Social Support and Psychological and Physical States Among Japanese Women With Breast Cancer Before and After Breast Surgery

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Purpose/Objectives: To investigate the relationship of social support and psychological and physical states among Japanese women with breast cancer and to compare the variables before and one year after breast surgery.

Design: A prospective longitudinal study.

Setting: A general hospital in northern Japan.


Methods: Measures were the Japanese versions of the Interpersonal Relationship Inventory, the General Health Questionnaire, and the Physical States Interview Form. Data were collected at four time points: before (time 1), three months after (time 2), six months after (time 3), and one year after (time 4) breast surgery.

Main Research Variables: Social support (support, reciprocity, and conflict), social support network, and psychological and physical states.

Findings: Psychological and physical states correlated significantly at all four time points. Significant correlations also were found between psychological states and support at times 2 and 4 and between psychological states and reciprocity at time 4. Repeated measures analysis of variance showed significant differences in support, reciprocity, conflict, and physical states but no significant differences in social support network or psychological states.

Conclusions: The results of the study suggest that healthcare professionals need to consider social support as an important factor when helping Japanese women adjust to the diagnosis and treatment of breast cancer.

Implications for Nursing: Healthcare professionals need to provide appropriate social support for Japanese women with breast cancer not only at the time of diagnosis of breast cancer but also after breast surgery.

Social support is known not only to directly affect stress and health outcomes but also to buffer the effects of stress on health outcomes. Studies of social support in Western cultures have shown positive effects on health outcomes among women with breast cancer (Bloom, Johnston, Banks, & Fobair, 2001; Han et al., 2005; Maly, Leake, & Silliman, 2004; Maly, Umezawa, Leake, & Silliman, 2005; Tan & Karabulutlu, 2005), and a longitudinal study of social support among patients with breast cancer found significant negative relationships between social support and psychological distress (Northouse, 1989). In addition, studies of social support for patients with breast cancer have reported significant positive influences of support intervention programs (e.g., telephone support, support groups) on patients’ psychological states (Coleman et al., 2005; Northouse, Kershaw, Mood, & Schafenacker, 2005; Simpson, Carlson, Beck, & Patten, 2002; Wilmoth, Tulman, Coleman, Stewart, & Samarel, 2006), as well as a decrease in psychological distress. Other studies have identified positive influences of social support on the psychological and physical states among older adult women with breast cancer (Avis, Crawford, & Manuel, 2004; Maly et al., 2005). However, those studies focused on the positive effects of social support on stress and health outcomes and, as Dakof and Taylor (1990) pointed out, studies of social support should include its positive and negative aspects.

Cancer has been the leading cause of death in Japan since 1981, and death as a result of breast cancer is increasing, from 7 per 100,000 in 1981 to 15.2 per 100,000 in 2003 (Health and Welfare Statistics Association, 2005). Breast cancer is estimated to become the most common cancer diagnosis among Japanese women by 2020 (Ohsimaha, Kuroishi, & Tajima, 2004). Despite the increasing incidence among Japanese women, few studies to date have investigated the relationship between social support and the effects on health outcomes among these women (Makabe & Nomizu, 2006; Miyashita, 2005). Social support requires interpersonal relationships, which are influenced by beliefs, values, and behavior (Bourjolly & Hirschman, 2001; Hamilton & Sandelowski, 2004), and studies of social support indicate that the experience of breast cancer differs among cultures (Ashing-Giwa et al., 2004; Davis, Williams, Parle, Redman, & Turner, 2004; Kagawa-Singer & Wellisch, 2003; Makabe & Hull, 2000). One of the studies (Makabe & Hull) was a qualitative study of social support among Japanese women with breast cancer and identified reciprocity as one of the unique components of social support in the population. Reciprocity is related to giri, a Japanese term referring to social obligation and to valuing the maintenance of harmonious relationships. Because of this unique cultural characteristic, the results of social support studies conducted in other cultures should be considered with caution for Japanese populations. Thus, a study of social support and health outcomes among Japanese women with breast cancer that considers the cultural issues of social support is needed to help provide a basis for assessment and...
Social support was viewed from three aspects: support, reciprocity, and conflict. According to Tilden, Hirsh, and Nelson (1994), support is defined as the perceived availability or enactment of helping behaviors by members of the social network, reciprocity is defined as the perceived availability or occurrence of an exchange of emotional or tangible goods or services, or the returning of emotional or tangible goods or services, and conflict is defined as perceived discord or stress in relationships caused by behaviors of others or the absence of behaviors of others, such as the withholding of help. A social support network is defined as sources of social support provided by others, as such, significant people in an individual’s life.

