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Giving and receiving emotional support online: Communication competence as a moderator of psychosocial benefits for women with breast cancer

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ABSTRACT

This study examines the moderating role of emotional communication competence in the relationship between Computer-Mediated Social Support (CMSS) group participation, specifically giving and receiving emotional support, and psychological health outcomes. Data were collected as part of randomized clinical trials for women diagnosed with breast cancer within the last two months. Expression and reception of emotional support was assessed by tracking and coding the 18,064 messages that 236 patients posted and read in CMSS groups. The final data used in the analysis was created by merging (a) computer-aided content analysis of discussion posts, (b) action log data analysis of system usage, and (c) baseline and 6-month surveys collected to assess change. Results of this study demonstrate that emotional communication competence moderates the effects of expression and reception of emotional support on psychological quality of life and breast cancer-related concerns in both desired and undesired ways. Giving and receiving emotional support in CMSS groups has positive effects on emotional well-being for breast cancer patients with higher emotional communication, while the same exchanges have detrimental impacts on emotional well-being for those with lower emotional communication competence. The theoretical and practical implications for future research are discussed.

1. Introduction

Aside from skin cancer, breast cancer is the most frequently diagnosed cancer among American women and approximately 12% of women in the United States develop invasive breast cancer during their lifetime (Ma & Jemal, 2013). As a result of their cancer diagnosis and subsequent treatments, women with breast cancer often face major psychosocial and emotional challenges (Carlsson & Hamrin, 1994; Ganz, 2008; Shapiro et al., 2001). To cope with such stresses, breast cancer patients exchange social support with peer patients in Computer-Mediated Social Support (CMSS) groups (Klemm et al., 2003; Sharf, 1997; Shaw, McTavish, Hawkins, Gustafson, & Pingree, 2000). Accordingly, the participants benefit from the social support of the groups. A growing body of research has found that breast cancer patients' participation in CMSS groups is beneficial to their emotional well-being (Lieberman et al., 2003; Lieberman & Goldstein, 2005; Winzelberg et al., 2003), psychosocial well-being (Gustafson et al., 2001; Rodgers & Chen, 2005), and healthcare competence (van Uden-Kraan et al., 2008).

From the perspective that people exchange social support via text-based messages in virtual communities (Walther & Boyd, 2002), recent research has focused to identify the health benefits of expression and reception of social support in CMSS groups for women with breast cancer (Kim et al., 2012; Namkoong et al., 2010). These studies have found that giving and getting supportive messages benefits women with breast cancer, with the effect of expression often outpacing reception (Pingree, 2007; Han et al., 2011; Winefield, 2006). Other studies have found that individual differences, including demographic characteristics, digital competence, and coping strategies predict giving and receiving emotional support (Kim et al., 2011; Yoo et al., 2013). Yet, despite the importance of individual characteristics in exploring the expression and reception of social support in CMSS groups, relatively little attention has been paid to whether the benefits of the support expression and reception are conditioned by personal characteristics of the communicators. Particularly noteworthy in this context is communication competence, individuals' abilities to send, receive,

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and interpret messages regarding social support processes (Goffman, 1972; Wentowski, 1981). In other words, communication competence reflects the ability to render and elicit social support (Heller, 1979; Sarason, Sarason, Hacker, & Basham, 1985; Wentowski, 1981). Accordingly, communication competence may affect the health benefits of emotionally supportive expression and reception in breast cancer CMSS groups.

To better understand how the effects of exchanging computer-mediated social support differ according to communication competence, we examine the moderating role of emotional communication competence in the relation between the expression and reception of emotional support and two measures of emotional well-being: (a) psychological quality of life and (b) breast cancer-related concerns. Tracking and coding the messages sent and received by 237 women with breast cancer in CMSS groups was used to assess expression and reception of emotional support. The data used in the analysis was created by merging (a) computer-aided content analysis of discussion posts within online support groups, (b) action log data analysis of use of this system, and (c) baseline and 6-month surveys collected to assess change.

2. Emotional support for cancer patients

Emotional support is a critical form of social support, facilitating both coping strategies and contributing to sustained well-being. In general, emotional support has been described as messages or actions assuring an individual that he or she is cared for, loved, esteemed, and valued (Cobb, 1976). It centers on the provision of "comfort and security during times of stress that leads the person to feel he or she is cared for by others" (Cutrona & Russell, 1990, p. 322).

Emotional support can be conceptualized as having four distinct functions. First, emotional support facilitates empathic and sympathetic responses, including the cognitive understanding for the suffering of others (Cutrona & Suhr, 1994; Dakof & Taylor, 1990). Second, emotional support provides encouragement and reassurance, bolstering the recipient's hope and confidence (Burleson, 1994; Rook & Underwood, 2000). Third, emotional support offers caring and physical affection, including hugs, kisses, hand-holding, and shoulder patting (Albrecht & Adelman, 1987; Cutrona & Russell, 1990; House, 1981). Finally, emotional support includes universality to emphasize the importance of closeness, bonding, and community (Braithwaite, Waldron, & Finn, 1999; Coursaris & Liu, 2009; Shaw et al., 2000; Yalom, 1970). Most conceptions center on individuals' efforts to assist one another cope with affective distress.

