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The Role of the Family Environment and Computer-Mediated Social Support on Breast Cancer Patients' Coping Strategies

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Despite the importance of family environment and computer-mediated social support (CMSS) for women with breast cancer, little is known about the interplay of these sources of care and assistance on patients' coping strategies. To understand this relation, the authors examined the effect of family environment as a predictor of the use of CMSS groups as well as a moderator of the relation between group participation and forms of coping. Data were collected from 111 patients in CMSS groups in the Comprehensive Health Enhancement Support System "Living with Breast Cancer" intervention. Results indicate that family environment plays a crucial

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role in (a) predicting breast cancer patient's participation in CMSS groups and (b) moderating the effects of use of CMSS groups on breast cancer patients' coping strategies such as problem-focused coping and emotion-focused coping.

The size and number of computer-mediated social support (CMSS) groups available to patients have risen quickly in recent years (Lieberman & Winzelberg, 2009). These groups have been found to improve participants' psychological and psychosocial well-being (Gustafson et al., 2001; Gustafson et al., 2005; Lieberman et al., 2003; Shaw, McTavish, Hawkins, Gustafson, & Pingree, 2000; Winzelberg et al., 2003). These studies have focused on cognitive and psychological mechanisms at the individual level. As a consequence, mesosocial characteristics such as social network size and availability have received less attention.

Despite this emphasis on individual characteristics, the experience of cancer may lead patients to adopt a more group-oriented mentality. In general, family members are closer psychologically to patients than others in their social network and share the patients' innermost thoughts and feelings (Manne et al., 2004). Because of this strong emotional bond, family provides the most effective source of support for women with chronic disease (Primomo, Yates, & Woods, 2007). Moreover, families of women with breast cancer have the capacity to influence patients' attitudes and belief systems related to their illness (Mirsu-Paun, 2004).

Given the importance of the family context, numerous studies have found that a supportive family environment for women with breast cancer is positively associated with health outcomes, including physical functioning (Primomo et al., 2007), psychological well-being (Baider & Kaplan De-Nour, 1988; Baider, Rizel, & Kaplan De-Nour, 1986; Bloom, 1982; Bloom & Spiegel, 1984; Edwards & Clarke, 2004; Ozono et al., 2005; Spiegel, Bloom, & Gottheil, 1983), and the ability to adjust and cope with breast cancer (Spinetta, 1984; Wellisch et al., 1999).

The importance of the family environment for breast cancer patients' participation in and benefits from CMSS groups cannot be underestimated. Accordingly, the effect of the family environment on use and efficacy of CMSS groups for women with breast cancer demands more attention. To that end, the present study explored the role of the family environment in using and potentially benefitting from participation in CMSS groups. First, we tested how family environment affects cancer patients' use of CMSS groups. Second, we examined the differing effects that the uses of these groups have on patients' coping abilities, exploring whether family environment moderates the effects of CMSS group use.

Literature Review

Cohesion, Expressiveness, and Conflict in the Family Environment

According to the general system theory (von Bertalanffy, 1968), *family* is defined as a system composed of small component subsystems including individual, marital, parent–child and sibling relationships that mutually affect one another. Because the family is a complex and integrated whole system, individual family members are necessarily interdependent, exerting a continuous and reciprocal influence on one another. Given that family members create a shared social reality that is linked to health (Kleinman, Eisenberg, & Good, 2006; Reiss, 1987), the family environment is a critical context affecting a patient's disease-related attitudes and behaviors. This is done primarily through communication pattern and the quality of relatedness within family systems (Weihs & Reiss, 2000).

The family environment plays a central role in increasing cancer patients' willingness and abilities to cope with their disease as it either facilitates or hinders the provision of social support from family members. In addition, most disease management takes place in the family environment, whether by the patient alone or with other family members (Ell, 1996). Family environment is an important determinant and a resource for cancer patients' coping efforts to stay healthy (Bloom, 2000; Helgeson & Cohen, 1996). In particular, three characteristics of family environment on a patient's willingness and ability to confront cancer have received empirical support: cohesion, expressiveness, and conflict.

The first, *family cohesion*, is defined as shared affection, support, helpfulness, emotional bonding, and caring among family members (Moos & Moos, 1976, 1986; Olson, Russell, & Sprenkle, 1983). Perceived emotional bonding such as family cohesion is very important for patients living with cancer because they generally tend to feel stigmatized or isolated. Family cohesion reduces stresses from social isolation and stigmatization that often accompanies cancer, creating a feeling of comfort and allowing patients to focus on coping with their illness. Patients' coping abilities are boosted by and continue to develop in a cohesive family environment (Alston & McCowan, 1995; Bloom 1982; Klassen et al., 2007).

