stable support system for affected women [13].

In contrast to research involving Chinese women with MBC, where bone metastasis was predominant (54.5%) and first-line palliative chemotherapy was common (51.1%) [4], the present study identified lung metastasis as the primary site of metastatic spread. Previous literature has indicated that bones, lungs, liver, and brain are frequently affected by distant metastasis in breast cancer cases [14, 4]. Studies conducted in Italy have highlighted the significance of lung cancer as the initial site of distant metastasis, with patients exhibiting improved survival outcomes compared to those with bone, liver, or brain metastases as their primary site of spread [15]. Additionally, research from the Dresden Regional Cancer Registry in Germany emphasized a significant increase in 5-year survival rates among patients with bone metastasis compared to other metastatic sites [16]. Despite these findings, Wang et al. [14] noted the lack of comprehensive population-based studies focusing on survival disparities among patients with different metastatic patterns, with bone, lung, and brain metastases recognized as having the most detrimental impact on HRQoL.

This sample comprised women in stages III and IV, as per the inclusion criteria, undergoing more aggressive treatments leading to a deteriorating prognosis and escalating symptoms during therapy. Despite significant advancements in breast cancer treatment, metastatic disease often manifests after a prolonged period of undetectable disease following surgery or systemic therapy, resulting in recurrence. As the disease progresses, symptoms worsen, consequently diminishing the quality of life for these women. They endure symptoms affecting both physical and psychological aspects, underscoring the importance of comprehending the progression of metastatic disease and its adverse health impacts. Metastatic recurrence, largely incurable, remains a primary concern for cancer patients and their caregivers, significantly influencing psychological well-being, including anxiety and depression [2].

Regarding the anxiety-depressive profile of the participants in this study, the sample exhibited trait anxiety (a stable variable indicating a heightened susceptibility to anxiety) prior to study enrollment, likely linked to uncertainties stemming from the breast cancer diagnosis and treatment. A study conducted in Taiwan [17] highlighted that women with breast cancer often experience various discomforts during treatment, such as physical changes, fatigue, pain, alterations in eating habits, sleep disturbances, and anxiety related to mortality, particularly in advanced-stage cancer patients, aligning with the findings of this research.

Trait anxiety denotes a predisposition to perceive situations as threatening and experience elevated anxiety levels. This study revealed that trait anxiety is significantly influenced by occupational status and the stage at the onset of palliative chemotherapy treatment. Heightened anxiety among individuals without paid employment may stem from concerns regarding income and financial challenges. Moreover, increased leisure time may lead to intensified contemplation about the disease, subsequent follow-up stages, or the current diagnosis phase.

Marital status is another critical factor warranting evaluation, as it plays a pivotal role in mediating anxiety among cancer patients. Divorced/separated, single, and widowed women exhibited lower trait anxiety scores in this study, while married or cohabiting women demonstrated higher trait and state anxiety scores. For many women diagnosed with breast cancer, apprehension regarding their families can trigger stress. This concern may be associated with feelings of insecurity about their partners' acceptance of the disease, coupled with fears of relationship strain due to the illness or the prospect of being replaced by another woman [18, 12].

In the second and third assessments of this study, a decrease in the momentary state of anxiety was observed. This reduction could be attributed to the conventional treatment (palliative chemotherapy) and an increased anticipation of symptom improvement and/or enhanced quality of life associated with the hope inspired by commencing a new therapy. Consistent with this trend, a study involving Chinese women noted that anxiety symptoms were more pronounced before chemotherapy (mean = 6.0, SD = 3.6), decreased after two cycles of chemotherapy (mean = 5.7, SD = 3.5), and slightly increased post-chemotherapy completion (mean = 5.8, SD = 3.6), without reaching initial levels. Additionally, these patients exhibited a heightened risk of anxiety disorder before chemotherapy, which decreased after two cycles [19].

The onset or modification of the therapeutic process often triggers psychological distress due to concerns about disease progression and the aggressiveness of new treatments, leading to elevated anxiety scores among women. These issues tend to diminish over the course of

palliative chemotherapy cycles, particularly as physical symptoms improve and the prospect of prolonging life with reduced suffering becomes more tangible.

