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Communication Competence, Psychological Well-being, and the Mediating Role of Coping Efforts among Women with Breast Cancer: Cross-sectional and Longitudinal Evidence

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Abstract

Despite existing research identifying psychological benefits of patients' interpersonal competence in various contexts, little longitudinal research has addressed underlying mechanism(s). To address this limitation, we examined both the cross-sectional and longitudinal associations between cancer patients' communication competence in close relationships and psychological well-being, as well as the mediating role of coping efforts. Data came from a larger project with women with breast cancer ($N = 661$), recruited from April 2005 to May 2007 at three large university-affiliated cancer centers in the U.S. to study the effects of an Internet-based system providing patients and families with a range of services. The present study focused on survey data at baseline, 6 weeks, and 12 weeks after the intervention (controlling for the possible effects of the intervention). Results from both cross-sectional and longitudinal analyses indicated that competence in open communication between patients and their close support persons had a positive association with patients' psychological well-being and that approach coping efforts partially mediated this association. We discussed the implications and limitations of the study.

Keywords

communication competence; approach coping; psychological well-being; breast cancer

In the United States, breast cancer is the second most frequently occurring cancer among women, with more than 2.5 million women having a history of breast cancer in 2010 (Altekruse et al., 2010). Living with breast cancer is a traumatic experience with physical and psychological impacts, such as changes in physical appearance, depression, and decline in subjective quality of life (Ganz, 2000). Notably, such experiences do not occur in a relational vacuum, presenting a challenge for both patients and their significant others

(Kraemer, Stanton, Meyerowitz, Rowland, & Ganz, 2011). Therefore, patients' ability of effective and open communication in close relationships plays a vital role during cancer experiences.

Past research has found an association between communication competence and relational outcomes and psychosocial adjustments in a variety of contexts (Spitzberg & Cupach, 2011; Wright, Banas, Bessarabova, & Bernard, 2010), including cancer communication (Query & Wright, 2003). Relatedly, open communication in close relationships has psychological health benefits for cancer patients, such as reduced distress (see for review, Goldsmith, Miller, & Caughlin, 2008), mediated through coping behaviors (Donovan-Kicken & Caughlin, 2011). However, little longitudinal evidence exists to understand whether and how communication competence in close relationships relates to psychological benefits among cancer patients. Longitudinal assessment will help provide a better understanding of the dynamic, and causal, relationships between patient communication and well-being over the course of the disease trajectory (Han, 2011). Therefore, this study aimed to examine the association between communication competence in close relationships and psychological well-being and the mediating role of coping efforts, analyzing both cross-sectional and longitudinal data from women with breast cancer.

Relational contexts of cancer experience

Cancer patients most likely do not experience illnesses alone, but rather in a relational context (Kraemer et al., 2011). After diagnosis, patients desire a large amount of support immediately and throughout their cancer treatment. Patients may manage physical impacts and psychosocial ramifications in various close relationships, including those with family members, partners, and friends. These relationships play a critical role in helping patients cope with a cancer diagnosis (Arora, Finney Rutten, Gustafson, Moser, & Hawkins, 2007).

Research findings showed a significant association between cancer patients' perceptions of emotional support and health-related quality of life. For example, upon cancer diagnosis, patients reported receiving various types of support from their social network, such as informational, decision-making, and emotional support from family members, and mostly emotional support from friends; this support had a significant association with patients' quality of life at a later time (Arora et al., 2007). Other research suggested that relationships with partners are important in breast cancer experience (e.g., Ben-Zur, Gilbar, & Lev, 2001; Bigatti, Wagner, Lydon-Lam, Steiner, & Miller, 2010). Greater perception of partner emotional support was related to lower levels of depression in patients (Talley, Molix, Schlegel, & Bettencourt, 2010), and metastatic breast cancer patients and their partners who worked together to use common positive coping had less cancer-related distress, leading to a better quality of life for both of them (Badr, Carmack, Kashy, Cristofanilli, & Revenson, 2010).