The second characteristic, *family expressiveness*, is described as an open, direct, and pervasive style of verbal and nonverbal expression in the family. In general, discursive family behaviors may provide cancer patients the opportunity to articulate fears and unpleasant feelings, therefore starting the first step toward understanding and managing the illness (Friedman & DiMatteo, 1982; Spiegel, Bloom, Kraemer, & Gottheil, 1989). For example, open, honest, and frequent communication between patients and their families is essential for ensuring that the wishes of patients are heard and attended to when promoting effective decision making regarding treatment options (Beach & Anderson, 2003; Gardner & Cutrona, 2004). Expressive family communication also provides emotional support for active coping with cancer by encouraging patients to elaborate on the problematic situation and their feelings (Burleson, 2003). In these respects, family expressiveness is identified as an important factor for the encouragement of patients' willingness to fight against cancer and development of their coping abilities (Ballard-Reisch & Letner, 2003; Given, Given, & Kozachik, 2001; Gotcher, 1993; Walsh-Burke, 1992).

The third characteristic of family environment, *family conflict*, is defined as open expression of anger, aggression, and conflictual interactions that occurs as a result of incompatible goals or violations of relational expectations among family members (Comstock & Strzyzewski, 1990; Moos & Moos, 1986). Family conflict is a common occurrence in most families but can sometimes act as an additional stressor that inhibits active or coping with cancer. When there are family conflicts, there is less coping assistance for the patients (Reinhard, Given, Petlick, & Bemis, 2008). A conflict-ridden family environment is positively associated with deficits in patients' coping resources and difficulties with illness coping (Taylor & Stanton, 2007). In addition, family conflict often leads to disagreement between patients and their families in making decisions related to treatment (Lieberman & Fisher, 1999). In these situations, patients feel less confident about their own abilities to cope because they are unable to vent or to get positive feedback. As a result, they are more apt to avoid rather than confront stressful circumstances related to their coping with cancer.

Coping with Cancer and CMSS Groups

Coping is defined as the process of attempting to manage demands created by stressful events that are appraised as exceeding a person's resources (Lazarus & Folkman, 1984). To aid the process, patients with cancer need their own coping resources, including optimism, self-esteem, a sense of mastery, and social support (Taylor & Stanton, 2007). Among them, social support has served as a significant coping resource. In general, *social support* is defined as confirmation from others that one is loved, cared for, esteemed and valued, and part of a network of communication and mutual obligations (Cobb, 1976; Cohen & Wills, 1985; Seeman, 1996).

Social support groups purport to provide participants these different kinds of social support and assist in adopting proactive coping strategies. According to social comparison theory, patients make judgments about their own health and coping mechanisms by comparing them to those of others in their social networks (Helgeson & Gottlieb, 2000). Along these same lines, CMSS groups influence patients' coping strategies by offering a range of social support options, such as informational support, emotional support, and instrumental support. Many patients have engaged in CMSS groups to cope with their disease (Davison, Pennebaker, & Dickerson, 2000; Horrigan, Rainie, & Fox, 2001; Klemm et al., 2003) and CMSS groups have provided a wide range of beneficial types of coping assistance for patients facing cancer (Han et al., 2008; Lieberman, 2007; Shaw, Han, Kim et al., 2007; Shaw et al., 2000).

Family Environment as Motivator

Many family studies have defined the quality of family environment as either positive or negative on the basis of levels of cohesion, expressiveness, and conflict. According to their classification, family cohesion and expressiveness improve the quality of family environment, but family conflict worsens the quality. Hence, a positive family environment is representative of high cohesion, high expressiveness, and low conflict, while negative family environment is characterized by low cohesion, low expressiveness, and high conflict.

Given that CMSS groups provide a variety of coping resources, cancer patients with a positive family environment (e.g., high cohesion, high expression, low conflict) may be more likely to participate in CMSS groups because they have greater preparedness to cope actively with cancer. Shaw and colleagues (2006) found breast cancer patients with a supportive family environment participated more actively in CMSS groups by posting more messages on the discussion boards. On the basis of this earlier empirical evidence, we asserted that family environment may be a crucial motivator for breast cancer patients' participation in CMSS groups. In other words, breast cancer patients with positive family environments are more likely to use CMSS groups than those with negative family environments. Thus, we posed the following hypothesis:

> Hypothesis 1: Breast cancer patients with positive family environments—high cohesion (H1a), high expressiveness (H1b), or low conflict (H1c)—are more likely to use CMSS groups than those with negative family environments—low cohesion (H1a), low expressiveness (H1b), or high conflict (H1c).