Emotional support plays an important role in cancer patients' psychological and physical adjustment to their disease. When confronted with a traumatic event, such as cancer, most individuals have high needs of emotional support to improve their self-esteem or to reduce feelings of personal inadequacy. Indeed, cancer patients identify emotional support as the most helpful kind of support (Dakof & Taylor, 1990; Dunkel-Schetter, 1984; Neuling & Winefield, 1988). Emotional support is linked with greater psychological well-being (Bloom, 1986; Roberts, Cox, Shannon, & Wells, 1994; Slevin et al., 1996; Taylor, Falke, Shoptaw, & Lichtman, 1986), better quality of life (Courtens, Stevens, Crebolder, & Philipsen, 1996), and lower rates of cancer morbidity and mortality (Glanz & Lerman, 1992; Reynolds & Kaplan, 1990).

Emotional support has proven particularly beneficial for women with breast cancer. Many studies on breast cancer have shown that emotional support contributes to improve patients' mental well-being (Alferi, Carver, Antoni, Weiss, & Duran, 2001; Bloom & Spiegel, 1984; Bloom, Stewart, Johnson, Banks, & Fobair, 2001), health-related quality of life and self-efficacy (Arora, Finney Rutten, Gustafson, Moser, & Hawkins, 2007), coping with breast cancer (Northouse, 1988), and survival rates of breast cancer (Ell, Nishimoto, Mediansky, Mantell, & Hamovitch, 1992; Kroenke, Kubzansky, Schernhammer, Holmes, & Kawachi, 2006).

3. Computer-Mediated Social Support (CMSS) groups and emotional support

According to the cancer stigma hypothesis (Cobb, 1976), patients with cancer may feel marked and branded by their illness. The stigma of breast cancer, in particular, with its focus on issues of sexuality and womanhood, leads some patients to locate themselves outside what they see as acceptable criterion. For women with breast cancer, CMSS groups provide anonymous and asynchronous communication that allows participants to be more open and honest about potentially embarrassing topics and stigmatizing concerns without the limits of time, space, and social cues (White & Dorman, 2001; K.B. Wright, 2002). In this regard, CMSS groups have been attractive to breast cancer patients who have feelings of social isolation or unmet social needs. Women with breast cancer cope with varied stressors by exchanging social support with other patients in CMSS groups (Sharf, 1997; van Uden-Kraan et al., 2008; Weinberg, Schmale, Uken, & Wessel, 1996). Among all types of social support, emotional support is exchanged most frequently in CMSS groups for breast cancer patients (Rodgers & Chen, 2005; Winzelberg et al., 2003). As the need for emotional support increases, patients' family and friends might not be able to offer appropriate support because the situation also causes extensive illness-related concerns among these caregivers and supporters (Northouse et al., 2002). In response, CMSS groups can serve as an alternative to traditional support channels, with people facing similar challenges sharing practical information with each other and exchanging supportive messages with other participants (McTavish, Pingree, Hawkins, & Gustafson, 2003; Shaw et al., 2000).

4. Health benefits of CMSS groups: Expression and reception of emotional support

Most research on emotionally supportive exchanges investigates the benefits from the recipient's perspective. From this perspective, emotional support has been found to influence the feelings, coping strategies, personal relationships, and even physical health of the recipient (Albrecht & Goldsmith, 2003; Uchino, 2004; Wills & Fegan, 2001). Research has found that emotional support decreases the recipient's emotional distress and results in other desirable health outcomes (Burleson, 2003; Burleson & Goldsmith, 1988; Dunkel-Schetter, Blasband, Feinstein, & Herbert, 1992; Goldsmith, 1994). Similarly, the social and health benefits of emotional support can be achieved through the reception of relevant messages in online cancer support groups (K.B. Wright, 2002; K.B. Wright & Bell, 2003). For example, breast cancer patients consuming more emotional support messages in CMSS groups are likely to report fewer breast cancer-related concerns (Kim et al., 2012; Lieberman & Goldstein, 2005).

Countering the dominant message-reception paradigm, communication scholars have begun to advance a theoretical model of message-expression effects (Pingree, 2007; Shah, Cho, Eveland, & Kwak, 2005; Shah et al., 2007). From the expression-effects perspective, "the act of expression might change the message sender, which expressed ideas often do not exist intact, if at all, in the speaker's mind prior to expression" (Pingree, 2007, p. 439). For this reason, writing therapy has been widely applied to text-based online counseling (J. Wright, 2002). For instance, written expression of specific messages has been shown to improve patients' mental

benefits in online health interventions (Han et al., 2008; Lieberman & Goldsmith, 2006; Shaw et al., 2007; Shaw, Hawkins, McTavish, Pingree, & Gustafson, 2006). That is, translating individual concerns into the written word helps patients understand and cope with trauma, which consequently decreases their psychological distress (Pennebaker, 1997). Additionally, expressive writing facilitates social integration by helping patients to connect with those around them in a positive way (Pennebaker & Graybeal, 2001). Among cancer patients, expressive writing interventions have been found to be effective at improving emotional well-being (Gellaitry, Peters, Bloomfield, & Home, 2010). Participants write about cancer-related experiences or coping strategies and share them with others. In the same vein, recent research found the psychological benefits of expressing emotional support in online cancer communities (Han et al., 2011; Kim et al., 2012), revealing that it often outpaces the effects of message reception.