The distress experienced by women with metastatic breast cancer plays a pivotal role in their illness journeys and necessitates further examination. A comprehensive understanding of the emotional and psychological repercussions of this distress is crucial for delivering holistic and effective care to patients. Delving into aspects related to the disease trajectory can offer valuable insights for developing interventions and support strategies by the interdisciplinary team that enhance the well-being and quality of life of these women [4]. A previous study suggested that the state of anxiety may be linked to the number of children, although the authors focused on dependent children in women with advanced cancer. In that context, they found that a higher number of children correlated with an increased risk of anxiety [20]. A study in China yielded similar results, indicating that women with breast cancer who have more than one child are more prone to experiencing anxiety compared to those without children [19]. In contrast, the current study revealed divergent findings: women with more than three children exhibited lower baseline anxiety scores, potentially attributable to the family support they received. The proximity of children, family support, and social support networks play crucial roles in mitigating the negative impacts of diagnosis and treatment. Emotional support can alleviate stress and anxiety, foster resilience, and enhance the quality of life for women navigating through the disease. Recognizing and bolstering these support networks are essential components of holistic and multidimensional care for women with breast cancer.

The present study highlighted that baseline state-anxiety levels are influenced by the educational attainment of women with metastatic breast cancer. Functionally illiterate women did not exhibit higher anxiety scores compared to other educational categories. These findings align with a multicenter study conducted in the USA and Canada, which identified elevated physical symptom-related anxiety scores in univariate logistic regression analyses using the Hospital Anxiety and Depression Scale (HADS), underscoring the vulnerability of women with higher education levels [21].

A study conducted in Greece involving women with breast cancer demonstrated that education could serve as a protective factor against depression and anxiety in this population. The authors noted that women with lower levels of education were more likely to exhibit symptoms of depression and anxiety [22]. However, our study presented contrasting findings: women with higher levels of education displayed elevated anxiety scores, potentially due to increased responsibilities associated with daily activities, work commitments, and social engagements. The impact of the disease and its treatment often hinders women from carrying out their usual routines, affecting their HRQoL and triggering anxiety.

This research conducted a dynamic assessment of anxiety symptoms in patients before and during chemotherapy treatment, revealing a decline in anxiety scores as chemotherapy progressed. Understanding the factors and challenges related to anxiety in populations of patients with advanced cancer is crucial, as abnormal anxiety can detrimentally affect the psychological well-being of individuals. These results underscore the importance of implementing interventions focused on mental health during cancer treatment.

It is important to acknowledge the limitations of this study. The research was conducted at a single cancer center in Southern Brazil, potentially limiting the generalizability of the results to other regions within the country or to countries with more diverse populations of women. To enhance the applicability and validity of the data, future studies should consider collecting samples from multiple hospitals across the country.

In summary, women with breast cancer initiating palliative chemotherapy exhibited increased trait-anxiety when classified as "housewives" in terms of their work situation, while anxiety levels decreased among those who were divorced or separated. State-anxiety scores decreased in single women, widows, and those with a higher number of children. Notably, state-anxiety significantly decreased between baseline, the 5th week, and 11th week following the initiation of palliative chemotherapy.

The notable prevalence of anxiety among Brazilian women with breast cancer commencing palliative chemotherapy underscores the urgent need for enhanced mental health care and emphasizes the importance of comprehensive approaches that address both the physical and psychological aspects of care for these individuals. Understanding these findings will empower oncology nurses and the multidisciplinary team to develop and implement personalized care plans aimed at enhancing women's coping mechanisms, fostering problem-solving skills, and improving mood and quality of life. This highlights the significance of tailored, mental health-focused approaches to cancer treatment that prioritize the holistic well-being of patients.

Author Contribution Statement

Larissa Marcondes, Luciana Puchaski Kalinke conceived and designed the analysis. Paulo Ricardo Bittencourt Guimarães performed the statistical analysis. All authors discussed the results and contributed to the final manuscript.

Acknowledgements

Data availability statement

All the relevant data is presented in the manuscript, and sources have been cited.

Conflict of Interest

The authors declare no conflict of interest.

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