Communication competence and psychological well-being during cancer

Given the studies demonstrating that adjustment to cancer occurs in relational contexts, it is important to study the role of communication competence in close relationships in enhancing patients' psychological well-being. Communication competence is a

multidimensional concept, tapping into several aspects, including empathy, affiliation, relaxation, and interaction management (Wiemann & Backlund, 1980). Query and Kreps (1996) define communication competence as “the perceived tendency to seek out meaningful interaction with others, render support, be relaxed, appreciate others’ plight, and turn-take appropriately” (p. 339). Specifically, this study focused on the notion of communication competence in relation to open communication, reflecting the specific context of cancer experiences in close relationships among women with breast cancer. Patients and their significant others maintain open communication to coordinate coping efforts and social support (Goldsmith et al., 2008). Thus, we defined communication competence as one’s perception of skills in openly communicating emotions, thoughts, and other issues between oneself and the other party in close relationships. Competence is pertinent to not only skills of a patient but also skills of a dyad consisting of a patient and a close support person who are undergoing stressful illness experiences together.

Prior research has reported that relationships exist between communication competence and a variety of relational outcomes, including locus of control (Canary & Lakery, 2006) and social support (Cupach & Canary, 2000) as well as psychological health outcomes, such as, perceived stress, psychological well-being, and quality of life (Segrin, Hanzal, Donnerstein, Taylor, & Domschke, 2007; Weathers, Query, & Kreps, 2010; Wright et al., 2010). For example, cancer patients higher in communication competence showed lower levels of perceived stress and higher satisfaction with the support (Query & Wright, 2003). Relatedly, patients’ open communication with significant others (or its lack of) had a significant association with psychological health consequences among patients (Donovan-Kicken & Caughlin, 2011). Consistent with past research, we expected communication competence in close relationships to be associated with greater psychological well-being among breast cancer patients (H1a). Especially given the definition of communication competence as perceived skills of a close dyad, we also considered its effect over the course of the disease trajectory and hypothesized a longitudinal association between communication competence and psychological well-being (H1b):

H1a: Communication competence in close relationships at baseline (i.e., T1) will be positively associated with psychological well-being at T1 among women with breast cancer.

H1b: Communication competence in close relationships at T1 will be positively associated with psychological well-being at later times (i.e., T2 and T3) among women with breast cancer.

Cancer coping efforts as a mediator

Breast cancer patients use a variety of coping strategies to manage their illness and stress, such as focusing on meaningful values, positive attitudes, and distancing oneself from the reality (Drageset, Lindstrom, & Underlid, 2010). There are generally two types of coping strategies: approach coping and avoidance coping. Approach coping refers to active strategies oriented toward confronting stressors to identify possible solutions, including positive reappraisal, self-control, problem solving, and support seeking (Moos & Holahan, 2003). Avoidance coping is rather passive strategies used to avoid confronting stressors by

employing strategies, such as cognitive avoidance, self-blaming, acceptance/resignation, and venting (Moos & Holahan, 2003). Patients who appraised their cancer as a challenge are more likely to use approach coping strategies whereas those viewing cancer as a harm/loss use avoidance coping (Franks & Roesch, 2006).

Research indicated various health benefits of approach coping to cancer patients, including better sleep (Thomas, Bower, Hoyt, & Sepah, 2010) and behavior change (Park, Edmondson, Fenster, & Blank, 2008). Among breast cancer survivors, approach coping strategies were significant predictors of changes in stress level, mental outlook, and diet (Reardon & Aydin, 1993). Overall findings from women with breast cancer suggested that those who use approach coping strategies have better quality of life than those using more avoidance coping (e.g., Avis et al., 2005; McCaul et al., 1999). Research on specific types of coping efforts also showed that positive reframing was negatively related to psychological distress in women with early stage breast cancer (Carver et al., 1993) while self-blame was positively associated with distress among surgical breast cancer patients (David, Montgomery, & Bovbjerg, 2006).