Given that both giving and receiving emotional support online can evoke the psychological benefits of emotional support, such exchanges may contribute to improving emotional health outcomes. Accordingly, this study proposes the following hypotheses:

H1. Expression (H1a) and reception (H1b) of emotional support will be positively associated with psychological quality of life.

H2. Expression (H2a) and reception (H2b) of emotional support will be negatively associated with breast cancer-related concerns.

5. Emotional communication competence as a moderator

Individuals' ability to exchange and interpret messages is critical to healthy functioning and interpersonal interactions (Goffman, 1972; Wentowski, 1981). Such communication competence conditions individuals' ability to render and elicit social support (Heller, 1979; Sarason et al., 1985; Wentowski, 1981). In social support processes, communication competence is defined as the perceived tendency to establish meaningful relationships with others, render support, be relaxed, appreciate others' plights, and take turns appropriately (Query, Parry, & Flint, 1992). Therefore, communication competence plays an integral role in the exchange of social support (Albrecht & Adelman, 1987; Sarason et al., 1985).

Because both face-to-face communication and computer-mediated communication (CMC) involve the use of relevant communication skills, communication competence can be readily translated into CMSS contexts. Spitzberg (2006) proposed a model of CMC competence that is determined by the motivation, knowledge, and skills of the interaction in relation to the demands of the context and desired outcomes of the discourse. According to the model, competent users of CMC possess four written communication skills: attentiveness, composure, coordination, and expressiveness. These communication skills can be applied to the selection of channels and messages for social support in CMC settings. For example, attentiveness leads to the display of social support and comforting sophistication of message content in CMC. In addition, individuals with expressiveness skills can exchange social support through the use of emoticons and similar paralinguistic features of message content, the use of humor, and even the depth and breadth of self-disclosure. In this sense, it seems reasonable to suggest that communication competence influences the social support processes through CMC.

Communication competence is a multidimensional concept that includes the traditional notion of media literacy as well as interpersonal communication skills (Lee, Shah, & McLeod, 2012). Of the several types of communication competence, this study focuses on the notion of communication competence in relation to emotional communications,reflecting the specific context of exchanging socially supportive messages among breast cancer patients. Riggio and Carney's (2003) communication/social skills model highlights three sets of affective capabilities: skills in encoding emotional messages, skills in decoding emotional messages, and skills in regulating emotions. Accordingly, we define emotional communication competence as one's self-assessment of effectively sending, receiving, and regulating emotional messages.

Our conceptualization of emotional communication competence aligns well with a comprehensive body of research on emotional competence or intelligence. Studies of emotional competence or intelligence often view communicative skill as a core capability, including recognizing others' emotions, knowing the cultural rules for displaying emotions, and using the proper emotional vocabulary in expression (Saarni, 1990; Salovery, Hsee, & Mayer, 1993; Salovery & Mayer, 1990). For example, Mayer and Salovery's (1997) model of emotional intelligence deals with the ability to express emotions as one of three major components along with the abilities to perceive, understand, and manage emotions.

Given this conception of competence as centered on effectively communicating and regulating emotions, the health benefits of giving and receiving emotional support may be contingent on an individual's level of emotional communication competence. Individuals with high levels of emotional communication competence should be able to give and receive emotional support more effectively than those with low levels of emotional communication competence (Bodie & Burleson, 2008). The communicatively competent should not only be more attentive to emotional cues of communication, but also should be more proficient in (a) sending and receiving emotional support, (b) initiating and maintaining conversations, (c) expressing feelings clearly, and (d) demonstrating to others that they have been heard. On the other hand, those low in this competency are likely insufficient in communication skills that play an integral role in both the provision and reception of emotional support, a deficiency that inhibits their participation in emotionally supportive conversations. Thus, emotional communication competence is hypothesized to condition the emotional benefits of giving and receiving emotional support. Accordingly, the following hypotheses are offered:

H3. The positive relationship of expression (H3a) and reception (H3b) of emotional support with psychological quality of life will be greater for those with higher emotional communication competence.

H4. The negative relationship of expression (H3a) and reception (H3b) of emotional support with breast cancer-related concerns will be greater for those with higher emotional communication competence.

6. Methods

6.1. CMSS groups within CHESS

The Comprehensive Health Enhancement Support System (CHESS) is an online information and social networking system combining vetted medical information with a variety of other web-based resources. The system was developed based on input from health care professionals, patients, family caregivers, web designers, and communication researchers (Hawkins et al., 2010). The CHESS system for breast cancer provides three services: (a) information services, (b) support services, and (c) coaching services. The information services offer vetted facts about breast cancer, its treatment and consequences, the medical system, and general life issues. The support services provide an opportunity

to communicate with other patients as well as health care professionals. The coaching services enable the patients to cope with their illness more actively by providing tailored responses, guidelines, and simulations.

As the main support service, CMSS groups allow breast cancer patients to anonymously share informational and emotional support with other breast cancer patients. These text-based, asynchronous discussion boards that are accessible 24 h a day, 7 days a week, and have consistently been the most widely used CHESS service (Gustafson et al., 2005; McTavish et al., 2003). A trained facilitator moderates discussions to ensure that discussions are supportive and do not contain inaccurate or harmful information. The data used in this study were collected as part of a larger randomized clinical trial to examine different component parts of the CHESS "Living with Breast Cancer" intervention (Gustafson et al., 2001).