Family Environment as Moderator of the Effect of Using CMSS Groups

Identifying who benefits from CMSS groups is an important line of inquiry for scholars investigating support group interventions. Other researchers, however, argue that not all patients might benefit equally from CMSS groups (Shaw, Han, Hawkins, McTavish, & Gustafson, 2008). This argument has been supported by the presence of several moderator variables, such as personality factors, demographic characteristics and medical knowledge (Gustafson et al., 2001; Gustafson et al., 2005; Namkoong et al., 2010). In this regard, the family environment could function as an as unexplored moderator, improving benefits from CMSS groups for cancer patients, which previous research has overlooked. As noted earlier, three characteristics of positive family environment have been found to promote cancer patients using various coping resources in CMSS groups more efficiently and consequently, they may benefit more from using CMSS groups.

This assertion is based on the idea that individuals who have higher levels of social support from a positive family environment are generally more effective in marshaling other social resources, are happier, healthier and deal with stress more effectively (Cohen & Wills, 1985; Mirowsky & Ross, 2003; Thoits, 1983; Williams, Ware Jr, & Donald, 1981). Similarly, the social enhancement model suggests that individuals who have more existing social resources in their lives will benefit more from new types of resources such as the Internet (Kraut et al., 2002; Shah, Cho, Eveland, & Kwak, 2005; Shah et al., 2007; Valkenburg, Schouten, & Peter, 2005). According to this perspective, social support from a positive family environment can make patients feel comfortable exploring CMSS groups and thus, such confidence would amplify the effects of using CMSS groups. If so, patients with a positive family environment would obtain more health benefits from CMSS than those with a negative family environment.

Among the benefits of participating in CMSS groups, the development of positive coping strategies is the most noteworthy, in the sense that CMSS groups may be effective in helping cancer patients manage a stressful situation and alleviate negative emotions. Coping strategies are defined as "conscious, rational ways for dealing with the anxieties of life" (Reber, 1985). Research has distinguished between contrasting strategies—that is, problem-focused versus emotion-focused strategies and behavioral versus cognitive strategies. According to Lazarus and Folkman (1980), problem-focused coping tends to predominate when people feel something constructive can be done, whereas emotion-focused coping is inclined to predominate when people feel that the stressor is something to endure. These seemingly contrasting strategies can be adopted together in the same context because most stressors elicit both types of needs (Carver, Scheier, & Weintraub, 1989). Thus, individuals diagnosed with cancer engage in behavior and cognitive processes that have two parallel coping functions (Lazarus & Folkman, 1984; Leventhal, Brissette, & Leventhal, 2003).

Given the adoption of problem- and emotion-focused coping that are stimulated as a result of participation in CMSS groups, we propose family environment will moderate the benefit that patients gain from the use of CMSS groups. More specifically, in this study, we propose that a positive family environment will amplify the effects of CMSS groups on the adoption of problem-focused coping and emotion-focused coping among breast cancer patients. To examine this assertion, we offer the following hypotheses:

Hypothesis 2: The effect of CMSS groups on adopting problem-focused coping will be amplified for those with positive family environments—high cohesion (H2a), high expressiveness (H2b), or low conflict (H2c)—compared with those with negative family environments—low cohesion (H2a), low expressiveness (H2b), or high conflict (H3c).

Hypothesis 3: The effect of CMSS groups on adopting emotion-focused coping will be amplified for those with positive family environments—high cohesion (H2a), high expressiveness (H2b), or low conflict (H2c)—compared with those with negative family environments—low cohesion (H2a), low expressiveness (H2b), or high conflict (H3c).

Method

Participants

Subjects were recruited and data were collected from April 1, 2005 through May 31, 2007 at the University of Wisconsin Paul C. Carbone Comprehensive Cancer Center, Hartford Hospital's Helen and Harry Gray Cancer Center in Connecticut, and the University of Texas M.D. Anderson Cancer Center. The primary purpose of this recruitment was for a randomized clinical trial to examine several conditional effects of the Comprehensive Health Enhancement Support System (CHESS) "Living with Breast Cancer" intervention, a computer-based health care system that provides patients and their families with a range of conceptually distinct services, including information, interactive tools, and online social support (Gustafson et al., 2001; Gustafson et al., 2005; McTavish, Pingree, Hawkins, & Gustafson, 2003). The main interest of this study, however, was CMSS groups within a typical CHESS module, so we limited the sample to the Full CHESS user group with all available CHESS services. As a result, we included 111 women with breast cancer randomly assigned to the Full CHESS treatment condition. These subjects completed a baseline survey before randomization and subsequent follow-up surveys at 6, 12 and 24 weeks after the intervention began.

