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# Changes and Predictors of Unmet Supportive Care Needs in Taiwanese Women With Newly Diagnosed Breast Cancer

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**T**he incidence of breast cancer in women is increasing in Western and Asian countries, but the mortality rate is decreasing in the West but increasing in Asian countries (Leong et al., 2010; Yip, 2009). In Taiwan, breast cancer incidence increased from 6.23 per 100,000 in 1970 to 27.6 per 100,000 in 2000 for the entire population (Leong et al., 2010). In addition, the average onset age for breast cancer in Taiwanese women is 5–10 years earlier than for Western women, peaking at 45–49 years (Taiwan Cancer Registry, 2010). During the diagnostic and treatment phases of breast cancer, women may be anxious about the cancer diagnosis (Liao, Chen, Chen, & Chen, 2008) and need to make decisions about treatment modalities (Hwang & Park, 2006), cope with symptom distress (Tighe, Molassiotis, Morris, & Richardson, 2011), and request social support resources (Alqaissi & Dickerson, 2010). That situation, therefore, leads to women's perception of multiple supportive care needs.

## Literature Review

Supportive care aims to optimize patients' comfort, function, and social support at all stages of their illness (Cherny, Catane, Kosmidis, & ESMO Task Force on Supportive and Palliative Care, 2003). The need for such care reflects a feeling experienced when subjective perceptions are inconsistent with a desired state (Endacott, 1997). Supportive care needs of patients with breast cancer are multidimensional and include

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**Purpose/Objectives:** To investigate changes in unmet supportive care needs and factors affecting those needs in Taiwanese women with newly diagnosed breast cancer.

**Design:** Prospective longitudinal survey.

**Setting:** Two general surgery outpatient departments at a large medical center in northern Taiwan.

**Sample:** 124 women with newly diagnosed breast cancer.

**Methods:** Needs were assessed with the Supportive Care Needs Survey–Short Form at diagnosis (T1) and one month (T2), two months (T3), and three months (T4) after diagnosis.

**Main Research Variables:** Supportive care needs.

**Findings:** Women had moderate-to-high levels of unmet needs, with the highest being in the health system and information domain at each time point. Levels in the domains of psychological, health system and information, and sexuality needs were higher ( $p < 0.001$ ) at T1 than at T2, T3, and T4. However, levels of unmet physical and daily living needs increased significantly over time ( $p < 0.001$ ). Unmet supportive care needs were significantly predicted by younger age and higher levels of education, symptom distress, trait anxiety, state anxiety, and time since diagnosis.

**Conclusions:** Supportive care needs changed significantly over time and were predicted by personal characteristics, as well as physical and emotional factors.

**Implications for Nursing:** Oncology nurses should assess the needs of patients with breast cancer and provide them with individualized, culturally sensitive informational, social, and emotional support from breast cancer diagnosis through the first four months of treatment.

psychological, physical and daily living, patient care and support, health system and information, and sexuality needs (Minstrell, Winzenberg, Rankin, Hughes, & Walker, 2008).

Health system and information needs were reported by 57% of 459 female patients with breast cancer in South Korea as unmet care needs (Hwang & Park, 2006). Among unmet care needs reported by 75% of 535 patients with breast, gynecologic, and colorectal cancer in Singapore, disease information needs were the most prevalent (62%), followed by financial (40%), social support (40%), psychological (27%), and physical (26%) needs (Ng, Verkooijen, Ooi, & Koh, 2011). Similarly, high levels of supportive care needs were found in Taiwanese women with suspected breast cancer before and after diagnosis, with the top needs being in the domains of healthcare services for diagnosis, follow-up and consultation, and disease-related information (Liao et al., 2007). However, the self-reported supportive care needs of Turkish women with breast cancer mostly clustered around family and friends (79%) and after care (78%), with other needs being related to diagnosis, treatment, support, femininity and body image, and information (Erci & Karabulut, 2007).

At least one moderate- or high-level unmet need was reported by 43% of 449 Australian women after completing treatment for gynecologic cancer (Beesley et al., 2008). Their highest rated unmet need domain was psychological and health system and information needs (Beesley et al., 2008). Among 1,850 patients in the United Kingdom with various cancers, unmet needs reported at the end of treatment by 30% of the sample, particularly psychological needs, still were not met six months later for 60% of those patients (Armes et al., 2009). In addition, rural Australian women with early breast cancer perceived high levels of psychological and health system and information needs at one month postdiagnosis, but those needs decreased significantly at three months postdiagnosis, with sexuality needs increasing from one to three months postdiagnosis (Minstrell et al., 2008).