Moreover, prior research has indicated that coping efforts mediate the association between interpersonal communication dynamics and psychological well-being when dealing with health stressors (e.g., Donovan-Kicken & Caughlin, 2011; Kim et al., 2010; Manne & Glassman, 2000; Park et al., 2008). Interpersonal communication competence or resources available to individuals in a stressful situation may influence use of specific coping strategies, which in turn may affect adjustment to stressors. The rationale for the mediating role of coping efforts is twofold (Donovan-Kicken & Caughlin, 2011). First, a fundamental basis of some approach coping involves communicative interaction, such as using social support, and patients' support receiving may be enhanced by their communication competence. Second, communication competence can facilitate another fundamental basis of approach coping efforts, i.e., self-disclosure, which helps patients cognitively process their illness experience and be empowered to cope with it.

We thus hypothesized that approach coping efforts will mediate the association between communication competence and psychological well-being among women with breast cancer. We examined coping efforts as the relative amount of approach coping compared with the full range of an individual's coping efforts (Holahan, Moos, Holahan, & Brennan, 1997) to take into account individual differences in the total amount of coping efforts.¹ We posited the following hypotheses, respectively for the cross-sectional (H2a) and longitudinal (H2b) mediation:

H2a: At T1, coping efforts will mediate the association between communication competence in close relationships and psychological well-being.

¹Using a relative score of approach coping (Holahan et al., 1997) had several advantages. First, relative scores took into account individual differences in the total amount of coping efforts as a base rate of each individual (Vitaliano, Maiuro, Russo, & Becker, 1987). Second, it made our mediation analysis more straightforward and less data-driven to use one relative score of coping efforts than several mediating variables, especially considering that we repeated analyses using three waves of data. Also empirical evidence suggested predictive advantages of relative over absolute coping scores (Vitaliano et al., 1987).

H2b: Coping efforts at T2 will mediate the association between communication competence in close relationships at T1 and psychological well-being at T3.

Method

Procedures and Sample

Data were collected as part of a larger intervention project with women with breast cancer (see for details, Baker et al., 2011; Hawkins et al., 2011). The project recruited participants from April 1, 2005 to May 31, 2007 at the University of Wisconsin Paul P. Carbone Comprehensive Cancer Center, Hartford Hospital's Helen and Harry Gray Cancer Center, and the University of Texas M.D. Anderson Cancer Center, after Institutional Review Board approval was obtained for the study protocol. Eligibility criteria included: women aged 18 years or older, able to read and understand English, and within two months of a diagnosis or recurrence of breast cancer at the point of recruitment. Of a total of 1,034 women who were approached, 661 participated in the project (63.9% response rate).

In the present study, data from three waves of surveys were analyzed. The original project aimed at examining several conditional effects of intervention through the Comprehensive Health Enhancement and Support System (CHESS), an Internet-based health care system providing patients and families with a range of services. Participants filled out a baseline survey, prior to the intervention, assessing demographics, health characteristics, and various factors including communication competence, coping efforts, and quality of life. They also responded to three follow up surveys. The primary interest of the present study was to examine the cross-sectional and longitudinal associations between communication competence and well-being as being mediated by coping efforts, independent from the intervention conditions. We therefore analyzed three waves of survey responses at baseline (i.e., T1), after 6 weeks (T2, 86% retention rate) and after 12 weeks (T3, 85% retention rate), while controlling for the possible effects of the intervention.

Measures

Communication competence in close relationships—Participants were asked to identify one single, specific relationship (e.g., spouse or partner, friend, sibling, son or daughter, and parent) and to answer four items developed for this study, thinking about this specific relationship: e.g., “We openly talk to each other about our innermost fears and worries” and “We deal directly with problems or conflicts in our relationship rather than avoiding them.” We scored responses on a 5-point scale (0 = *We cannot do this at all* to 4 = *We can do this extremely well*) and later averaged them to create a scale (Cronbach's α = 0.90 at T1).