6.2. Participants

Recruitment for the clinical intervention occurred from April 1, 2005, through May 31, 2007, at the University of Wisconsin Hospital, Hartford Hospital (Connecticut), and MD Anderson (Texas). Patients were recruited via brochures placed at relevant locations and via doctors or nurses during clinic visits. All clinical staff introduced the study to potentially eligible patients and asked if they would be interested in participating. Once patients agreed to participate, a research staff member explained the nature and procedure of the interventions. All participants were offered laptop computers with a CHESS browser, which collected user data automatically, and Internet access during the study period.

In total, 661 women with breast cancer were randomized to one of the six treatment conditions. Each condition was provided different numbers and types of support services. The first condition (*Internet Only*, $n = 112$) is the control group that received training on how to navigate and search for relevant information in the Internet. The second condition (*CHESS Information Services*, $n = 118$) received only the CHESS information services. The third condition (*CHESS Information and Support Services*, $n = 109$) received both the information and support services from CHESS. The fourth condition (*Full CHESS: CHESS Information + Support + Coaching Services*, $n = 111$) received all three types of CHESS services. The fifth condition (*Human Cancer Mentor Only*, $n = 106$) received customized, confidential services from only cancer experts without the use of any CHESS services. The final condition (*Full CHESS + Human Cancer Mentor*, $n = 105$) was offered both human cancer mentoring and all CHESS services. Among these six conditions, this study focused on the 325 participants of the three conditions—*CHESS Information + Support Services*, *Full CHESS*, and *Full CHESS + Human Cancer Mentor*—in which they could access the CMSS support groups within CHESS. Of the 325 participants, we limited our analysis to the 236 women who either wrote or read at least one message via online discussion boards in the groups within the 6-month study period.

6.3. Data construction

The data used in the current study resulted from a combination of three major data components: (a) computer-aided content analysis of discussion posts within the CMSS groups, (b) action log data analysis of system use, and (c) baseline and 6-month surveys collected to assess change. We first analyzed the expression of emotional support within each posted message with the CMSS groups. In this process, we employed a computer-aided content analysis program, InfoTrend (Fan, 1985), to create a coding scheme that had high levels of reliability and validity (Han et al., 2011; Namkoong et al., 2010). We analyzed 18,064 posted messages using this program. Each discrete message post was the unit of analysis.

Table 1
Subcategories of emotional support and keywords.

Emotional support	Keywords
Empathy/sympathy	Empathy, sympathy, understand, sorry, worry, concern, etc.
Encouragement/ reassurance	Hope, wish, trust, congratulation, cheer, hang in there, keep stay strong, keep marching, do not give up etc.
Care/physical affection	Take care, hugs, kisses, love, etc.
Universality/ interrelationship	Common, isolated, sisterhood, not alone, together, etc.

As mentioned earlier, emotional support was composed of several constructs, such as understanding, empathy, concern, sympathy, reassurance, encouragement, physical affection, and universality. To develop coding rules that accurately reflect the range of emotional support categories, we clustered our coding around four core sub-concepts: (a) empathy/sympathy, (b) encouragement/reassurance, (c) care/physical affection, and (d) universality/interrelationship. Our operationalization of emotional support included most of the sub-concepts identified in previous literature, making it applicable across a wide range of cases and contexts.

After defining these sub-concepts, we created dictionaries of keywords associated with each category. For example, words such as "sorry" served as a starting point for the empathy/sympathy category and "hope" served as a starting point for the encouragement category (see Table 1). Using the keyword dictionaries, coding rules were created by establishing a relationship between multiple terms, phrases, or concepts. Distinct from word-counting content analysis software, the InfoTrend system enabled us to delineate the distance between terms as well as their directionality.

By coding concepts based on the order in which the words appear, we were able to establish the meaning of concepts more accurately. The distance and direction could be set by indicating the space in characters and putting "A (Ahead)," "B (Behind)," or "E (Either Direction)" between the keywords. This function allowed us to capture emotional support as it occurs in natural language without coding different concepts that used the same term. For example, we coded "I am worried about how you are doing," by making the coding rule, "*Worry A 20 You = Express Concern* (*Empathy/Sympathy*)," which means InfoTrend would code this only if a "*Worry*" appeared 20 characters ahead of the word "*You*" (see Fig. 1). This means phrases like "Don't worry, I know how to get there," would not be coded as Empathy/Sympathy. In addition, once rules were created, they could be layered with other rules. This way, we could capture complex expression of emotional support that could not be accurately coded using other software.

After setting final coding rules, a reliability test was conducted on a random subset of 200 discussion posts. The reliability test between human and computer coding showed an estimate of 91.0% agreement across the four different categories (empathy/sympathy: 90.9%, encouragement/reassurance: 88.4%, care/physical affection: 92.0%, and universality/relationship: 95.0%). Scott's pi (1955), which was calculated by comparing chance agreement across the four coding categories with actual agreement, was found to be 86.2% greater than by chance.

As the next step, we integrated these codings with action log data of system use that tracked each "click and keystroke" made by all CHESS participants. MySQL queries were used to match each coded message with the information about who posted the message and who consumed the message. This enabled us to track which CHESS participant expressed and/or received specific messages. This data was then combined with survey data, which was collected at baseline and 6-month follow up surveys, to examine patients' emotional health outcomes.

