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Emotional Support Source and Time Since Diagnosis as Correlates of Anxiety Among Women with Breast Cancer Undergoing Chemotherapy: A Cross-Sectional Study

Zahra Rezaei Borojerdi[1], Hediyeh Barkhordari[2], *Sajad Ataei Azimi[1]

[1]Department of Hematology and Oncology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

[2]Nursing Research Center, Kerman University of Medical Sciences, Kerman, Iran.

Abstract

Background: Anxious preoccupation is common among Iranian women with stage I–III breast cancer receiving chemotherapy. This study examined sociodemographic, clinical, and interpersonal correlates of anxious preoccupation among women with stage I–III breast cancer receiving chemotherapy in Iran.

***Materials and Methods*:** This cross-sectional analytical study enrolled 200 women with histologically confirmed stage I–III breast cancer receiving chemotherapy at oncology facilities in Kerman, Iran, using purposive convenience sampling. Cancer-related anxious preoccupation was assessed with the Mini-Mental Adjustment to Cancer Anxious Preoccupation subscale. Mean scores were compared across participant characteristics using independent-samples t tests and one-way ANOVA, with Fisher's LSD post hoc testing for significant results.

Results: Among 200 participants, mean anxious-preoccupation scores differed significantly by primary emotional-support source ($p = 0.003$) and time since breast-cancer diagnosis ($p < 0.001$). Women identifying parents as their principal emotional supporters reported higher anxious-preoccupation scores than those primarily supported by spouses or children. Scores were highest among women assessed four months after diagnosis and significantly exceeded those reported at three, five, and six months. No significant differences were observed by educational level, marital status, health-insurance type, tumor histology, histological grade, or affected-breast laterality (all $p > 0.05$). Chemotherapy duration was perfectly collinear with time since diagnosis and produced identical results; therefore, its independent association with anxious preoccupation could not be estimated.

Conclusion: Among women with stage I–III breast cancer receiving chemotherapy, anxious preoccupation was associated with support source and time since diagnosis. Scores were higher four months after diagnosis and among women primarily supported by parents. As chemotherapy duration was collinear with diagnosis timing, psychosocial assessment should consider support networks throughout treatment.

Key Words: Anxious preoccupation, Breast neoplasms, Chemotherapy, Iran, Social support.

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Corresponding Author:

Sajad Ataei Azimi, MD, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Email: ataeiazimis@mums.ac.ir

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1- INTRODUCTION

Breast cancer is the most commonly diagnosed cancer among women worldwide and remains a major public-health challenge. According to the GLOBOCAN 2020 estimates, approximately 2.3 million new cases of female breast cancer were diagnosed globally, accounting for 11.7% of all newly diagnosed cancers (1). In Iran, breast cancer is also the most prevalent malignancy among women and represents an important public-health concern (2). Breast cancer additionally imposes substantial psychological and socioeconomic burdens on patients and their families, highlighting the need for supportive-care strategies in Iranian cancer populations (3).

Advances in breast cancer management, including surgery, chemotherapy, radiotherapy, endocrine therapy, and targeted treatments, have improved clinical outcomes. Nevertheless, cancer treatment is frequently accompanied by substantial physical and psychological challenges. Chemotherapy may cause nausea, vomiting, fatigue, alopecia, anemia, and cognitive difficulties, and its toxicities can adversely affect patients' daily functioning and well-being (4, 5). Repeated hospital visits, treatment-related uncertainty, altered body image, and disruption of occupational and social roles may further compromise quality of life during chemotherapy (6, 7).

Psychological distress, including anxiety-related symptoms, is common among women with breast cancer. A systematic review and meta-analysis reported a substantial prevalence of psychological distress among patients with breast cancer, although prevalence estimates varied according to the assessment instrument, treatment stage, and clinical setting (8). Anxiety-related distress may adversely affect quality of life and the experience of cancer treatment (7, 9). Women receiving chemotherapy may be especially vulnerable because of uncertainty about prognosis, fear of disease progression or recurrence, treatment-related adverse effects, and changes in body image and daily functioning (6, 10). Recent evidence also indicates that psychological distress is associated with a range of demographic, clinical, social, and treatment-related characteristics among women with breast cancer (11).