The diagnosis of breast cancer and its subsequent treatment significantly impact women's physical, psychological, informational, and social well-being, thereby causing substantial supportive care needs. Disruption of physical functions often is linked to symptom distress, both of which can lead to difficulties in daily activities and may generate unmet care needs. Those symptoms include upper-arm problems (e.g., numbness and swelling of operated side, limited shoulder movement), sleep disturbance, fatigue, body image disturbance (Ganz, Kwan, Stanton, Bower, & Belin, 2011; Hayes, Janda, Cornish, Battistutta, & Newman, 2008; Hayes, Rye, Battistutta, & Newman, 2010; Rosedale & Fu, 2010), lymphedema (Hayes et al., 2008; Rosedale & Fu, 2010), vaginal problems (e.g., vaginal dryness, pain with intercourse), nausea (Ganz et al., 2011), and persistent pain and sensory disturbances in the surgical area (Gärtner et al., 2009).

Supportive care needs of patients with breast cancer may be affected by cancer diagnosis, cancer treatment,

treatment-related symptoms, psychological distress, social support, and personal factors. For example, high levels of unmet needs of patients with breast cancer were significantly associated with age younger than 60 years, advanced cancer stage, and recent diagnosis (Ng et al., 2011). Similarly, greater psychological needs were found in South Korean women with less education. Higher physical and daily needs were associated with receiving chemotherapy, having a short postsurgical interval, and being less educated. Sexuality needs were significantly correlated with younger age, and more perceived health system and information needs were associated with advanced stage and younger age. In addition, greater care and support needs were desired by women with higher education levels (Hwang & Park, 2006).

Patients with breast cancer with worse physical symptoms were shown to have greater unmet physical and daily living needs related to managing fatigue and adapting to hair loss and disfigurement (Tighe et al., 2011). In addition, a qualitative study of Jordanian patients with breast cancer (Alqaissi & Dickerson, 2010) revealed that culture influenced their needs. Themes ascribed to social support were breast cancer as a stigmatized disease, social support from social network members, being strong for self and others, resources influence availability and need for social support, controlling information for protection, and using spiritual meaning as support. The unmet needs of those women varied with the resources available to them (Alqaissi & Dickerson, 2010).

The conceptual framework for the current study was based on a literature review showing that patients with breast cancer have multidimensional supportive care needs (Erci & Karabulut, 2007; Hwang & Park, 2006; Liao et al., 2007) that change over time (Minstrell et al., 2008). In addition, those needs are influenced by age (Hwang & Park, 2006; Ng et al., 2011), educational level (Hwang & Park, 2006), cancer stage (Ng et al., 2011), treatment modality (Hwang & Park, 2006), symptom distress (Tighe et al., 2011), anxiety (Girgis, Breen, Stacey, & Lecathelinais, 2009), and social support (Alqaissi & Dickerson, 2010; Fobair et al., 2006). Therefore, those factors were chosen as possible predictive factors of women's supportive care needs.

Although supportive care needs in breast cancer have been well studied, most research has used a cross-sectional design and focused only on the diagnostic phase, the treatment phase, or after treatment was completed. Those designs have not addressed longitudinal changes in patients' supportive care needs from diagnosis throughout the treatment period. Therefore, the aims of the current study were to (a) explore changes in supportive care needs of patients with breast cancer over four months following diagnosis and (b) examine the predictors of changes in supportive care needs over that period.

## Methods

### Design and Sample

A prospective longitudinal design was used to explore changes in women's supportive care needs across the diagnostic and treatment phases of breast cancer. Participants were recruited from the general surgical oncology outpatient department of a 4,000-bed medical center in northern Taiwan from September 2008 to November 2009. Inclusion criteria were being older than 20 years, having pathologic confirmation of newly diagnosed breast cancer and patient awareness of the cancer diagnosis, and being able to speak and read Mandarin Chinese and Taiwanese. Of the 134 patients who met the criteria, 1 refused to participate because of physical weakness and 9 were transferred to other hospitals. Therefore, 124 patients (91% response rate) were included in the final data analysis.