Intervention

The CMSS groups within CHESS are text-based, facilitated, asynchronous message boards (i.e., discussion groups) that allow users to anonymously share information with and offer support to other breast cancer patients. The research staff informed the patients about the resources to which they had been randomized and asked whether they needed a laptop computer or Internet service. Any patient who did not have access to a computer with Internet access was provided with one by the research team. Internet service costs for all participants were paid by the researchers during the 6-month intervention period. In addition, every participant was offered training on CHESS either in person or over the telephone.

Measures

Coping Strategies

We used two coping strategies as the primary outcome variables: problem-focused coping and emotion-focused coping. These were measured as subscales from the original 60-item scale called the Brief COPE (Carver, 1997). Problem-focused coping (pretest: $M = 2.18$, $SD = 0.68$, Cronbach's $\alpha = .72$) was measured on a 4-point scale ranging from 0 (*I haven't been doing this at all*) to 3 (*I've been doing this a lot*), with each scale consisting of four items about active coping and planning. Emotion-focused coping (pretest: $M = 1.64$, $SD = 0.76$, Cronbach's $\alpha = .74$) was measured on a 4-point scale ranging from 0 (*I haven't been doing this at all*) to 3 (*I've been doing this a lot*), with each scale consisting of four items about positive reframing and humor.

Use of CMSS Groups

This study used the amount of time that participants spent in the CMSS groups to measure the degree of usage of CMSS groups within CHESS. In general, we assumed that the more people are exposed to interactive communication within CMSS groups, the more opportunities they will have to be supported by it. On the basis of this assumption, some previous studies have found that time spent in the specific service of CHESS was significantly associated with positive changes in health outcomes: participation in health care, health information competence, health self-efficacy, and social support (Han et al., 2009; Lee, Hwang, Hawkins, & Pingree, 2008; Shaw, Han, Baker, et al., 2007).

Family Environment

Family environment was measured by using three subscales of family relationships (cohesion, expressiveness, and conflict) with relevant items from the Family Environment Scale (Moos & Moos, 1983, 1986). On a true/false response scale, respondents selected their positions on statements in three subcategories. Cohesion was measuredas an additive scale on the basis of respondents' reports of four items about the degree of commitment, help, and support that family members provide for one another (pretest: $M = 3.62$, $SD = 0.83$, Cronbach's $\alpha = .67$), whereas expressiveness was measured as an additive scale on the basis of responses to five items about the extent to which family members are encouraged to act openly and to express their feelings directly (pretest: $M = 3.27$, $SD = 1.49$, Cronbach's $\alpha = .63$). In addition, conflict was an additive measure determined on the basis of respondents' reports of four items about the amount of expressed anger, aggression, and disagreement among family members (pretest: $M = 0.80$, $SD = 1.10$, Cronbach's $\alpha = .67$).

Control Variables

We statistically controlled for four social and demographic variables: age, ethnicity (Caucasian = 1, non-Caucasian = 0), living status (living alone = 1, not living alone = 0), and education. In addition, the study controlled for an important clinical characteristic expected to influence the dependent variables: stage of breast cancer—patients at stages 0, I, and II = early (0) and those at stage III, IV = late (1). We also controlled some variables, including dependent variable scores (i.e., problem- and emotion-focused coping) at baseline and the time spent in other services within CHESS (excluding that of CMSS groups in the model) to examine the moderating effect of the family environment.

Results

To test family environment as a moderator of the intervention effect, as well as a predictor of using CMSS groups for women with breast cancer, we used several hierarchical ordinary least squares regression models.

Table 1 shows the demographic characteristics of this study sample. The mean age of participants was 50.9 years, with ages ranging from 26 to 74 years. The racial characteristics of the sample were 90.0% Caucasian and 10.0% non-Caucasian. Of these, 9.1% of participants lived alone, whereas 90.9% of participants lived with others. Education background was diverse, with 38.2% having a bachelor's degree, 21.8% having a graduate degree, 15.5% having some college courses, and 13.6% having a high school diploma. In terms of clinical characteristics, most patients (92.6%) were in the early stage of cancer (stage 0, I, and II).