The psychological response to breast cancer is heterogeneous and may be associated with demographic, clinical, and interpersonal characteristics. Age, educational level, marital status, employment, health-insurance status, and perceived social support have been associated with psychological adjustment and mental health outcomes among women with breast cancer (11–13). Clinical factors, including time since diagnosis, duration of chemotherapy, treatment-related experiences, and tumor-related characteristics, may also be associated with psychological adjustment; however, findings across studies have been inconsistent (11, 13, 14). This variability highlights the importance of considering both clinical context and timing of assessment when evaluating cancer-related psychological distress.

Social and emotional support may represent important interpersonal correlates of psychological adjustment during cancer treatment. Support from spouses, children, parents, relatives, and peers can provide emotional reassurance, practical assistance, and help with treatment-related demands. However, its availability, adequacy, and perceived quality may differ across patients and cultural contexts. The identity of the primary support provider may also be relevant because it may reflect differences in relationship expectations, caregiving roles, and perceived family responsibility. Higher perceived social support has

generally been associated with lower psychological distress and better quality of life among women with breast cancer, although these associations may vary according to the source and perceived quality of support (9–11). A recent systematic review and meta-analysis reported a small but significant inverse association between social support and psychological distress in breast cancer populations (11). In addition, a systematic review and meta-analysis of randomized controlled trials suggested that peer-support interventions may improve quality of life and reduce anxiety among women with breast cancer, although the certainty of the evidence was low and substantial heterogeneity was observed across studies (15).

The assessment of cancer-related psychological adjustment requires conceptually appropriate instruments. The Mini-Mental Adjustment to Cancer scale includes an Anxious Preoccupation subscale that assesses cancer-related worry, uncertainty, and preoccupation with illness (16). The Persian version of the Mini-MAC has demonstrated acceptable psychometric properties, supporting its use among Iranian patients with cancer (17).

Despite growing evidence regarding psychological distress in breast cancer, the associations of anxious preoccupation with treatment timing and the primary source of emotional support remain insufficiently characterized among women receiving chemotherapy in Iran. In particular, limited information is available on whether anxious-preoccupation scores differ according to time since diagnosis and the family member identified as the principal source of emotional support. Identifying these correlates may help oncology teams recognize patients who could benefit from timely psychological assessment and culturally responsive, family-centered psychosocial support.

Accordingly, this study aimed to examine the associations of primary emotional support source and time since diagnosis with anxious preoccupation among women with stage I–III breast cancer undergoing chemotherapy in Kerman, Iran. As secondary analyses, we assessed whether anxious-preoccupation scores differed according to selected sociodemographic characteristics, tumor-related variables, and treatment-related characteristics. Because duration of chemotherapy was assessed as a clinical variable, its association with anxious preoccupation was also examined; however, it was interpreted cautiously because of its close temporal relationship with time since diagnosis.

2- MATERIALS AND METHODS

2-1. Study Design and Setting

This cross-sectional analytical study was conducted between 2021 and 2022 at three oncology facilities in Kerman, southeastern Iran: Javad-al-Aemeh Oncology Center, affiliated with Kerman University of Medical Sciences; Yas Cancer Charity Foundation; and private oncology clinics. The study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement for cross-sectional studies (18).

2-2. Participants and Sampling

The target population comprised women with non-metastatic breast cancer who were receiving active chemotherapy during the study period. Participants were recruited using purposive convenience sampling. Potentially eligible patients were identified through review of clinical records and were approached during scheduled outpatient chemotherapy visits.

Participants were eligible if they: (1) were aged 18 years or older; (2) had histologically confirmed stage I–III breast cancer documented in their medical

records; (3) were receiving active chemotherapy; (4) had completed at least 1 month of chemotherapy after initiation of the first chemotherapy cycle; (5) were able to read and complete the Persian-language questionnaires; and (6) provided written informed consent.

Patients were excluded if they had metastatic breast cancer (stage IV), a documented diagnosis of a severe psychiatric disorder before cancer diagnosis, or incomplete responses to more than 10% of Mini-MAC items. Participants who withdrew before completing the questionnaire were also excluded.

Following eligibility screening and exclusion of incomplete questionnaires, data from 200 participants were included in the final analysis.

2-3. Variables and Data Sources

The primary outcome was cancer-related anxious preoccupation, assessed using the Anxious Preoccupation subscale of the Mini-Mental Adjustment to Cancer scale (Mini-MAC). The explanatory variables comprised demographic, clinical and tumor-related, treatment-timing, and support-related characteristics.