Derived from Lazarus and Folkman (1984), the definition of psychological states is an individual’s psychological symptoms are the results of the relationships between a person and the environment that are appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being. Women with breast cancer commonly experience these physical signs and symptoms.

Methods

Sample and Setting

A convenience sample of Japanese women with breast cancer (N = 61), who were hospitalized in a general hospital located in northern Japan, participated in the study. Data were collected at four time points: before breast surgery (time 1), three months after (time 2), six months after (time 3), and one year after breast surgery (time 4). Inclusion criteria were Japanese women who were born and had lived their entire lives in Japan, were older than 30 years, and had received a diagnosis of breast cancer. Potential subjects diagnosed with a psychiatric disorder were excluded from the study.

Measurements

Three instruments with established reliability and validity were used: the Japanese versions of the Interpersonal Relationship Inventory (IPRI), the General Health Questionnaire (GHQ), and the Physical States Interview Form (PSIF).

The IPRI is a self-report questionnaire, consisting of three subscales: support, reciprocity, and conflict. Each subscale score is used as a separate score (Tilden, Nelson, & May, 1990a, 1990b). Tilden et al. (1990a) reported test-retest reliability, with a two-week interval, for support (r = 0.91), reciprocity (r = 0.84), and conflict (r = 0.81). The alpha coefficient of each subscale was 0.92 for support, 0.83 for reciprocity, and 0.91 for conflict. In addition, content validity by three experts was 0.97 using the Content Validity Index. Construct validity was established as significant differences between two contrasting groups. Also, concurrent validity was established as significant correlations with other social support instruments, namely the Personal Relationship Questionnaire and the Family Relationship Index (Tilden et al., 1990a, 1990b, 1994). The Japanese version of the IPRI (IPRI) was translated from English into Japanese with the use of back translation. The equivalence test between the IPRI and the JIPRI showed item-level Pearson product–moment correlation coefficients of greater than 0.70 for 15 of 39 items, 0.50–0.69 for 15 out of 39 items, and less than 0.49 for 9 of 39 items (Makabe, 1998a). In the present study, the support subscale was used to measure the positive aspects of social support, the reciprocity subscale was used to...
measure the exchange or returning of emotional or tangible goods or services, and the conflict subscale was used to measure the negative aspects of social support. In the study sample, the alpha coefficient of support was 0.829 (time 1), 0.869 (time 2), 0.915 (time 3), and 0.906 (time 4); the alpha coefficient of reciprocity was 0.786 (time 1), 0.831 (time 2), 0.861 (time 3), and 0.854 (time 4); and the alpha coefficient of conflict was 0.800 (time 1), 0.861 (time 2), 0.851 (time 3), and 0.877 (time 4). Moreover, the sum of the number of personal network on the JIPRI was used to measure the social support network.

The GHQ was designed as a self-administered screening test aimed at detecting respondents with a nonpsychotic psychiatric illness. The GHQ has five versions: 60-, 30-, 28-, 20- and 12-item GHQs, and the 60-item GHQ is widely used as an indication of psychological distress, disturbance, states, or health. A low score reflects a better psychological state (Goldberg, 1972; Goldberg & Williams, 1988). Goldberg reported a split-half reliability coefficient of the GHQ of 0.95 for a sample of psychiatric outpatients. He also reported an acceptable level of test-retest stability reliability. Construct validity through factor analysis on the 60-item GHQ (Goldberg & Hiller, 1979; Worsley, Walters, & Wood, 1978) and concurrent validity revealed correlations between the 60-item GHQ and clinical assessment to be of an acceptable level (r = 0.80) (Goldberg & Blackwell, 1970). Benjam, Decalmer, and Haran (1982) determined correlations with the Clinical Interview Schedule, showing a significant relationship between total score (Spearman) (r = 0.63) and overall severity rating (r = 0.55). The Japanese version of the GHQ (JGHQ) was translated from English into Japanese by Nakagawa and Daibou (1985) with the use of back translation. Construct validity of the 60-item JGHQ was examined by the group contrasted approach, and t-test results (group mean comparison) were significantly different (p < 0.01). Constructed validity testing of the 60-item JGHQ was conducted using factor analysis and revealed 12 factors that accounted for 53.5% of variance. Concurrent validity of the 60-item JGHQ was tested using the Present States Examination, and the results indicated a significant correlation (r = 0.64) between the two instruments (Nakagawa & Daibou). In the present study, total score on the 60-item JGHQ was used to measure psychological states, where alpha coefficient was 0.936 (time 1), 0.964 (time 2), 0.969 (time 3), and 0.971 (time 4).