Table 2 presents the result of a hierarchical regression model examining the effect of the family environment on breast cancer patients' use of CMSS groups at 6, 12, and 24 weeks postintervention access. Most control variables were not found to be significant predictors, but education was negatively related to the use of CMSS groups, with those lower in education more likely to use CMSS groups than those higher in education.

Hypothesis 1, which proposed positive effect of family environment on the use of CMSS groups, was partially supported. Family expressiveness and family conflict

Table 1. Demographic characteristics ($N = 111$)

Characteristic	*n* (%)
Age, *M* (*SD*)	50.9 (9.00)
Ethnicity	
Caucasian	99 (90.0)
Non-Caucasian	11 (10.0)
N/A	1
Live alone	
Yes	10 (9.1)
No	100 (90.9)
N/A	1
Education	
Did not complete junior/middle high	1 (0.9)
Did not complete high school	1 (0.9)
High school degree	15 (13.6)
Some college	17 (15.5)
Bachelor's degree	42 (38.2)
Some graduate school	10 (9.1)
Graduate degree	24 (21.8)
N/A	1
Stage of cancer	
Early stage (stage 0, 1, 2)	100 (92.6)
Late stage (3, 4, or inflammatory)	8 (7.4)
N/A	3

had no effect on the patients' use of CMSS groups. However, there was a significant positive relationship between family cohesion and the use of CMSS groups at 12 weeks ($\beta = .23$, $p < .05$) and 24 weeks ($\beta = .23$, $p < .05$).

Hypothesis 2 predicting the moderating effect of some characteristics of family environment on the association between the use of CMSS groups and breast cancer patients' problem-focused coping was also partially supported. As shown in Table 3,

Table 2. Hierarchical regression analysis predicting the use of CMSS groups

	Use of CMSS groups		
	6 W ($n = 105$)	12 W ($n = 105$)	24 W ($n = 105$)
Block 1. Control variables			
Age	−.04	−.05	−.05
Ethnicity (Caucasian = 1)	.14	.16	.17#
Live alone (yes = 1)	−.14	−.16#	−.17#
Education	−.24*	−.24*	−.21*
Stage of cancer	−.07	−.11	−.11
ΔR^2 (%)	9.3#	11.1*	10.6*
Block 2. Family environment			
Cohesion (pretest)	.22#	.23*	.23*
Expressiveness (pretest)	−.09	−.10	−.10
Conflict (pretest)	.03	.09	.08
ΔR^2 (%)	3.6	4.1	4.0
Total R^2 (%)	12.9	15.2	14.6

Note. Cell entries refer to the standardized regression coefficient.
#$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 3. Hierarchical regression analysis predicting problem-focused coping

	Problem-focused coping		
	6 W ($n = 90$)	12 W ($n = 90$)	24 W ($n = 87$)
Block 1. Control variables			
Problem-focused coping (pretest)	$.52^{***}$	$.53^{***}$	$.44^{***}$
Age	−.10	−.15	−.17#
Ethnicity (Caucasian = 1)	−.07	.02	.08
Live alone (yes = 1)	−.06	.004	−.09
Education	−.04	.10	$.23^{*}$
Stage of cancer	−.03	−.05	−.06
Other service use time	−.03	−.05	−.12
ΔR^2 (%)	28.2^{***}	29.6^{***}	29.0^{***}
Block 2. Family environment			
Cohesion (pretest)	−.13	−.03	−.09
Expressiveness (pretest)	$.34^{**}$	$.32^{**}$	$.27^{**}$
Conflict (pretest)	−.17#	−.16#	$-.20^{*}$
ΔR^2 (%)	11.8^{**}	11.7^{**}	9.8^{*}
Block 3. Use of CMSS groups			
Time spent in CMSS groups (posttest)	−.05	−.05	.11
ΔR^2 (%)	0.1	0.1	0.6
Block 4. Interaction			
Cohesion × Time Spent in CMSS Groups	$.25^{*}$	.21#	.15
Expressiveness × Time Spent in CMSS Groups	.23	−.02	−.04
Conflict × Time Spent in CMSS Groups	.05	.05	.16
ΔR^2 (%)	4.9#	4.0	4.9
Total R^2 (%)	45.0	45.4	44.3

Note. Cell entries are before-entry standardized regression coefficient for Block 4 and final standardized regression coefficients for Blocks 1, 2, and 3.