Demographic variables included age, marital status, educational level, employment status, household income, and health-insurance status. Clinical and tumor-related variables included cancer stage, tumor histology, histological grade, laterality of the affected breast, time since diagnosis, history of breast surgery, chemotherapy regimen, number of completed chemotherapy cycles, and duration of chemotherapy. Clinical and tumor-related data were extracted from medical records. Demographic data and information on the primary source of emotional support were obtained using a structured participant questionnaire.

The primary source of emotional support was defined as the person or group from whom the participant reported receiving the main emotional support during cancer treatment. Time since diagnosis and duration of chemotherapy were recorded in months and categorized for analysis based on the distribution of the data and clinical relevance. The cut-points used to form these categories should be reported in the Results section and in all relevant tables.

2-4. Measures

2-4-1. Demographic and Clinical Questionnaire

A structured questionnaire was used to collect demographic and support-related information. Clinical and tumor-related variables were verified against medical records to reduce the risk of misclassification.

2-4-2. Mini-Mental Adjustment to Cancer Scale

Cancer-related psychological adjustment was assessed using the Mini-Mental Adjustment to Cancer scale (Mini-MAC). The Mini-MAC is a 29-item self-report instrument that assesses five dimensions of psychological adjustment to cancer: Fighting Spirit, Helplessness/Hopelessness, Anxious Preoccupation, Fatalism, and Cognitive Avoidance (16). Each item is scored on a 4-point Likert scale ranging from 1 (“definitely does not apply to me”) to 4 (“definitely applies to me”).

In the present study, the eight-item Anxious Preoccupation subscale was used as the primary outcome measure. Total scores range from 8 to 32, with higher scores indicating greater cancer-related anxious preoccupation. The Persian version of the Mini-MAC has demonstrated acceptable psychometric properties among Iranian patients with cancer. In the Persian validation study, the Anxious Preoccupation subscale demonstrated excellent internal

consistency (Cronbach's alpha = 0.90) (17).

The Mini-MAC assesses psychological adjustment to cancer. Accordingly, scores on the Anxious Preoccupation subscale were interpreted as reflecting cancer-related worry, uncertainty, and preoccupation with illness, rather than as a diagnostic measure of an anxiety disorder (16, 17).

2-5. Data-Collection Procedure

Data were collected during scheduled chemotherapy visits. The researcher reviewed clinical records to identify potentially eligible patients. Eligible patients received verbal and written information regarding the study objectives, the voluntary nature of participation, confidentiality safeguards, and their right to decline or withdraw without any effect on their treatment or care.

After providing written informed consent, participants completed the questionnaires in a quiet area of the outpatient chemotherapy unit or during a rest period before or after chemotherapy infusion, according to their preference and clinical condition. The researcher remained available to clarify questionnaire instructions without influencing participants' responses. Participants were assigned unique study identification codes, and identifying information was stored separately from the research data. Completed questionnaires and clinical data were entered into a password-protected database accessible only to the research team.

2-6. Statistical Analysis

Data were analyzed using IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, NY, USA). Categorical variables were summarized as frequencies and percentages. Continuous variables were summarized as means and standard deviations if approximately normally distributed; otherwise, medians and interquartile ranges should be reported.

The distribution of Anxious Preoccupation scores was assessed using histograms, Q–Q plots, the Kolmogorov–Smirnov test, and skewness and kurtosis indices. Homogeneity of variances was assessed using Levene's test. Because Anxious Preoccupation scores were approximately normally distributed and variance homogeneity was considered acceptable, parametric tests were used.

Independent-samples *t* tests were used to compare mean Anxious Preoccupation scores between two groups. One-way analysis of variance (ANOVA) was used to compare mean scores across three or more groups. When the overall ANOVA was statistically significant, pairwise comparisons were conducted using Fisher's least significant difference post hoc test.

All statistical tests were two-sided, and a *p* value of less than 0.05 was considered statistically significant.

2-7. Ethical Considerations

The study protocol was reviewed and approved by the Ethics Committee of Kerman University of Medical Sciences, Kerman, Iran, before participant recruitment and data collection (Ethics Code: IR.KMU.REC.1400.246). The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (19). All eligible participants received verbal and written information regarding the study objectives, procedures, voluntary nature of participation, and measures taken to protect privacy and confidentiality. Written informed consent was obtained from all participants before enrolment and data collection. Participants were informed that they could decline participation or withdraw from the study at any time without providing a reason and without any effect on their treatment or care.