Ethical approval for the study was granted by the institutional review board for Chang Gung Memorial Hospital. Before data were collected, participants received a full explanation of the study purposes and their right to refuse to participate. All signed informed consent.

### Data Collection

Data were collected at four time points: cancer diagnosis (T1) and one month (T2), two months (T3), and four months (T4) after diagnosis. T1 refers to data collection in the outpatient department after patients received explanations of their pathology results of the biopsy and probable treatment program or surgical procedures from their attending physician and nurses. T2 refers to when women visited the postoperative clinic after being examined by their attending physician, after receiving adjuvant therapy in the outpatient department, or while receiving breast surgery in the inpatient unit. T3 and T4 refer to when women were receiving outpatient adjuvant therapy, such as CEF (cisplatin, epirubicin, and 5-fluorouracil), or trastuzumab therapy in the inpatient department. Participants were interviewed face-to-face by a trained research assistant using structured questionnaires in a consulting room. Disease- and treatment-related factors were collected through chart review. Demographic information and trait anxiety were assessed only at T1. Social support, symptom distress, state anxiety, and supportive care needs were assessed at every time point.

### Instruments

Background information was obtained from patients with a **personal attribute scale**. Attributes included age, marital status, education level, religious status, and financial status. Disease- or treatment-related factors included cancer stage, type of surgery, and type of treatment modality.

Anxiety was assessed using the Chinese version (Chung & Long, 1984) of the **State-Trait Anxiety Inventory (STAI)** (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The 40-item Chinese version of the STAI has been widely used and found to be a valid assessment of anxiety in Taiwanese patients with breast cancer (Liao et al., 2008). Each item is scored from 1 (not at all) to 4 (often), with total scores ranging from 20–80 for state anxiety and trait anxiety. Higher scores indicate greater levels of anxiety (scores higher than 44 indicate high level of anxiety and scores of 44 or lower represent mild-to-moderate anxiety) (Millar, Jelcic, Bonke, & Asbury, 1995). Cronbach alpha values in this study were 0.93 and 0.95 for the state and trait anxiety subscales, respectively. The trait anxiety subscale was used to assess patients' persistent characteristic of anxiety, and the state anxiety subscale was used to assess temporary, appropriate anxiety in response to stress. People with high trait anxiety tend to feel stronger state anxiety in stressful situations than people with lower trait anxiety (Spielberger et al., 1983).

Social support was measured with the Chinese version of the **Social Support Scale-modified (SSS-m)** (Lin, 2002), adapted from the Social Support Scale (Cohen & Hoberman, 1983). The 32-item SSS-m has two subscales that assess perceived availability of support from family members and healthcare professionals. Each subscale measures four types of social support: emotional (four items), informational (four items), appraisal (four items), and practical (four items). Each item is scored from 0 (not at all) to 3 (always); higher scores indicate greater levels of social support (Cohen & Hoberman, 1983). The SSS-m has demonstrated satisfactory psychometric properties in Taiwanese caregivers of patients on ventilators (Lin, 2002). In the current study, Cronbach alphas for the family and healthcare professional subscales were 0.95 and 0.96, respectively.

Patients' physical distress was assessed by the 25-item Chinese version of the **Symptom Distress Scale-Modified for Breast Cancer (SDS-mbc)** (Lai, 1998). SDS-mbc items are rated on a Likert-type scale from 1 (no distress at all) to 5 (as much distress as possible). Higher scores indicate that more symptom distress is perceived by the patient (McCorkle & Young, 1978). The SDS-mbc has demonstrated reliability in cancer-related studies in Taiwan (Lai, 1998). Cronbach alpha for the SDS-mbc in the current study was 0.9.

Patients' supportive care needs were assessed using the Chinese version of the **Supportive Care Needs Survey-Short Form (SCNS-SF34)**. The Chinese version was developed by the researchers for the original SCNS-SF34 (Boyes, Girgis, & Lecathelinais, 2009), which originated from the Supportive Care Needs Survey (Bonevski et al., 2000). The SCNS-SF34 has five need domains (subscales): physical and daily living, psychological, patient care and support (related to

healthcare providers' showing sensitivity to physical and emotional needs, privacy, and choices), health system and information (related to the treatment center and obtaining information about the disease, diagnosis, treatment, and follow-up), and sexuality (related to sexual relationships). The summated scores of each subscale and the overall scale are converted into standardized scores ranging from 0–100, with higher scores

representing more unmet needs (McElduff, Boyes, Zucca, & Girgis, 2004). The SCNS-SF34 has been widely examined in patients with cancer and found to have satisfactory psychometric properties (Boyes et al., 2009). In addition, internal consistency reliability was satisfactory (Cronbach alpha 0.87–0.96) for patients with cancer from 1 week to 20 years after diagnosis (McDowell, Occhipinti, Ferguson, Dunn, & Chambers, 2010).