Coping efforts—To assess coping efforts, we used eight subscales of the Brief Cope scale (Carver, 1997): positive reframing, active coping, planning, humor, self-blaming, self-distraction, denial, and behavioral disengagement. Each subscale consisted of two items about how much participants have attempted to cope with stress in their lives since they were diagnosed with cancer, assessed on a 4-point scale: 0 = *I haven't been doing this at all* to 3 = *I've been doing this a lot*. Specifically, we assessed approach coping efforts by

averaging responses to eight items (Cronbach's $\alpha = 0.76$ at T1): e.g., "I have been trying to see breast cancer in a different light to make it seem more positive" (positive reframing), "I have been taking action to try to make the situation better" (active coping), "I have been trying to come up with a strategy about what to do" (planning), "I have been making jokes about it" (humor). Avoidance coping was an average score of eight items (Cronbach's $\alpha = 0.65$ at T1): e.g., "I have been blaming myself for things that happened (self-blaming), "I have been turning to work or other activities to take my mind off things" (self-distraction), "I have been refusing to believe that it has happened" (denial), and "I have been giving up trying to deal with it" (behavioral disengagement). Lastly, we computed participants' coping efforts by dividing approach coping scores by the sum of all coping scores (with a possible range of 0 to 1).

Psychological well-being—We assessed psychological well-being using a subscale of the World Health Organization Quality of Life Assessment-Bref (WHOQOL-Bref) measurement (Skevington, Lotfy, & O'Connell, 2004). We assessed, on a 5-point scale, six items about how participants felt or experienced life in the past four weeks: e.g., "How much do you enjoy life?", "To what extent do you feel your life to be meaningful?" (0 = *Not at all* to 4 = *An extreme amount*), "How often do you have negative feelings such as blue mood, despair, anxiety, depression?" (0 = *Never* to 4 = *Always*, reverse coded). We averaged responses to the items to create a scale (Cronbach's $\alpha = 0.78$ at T1).

Control variables—To reduce possible confounding effects, we controlled demographic and other background characteristics in the analysis. Demographics included age, education level (1 = *high school or less* to 4 = *graduate degree*), income (1 = *less than 40 thousand* to 5 = *100 thousand or more*), and race/ethnicity (1 = *Caucasian*, 0 = *others*). Other background characteristics included having health insurance (1 = *yes*, 0 = *no*), living situation (1 = *living alone*, 0 = *living with someone else*), and the number of days since diagnosis. Additionally, in the longitudinal analysis, we controlled the baseline scores of the dependent variables, the six CHES intervention conditions (by using five dummy variables), and the time spent in CHES services.

Data Analysis

First, for descriptive analyses, we computed the means and standard deviations for numerical variables, and percentages for categorical variables. Second, we ran correlation analyses using Pearson's r with all variables before conducting multiple regressions, to make sure coefficients were smaller than the recommended threshold of 0.70 (Tabachnik & Fidell, 2001) so as not to cause severe multi-collinearity. Third, to test the hypotheses, we conducted hierarchical ordinary least squares (OLS) multiple regressions and the bootstrap approach, using the cross-sectional data and longitudinal data, respectively. In the OLS multiple regressions, we entered control variables in the first block, added the main independent variable (communication competence) in the second block, and entered the mediating variable (coping efforts) in the last block. We identified control variables based on past research on psychological health among breast cancer patients (e.g., Shim, 2010; Talley et al., 2010) and included them in multivariate analyses to make sure that the observed associations were not attributable to those variables (Lewis et al., 2012). We

assessed model fit using adjusted R square values. We also employed the bootstrap approach for a more rigorous test of mediation hypothesis (Preacher & Hayes, 2004, 2008a, 2008b), that is, empirically bootstrapping the sampling distribution of the indirect effect and obtaining its 95% confidence interval (CI). If zero was not contained within the CIs, the mediation was considered statistically significant. Additionally, we repeated the bootstrapping analysis procedure to rule out alternative models, reversing the order of communication competence and psychological well-being. We conducted all analyses using SPSS 18.0, with significance accepted for $p < 0.05$ except where stated otherwise.

Results

Participants consisted of 88% Caucasians; 15% lived alone, and 99% had health insurance (Table 1). The mean age of participants was 52.1 years ($SD = 10.0$ years), with ages ranging from 23 to 88 years. About 15% of participants had a high school education or less; 31% had attended some college; 23% had a bachelor's degree, and 31% had a graduate degree. The median level of annual household income was \$60,000 to less than \$80,000. The mean number of days since diagnosis was 45.7 days ($SD = 27.4$ days).