#$p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

we found a significant interaction effect between family cohesion and the use of CMSS groups on problem-focused coping at 6 weeks ($\beta = .25$, $p < .05$). In addition, family expressiveness was found to be a significant factor in breast cancer patients developing a problem-focused coping at 6, 12, and 24 weeks postintervention access. In contrast, family conflict had a negative effect on patients' problem-focused coping at 24 weeks.

Hypothesis 3 proposed that some features of family environment moderate the effects of the use of CMSS groups on breast cancer patients' emotion-focused coping. As indicated in Table 4, there were significant interaction effects between family expressiveness ($\beta = .38$, $p < .05$) or family conflict ($\beta = -.31$, $p < .05$) and the use of CMSS groups on patients' emotion-focused coping at 6 weeks. Therefore, H3 was partially supported. With respect to the effect of other factors on emotion-focused coping, only family cohesion at 12 weeks had a significant influence.

To better understand the moderating effect of family environment, this study provides three figures. Figure 1 presents the moderating effect of family cohesion at 6 weeks postintervention access, suggesting that there was a noticeable positive effect stemming from the use of CMSS groups, specifically regarding problem-focused coping for participants with higher levels of cohesion among family members, while there was a negative effect from the use of CMSS groups on problem-focused coping for those whose families have lower levels of cohesion. Figure 2 represents the moderating effect of family expressiveness at 6 weeks

Table 4. Hierarchical regression analysis predicting emotion-focused coping

	Emotion-focused coping		
	6 W ($n = 90$)	12 W ($n = 90$)	24 W ($n = 87$)
Block 1. Control variables			
Emotion-focused coping (pretest)	.50***	.47***	.43***
Age	−.03	−.17#	−.22*
Ethnicity (Caucasian = 1)	−.06	.05	.12
Live alone (yes = 1)	.14	.13	.14
Education	.09	.06	.08
Stage of cancer	−.16#	−.15	−.08
Other service use time	.04	−.06	−.02
ΔR^2 (%)	29.5***	30.3***	30.2***
Block 2. Family environment			
Cohesion (pretest)	.04	.22*	.06
Expressiveness (pretest)	.17#	.14	.05
Conflict (pretest)	−.02	.11	.19#
ΔR^2 (%)	3.3	7.9*	3.7
Block 3. Use of CMSS groups			
Time spent in CMSS groups (posttest)	−.15	−.11	.03
ΔR^2 (%)	1.0	1.0	0.0
Block 4. Interaction			
Cohesion × Time Spent in CMSS Groups	.04	.13	.04
Expressiveness × Time Spent in CMSS Groups	.38*	.12	.10
Conflict × Time Spent in CMSS Groups	−.31*	−.11	−.02
ΔR^2 (%)	8.1*	2.4	0.7
Total R^2 (%)	41.9	41.6	30.5

Note. Cell entries are before-entry standardized regression coefficient for Block 4 and final standardized regression coefficients for Blocks 1, 2, and 3.

#$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

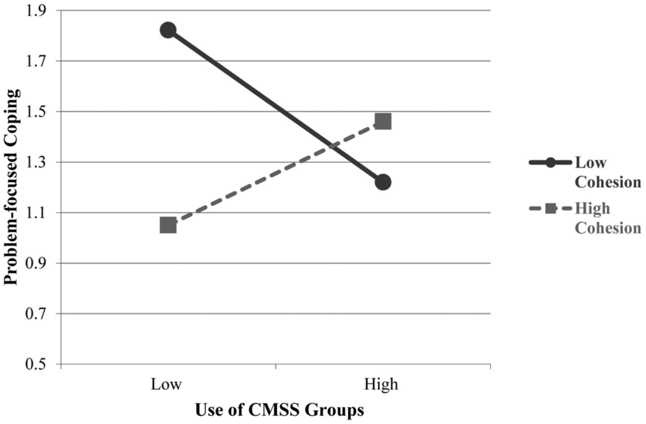

Figure 1. Interaction between family cohesion and the use of CMSS groups on problem-focused coping at 6 weeks (scale ranges only partially displayed on the y axis). For illustration purpose, it is plotted using the means of the four subgroups: (a) low CMSS group use/low family cohesion; (b) low CMSS group use/high family cohesion; (c) high CMSS group use/low family cohesion; (d) high CMSS group use/high family cohesion. CMSS = computer-mediated social support.