**Table 1. Prevalence of Top 10 Unmet Supportive Care Needs**

Domain and Supportive Care Need	T1 (N = 124)			T2 (N = 119)			T3 (N = 115)			T4 (N = 114)		
	n	%	Rank									
<b>Physical and daily living needs</b>												
Feeling unwell a lot of the time	14	11	–	22	18	–	28	24	–	29	25	8
Work around the home	13	10	–	32	27	–	28	24	–	36	32	4
Not being able to do the things one used to do	12	10	–	28	24	–	38	33	5	47	41	1
<b>Psychological need</b>												
Worry that the results of treatment are beyond one's control	90	73	4	61	51	4	46	40	2	31	27	5
Fears about the cancer spreading	88	71	5	49	41	8	28	24	–	16	14	–
Uncertainty about the future	85	69	6	53	45	7	36	31	6	25	22	–
Concerns about the worries of those closest to oneself	82	66	10	45	38	10	29	25	9	16	14	–
<b>Patient care and support needs</b>												
Hospital staff attending promptly to physical needs	72	58	–	34	29	–	23	20	–	30	26	7
<b>Health system and information needs</b>												
Being informed that cancer is under control or diminishing	110	89	1	78	66	1	50	43	1	40	35	2
Being informed about test results as soon as feasible	107	86	2	73	61	2	45	39	3	38	33	3
Being informed about things one can do to help oneself get well	104	84	3	65	55	3	39	34	4	31	27	5
Being adequately informed about the benefits and side effects of treatments before choosing to have them	84	68	7	54	45	6	22	19	–	18	16	–
Receiving information about aspects of managing one's illness and side effects at home	83	67	8	39	33	–	12	10	–	11	10	–
Receiving explanations of tests when desired	83	67	8	55	46	5	21	18	–	15	13	–
Receiving written information about the important aspects of one's care	82	66	10	37	31	–	11	10	–	14	12	–
Having access to professional counseling if the patient, family, or friends need it	71	57	–	49	41	8	29	25	9	27	24	–
Being treated in a hospital or clinic that is as physically pleasant as possible	70	56	–	37	31	–	31	27	8	29	25	8
Having one member of hospital staff to talk to about all aspects of one's condition, treatment, and follow-up	70	56	–	45	38	10	32	28	7	28	25	10
T1—cancer diagnosis (reference group); T2—one month after diagnosis; T3—two months after diagnosis; T4—four months after diagnosis												

The Chinese version of the SCNS-SF34 was developed using a translation and back-translation process (Marin & Marin, 1991). That process was repeated until the back-translated and original items were in agreement. For the current study, the content validity of the Chinese version of the SCNS-SF34 was evaluated by seven experts in breast cancer or cancer-related issues. The content validity indices of the Chinese version of the SCNS-SF34 for content importance and wording suitability were 1 and 0.82, respectively. The internal consistency reliability coefficients (Cronbach alphas) for the overall scale and the five subscales were 0.82 and 0.75–0.96, respectively. In the current study, Cronbach alphas for the five subscales were from 0.81–0.95.

## Data Analysis

The data were analyzed with descriptive statistics (means and frequencies). Overall changes in supportive care needs from diagnosis through the first four months after diagnosis were analyzed with repeated-measures analysis of variance. Important factors related to changes in supportive care needs over the four months were identified with the generalized estimating equations (GEE) approach (Zeger & Liang, 1986). The GEE approach facilitates analysis of longitudinal data collected by specifying a model relating covariates to outcomes and a plausible correlation structure between responses at different time points (Ballinger, 2004). In the current study, changes in supportive care needs were treated as outcome variables and predicted by selected independent variables (age, education level, cancer stage, number of treatment modalities, trait anxiety, state anxiety,

symptom distress, family support, healthcare professional support, and time since diagnosis). To identify the prevalence of unmet supportive care needs, the authors considered unmet needs as SCNS-SF34 scores indicating moderate and high need, whereas met supportive care needs were considered scores indicating no need, needs already satisfied, and some need (Bonevski et al., 2000).