We conducted descriptive statistics of primary variables at baseline (Table 2), respectively for communication competence in close relationships ($Mean = 2.69$, $SD = 0.92$, possible range = 0 – 4), coping efforts (i.e., the relative score of approach coping efforts divided by the sum of all coping scores, $Mean = 0.71$, $SD = 0.15$, possible range = 0 - 1) and psychological well-being ($Mean = 2.85$, $SD = 0.58$, possible range = 0 - 4). These three variables had bivariate correlations of 0.20 to 0.38 at baseline (T1), and over time, their means were quite stable: communication competence (T2: $Mean = 2.65$, $SD = 0.94$; T3: $Mean = 2.64$, $SD = 0.92$), coping efforts (T2: $Mean = 0.73$, $SD = 0.15$; T3: $Mean = 0.72$, $SD = 0.15$), and psychological well-being (T2: $Mean = 2.76$, $SD = 0.62$; T3: $Mean = 2.74$, $SD = 0.62$).

Association between communication competence in close relationships and psychological well-being

We conducted hierarchical OLS multiple regressions to examine the association between communication competence in close relationships and psychological well-being among women with breast cancer. We examined the cross-sectional association (H1a) and longitudinal association (H1b), respectively (Model 1 in Table 3). First, in the cross-sectional analysis, communication competence in close relationships at T1 had a statistically significant, positive association with psychological well-being at T1 ($\beta = 0.34$, $p < 0.001$). Thus, the results lent support for H1a. Of the control variables, income was the only factor significantly related to psychological well-being at T1 ($\beta = 0.25$, $p < 0.001$).

In the longitudinal analyses, communication competence at T1 had statistically significant relationships with psychological well-being at later times, T2 ($\beta = 0.14$, $p < 0.01$) and T3 ($\beta = 0.14$, $p < 0.01$), thereby supporting H1b. The baseline score of psychological well-being was the most strongly related of the control variables (T1: $\beta = 0.54$, $p < 0.001$, T2: $\beta = 0.50$, $p < 0.001$). Age also had a positive association with psychological well-being at later time points (T1: $\beta = 0.09$, $p < 0.05$, T2: $\beta = 0.13$, $p < 0.01$).

Coping efforts in mediating the association between communication competence and psychological well-being

We examined the mediating role of coping efforts, both cross-sectional (H2a) and longitudinal (H2b), in two different manners. First, we ran hierarchical OLS multiple regressions by newly adding coping efforts in the model (Model 2 in Table 3). We checked whether the strength of the relationship between independent and dependent variables was reduced after adding a mediator in the model, in correspondence to Baron and Kenny's (1986) argument of the mediation test. Next, we ran a more rigorous test of this mediation using the bootstrapping approach (Table 4).

In the cross-sectional regression using T1 variables, the association between communication competence and psychological well-being became a bit weaker after we added coping efforts in the model, although the association remained to be significant ($\beta = 0.28, p < 0.001$). At T1, coping efforts had a significant relationship with psychological well-being ($\beta = 0.31, p < 0.001$), and the change in R^2 values from Model 1 to Model 2 was significant (8.7%, $p < 0.001$). According to the bootstrapping approach with T1 variables, the 95% CI for the indirect path from communication competence to psychological well-being via coping efforts was .017 to .058. We, however, also found a significant direct path between communication competence and psychological well-being. Taken together, findings were in support of H2a about the cross-sectional mediation through coping efforts, albeit a partial mediation.

In the longitudinal regression analyses examining factors related to psychological well-being at T2 and T3, we entered communication competence at T1 as an independent variable and coping efforts at T2 as a mediator. After we added coping efforts in the model, we found a slight reduction in the size of the associations between communication competence at T1 and psychological well-being at later times (β s changing to 0.10, $p < 0.001$ and 0.13, $p < 0.001$, respectively for T2 well-being and T3 well-being). Coping efforts at T2 had significant positive associations with psychological well-being at T2 ($\beta = 0.24, p < 0.001$) and T3 ($\beta = 0.11, p < 0.01$). The changes in R^2 values from Model 1 to Model 2 were also significant (T2 well-being: 4.9%, $p < 0.001$; T3 well-being: 1.1%, $p < 0.001$). Additionally, we conducted a bootstrapping analysis, entering communication competence at T1 as an independent variable, coping efforts at T2 as a mediator, and psychological well-being at T3 as a dependent variable. The 95% CI for the indirect path from communication competence to psychological well-being through coping efforts was 0.003 to 0.031. A significant direct path also existed from communication competence to psychological well-being. Therefore, data supported H2b about the mediating, albeit partial, role of coping efforts over time from T1 to T3.