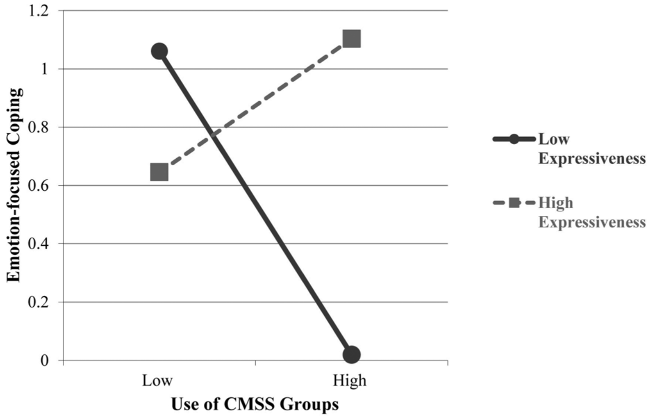

Figure 2. Interaction between family expressiveness and the use of CMSS groups on emotion-focused coping at 6 weeks (scale ranges only partially displayed on the *y* axis). For illustration purpose, it is plotted using the means of the four subgroups: (a) low CMSS group use/low family expressiveness; (b) low CMSS group use/high family expressiveness; (c) high CMSS group use/low family expressivness; (d) high CMSS group use/high family expressiveness. CMSS = computer-mediated social support.

postintervention access, indicating that patients whose families have higher levels of expressiveness were more likely to use emotion-focused coping as they participated more in CMSS groups, whereas those whose families have low levels of expressiveness were more likely to avoid emotion-focused coping as they spent more time in CMSS groups. Figure 3 shows the moderating effect of family conflict at 6 weeks postintervention access, indicating that the use of CMSS groups encouraged emotion-focused coping for patients who have fewer conflicts among family members, but it hampered emotion-focused coping for those who have more conflicts among family members.

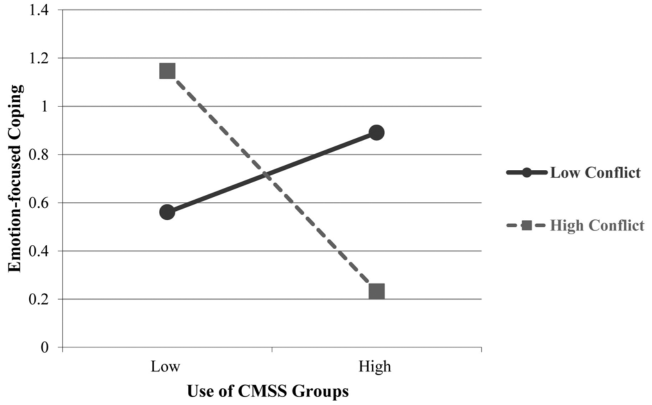

Figure 3. Interaction between family conflict and the use of CMSS groups on emotion-focused coping at 6 weeks (scale ranges only partially displayed on the *y* axis). For illustration purpose, it is plotted using the means of the four subgroups: (a) low CMSS group use/low family conflict; (b) low CMSS group use/high family conflict; (c) high CMSS group use/low family conflict; (d) high CMSS group use/high family conflict. CMSS = computer-mediated social support.

Discussion

In the present study, we examined the family environment as a predictor of the use of CMSS groups for women with breast cancer and the moderating role of family environment on the effect of CMSS groups for breast cancer patients' coping strategies.

First, family cohesion positively influenced the use of CMSS groups. Family cohesion has been known to be one of the most important determinants of coping behavior for women with breast cancer as patients with high family cohesion report improved coping skills, behavior, and style (Baider & Kaplan De-Nour, 1988; Baider et al., 1986; Bloom, 1982; Hannum, Giese-Davis, Harding, & Hatfield, 1991; Kotkamp-Mothes, Slawinsky, Hindermann, & Strauss, 2005).

Managing serious illnesses like breast cancer requires greater family closeness or intimacy than may be needed under less stressful circumstances. Patients likely experienced a diverse range of emotional stresses as a result of their breast cancer diagnoses. In this circumstance, families with high levels of cohesion can help patients cope with such stresses more effectively by increasing the likelihood that patients receive enough support from their families to fight their illness. With a supportive family environment, patients may perceive that they do not have to fight cancer alone and their family members are trying to beat their cancer together. As a result, patients whose families are very cohesive are more likely to participate in CMSS groups as a part of an active effort to deal with their illness.