## Results

The 124 women in the current study had a mean age of 49.37 years (SD = 0.8, range = 25–70). Most were married (n = 104, 84%), had completed at least senior high school (n = 82, 66%), and had a religious affiliation (n = 87, 70%). Seventy-nine (64%) had an annual family income lower than 840,000 New Taiwan dollars (\$28,000 U.S.). Most had stage I (n = 32, 26%) or II (n = 43, 35%) disease, and received radical mastectomy (n = 68, 55%). Eighty patients (65%) received surgery with chemotherapy, 15 (12%) received surgery only, 12 (10%) received surgery with chemoradiation, 10 (8%) received surgery with radiotherapy, 5 (4%) received surgery with hormone therapy, and 2 (2%) received only chemotherapy.

## Trait and State Anxiety

The prevalence rate of high anxiety was determined from STAI scores higher than 44 (for state or trait anxiety). At baseline (T1), the prevalence of high trait anxiety in participants was 34% (n = 42). The prevalence rates of high state anxiety were 84% (n = 104) at T1, 46% (n = 55) at T2, 36% (n = 41) at T3, and 22% (n = 25) at T4.

**Table 2. Changes in State Anxiety, Social Support, Symptom Distress, and Supportive Care Needs Over Time**

Variable	T1		T2		T3		T4		F*	LSD
	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE	$\bar{X}$	SE		
<b>State anxiety</b>	56.55	1.2	44.04	1.28	39.35	1.2	36.97	1.16	128.6	T1 > T2 > T3 > T4
<b>Social support</b>										
Family	41.4	0.84	44.32	0.64	43.18	0.89	42	0.83	4.08	T2 > T3 > T4 > T1
Healthcare professional	24.71	1.29	31.47	0.97	26.12	1.2	24.06	1.23	12.39	T2 > T3 > T1 > T4
<b>Symptom distress</b>	31.94	0.85	37.25	0.87	35.15	0.78	38.19	1.02	17.1	T4 > T2 > T3 > T1
<b>Supportive care needs</b>	55.59	1.95	43.69	2.01	33.51	1.96	31.59	1.99	91.23	T1 > T2 > T3 > T4
Physical and daily living	17.72	2.43	34.34	2.32	31.05	2.57	36.8	2.55	25.95	T4 > T2 > T3 > T1
Psychological	63.49	2.83	46.03	2.75	33.95	2.57	27.39	2.39	84.8	T1 > T2 > T3 > T4
Patient care and support	47.9	2.46	33.03	2.2	27.11	1.81	29.34	2.19	38.94	T1 > T2 > T4 > T3
Health system and information	75.78	2.25	56.84	2.66	41.58	2.37	38.3	2.39	104.05	T1 > T2 > T3 > T4
Sexuality	31.14	3.18	21.05	2.29	17.25	2.01	16.08	2.31	18.56	T1 > T2 > T3 > T4

N = 124

\*  $p < 0.001$

LSD—least significance difference; SE—standard error; T1—cancer diagnosis (reference group); T2—one month after diagnosis; T3—two months after diagnosis; T4—four months after diagnosis