Ruling out an alternative model

As a way of ruling out an alternative model, we repeated the bootstrapping analyses, reversing the order of communication competence and psychological well-being (i.e., we entered psychological well-being as an independent variable and communication competence as an outcome). First, results from the cross-sectional data at T1 showed that the 95% CI for the indirect relation was -0.019 to 0.096 , not supporting the mediating role of

coping efforts. Second, the longitudinal analysis showed that psychological well-being at T1 had no significant association with communication competence at T3 (with the total effect being non-significant), although there was an indirect effect through coping at T2 (95% CI = 0.012 to 0.067). Therefore, taken together all findings, data lent greater support for our hypothesized model about the influence of communication competence on psychological well-being mediated through coping efforts than the alternative model reversing the order between independent and dependent variables.

Discussion

Patients are active agents who are willing to work toward outcomes of their stressful illness experience, and their coping efforts are shaped by personal and contextual factors surrounding the experience (Moos & Holahan, 2003), such as communication competence in close relationships. In the present study, we aimed to extend previous research by examining whether and how communication competence in close relationships brings psychological health benefits to women with breast cancer, analyzing both cross-sectional and longitudinal data. Our findings demonstrated that communication competence with significant others (including partners, family members, and friends) plays an integral role in shaping patients' psychological health outcomes, consistent with past literature (Query & Wright, 2003; Sptizberg & Cupach, 2011).

The findings suggested that future relationship- or community-based interventions should attend to communication competence of breast cancer patients and their close support persons. Clinicians may also encourage communication competence upon cancer diagnosis and throughout treatment to improve the cancer experience. Recognizing cancer experiences do not occur in a relational vacuum (Kraemer et al., 2011), increasing competence for effective and open communication in close support networks can help patients better achieve psychological adjustments to stressful experiences. Clinicians may also identify the primary support persons of patients, and encourage patients to specifically reach out to partners, family members, or friends during cancer coping.

Coping efforts mediating communication competence and psychological well-being

This study provided further support for the mechanism underlying the psychological benefit of communication competence, addressing a past limitation by using cross-sectional and longitudinal analyses (Spitzberg & Cupach, 2011). As patients reported having higher communication competence in close relationships, they were more likely to engage in approach coping efforts relative to all coping efforts they were making. Competence with open communication in close relationships may increase patients' access to mobilizing support from significant others (Sptizberg & Cupach, 2011) and reframing cancer experience through disclosure (Pennebaker & Beall, 1986; Sloan & Marx, 2004; Smyth, True, & Souto, 2001). As such, communication competence specifically enhanced patient use of approach coping strategies of positive reframing, active coping, planning, and humor, which in turn was associated with a higher level of psychological well-being. This finding suggested that communication competence with significant others may not have simple implications for psychological adjustment among breast cancer patients; but rather, the

(partial) mediating role of coping enhances a more comprehensive understanding of this process.

While patients may benefit from learning multiple approach coping strategies, health interventions and clinicians may encourage or affirm patient use of specific coping strategies. We conducted additional analyses using T1 data and found that participants reported engaging in specific approach coping efforts in the following order: active coping ($Mean = 2.15$, $SD = 0.80$), planning ($Mean = 2.08$, $SD = 0.84$), positive reframing ($Mean = 1.93$, $SD = 0.91$) and humor ($Mean = 1.01$, $SD = 0.97$). In regressions examining the associations of psychological well-being with specific coping efforts (also including communication competence and control variables, $R^2 = 0.23$, $p < 0.001$), positive reframing ($\beta = 0.17$, $p < 0.001$) and active coping ($\beta = 0.15$, $p = 0.002$) were significantly related factors, whereas planning and humor were not. This result gave preliminary clinical implications about which specific coping strategy may be better in bringing psychological help benefits, awaiting further research.