Participants' confidentiality was protected through the use of unique study identification codes. Identifying information was stored separately from the research dataset, and access to identifiable data was restricted to authorized members of the research team. Study findings are reported only in aggregate form, and no personally identifiable information is disclosed.

3- RESULTS

3-1. Participant Characteristics

A total of 200 women with stage I–III breast cancer who were receiving chemotherapy were included in the analysis. Their demographic and clinical characteristics are presented in **Table 1**.

Most participants were married (n = 172, 86.0%). Regarding educational attainment, 70 participants (35.0%) had university education and 67 (33.5%) had completed high school. Social Security insurance was reported by 103 participants (51.5%), whereas 97 participants (48.5%) were covered by Medical Services insurance.

Invasive ductal carcinoma was the most common histopathological subtype (n = 174, 87.0%), and grade II tumors were predominant (n = 130, 65.0%). Left-sided breast cancer was observed in 115 participants (57.5%). The spouse was the most frequently reported primary source of emotional support (n = 103, 51.5%), followed by children (n = 51, 25.5%) and parents (n = 46, 23.0%).

Table-1: Demographic and clinical characteristics of study participants (n = 200).

Variables	Category	n	%
Educational level	Primary education	50	25.0
	Middle school	13	6.5
	High school diploma	67	33.5
	University education	70	35.0
Marital status	Single	12	6.0
	Married	172	86.0
	Divorced/widowed	16	8.0
Health insurance	Social Security	103	51.5
	Medical Services	97	48.5
Time since diagnosis (months)	3	55	27.5
	4	54	27.0
	5	55	27.5
	6	36	18.0
Duration of chemotherapy (months)	2	55	27.5

Variables	Category	n	%
	3	54	27.0
	4	55	27.5
	5	36	18.0
Histological grade	Grade I	8	4.0
	Grade II	130	65.0
	Grade III	62	31.0
Tumor histology	Invasive ductal carcinoma	174	87.0
	Lobular carcinoma	8	4.0
	Carcinoma, not otherwise specified	18	9.0
Affected breast	Left	115	57.5
	Right	85	42.5
Primary source of emotional support	Spouse	103	51.5
	Children	51	25.5
	Parents	46	23.0
Total	—	200	100.0

Note. Data are presented as frequency (n) and percentage (%). The duration-of-chemotherapy categories corresponded exactly to the time-since-diagnosis categories and were therefore perfectly collinear.

3-2. Anxious Preoccupation Scores

The mean Anxious Preoccupation score in the total sample was 82.00 ± 14.79. Unadjusted comparisons of Anxious Preoccupation scores across demographic and clinical characteristics are presented in **Table 2**.

No statistically significant differences in Anxious Preoccupation scores were observed according to educational level, marital status, health-insurance type, tumor histology, affected breast side, or histological grade (all $p > 0.05$). In contrast, mean scores differed significantly according to time since diagnosis, $F(3,196) = 13.914$, $p < 0.001$, and the primary source of emotional support, $F(2,197) = 6.053$, $p = 0.003$.

Participants assessed 4 months after diagnosis had the highest mean Anxious Preoccupation score (90.12 ± 13.04), whereas those assessed 6 months after diagnosis had the lowest mean score (75.00 ± 11.57). Mean scores were 76.13 ± 14.24 among participants assessed 3 months after diagnosis and 84.47 ± 14.47 among those assessed 5 months after diagnosis.

Mean Anxious Preoccupation scores also differed by the primary source of emotional support. Participants who identified their parents as their primary

source of emotional support had the highest mean score (88.04 ± 13.23), followed by those reporting children (82.02 ± 15.85) and a spouse (79.28 ± 14.23) as their primary source of emotional support.

Duration of chemotherapy was perfectly collinear with time since diagnosis: the 2-, 3-, 4-, and 5-month chemotherapy-duration categories corresponded exactly to the 3-, 4-, 5-, and 6-month time-since-diagnosis categories, respectively. Accordingly, the descriptive statistics and unadjusted comparisons for duration of chemotherapy were identical to those for time since diagnosis. Duration of chemotherapy was therefore not included simultaneously with time since diagnosis in adjusted analyses.