## Unmet Supportive Care Needs

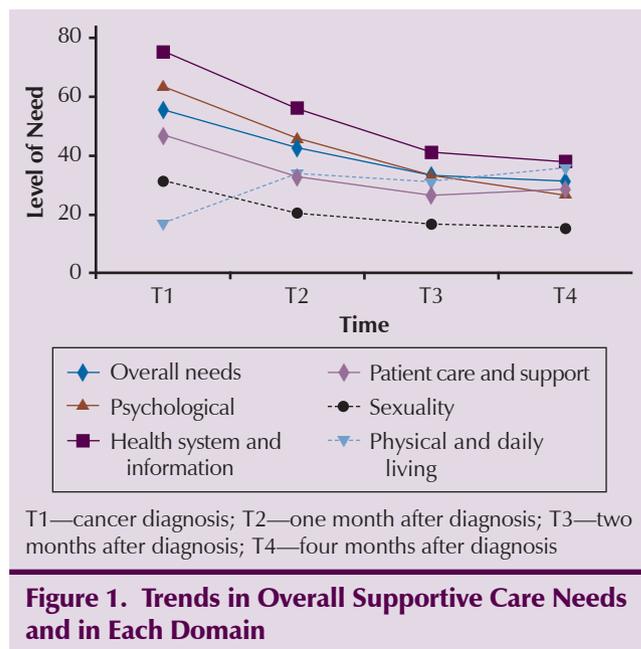
The top 10 unmet supportive care needs were derived from the frequencies of moderate and high scores for each SCNS-SF34 item. At T1 and T2, women's unmet needs focused on health system and informational needs, as well as psychological needs. Ranked in descending order, the top three unmet needs at T1 and T2 were being informed that cancer is under control or diminishing, being informed about test results as soon as feasible, and being informed about things one can do to help oneself get well. At T3, women's perceived unmet supportive care needs were for physical and daily living, psychological, and health system and informational needs. The top three unmet needs at T3, ranked in descending order, were being informed that cancer is under control or diminishing, worry that the results of treatment are beyond one's control, and being informed about test results as soon as feasible. At T4, unmet needs focused on four of five domains: health system and information, physical and daily living, patient care and support, and psychological. Ranked in descending order, the top three unmet needs were not being able to do the things one used to do, being informed that cancer is under control or diminishing, and being informed about test results as soon as feasible (see Table 1).

## State Anxiety, Social Support, Symptom Distress, and Supportive Care Needs

State anxiety peaked at T1 and decreased over time during treatment. Calculation of differences in trends over time by least significant difference showed that each group's state anxiety levels differed significantly at each time point. Scores for social support from family and healthcare professionals increased from T1 to T2, peaked at T2, and decreased at T3 and T4, with family support at T4 being higher than at T1. Overall symptom distress scores increased from T1 to T2, improved at T3, and increased at T4 to higher than at T2. The highest level of overall symptom distress was at T4. The change in overall supportive care needs had a similar slope to that of state anxiety, with supportive care needs peaking at T1 and decreasing over time during treatment. Women reported having the greatest needs in the health system and information domain at each time point (see Table 2 and Figure 1).

## Significant Predictors of Changes in Supportive Care Needs

In the GEE analysis, the authors explored important factors (e.g., age, educational level, cancer stage, type of treatment modality, trait anxiety, state anxiety, symptom distress, social support, time since diagnosis) related to changes in supportive care needs across the first four months after diagnosis. Supportive care needs were sig-



nificantly predicted by younger age, higher levels of education, higher trait anxiety, state anxiety, severe symptom distress, and shorter time since diagnosis (see Table 3).

## Discussion

The results of this longitudinal study add to the literature on the unmet supportive care needs of patients with breast cancer by showing that the needs of this Taiwanese sample persisted at moderate-to-high levels from cancer diagnosis to four months afterward and changed over time. At all four data collection times, the highest needs were in the health system and information domain.

The results show that women's unmet care needs from T1 to T3 focused on health system and information and psychological needs. At T4, health system and information needs still had the highest score, with physical and daily living needs scoring higher than psychological needs. Those results are consistent with prior reports that patients with newly diagnosed breast cancer worried about issues related to cure and surviving breast cancer (Liao et al., 2007; Minstrell et al., 2008).

The results indicate that patients with breast cancer who undergo treatment, regardless of treatment modality, continue to perceive unmet informational needs four months after diagnosis. That finding differs from those of a prior report that women with breast cancer who receive more chemotherapy perceived higher unmet informational and psychological needs (Beesley et al., 2008). That difference may be explained by women in the previous study being assessed for needs three months to five years postdiagnosis, whereas the current sample was assessed from diagnosis to four months