It is also noteworthy that we examined a relative score of approach coping efforts out of all coping strategies used by patients (e.g., Holahan et al., 1997). We saw how much of a person's coping was related to active approach coping, after adjusting for individual differences in the total amount of coping efforts (Vitaliano et al., 1987). The amount of coping needed by each patient to overcome the challenges associated with breast cancer may vary, and what produces beneficial outcomes may be the relative amount of approach coping efforts rather than the absolute amount. Recognizing that individual differences exist in the required or desirable amount of coping efforts, health interventions and clinicians should develop more tailored programs to encourage coping among cancer patients.

Limitations

The implications of this study should be considered in light of some limitations. First, the construction of communication competence measures was confined to the items collected as part of a larger project. We did not use standard instruments for this measurement, which could have resulted in misclassification of information and non-comparability to other studies that used standard instruments. Second, this study had limited generalizability outside of women with breast cancer. We must thus be cautious with applying the findings of this study to other types of cancer or diseases and patients of different gender or age. Third, this study did not specify patients' close relationships, but it is possible that the kind and degree of support offered varied by the specific type of relationships (Arora et al., 2007). In addition, the observed association between communication competence and psychological well-being mediated through coping efforts did not justify causal claims. Further, other unmeasured confounders might have accounted for the associations, and the association might have reflected a reverse causal relationship. Nevertheless, we ruled out this reverse causation to some degree by taking advantage of the longitudinal data, and our interpretation of the results was consistent with previous literature on adjustment to illness.

Conclusion

To conclude, this research suggested why communication competence in close relationships has great implications for women living with cancer. Communication and interactive behaviors can be managed in a productive manner, as opposed to some other unchangeable factors that influence cancer experience, such as age and cancer stage (Donovan-Kicken & Caughlin, 2011; Goldsmith et al., 2011). Therefore, this study implied that if patients find it challenging to cope with breast cancer, it may be important to consider whether those challenges are related to any patterns of low communication competence in close relationships between patients and their significant support persons. Also, if patients with a high level of psychological well-being have high open communication competence in close relationships, it would be useful to understand whether and what approach coping efforts they make to cope with the cancer, so that those efforts can be further encouraged and diversified. Assisting patients in their selection of approach and adaptive coping strategies in the context of relational communication will help them avoid “a downward spiral of isolation and negativity” (Donovan-Kicken & Caughlin, 2011, p. 603) and instead trigger an upward spiral of connection and positivity. Communication competency should be considered as a way to help patients with the cancer experience.

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Table 1

Demographic Information of Participants

Variable	% or Mean (SD)
Race/Ethnicity	
Caucasian	88.2%
African American	4.8%
Other	7.0%
Age (years), mean (sd)	52.1 (10.0)
23–39	9.5%
40–49	31.5%
50–59	37.8%
60–88	21.2%
Annual household income	
Less than \$40,000	20.3%
\$40,000 – less than \$60,000	20.0%
\$60,000 – less than \$80,000	14.8%
\$80,000 – less than \$100,000	16.9%
\$100,000 or more	28.0%
Education	
High school education or less	15.0%
Some college	30.8%
Bachelor's degree	23.1%
Graduate degree	31.1%
Number of days since diagnosis, mean (sd)	45.7 (27.4)
Living alone	14.5%
Having health insurance	99.1%

Note. $N = 661$. Living alone was coded 1 = *yes, living alone*, 0 = *living with someone else*. Having health insurance was coded 1 = *yes*, 0 = *no*.