Table-2: Unadjusted comparisons of Anxious Preoccupation scores according to demographic and clinical characteristics (n = 200).

Variables	Category	n	Anxious Preoccupation score, mean ± SD	Test statistic	P-value
Educational level	Primary education	50	82.16 ± 14.24		0.893
	Middle school	13	79.16 ± 15.31		
	High school diploma	67	81.78 ± 14.76		
	University education	70	82.62 ± 15.35		
Marital status	Single	12	90.28 ± 12.10		0.102
	Married	172	81.30 ± 14.81		
	Divorced/widowed	16	83.33 ± 15.22		
Health insurance	Social Security	103	83.74 ± 13.62		0.087
	Medical Services	97	80.15 ± 15.80		
Time since diagnosis (months)	3	55	76.13 ± 14.24		<0.001
	4	54	90.12 ± 13.04		
	5	55	84.47 ± 14.47		
	6	36	75.00 ± 11.57		
Duration of chemotherapy (months)†	2	55	76.13 ± 14.24		<0.001
	3	54	90.12 ± 13.04		

Variables	Category	n	Anxious Preoccupation score, mean ± SD	Test statistic	P-value
	4	55	84.47 ± 14.47		
	5	36	75.00 ± 11.57		
Tumor histology	Invasive ductal carcinoma	174	82.01 ± 14.95		0.989
	Lobular carcinoma	8	81.25 ± 17.96		
	Carcinoma, not otherwise specified	18	82.17 ± 12.28		
Affected breast	Left	115	83.55 ± 14.09		0.084
	Right	85	79.90 ± 15.52		
Histological grade	Grade I	8	72.91 ± 17.11		0.207
	Grade II	130	82.47 ± 14.55		
	Grade III	62	82.19 ± 14.85		
Primary source of emotional support	Spouse	103	79.28 ± 14.23		0.003
	Children	51	82.02 ± 15.85		
	Parents	46	88.04 ± 13.23		
Total	—	200	82.00 ± 14.79	—	—

Note. Data are presented as mean ± standard deviation (SD). One-way analysis of variance (ANOVA) was used for variables with three or more categories, and an independent-samples *t* test was used for dichotomous variables.

†Duration of chemotherapy was perfectly collinear with time since diagnosis; therefore, the two variables were not included simultaneously in adjusted analyses.

3-3. Post-hoc Comparisons

Fisher's least significant difference (LSD) post-hoc comparisons were conducted following statistically significant omnibus ANOVA results for time since diagnosis and primary source of emotional support (**Table 3**).

For time since diagnosis, participants assessed 4 months after diagnosis had significantly higher mean Anxious Preoccupation scores than those assessed 3 months after diagnosis (mean difference [MD] = 13.99, 95% confidence interval [CI]: 8.87 to 19.11; $p < 0.001$), 5 months

after diagnosis (MD = 5.65, 95% CI: 0.54 to 10.77; p = 0.031), and 6 months after diagnosis (MD = 15.12, 95% CI: 9.38 to 20.87; p < 0.001).

Participants assessed 5 months after diagnosis also had significantly higher mean scores than those assessed 3 months after diagnosis (MD = 8.34, 95% CI: 3.24 to 13.44; p = 0.001) and 6 months after diagnosis (MD = 9.47, 95% CI: 3.75 to 15.20; p = 0.001).

No statistically significant difference was observed between participants assessed 3 and 6 months after diagnosis (MD = 1.13, 95% CI: −4.60 to 6.86; p = 0.696).

With respect to the primary source of emotional support, participants who identified their parents as their main source of emotional support had significantly higher mean Anxious Preoccupation scores than those who identified their spouse (MD = 8.76, 95% CI: 3.71 to 13.82; p = 0.001) or children (MD = 6.02, 95% CI: 0.22 to 11.83; p = 0.042) as their main source of emotional support.

No statistically significant difference was observed between participants supported primarily by their spouse and those supported primarily by their children (MD = 2.74, 95% CI: −2.14 to 7.61; p = 0.269).