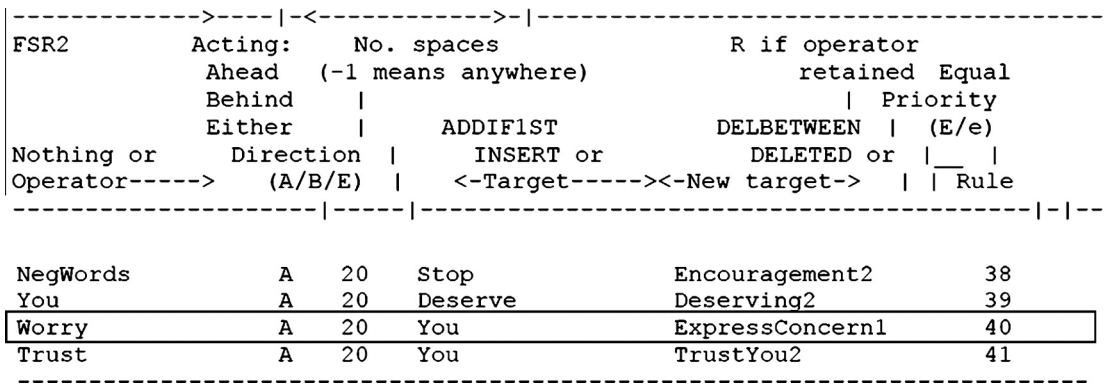

Fig. 1. An example of InfoTrend coding rules for emotional support.

Table 2
Descriptive statistics of messaging activities in CMSS groups for women with breast cancer.

	Participants (N = 236)			
	M	SD	Minimum	Maximum
Total number of messages posted	21.46	54.53	0	426.00
Total number of messages viewed	466.22	934.67	0	7121.00
Total counts of emotional support posted	24.09	70.97	0	459.00
Total counts of emotional support viewed	653.08	1294.11	0	9305.00
Expression of emotional support[a]	.40	.54	0	2.38
Reception of emotional support[b]	1.21	.76	0	6.63

[a] This expression measure is operationalized by the total counts of emotional support posted divided by the total number of messages posted.
[b] This reception measure is constructed by the total counts of emotional support viewed divided by the total number of messages viewed.

6.4. Measures

6.4.1. Dependent variables

6.4.1.1. Psychological quality of life. Psychological quality of life was assessed using six items in the World Health Organization Quality of Life (WHOQOL) instrument measured using a 5-point scale (0 = not at all to 4 = completely) (Harper & Power, 1998). Respondents were asked to answer the following statements: (a) "How much do you enjoy life?", (b) "To what extent do you feel your life to be meaningful?", (c) "How well are you able to concentrate?", (d) "Are you able to accept your bodily appearance?", (e) "How satisfied are you with yourself?", and (f) "How often do you have negative feelings such as blue mood, despair, anxiety, and depression?" (M = 2.85, SD = .59, Cronbach's α = .78 at pretest; M = 2.91, SD = .53, Cronbach's α = .81 at posttest).

6.4.1.2. Breast cancer-related concerns. Breast cancer-related concerns were measured with nine items of the Functional Assessment of Cancer Therapy scale (Kay-Lambkin, Baker, Lewin, & Carr, 2009), assessing breast cancer patients' emotional, physical, and body image concerns related to treatment for breast cancer and its side effects. These were measured using a 6-point scale (0 = *not at all* to 5 = *very much*) on which participants indicated how much they agreed with the following statements: (a) "I was short of breath", (b) "I was self-conscious about the way I dress", (c) "I was bothered by swollen or tender arms", (d) "I felt sexually attractive (reverse coded)", (e) "My hair loss bothered me", (f) "I worried about the risk of cancer in other family members", (g) "I worried about the effect of stress on my illness", (h) "My change in weight bothered me", and (i) "I am able to feel like a woman (reverse coded)" (M = 1.11, SD = .61, Cronbach's α = .64 at pretest; M = 1.15, SD = .67, Cronbach's α = .72 at posttest). This scale did not have high internal consistency because distinct breast cancer-related concerns can occur independently of each other. Nonetheless, it is still well suited to assess multi-dimensional concerns among women with breast cancer (Baker et al., 2011; Hawkins et al., 2010).

6.4.2. Independent variables

6.4.2.1. Expression and reception of emotional support. To measure the expression and reception of emotional support as independent variables, we used a measure of proportion consistent with previous research (Kim et al., 2012, 2011; Yoo et al., 2013). We constructed these measures by dividing the total count of emotional support expressed or received by the total number of messages written or read, respectively. This approach makes more sense than simply using raw scores because there is significant variance among participants in the total volume of messages written and read. This ratio variable can also rule out the potential confounding effect of verbosity and the writing/reading of other types of message content (Han et al., 2011). Thus, the expression of emotional support was operationalized by the total count of emotionally supportive messages posted divided by the total number of messages posted at CMSS groups for the 6-month study period (M = .40, SD = .54). Reception of emotional support messages was constructed by the total count of emotionally supportive messages read divided by the total number of messages read at CMSS groups for the 6-month study period (M = 1.21, SD = .76). Table 2 shows the descriptive statistics for the relevant components of the ratio measurement.