The PSIF was developed to obtain information about the physical signs and symptoms commonly experienced by women who have had breast surgery for malignant disease (Makabe, 1998b). The following items were derived from a literature review of the physical signs and symptoms related to surgery for breast cancer: poor wound healing, lymphedema in the affected arm, fatigue, pain in the affected arm or surgical area, range-of-motion problems of the arm, abnormal arm sensation (e.g., numbness, burning, stiffness, tingling, heaviness, weakness), abnormal breast sensation (e.g., numbness, itching), phantom breast sensation, and other signs and symptoms. Because some of the items potentially required explanation (e.g., breast sensation, phantom breast sensation), an interview method was used for data collection. The subjects answered “yes” or “no” to each item and then described the signs and symptoms if they answered “yes.” Content analysis of their descriptions of signs and symptoms was performed. A cumulative score of “yes” responses was used to indicate physical state. Possible scores were 0–10, with a low score indicating a better physical state. To establish intrarater reliability of the PSIF, the primary investigator performed the content analysis twice, with a two-week interval, and the results of content analysis were the same on both occasions.

**Data Collection Procedures**

Prior to the initiation of the study, the Fukushima Medical University School of Nursing and hospital research ethical committees reviewed and approved the study to ensure the protection of human subjects. Japanese women with breast cancer were recruited from a general hospital in northern Japan. Data were collected before breast surgery (time 1) three months after (time 2), six months after (time 3), and one year after breast surgery (time 4). During the data collection period, the primary investigator explained to potential subjects who met the inclusion criteria the purpose of the study, procedures, risks and benefits, confidential treatment of any information received, the voluntary nature of participation, and the lack of penalty for withdrawal from the study. Before giving consent, potential subjects had an opportunity to ask questions about the study and to refuse to participate. After consent was received, the interview method was used at the hospital with each participant. At the data collections time points 2, 3, and 4, a letter was mailed reminding the participants of the purpose of the study, procedures, risks and benefits, confidential treatment of any information received, the voluntary nature of participation, and the lack of penalty for withdrawal from the study.

**Data Analysis**

Descriptive statistics were used to describe the sample and mean scores of the major variables. Chi-square tests and student’s t tests were used for comparisons between those who completed measures at all four time points and those who did not. Pearson’s correlation coefficients were calculated to explore associations among variables. Repeated measures analysis of variance (ANOVA) was used to detect significant overall differences in the variables across time. The Tukey test for post-hoc evaluation was used. Data were analyzed using the statistical software package SPSS® 14.0 (SPSS Inc.). Significance was set at p < 0.05.

**Results**

**Sample**

Although 158 women consented to participate prior to breast surgery, data collected from the 61 subjects who provided data at all four time points were analyzed in the study. Table 1 describes comparisons of demographic and illness-related data between study subjects (N = 61) and those who dropped out of the study (N = 97). No significant differences in the main variables of demographic or illness-related data were found. However, individuals who were divorced or separated, employed, receiving postoperative adjuvant chemotherapy, or having other medical problems were more likely to drop out of the study. As for the demographic characteristics of the 61 remaining subjects, the age range was 35–75 years, with a mean of 53.11 years (SD = 10.19). Most were married (n = 49, 80%), and the length of their marriages ranged from 2–55 years (X = 27.72, SD = 13.10). Half of the women had received a high school education (n = 30, 49%), and half were employed...
(n = 31, 51%). With regard to illness-related characteristics of the sample, 48% (n = 29) of the women had breast conservation surgery, and 49% (n = 30) had a modified radical mastectomy. Most were classified as stage I (n = 20, 33%) or stage II (n = 35, 57%); most received postoperative adjuvant chemotherapy (n = 44, 72%). One-fourth of the subjects (n = 14, 23%) had other medical problems such as hypertension and diabetes.