Table-3: Post Hoc Pairwise Comparisons of Anxious Preoccupation Scores

Variables	Group I	Group J	Mean difference (I − J)	Standard error	P-value	95% CI
Primary source of emotional support	Spouse	Children	−2.74	2.472	0.269	−7.61 to 2.14
	Spouse	Parents	−8.76	2.561	0.001	−13.82 to −3.71
	Children	Parents	−6.02	2.936	0.042	−11.83 to −0.22
Time since diagnosis (months)	3	4	−13.99	2.595	<0.001	−19.11 to −8.87
	3	5	−8.34	2.583	0.001	−13.44 to −3.24
	3	6	1.13	2.904	0.696	−4.60 to 6.86
	4	5	5.65	2.595	0.031	0.54 to 10.77
	4	6	15.12	2.914	<0.001	9.38 to 20.87
	5	6	9.47	2.904	0.001	3.75 to 15.20

Note*:* Pairwise comparisons were presumably conducted using a post hoc multiple-comparison procedure following one-way analysis of variance. Specify the exact post hoc test used (e.g., Tukey HSD, Bonferroni, or LSD) in the table footnote or statistical analysis section. CI: confidence interval.

4- DISCUSSION

This study examined demographic, clinical, and psychosocial correlates of cancer-related anxious preoccupation among women with breast cancer receiving chemotherapy. Anxious Preoccupation scores differed significantly according to the primary source of emotional support and time since diagnosis. In contrast, educational level, marital status, health-insurance type, tumor histology, histological grade, and affected breast side were not significantly associated with Anxious Preoccupation

scores. Duration of chemotherapy yielded identical results because it was perfectly collinear with time since diagnosis; therefore, its independent association with cancer-related anxious preoccupation could not be evaluated.

A notable finding was the association between the primary source of emotional support and Anxious Preoccupation scores. Participants who identified their parents as their principal source of emotional support reported significantly higher scores than those supported primarily by their spouse or children. Participants supported primarily by their spouse had the lowest mean score, although the difference between the spouse-support and child-support groups was not statistically significant. This finding should not be interpreted to mean that parental support causes greater anxious preoccupation. Rather, it may reflect differences in the availability, perceived adequacy, quality, or relational context of support. It is also possible that women with greater cancer-related worry were more likely to seek or require emotional support from their parents. Because the present study did not assess perceived social support, relationship quality, family functioning, caregiver burden, or caregivers' psychological well-being, the mechanisms underlying this association remain uncertain.

Previous evidence indicates that social support is associated with psychological adjustment, psychological distress, anxiety, depression, and quality of life among women with breast cancer (9, 10, 12), whereas peer-support interventions have been shown to improve quality of life and reduce anxiety (15). A prospective study reported significant relationships among perceived social support, anxiety, depression, and quality of life in women with breast cancer (9). In addition, demographic characteristics and perceived social support have been associated with mental adjustment to breast cancer (12). Furthermore, a recent systematic review and meta-analysis of randomized controlled trials found that peer-support interventions significantly improved quality of life and reduced anxiety among women with breast cancer, although the quality of evidence was low and substantial heterogeneity was observed across studies (15). Therefore, the present findings suggest that assessing the primary provider of emotional support may provide useful psychosocial information beyond marital status alone.

Anxious Preoccupation scores differed significantly across time-since-diagnosis groups. The highest mean score was observed among participants assessed 4 months after diagnosis, whereas lower mean scores were observed among those assessed at 3 and 6 months. Post-hoc comparisons showed that participants assessed 4 months after diagnosis had significantly higher scores than those assessed at 3, 5, and 6 months. Participants assessed at 5 months also reported significantly higher scores than those assessed at 3 and 6 months, whereas no statistically significant difference was found between the 3- and 6-month groups.

These findings indicate heterogeneity in cancer-related anxious preoccupation across groups assessed during the early period after breast cancer diagnosis and treatment initiation. However, because the study was cross-sectional, the observed differences should not be interpreted as within-person changes, longitudinal trajectories, or evidence of psychological adaptation over time. The higher mean score in the 4-month group may be related to treatment burden, chemotherapy-related adverse effects, uncertainty regarding treatment response, disruption of daily roles, or concerns about prognosis. However, these factors were not measured in the present study and should be

considered hypotheses for future research rather than established explanations.