Table 2

Descriptive Statistics and Zero-order Correlations at Baseline

	1	2	3	4	5	6	7	8	9	10
Comm competence (1)	-	0.20***	0.35***	0.01	0.01	0.10*	0.07	-0.01	0.01	-0.01
Coping efforts (2)	-	-	0.38***	0.03	0.09*	0.16***	0.02	0.04	0.07	-0.01
Psych well-being (3)	-	-	-	0.05	0.05	0.24***	0.02	-0.04	-0.03	0.05
Age (4)	-	-	-	-	-0.07	-0.06	0.16***	-0.06	0.17***	0.06
Education (5)	-	-	-	-	-	0.31***	0.09*	0.09*	0.10**	0.03
Income (6)	-	-	-	-	-	-	0.19***	0.10*	-0.31***	-0.07
Caucasian (7)	-	-	-	-	-	-	-	0.02	0.03	0.01
Insurance (8)	-	-	-	-	-	-	-	-	-0.01	0.00
Living alone (9)	-	-	-	-	-	-	-	-	-	-0.02
Days since diagnosis (10)	-	-	-	-	-	-	-	-	-	-
Mean at baseline	2.69	0.71	2.85	52.05	2.70	3.12	0.88	0.99	0.14	63.06
SD at baseline	0.92	0.15	0.58	10.01	1.06	1.51	0.32	0.10	0.35	214.94

Note. Cell entries are unadjusted bivariate correlations, and means/standard deviations at baseline. $N = 661$.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$.

Education level was coded 1 = *high school or less* to 4 = *graduate degree*; income as 1 = *less than 40 thousand* to 5 = *100 thousand or more*; Caucasian as 1 = *yes*, 0 = *others*; Living alone as 1 = *yes, living alone*, 0 = *living with someone else*; Having health insurance as 1 = *yes*, 0 = *no*.

OLS Multiple Regressions Examining Factors Related to Psychological Well-being: Cross-sectional and Longitudinal Analyses

Table 3

	Psychological well-being At T1		Psychological well-being At T2		Psychological well-being At T3	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Control variables						
T1 well-being	NA	NA	0.54***	0.49***	0.50***	0.47***
Time spent on CHES	NA	NA	-0.02	-0.03	0.04	0.06
Age	0.08	0.07	0.09*	0.08*	0.13**	0.12**
Education	-0.01	-0.01	-0.02	-0.05	0.04	0.03
Income	0.25***	0.20***	-0.04	-0.05	-0.05	-0.06
Ethnicity (Caucasian)	-0.04	-0.03	-0.05	-0.05	0.02	0.02
Health insurance	-0.06	-0.07	-0.02	-0.02	-0.02	-0.02
Living alone	0.05	0.01	0.00	-0.03	-0.02	-0.04
Days since diagnosis	0.07	0.07*	-0.01	-0.02	0.03	0.03
R ² (%)		8.3***		35.4**		32.2***
Independent variable						
T1 Comm competence	0.34***	0.28***	0.14**	0.10*	0.14**	0.13**
R ² (%)		11.2***		1.5**		1.8**
Mediator						
T1 Coping efforts		.31***		NA		NA
T2 Coping efforts		NA		0.24***		.11**
R ² (%)	8.7***	4.9***	1.1***			

Note. Cell entries are standardized betas and adjusted R squares. Ns = 562 – 661.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$.

In the longitudinal analyses, none of the five dummy variables for the intervention conditions had a significant association with psychological well-being, and thus we do not report them in the Table.

Table 4

Mediation of the Association between Communication Competence and Psychological Well-being through Coping Efforts

	Cross-sectional analysis	Longitudinal analysis
Direct and total effects: Unstandardized coefficients		
IV on mediator	0.03***	0.03**
Mediator on DV	1.24***	0.46**
Total effect of IV on DV	0.21***	0.10***
Direct effect of IV on DV	0.18***	0.08**
Formal test of the indirect effect		
Bootstrapping: 95% CI	0.017 – 0.058	0.003 – 0.031

Note. *Ns* = 562 – 661,

*
 $p < 0.05$,

**
 $p < 0.01$,

 $p < 0.001$.

IV refers to communication competence; Mediator is coping efforts; DV refers to psychological well-being. In the cross-section analysis, we used T1 variables for an IV, a DV, and a mediator. In the longitudinal analysis, we entered communication competence at T1 as an IV, coping efforts at T2 as a mediator, and psychological well-being at T3 as a DV. In both analyses, we entered relevant control variables as covariates, including age, education level, income, ethnicity, health insurance, living status, and days since diagnosis; the longitudinal analysis also included time spent on the online interactive site and five dummy variables for the intervention conditions.