6.4.3. Moderator variable

6.4.3.1. Emotional communication competence. Emotional communication competence refers to an individual's belief in her abilities to exchange and interpret emotional messages effectively. It served as a moderator variable and was assessed at baseline using a 5-point scale (0 = *I cannot do this at all* to 4 = *I can do this extremely well*) by using four items: (a) "I can identify and label my feelings

accurately for others", (b) "When I disagree with someone, I check out my understanding of their viewpoint before I share my own feelings", (c) "I state my feelings and needs clearly and directly", and (d) "I am able to let others know that I understand their feelings even when their feelings are different than my own" (M = 2.58, SD = .70, Cronbach's α = .81).

6.4.4. Control variables

We included the following variables to control their potentially confounding effects: demographic and disease-related information contained age, education (1 = *did not complete junior/high school* to 8 = *graduate degree*), income (1 = *less than $20,000* to *6 = over than $100,000*), the time interval between breast cancer diagnosis and intervention participation (in days), and surgery experience (1 = *yes* and 0 = *no*). As additional control variables, we used two experimental conditions (1 = *Full CHESS* or *Full CHESS + Mentor* and 0 = *CHESS Information + Support Services* as a reference group), total time spent in CHESS (in minutes), and pretest values of psychological quality of life and breast cancer-related concerns.

6.5. Analytic framework

In order to test emotional communication competence as a potential moderator of the effects of emotional support expression and reception on psychological quality of life and breast cancer-related concerns, we used two types of hierarchical ordinary least squares regression models. In each regression model, control variables were entered in the first block. The pretest value of emotional communication competence was entered as moderator in the second block, and the main effect of exchanging emotional support was examined by entering the expression and reception of emotional support in the third block. Finally, in the fourth block, two-way interaction terms between emotional communication competence and expression (or reception) of emotional support were entered into the equation, which multiplies the standardized values of two variables to reduce multicollinearity problems between the interaction terms and their components (Cohen & Cohen, 1983).

7. Results

Table 3 presents the demographic and disease-related characteristics of our sample. The participants had a mean age of 51.18 years. The sample also had a diverse educational background with about 65% having at least an associate or bachelor's degree. The median category for annual household income was the range $60,001–$80,000. The participants had an average 75.12 days between breast cancer diagnosis and intervention participation and they used CHESS an average 723.27 min for the 6-month intervention period.

H1 predicted that the exchange of emotional support would be positively related to psychological quality of life. Table 4 presents the results of the regression analysis that expressing (H1a) and receiving (H1b) emotional support did not have significant effects on psychological quality of life (β = −.09, .06, p = n.s., for emotional support expression and reception, respectively). Thus, H1 was not supported.

H2 predicted that the exchange of emotional support would be negatively related to breast cancer-related concerns. As shown in Table 4, the expression (H2a) and reception (H2b) of emotional support was unrelated with breast cancer-related concerns (β = .001, −.11, p = n.s., for emotional support expression and reception, respectively). Therefore, H2 was not supported.

H3 predicted emotional communication competence would moderate the relationship of exchanging emotional support on psychological quality of life. The present study found a significant interaction effect between emotional communication competence and the expression of emotional support on psychological quality

Table 3
Demographic and disease-related characteristics of study participants.

	Participants (N = 236)
Age	
Mean (SD)	51.18 (9.05)
Education	
1. Did not complete junior/middle school	0.9%
2. Did not complete high school	1.7%
3. High school degree	15.5%
4. Some college courses	16.7%
5. Associate degree (2 year college)	9.0%
6. Bachelor's degree (4 year college)	26.6%
7. Some graduate courses	7.7%
8. Graduate degree	21.9%
Income	
1. Less than $20,000	5.5%
2. $20,001–$40,000	14.3%
3. $40,001–$60,000	17.5%
4. $60,001–$80,000	17.1%
5. $80,001–$100,000	19.8%
6. More than $100,000	25.8%
Surgery experience	
Yes	55.3%
No	44.7%
Time interval between diagnosis to intervention (days)	
Mean (SD)	75.12 (91.34)
Total time spent in CHESS (min)	
Mean (SD)	723.27 (1093.75)

Table 4
Hierarchical regression analysis predicting emotional outcomes.

Criterion variables	Psychological well-being (posttest)	Breast cancer-related concerns (posttest)
Block 1. Control variables		
Pretest value of each outcome variable	.57***	.43***
Age	−.07	−.01
Education	−.04	−.02
Income	.03	−.01
Time (diagnosis to intervention)	−.09	.06
Surgery experience (yes = 1)	.12	−.20**
Full CHESS group (yes = 1)	−.06	.09
CHESS + mentor group (yes = 1)	−.08	−.002
Total time spent in CHESS	.08	−.16*
Δ R^2 (%)	33.7***	20.3***
Block 2. Moderator variable		
Emotional communication competence (pretest)	−.03	.11
Δ R^2 (%)	0.1	1.1
Block 3. Main effects		
Expression of emotional support	−.09	.001
Reception of emotional support	.06	−.11
Δ R^2 (%)	0.8	1.1
Block 4. Interaction effects		
Emotional communication competence (pretest) × Expression of emotional support	.17*	−.07
Emotional communication competence (pretest) × Reception of emotional support	−.06	−.17*
Δ R^2 (%)	3.0*	2.9*
Total R^2 (%)	37.6	25.4

Note: Cell entries are before-entry standardized regression coefficient for Block 4 and final standardized regression coefficients for Blocks 1, 2, and 3.
* p < .05.
** p < .01.
*** p < .001.