### Psychological and Physical States

Pearson’s coefficients showed positive significant correlations between psychological and physical states at all four time periods (r = 0.45, p < 0.01; r = 0.43, p < 0.01; r = 0.30, p < 0.05; and r = 0.45, p < 0.01 respectively). In addition, negative significant correlations were found between psychological states and support at time 2 (r = −0.33, p = 0.05) and time 4 (r = −0.43, p < 0.01) and between psychological states and reciprocity at time 4 (r = −0.43, p < 0.01). There were no significant correlations between psychological states and conflict from times 1–4 (see Table 2).

### Psychological States and Social Support

No significant differences were observed in psychological states (F [3, 171] = 1.93, p = 0.127) or social support networks (F [3, 129] = 0.34, p = 0.799) (see Table 3). The social support networks consisted mainly of family members and friends from times 1–4. In repeated measures, ANOVA identified significant differences in support (F [3,168] = 8.90, p < 0.001), reciprocity (F [3,168] = 9.52, p < 0.001), conflict (F [3, 168] = 3.05, p = 0.030), and physical states (F [3, 174] = 53.14, p < 0.001). The results of the Tukey test for post-hoc comparisons were as follows: Support was significantly decreased and showed differences between time 1 (X = 4.00, SD = 0.49) and time 2 (X = 3.82, SD = 0.52), time 1 and time 3 (X = 3.72, SD = 0.65), and time 1 and time 4 (X = 3.75, SD = 0.61); reciprocity was significantly decreased and showed differences between time 1 (X = 3.68, SD = 0.47) and time 2 (X = 3.55, SD = 0.45), time 1 and time 3 (X = 3.43, SD = 0.58), and time 1 and time 4 (X = 3.47, SD = 0.54); conflict was significantly increased and showed differences between time 1 (X = 2.42, SD = 0.52) and time 2 (X = 2.62, SD = 0.54); and physical states was significantly increased and showed differences between time 1 (X = 1.25, SD = 1.27) and time 2 (X = 3.83, SD = 1.85), time 1 and time 3 (X = 3.58, SD = 2.00), and time 1 and time 4 (X = 3.19, SD = 2.06). Descriptive statistics of physical states at time 4 showed abnormal breast sensation (n = 34, 56%), fatigue (n = 31, 51%), pain in the affected arm or chest (n = 30, 49%), abnormal arm sensation (n = 29, 48%), lymphedema in the affected arm (n = 17, 28%), problems of range of motion in the affected arm (n = 17, 28%), phantom breast sensation (n = 8, 13%), poor wound healing (n = 3, 5%), and other signs (n = 2, 3%) and symptoms (n = 25, 41%) (see Figure 2).

### Discussion

The longitudinal study assessed correlations of social support and psychological and physical states among Japanese women with breast cancer and compared the variables before and one year after breast surgery. The results revealed not only the existence of significant relationships among the factors but also significant changes in them before and one year after breast surgery.

### Relationships Among Social Support and Psychological and Physical States

First, significant positive correlations between psychological and physical states were found before breast surgery...
Table 2. Correlations of Main Variables With Psychological States

<table>
<thead>
<tr>
<th>Variable</th>
<th>Psychological State</th>
<th>Time 1</th>
<th>Time 2</th>
<th>Time 3</th>
<th>Time 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support network</td>
<td></td>
<td>0.04</td>
<td>–0.19</td>
<td>0.26</td>
<td>–0.09</td>
</tr>
<tr>
<td>Physical states</td>
<td></td>
<td>0.45**</td>
<td>0.43**</td>
<td>0.30*</td>
<td>0.45**</td>
</tr>
</tbody>
</table>

N = 61
* p < 0.05
** p < 0.01
Note. All significance levels were based on a two-tailed test.