Previous research has reported substantial variability in psychological distress and anxiety patterns among people with cancer. A systematic review of longitudinal studies found heterogeneous trajectories of clinically relevant distress, with physical symptoms and functional impairment among the more consistent predictors of persistent distress (19). Research involving patients undergoing chemotherapy has also found substantial interindividual variation in anxiety and identified associations with symptom burden, sleep disturbance, cognitive function, stress, resilience, and coping characteristics (20). Qualitative evidence among women receiving neoadjuvant chemotherapy has further described emotional distress related to treatment adverse effects, uncertainty about treatment outcomes, physical symptoms, and mortality concerns (21). These studies support the need for longitudinal research to determine whether the differences observed in the present cross-sectional study represent actual temporal changes within individuals or differences between separate groups of patients assessed at different stages of care.

The findings related to chemotherapy duration require particular caution. In this study, chemotherapy duration was perfectly collinear with time since diagnosis. Specifically, the 2-, 3-, 4-, and 5-month chemotherapy-duration categories corresponded exactly to the 3-, 4-, 5-, and 6-month time-since-diagnosis categories, respectively. Consequently, the two variables had identical group sizes, mean Anxious Preoccupation scores, test statistics, and p values. It was therefore not possible to determine whether the observed association reflected time since diagnosis, chemotherapy exposure, or their shared temporal structure. Only one of these variables should be retained in subsequent multivariable analyses; time since diagnosis may be preferable because it represents the broader clinical context.

No statistically significant associations were observed between Anxious Preoccupation scores and educational level, marital status, health-insurance type, tumor histology, histological grade, or affected breast side. These null findings should be interpreted cautiously because some clinical subgroups, particularly participants with lobular carcinoma and grade I tumors, were small. Small subgroup sizes may reduce statistical power and limit the ability to identify clinically meaningful differences. Moreover, the absence of statistical significance does not necessarily indicate the absence of an association.

The lack of a significant association between marital status and cancer-related anxious preoccupation, despite the significant association with the primary source of emotional support, is clinically relevant. Marital status is a demographic characteristic, whereas the primary source of emotional support may more directly reflect a patient's functional support network. Previous research has emphasized the importance of perceived social support, coping resources, and interpersonal relationships in psychological adjustment to breast cancer (9, 12). In addition, evidence from a recent systematic review and meta-analysis suggests that peer-support interventions may improve quality of life and reduce anxiety among women with breast cancer, although the quality of evidence was low and substantial heterogeneity was observed across studies (15). Therefore, psychosocial assessment should extend beyond marital status alone and include the source, availability, adequacy, and perceived helpfulness of emotional support.

The absence of significant associations between cancer-related anxious

preoccupation and tumor histology, histological grade, or affected breast side should not be interpreted as evidence that clinical characteristics are irrelevant to psychological distress. Tumor stage, treatment regimen, treatment response, treatment toxicity, comorbidities, and symptom burden were not included in the present analyses. Previous research has identified associations between emotional problems and several clinical, functional, and treatment-related factors among women receiving breast cancer treatment (13, 14, 20, 22). Therefore, the present null findings apply only to the tumor-related characteristics examined in this sample.

From a clinical perspective, the findings support routine psychosocial assessment during breast cancer care. Assessment should include patients' support networks, especially the primary provider and perceived adequacy of emotional support, in addition to demographic and clinical characteristics. Although the higher Anxious Preoccupation score observed among participants assessed 4 months after diagnosis may indicate a period of increased psychosocial need, this observation requires confirmation in longitudinal studies before it can be used to define a specific screening time point.

Clinical guidelines recommend routine screening for anxiety, depression, and emotional distress from the time of cancer diagnosis, at clinically appropriate intervals, and when changes occur in disease status, treatment status, or psychosocial circumstances (23, 24). Screening should be followed by further assessment of symptom severity and clear referral pathways for patients who require psychosocial or mental health support (23, 24). Validated measures, such as the Hospital Anxiety and Depression Scale and Generalized Anxiety Disorder-7 scale, may facilitate identification of patients requiring further clinical assessment. The Mini-MAC may complement these instruments by assessing cancer-specific psychological adjustment, including anxious preoccupation, rather than providing a diagnostic assessment of an anxiety disorder (16, 17, 23, 24). Current oncology guidelines emphasize screening coupled with appropriate assessment, triage, referral, and access to psychosocial support rather than screening alone (23).

The substantial burden of anxiety and psychological distress among women with breast cancer further supports the integration of psychosocial care into routine oncology services (8, 11, 13, 25). Systematic-review evidence suggests that peer-support programs and web-based psychosocial interventions may improve quality of life and reduce anxiety among women with breast cancer (26, 27).