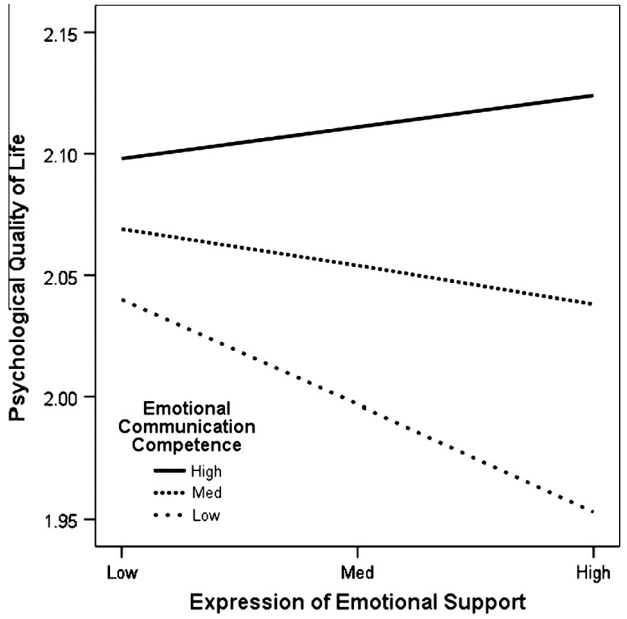

Fig. 2. Interaction between emotional communication competence and expression of emotional support on psychological quality of life (scale ranges only partially displayed on *y*-axis).

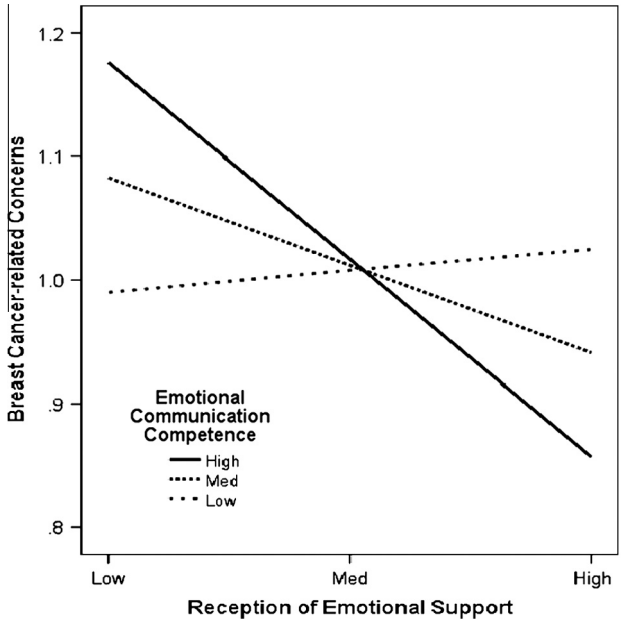

Fig. 3. Interaction between emotional communication competence and reception of emotional support on breast cancer-related concerns (scale ranges only partially displayed on *y*-axis).

of life ($\beta = .17$, $p < .05$). More specifically, the expression of emotional support had a positive relationship with psychological quality of life for breast cancer patients who had higher levels of emotional communication competence, whereas it had a negative relationship on psychological quality of life for those who had lower levels of emotional communication competence (see Fig. 2). However, the interaction between emotional communication competence and the reception of emotional support on psychological quality of life was not significant ($\beta = -.06$, p = n.s.). Thus, H3 received partial support.

H4 predicted emotional communication competence would moderate the relationship between the exchange of emotional support and breast cancer-related concerns. There was a significant interaction between the reception of emotional support and communication competence on breast cancer-related concerns ($\beta = -.17$, $p < .05$). That is, the reception of emotional support reduced breast cancer-related concerns for women with higher levels of emotional communication competence, while it increased breast cancer-related concerns for those who had lower levels of emotional communication competence (see Fig. 3). However, emotional communication competence did not moderate the influence of expressing emotional support on breast cancer-related concerns ($\beta = -.07$, p = n.s.). Thus, H4 received partial support.

8. Discussion

The primary focus of this study concerned the moderating role of emotional communication competence on the relationship between the exchange of emotional support and emotional health outcomes. Research on CMSS groups has found that the expression and reception of emotional support promotes participants' emotional well-being (Han et al., 2011; Kim et al., 2012). Prior research also suggests that people with high emotional communication competence are better able to send, receive, and interpret messages concerning emotional support than those with low emotional communication competence (Bodie & Burleson, 2008). Thus, we expected that the psychological benefits of expression and reception of emotional support would differ depending on the levels of emotional communication competence.