**Table 3. Significant Predictors of Changes in Supportive Care Needs**

Variable	B	SE	95% CI	Z	p
<b>Age (years)</b>					
51 or older	-7.48	3.63	[-14.6, -0.36]	4.24	0.039
50 or younger	0				
Time	-8.35	0.89	[-10.1, -6.6]	87.3	< 0.001
• 51 or older x time	0.73	1.32	[-1.86, 3.31]	0.3	0.581
• 50 or younger x time	0				
<b>Education (type of school)</b>					
Senior high or more	8.64	3.69	[1.41, 15.86]	5.49	0.019
Junior high or less	0				
Time	-7.46	1	[-9.42, -5.5]	55.59	< 0.001
• Senior high or more x time	-0.88	1.32	[-3.46, 1.7]	0.44	0.505
• Junior high or less x time	0				
<b>Cancer stage</b>					
III or IV	2.95	5.8	[-8.41, 14.32]	0.26	0.611
II	1.24	5.71	[-9.96, 12.44]	0.05	0.828
I	0.64	5.44	[-10.02, 11.31]	0.01	0.906
0	0				
Time	-9.99	1.82	[-13.56, -6.41]	29.98	< 0.001
• III or IV x time	4.47	2.17	[0.22, 8.73]	4.25	0.039
• II x time	3.12	2.11	[-1.01, 7.25]	2.2	0.138
• I x time	-0.43	2.16	[-4.66, 3.8]	0.04	0.842
• 0 x time	0				
<b>Type of surgery</b>					
With adjuvant therapy	4.23	5.4	[-6.36, 14.81]	0.61	0.434
Surgery only	0				
Time	-10.82	2.92	[-16.54, -5.1]	13.74	< 0.001
• With adjuvant therapy x time	2.84	2.99	[-3.02, 8.69]	0.9	0.343
• Surgery only x time	0				
<b>Trait anxiety</b>					
	0.9	0.12	[0.67, 1.13]	60.04	< 0.001
Time	-7.82	2.22	[-12.16, -3.48]	12.45	< 0.001
• Trait anxiety x time	-0.01	0.05	[-0.11, 0.1]	0.02	0.891
<b>State anxiety</b>					
	1.02	0.08	[0.87, 1.17]	181.43	< 0.001
Time	-6.12	1.92	[-9.89, -2.34]	10.1	0.001
• State anxiety x time	0.12	0.04	[0.04, 0.2]	8.47	0.004
<b>Symptom distress</b>					
	25.61	3.37	[19.01, 32.21]	57.87	< 0.001
Time	-16.72	2.78	[-22.16, -11.28]	36.25	< 0.001
• Symptom distress x time	4.55	1.94	[0.74, 8.36]	5.49	0.019
<b>Social support (HCP)</b>					
	-0.2	2.21	[-4.53, 4.12]	0.01	0.927
Time	-11.39	1.68	[-14.69, -8.09]	45.73	< 0.001
• Social support (HCP) x time	2.25	1.01	[0.28, 4.22]	5.01	0.025
<b>Social support (family)</b>					
	-0.24	3.84	[-7.77, 7.29]	0	0.95
Time	-8.4	5.97	[-20.1, 3.31]	1.98	0.16
• Social support (family) x time	0.13	2.2	[-4.17, 4.44]	0	0.951
<b>Time point</b>					
T4	-23.24	1.99	[-27.14, -19.35]	136.8	< 0.001
T3	-21.05	1.87	[-24.72, -17.39]	126.86	< 0.001
T2	-10.77	1.57	[-13.84, -7.7]	47.17	< 0.001
T1	0				
Time	0				
• T4 x time	0				
• T3 x time	0				
• T2 x time	0				
• T1 x time	0				

N = 124

CI—confidence interval; HCP—healthcare professional; SE—standard error; T1—cancer diagnosis (reference group); T2—one month after diagnosis; T3—two months after diagnosis; T4—four months after diagnosis

later. Newly diagnosed women not only have a great need for information to make decisions, but also require hearing that information several times to fully understand it (Liao & Chen, 2006). Therefore, healthcare providers should actively and continuously provide information to patients with breast cancer that is aligned to their need for psychological supportive care during the diagnostic and treatment phases.

The slopes for psychological, health system and information, and sexuality needs were similar to those for the anxiety pattern, peaking at T1 and dropping slightly from T2 to T4. Those domains were positively correlated with anxiety ( $p < 0.001$ ), consistent with a previous report that uncertainty after cancer diagnosis was seen as a source of stress and was positively correlated with anxiety (Liao et al., 2008). Therefore, supportive care incorporating information and emotional support could reduce patients' anxiety and improve their unmet care needs (Liao, Chen, Chen, Chen, & Chen, 2009; Liao et al., 2010).

Scores for patient care and support needs peaked at T1, dropped slightly at T2, and increased slightly at T4. That trend suggests that adjuvant therapy caused physical and emotional discomfort for patients with newly diagnosed breast cancer. Clinical providers should refer patients to support resources to help them cope with treatment-related discomfort. The changes in women's physical and daily living needs and symptom distress were parallel, increasing significantly over the four months after diagnosis, with severity peaking at T4. That increase in physical and daily living needs while receiving active treatment was likely because of treatment-related side effects. Therefore, patients' symptom

distress should be appropriately managed throughout the first four months of treatment.