However, the choice of intervention should be guided by symptom severity, patient preferences, access to psycho-oncology services, family circumstances, cultural context, and available clinical resources. Culturally responsive psychosocial care is particularly important because family roles, caregiving expectations, and interpretations of emotional support may vary across settings and cultures (10).

4-1. Study Limitations

Several limitations should be considered. First, the cross-sectional design precludes causal inference and does not allow conclusions regarding changes in cancer-related anxious preoccupation within individuals over time. Second, participants were assessed at only one time point; therefore, differences between time-since-diagnosis groups should not be interpreted as individual trajectories, treatment-related improvement, or psychological adaptation.

Third, time since diagnosis and duration of chemotherapy were perfectly collinear, preventing assessment of their independent associations with cancer-related anxious preoccupation and precluding their simultaneous inclusion in multivariable

analyses.

Fourth, important potential confounders were not measured or adjusted for, including cancer stage, treatment regimen and intensity, treatment response, pre-existing anxiety or depressive disorders, psychiatric medication use, pain, fatigue, sleep disturbance, fear of cancer recurrence, physical symptom burden, and financial strain. Previous studies have identified psychological, clinical, and symptom-related variables as relevant to anxiety and adjustment in patients undergoing cancer treatment (13, 14, 19–21).

Fifth, the study assessed only the identity of the primary emotional support provider. It did not assess support quality, adequacy, frequency, reciprocity, relationship satisfaction, family functioning, or perceived helpfulness. Consequently, the association between parental support and higher Anxious Preoccupation scores should not be interpreted as evidence that parental support is ineffective or harmful.

Sixth, the small size of several clinical subgroups, particularly the lobular carcinoma and grade I tumor groups, may have limited statistical power. Finally, the predominance of invasive ductal carcinoma and the particular cultural and healthcare context of the study may limit the generalizability of the findings to women with other tumor types, treatment pathways, family structures, and cultural backgrounds. Because multiple unadjusted and post-hoc pairwise comparisons were conducted, chance findings cannot be completely excluded, particularly because Fisher's LSD procedure provides limited control for multiple testing.

4-2. Future Research

Future studies should use prospective longitudinal designs with repeated assessments of cancer-related anxious preoccupation from diagnosis through chemotherapy and follow-up. Such designs would permit evaluation of within-person changes and distinguish temporal changes from differences between groups assessed at different clinical time points.

Future research should also evaluate the independent effects of time since diagnosis and chemotherapy exposure by recruiting patients with varied treatment schedules and avoiding perfect alignment between chemotherapy duration and diagnostic timing. Multivariable analyses should adjust for cancer stage, treatment regimen, treatment response, symptom burden, pain, fatigue, sleep disturbance, fear of recurrence, pre-existing psychological disorders, financial stress, and perceived social support.

Qualitative and mixed-methods studies may help clarify why some women rely primarily on parents rather than spouses or children for emotional support and how family relationships, support quality, caregiving expectations, and cultural norms influence cancer-related anxious preoccupation during breast cancer treatment (10, 21). Future trials should evaluate the effectiveness of tailored psychosocial interventions, including individual psychological support, family-based interventions, peer-support programs, and digitally delivered interventions, for reducing anxiety among women receiving chemotherapy (26, 27).

5- CONCLUSION

Cancer-related Anxious Preoccupation scores among women with stage I–III breast cancer undergoing chemotherapy were significantly associated with the primary source of emotional support and time since diagnosis. Participants who identified their parents as their primary source of emotional support reported higher scores than those supported primarily by their spouse or children. Scores also differed across time-since-diagnosis groups, with the highest mean score observed among participants

assessed 4 months after diagnosis.

No statistically significant differences in Anxious Preoccupation scores were observed according to educational level, marital status, health-insurance type, tumor histology, histological grade, or laterality of the affected breast. Duration of chemotherapy was perfectly collinear with time since diagnosis; therefore, its independent association with cancer-related anxious preoccupation could not be determined. These findings support routine psychosocial assessment during chemotherapy, including assessment of patients' support networks and timely evaluation of cancer-related anxious preoccupation. Prospective longitudinal studies with adjustment for relevant social, psychological, and clinical factors are needed to clarify temporal patterns and underlying mechanisms.

6- CONFLICT OF INTEREST: None.

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