Changes in Social Support and Psychological and Physical States

In repeated measures, ANOVA identified some significant differences for physical states, support, reciprocity, and conflict, but no significant differences were revealed in social support network or psychological states. First, physical states were significantly increased across all time periods, with differences evident between, before, and three months after surgery, before and six months after breast surgery, and before and one year following breast surgery. The results revealed that the women’s physical states had not recovered to the preoperative level at one year after breast surgery. In addition, high scores in fatigue, pain, abnormal breast sensations, and abnormal arm sensations are congruent with those of previous studies (Gelinas & Fillion, 2004; Makabe, 2002; Wyatt & Friedman, 1998). Moreover, the results should be considered from various factors, such as age. Age-specific research studies among women with breast cancer have included only young patients (Bloom, Stewart, Chang, & Banks, 2004; Dow & Laflerty, 2000) and only older patients (Deimling et al., 2006; Heidrich, Egan, Hengdumsob, & Randolph, 2006; Wyatt & Friedman). For example, Maly et al. (2005) reported significant relationships among social support, depression, and anxiety in patients with breast cancer aged 55 years or older. In addition, long-term studies have reported that women with breast cancer experienced physical signs and symptoms for years (Avis et al., 2004; Baron, Fey, Borgen, & Van Zee, 2004; Carpenter et al., 2004; Helgeson & Tomich, 2005; Hunter et al., 2004; Ingram & Brown, 2004; Wilmoth, Coleman, Smith, & Davis, 2004). Further work in the field of social support that focuses on age-specific patients with breast cancer has the potential to further clarify these results.

Support and reciprocity also were found to differ significantly before and after breast surgery. The women in the present study perceived support and reciprocity to be significantly higher before surgery than at any time after surgery; and higher support and reciprocity scores were associated with a low JGHQ score, indicating better psychological states. Davis et al. (2004), in a study sample of Australian women 6–12 months after diagnosis with early-stage breast cancer, found that 16% of women reported not receiving enough support during their diagnosis and treatment. Miyashita (2005) reported that women with breast cancer who received emotional and informational support were able to maintain their life satisfaction, but women without the interventions did not. Healthcare professionals need to provide adequate support for women with breast cancer to improve their psychological states and maintain life satisfaction. With regard to reciprocity, cultural issues should be accounted for when interpreting study results (Makabe & Hull, 2000).

No significant changes were observed in psychological states, as measured by the JGHQ, but a tendency for change was apparent. According to Nakagawa and Daibo (1985), the cutoff score of the JGHQ for the Japanese population is 16. Thus, psychological states in the current study’s sample at three months after and six months after breast surgery were higher.
than the cutoff score. Further longitudinal studies involving long-term observations should be conducted to investigate the relationships and changes in social support and psychological and physical states among Japanese women with breast cancer.

**Limitations**

Three limitations of the study were recognized. First, the dropout rate was high, with only 61 of 158 subjects providing data at all four data collection time points. Even though no significant differences were found in demographics and illness-related data among the 61 subjects and those who dropped out, the results should be interpreted carefully. Second, most subjects were in the early stage of the disease, and, as such, the findings would not be applicable to patients with stage III or IV disease. Third, although the alpha coefficient of each of the support, reciprocity, and conflict subscales on the JIPRI was acceptable in the sample of Japanese patients, measuring the contents of the subscales should be considered together with the cultural issues of interpersonal relationships, and especially that of reciprocity.

**Implications for Nursing Practice and Research**

Finfgeld-Connett (2005) stated that nurses should encourage patients to use and enhance personal support networks to increase social support, so as to lead to improvements in mental health. The results of the present study suggest the following clinical implications. Healthcare providers must assess the levels of different types of social support (support, reciprocity, and conflict) and the relationship with psychological and physical states among Japanese patients with breast cancer. The findings of such assessments should be applied to improve patients’ health outcomes. Nurses should provide support and guidance to encourage patients to use and enhance personal social support networks. Through increased knowledge of cultural issues and in consideration of cultural differences, healthcare professionals should make contact with patient family members and significant others to facilitate patients’ adjustment and prepare them to take an ongoing supporting role.

Future studies also should consider additional important cultural characteristics, especially those related to age. Prospective longitudinal studies with long-term observations are needed to investigate correlations of and comparisons to social support and psychological and physical states among Japanese women with breast cancer.

**Conclusion**

The present study focused on Japanese women with breast cancer before and one year after breast surgery and provided important information concerning the relationships to and changes in social support and psychological and physical states among these patients. The results of this study indicate that healthcare professionals should consider both the positive and negative aspects of social support when helping Japanese women adjust to the diagnosis and treatment of breast cancer. The results also will be of help to healthcare professionals to provide guidance that will improve patients’ psychological and physical states while accounting specifically for Japanese cultural norms.

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