In addition, breast cancer patients with more cohesive families may be reluctant to burden family members. Breast cancer is a major stressor that can cause extensive illness-related concerns in the family members and the patient herself (Northouse et al., 2002). Thus, the effect of breast cancer on family members has been found to be one of the most important concerns of women diagnosed with the disease (Figueiredo, Fries, & Ingram, 2004). Accordingly, breast cancer patients participate in CMSS groups because they are concerned about the challenges they face and do not want to worry their family members (Shaw et al., 2000). This tendency is more apparent in the patients whose families are cohesive, likely because members of cohesive families have a high degree of commitment to promoting other members' happiness and welfare and to the family group as a whole (Lamanna & Riedmann, 2008). Therefore, patients may be conscientious about fears that family members confront related to their cancer diagnoses, and tend to hide or downplay their challenges from family. Instead, given the option, they may look to CMSS groups to talk about their distress.

Second, this research demonstrated that positive characteristics of family environment moderate the effect of the use of CMSS groups on patients' coping strategies. Patients with high family cohesion are more likely to adopt problem-focused coping as they spend more time in CMSS groups. Similarly, those with a positive family environment, signified by factors like high family expressiveness and low family conflict, are more likely to choose emotion-focused coping as they participate more in CMSS groups. It is possible that patients who receive sufficient support from positive family environments are more likely to deal with their disease through active participation in CMSS groups because the quality of family relationships may enhance the patients' willingness to fight against breast cancer (Sollner et al., 1999). This could help patients pursue problem-focused or emotion-focused coping strategies by using various modes of support from CMSS groups.

However, breast cancer patients with negative family environments tend to avoid approach coping strategies as they participate in CMSS groups. Patients with lower perceived social support from or dissatisfaction with family relationships may be less able to take advantage of other resources they can use; furthermore, they may become overwhelmed and tend to retreat, using denial, distraction, or self-destructive activities (Tate, Van Den Berg, Hansen, Kochman, & Sikkema, 2006). In this situation, the excessive use of CMSS groups might hinder the use of approach coping strategies because patients lack the positive family environment necessary to share or use various coping resources received from participating in CMSS groups.

The findings provide new insights on the relationship between two sources of social support for women with breast cancer. Some previous studies have suggested that CMSS groups substitute or replace the role of traditional social support networks, such as family members and close friends (Papacharissi & Rubin, 2000; Wright, Sparks, & O'Hair, 2008). Moreover, previous research has suggested that patients are sometimes able to obtain more beneficial support from groups composed of people with similar health concerns, compared with those who rely on support from family (Andersen, 1992; Helgeson, Cohen, Schulz, & Yasko, 2000; Manne et al., 2004; Scheier et al., 2007). The study demonstrated that the effect of CMSS groups may augment traditional social support systems rather than replace them (see Shah et al., 2005; Shah et al., 2007). From the perspective of social network, each social network plays a unique role in providing support for patients with chronic illness. For example, strong-tie networks such as family and friends serve as an emotional support provider while weak-tie networks such as health care providers are primarily perceived of as a key source of helpful informational support (Arora, Finney Rutten, Gustafson, Moser, & Hawkins, 2007). In this sense, the CMSS group is not a replacement for traditional care mode, but instead is a part of a comprehensive continuum of prevention, care, treatment, and support services that include the family, the community, and health care providers.

In addition, these results provide important practical implications for health care practitioners who use CMSS group interventions for women with breast cancer. Practitioners should consider the quality of traditional social support networks when they provide additional resources to breast cancer patients in the form CMSS groups. They should consider different strategies, depending on the family environment, to maximize the effect of CMSS groups for breast cancer patients. For breast cancer patients with positive family environments, they should promote patient use of CMSS groups more actively. However, more careful consideration is required before encouraging the use of CMSS groups for those with less supportive family environments. For these patients, both breast cancer patients and their family members should consider participating in CMSS groups together, to enhance the family members' understanding of coping with breast cancer. Another potential strategy for newly diagnosed cancer patients might use family counselors who offer encouragement, listen to breast cancer patients' concerns, share feelings, and provide advice on how to cope with cancer. Likewise, clinicians can teach family members how to provide emotional support and physical care to people living with cancer.

The present study has several limitations. The modest sample size ($N = 111$) limits the statistical power to detect significant differences and interaction effects in our analyses. Increasing sample size is one approach for boosting statistical power for future studies. Another limitation is that three subscales of family relationships used in this research had relatively low reliabilities. Because scales with low reliabilities could influence the estimation of the standardized regression coefficients reported in this study, these subscales need further development. Last, this study assumes that the characteristics of the family environment are generally viewed as stable although the occurrence of cancer may affect the family environment.

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