Somewhat surprisingly, the findings reveal that the expression and reception of emotional support were not directly associated with emotional health outcomes. Instead, the impact of exchanging emotional support was moderated by emotional communication competence in both desired and undesired ways. High communication competence amplified the benefits of exchanging emotional support, while low communication competence produced attenuated benefits of exchanging emotional support. These findings are consistent with a growing body of research indicating that the effects of supportive messages do not unfold in the same way for all individuals (Bodie & Burleson, 2008). Interestingly, the role of emotional support expression was only found to improve psychological quality of life, while emotional support reception was only effective in reducing breast cancer-related concerns.

Building on the past work distinguishing message expression and reception effects, this research suggests that these influences are, for emotional well-being at least, contingent on communication competence. Emotional communication competence is known to foster active engagement that is critical to building supportive relationships; therefore, those who display this capability are more likely to participate in purposeful and goal-directed behaviors. In addition, they are able to interpret another person's situation to render satisfactory social support. Since the expression of emotional support requires cognitive effort and active motivation to engage in CMSS groups, emotionally communication competent patients likely gain self-efficacy by providing emotional support. Given that the regulation of goal-achieving behaviors operates as an important contributor to emotional well-being (Bandura, 1986, 1997), those who have high levels of emotional communication competence appear especially likely to reap the full range of emotional benefits from helping others by providing emotional support. In contrast, patients with low levels of emotional communication skills can experience more uncomfortable and stressful events because poor communication competence is a vulnerability factor (Segrin, 2001). This deficit in emotional communication skills might generate distress, as they tend to express emotional support in CMSS groups.

While breast cancer patients' message expression within CMSS groups improves emotional well-being among those with higher communication competence, it does not influence the worry and concerns related to a given health problem. Instead, the reception of supportive messages appears to have a positive impact on reducing breast cancer-related concerns (Shaw et al., 2000; Kim et al., 2011), though in this study we find this effect is concentrated among those with higher communication competence. The reception of emotional support only helps those with this competency because these individuals can symbolically influence interaction to mobilize their support group or social network (Query & James, 1989). Emotional communication competence makes them feel less isolated and increases their understanding about the illness and treatment processes, thusdecreasing breast cancer-related concerns. Scholars examining the Relational Health Communication Competence Model (Kreps, 1988) found that communication competence predicted increased satisfaction from receiving social support (Weathers, Query, & Kreps, 2010; K.B. Wright, Banas, Bessarabova, & Bernard, 2010; K.B. Wright et al., 2013). Additionally, the increased satisfaction of social support resulted in the reduction of perceived stress (K.B. Wright et al., 2010). From this perspective, patients with high emotional communication competence might show low levels of breast cancer-related concerns as they receive emotional support in CMSS groups. However, those with low emotional communication competence might report high levels of breast cancer-related concerns because they are likely to be dissatisfiedwith emotional support received in CMSS groups.

Although we analyzed secondary data, the data themselves were constructed by integrating computational and conventional social science methods. These insights about message expression and reception are only available because three different types of data were combined: (a) computer-aided content analysis of discussion posts within online support groups, (b) action log data analysis of use of this system, and (c) baseline and 6-month surveys collected to assess change. This move toward computational methods – also called "big data" by some—relies on taking tens of thousands of discussion posts, millions of lines of action log data, and multiple waves of survey data to more carefully test theories of influence.

8.1. Limitations and directions for future research

Nonetheless, despite these virtues, this study is not without shortcomings. In particular, the measurement of emotional communication competence leaned toward measuring the competence of message expression rather message reception, so it might be less adapt at testing the moderating effect of emotional communication competence for getting emotional support. Future research should use a measure of communication competence equally related to both expression and reception. Second, we adopted a measure of proportion for reception of emotional support, such that it was measured by the total counts of emotionally supportive messages read divided by total number of all types of messages opened. However, opening a message does not guarantee that a subject read through the whole message and completely understood its content. Furthermore, the participants of our study used a text-based, asynchronous message system to read emotionally supportive messages in CMSS groups. The environment of online communication enables them to read all the messages that are targeted to others as well as themselves. Hence, if a woman read emotionally supportive messages directed to others, she might be less likely to perceive the benefits of reading those messages. Future work should consider more specified measures of reception for emotional support.

8.2. Conclusions and implications

Despite these limitations, it is noteworthy that this study provides further evidence of the importance of moderating factors in investigating the effects of supportive messages in online cancer communities. Numerous studies have found substantial evidence on moderators such as demographic characteristics, personality traits, cognitive factors, and interactional contexts (see reviews by Bodie & Burleson, 2008). This study not only demonstrates the moderating role of emotional communication competence in linking the effects of exchanging emotional support on emotional health outcomes, but it also provides an explanation of how this moderating effect takes place differently according to the features of emotional outcomes. Communication competence moderates the effect of supportive expression on psychological quality of life, but does not affect the impact of emotional support reception. On the contrary, the effect of emotional support reception on breast cancer-related concerns differs by emotional communication competence, but the influence of emotional support expression is unaffected.

These findings have practical implications. E-health practitioners should have different care guidelines in terms of the level of patients' emotional communication competence during the intervention period. For patients with high emotional communication competence, health care professionals may consider developing strategies that can promote more active participation in supportive discussion within CMSS groups. For those lacking emotional communication competence, it appears important to avoid certain types of CMSS interactions or to support the development of emotional communication competence. Hence, it may be worth considering the development of a more integrated e-health system that not only provides a space for the exchange of emotional support, but helps improve emotional communication competence.

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