The current study's participants experienced unmet physical and daily living needs from T2 to T4, with highest needs occurring at T4. That may be attributed to greater symptom distress during the postoperative and adjuvant therapy period (Beesley et al., 2008). Patients' physical symptoms suggest that the side effects of adjuvant therapy are prolonged from T3 to T4, affecting daily living. Therefore, oncology nurses should systematically assess the trend in physical symptoms during the treatment period to provide an appropriate supportive role, particularly in the first four months of treatment.

The sexuality needs of women in the current study peaked at T1 and decreased steadily to T4, in contrast to a previous report that sexuality needs of Australian patients with breast cancer increased from one to three months postdiagnosis (Minstrell et al., 2008). The sexuality needs of patients with cancer have been inversely associated with social support (Fobair et al., 2006; McDowell et al., 2010), perhaps because women with breast cancer are better adjusted in their sex lives if their partners pay close attention to them and offer encouragement for making them feel more intimate. The finding that women's sexuality needs decreased after T1 may be attributed to increased physical and daily living needs after surgery or chemotherapy, which could affect patients' focus in daily life. In addition, highest sexuality needs occurring at T1 may have been caused by married Asian women believing that nurturing their husband is their duty after breast cancer treatment (Kagawa-Singer & Wellisch, 2003). All participants were women, which might have made them unwilling to describe their sexual problems because sexuality is a very private issue in Taiwan, particularly for women. Therefore, the current results may have underestimated patients' sexuality needs.

In the current study, supportive care needs were significantly predicted by younger age and higher levels of education, anxiety, and symptom distress, but not type of treatment modality. That negative result might be attributed to the small numbers of patients receiving each treatment type. Clinical observations have indicated that women who receive surgery with chemotherapy experience greater physical and emotional impact than patients who receive surgery only, suggesting that supportive care needs and chemotherapy (treatment modality) are interrelated (Smithies, Bettger-Hahn, Forchuk, & Brackstone, 2009). Therefore, studies with larger samples are needed to explore that possibility.

The current sample of women with breast cancer also had a high prevalence of elevated state anxiety levels, which decreased significantly over the four months after diagnosis. The prevalence of high-level

state anxiety at the diagnostic phase was greater than during the treatment phase, consistent with an earlier study of Taiwanese patients with breast cancer (Liao et al., 2008). The higher prevalence of high state anxiety levels at diagnosis than four months later may be attributed to the impact of cancer diagnosis and positive adjustment after the initial shock of diagnosis. Women's state anxiety levels also have been associated with their unmet supportive care needs (Liao et al., 2007). In addition, supportive care needs were significantly predicted by trait anxiety, which represented a persistent characteristic of the emotional state of patients with breast cancer. Therefore, clinical providers should assess patients' psychological characteristics at diagnosis and appropriately provide emotional support.

## Limitations

The authors explored changes in supportive care needs only over the four months after diagnosis. Future studies should investigate the effects of anxiety, symptom distress, and social support on supportive care needs for at least one year, and longer if possible. Long-term assessment of supportive care needs is warranted across the diagnostic, treatment, and recovery stages to provide a reference for developing interventions. The current study was conducted in one site in northern Taiwan, and the results cannot be generalized to other geographic areas and hospitals. Therefore, additional study is suggested to compare differences in supportive care needs among multiple centers. Finally, the numbers of patients receiving each type of treatment were small and unequal. Future studies should consider increasing the sample size to allow comparison of different treatments among patients with breast cancer.

## Conclusions and Implications for Nursing

Oncology nurses should be aware of the changes over time in women's supportive care needs and the extent to which the intensity of needs are influenced by personal characteristics and psychological and physical problems. Nursing staff should provide patients not only with diagnosis- and treatment-related information, but also emotional support to help them cope with their needs and symptoms. Oncology nurses could use the current study's findings to support the development of a culturally sensitive care program to address the unmet needs of women with newly diagnosed breast cancer by providing informational and social support for them and their families to help them cope emotionally from diagnosis through the treatment period. The outcomes of such a program then could be evaluated for publication.

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