Sexual problems, communication patterns, and depressive symptoms in couples coping with metastatic breast cancer

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Abstract

Background: The treatment of breast cancer tends to result in physical side effects (e.g., vaginal dryness, stomatitis, and atrophy) that can cause sexual problems. Although studies of early-stage breast cancer have demonstrated that sexual problems are associated with increased depressive symptoms for both patients and their partners, comparatively little is known about these associations in metastatic breast cancer (MBC) and how patients and partners cope together with sexual problems. We examined the links between sexual problems, depressive symptoms, and two types of spousal communication patterns (mutual constructive and demand–withdraw) in 191 couples in which the patient was initiating treatment for MBC.

Methods: Patients and partners separately completed paper-and-pencil surveys.

Results: Multilevel models indicated that high levels of sexual problems were significantly associated with more depressive symptoms only for patients who reported low levels of mutual constructive communication ($p < 0.01$) and high levels of demand–withdraw communication ($p < 0.0001$). In contrast, for partners, greater sexual problems were associated with more depressive symptoms regardless of the communication pattern reported. These associations remained significant when we controlled for patients’ reports of average pain and functional and physical well-being and couples’ dyadic adjustment.

Conclusions: Sexual problems were associated with depressive symptoms for both MBC patients and their partners. The way in which patients and partners talk with one another about cancer-related problems seems to influence this association for patients. MBC patients may benefit from programs that teach couples how to minimize demand–withdraw communication and instead openly and constructively discuss sexual issues and concerns.

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Introduction

The treatment of breast cancer can profoundly decrease the patient’s sexual functioning and thus overall quality of life (QOL) [1]. Researchers have largely focused on understanding how different treatment modalities (e.g., surgery, chemotherapy, and hormone therapy) are associated with physiological indices of sexual functioning (e.g., vaginal atrophy or lubrication). Although such research is important as it is associated with QOL, the focus on physiological indicators of function may neglect important subjective sexual experiences. In addition, the vast majority of studies has excluded patients’ spouses or intimate partners and has failed to examine the effects of sexual problems on couples’ relationships and interaction patterns [2–5]. Finally, very few studies on the sexual consequences associated with cancer have included patients with advanced disease [6,7]. These shortcomings are unfortunate because sexual relations may help couples maintain closeness and connection during this extremely stressful time and cope with emotional distress [1,8]. Given these gaps in the literature, we examined couples coping with metastatic breast cancer (MBC) for the presence of sexual problems and their associations with the disease.

Patients with MBC are a growing segment of the cancer survivor population. A multitude of treatment options such as targeted therapies [9] have allowed many patients to live for years with their disease [10]. Despite such advances, patients with MBC must cope with a host of physical symptoms such as pain [11], sleep disturbances [12], and fatigue [13]. Additionally, 30% to 100% of women undergoing chemotherapy [1,14] experience adverse treatment effects that resemble intensified menopausal symptoms (e.g., reduced libido, vaginal dryness, atrophy, and irritation) that can affect sexual function and satisfaction [15]. These side effects have been associated with depression in patients with advanced breast cancer [16,17] and their partners [18]. Indeed, studies have shown that male partners of breast cancer patients are concerned about changes in their sexual relationships and that these concerns are exacerbated when the wives’ disease recurs [19,20]. Although breast cancer including its side effects is a shared problem within the couple [20,21], little is known about how sexual problems introduced by cancer are associated with couples’ psychological well-being and how couples maintain well-being despite sexual problems.

Generally, sexuality at the end of life has been a neglected research topic. Only fairly recently have studies in palliative care settings revealed that loving, intimate relationships including sexual contact remain significant concerns during terminal illness [8,22,23] and that sexuality is an important component of holistic care, psychosocial functioning, and overall QOL [24–27]. However, the extent to which sexual problems due to cancer are associated with psychological function in couples coping with advanced disease such as MBC is relatively unknown. Even in the literature regarding early-stage disease or other cancer types such as prostate...
cancer, couple-based studies are relatively rare. Yet, we do know from the existing studies that communication processes play an important role in couples’ psychosocial adjustment to cancer [28–30], including their adaptation to sexual dysfunction or problems [31–35].

As couples cope with cancer, they often experience impaired communication about changes in their sexual relationship and sexual problems that may have emerged [36]. This lack of communication is problematic because it may lead to an emotional distance between the couple [37], increased psychological distress, and decreased marital satisfaction [34]. It may also induce feelings of fear of abandonment in women [38] because patients may feel undesirable to their partners because of treatment-related changes in appearance (i.e., mastectomy) [6]. Whereas partners may sexually withdraw for fear of causing pain or discomfort to the patient [39], women may withdraw from sexual affection to prevent requests for sexual activity [40]. Importantly, patients who report open communication with their partners seem to experience low levels of psychological distress despite sexual problems, as studies in the prostate cancer literature have demonstrated [41,42].

Although spousal communication patterns can be conceptualized in various ways, studies involving cancer patients and their partners have mainly examined mutual constructive (MC) communication and demand–withdraw (DW) communication patterns. Open and constructive spousal discussions (i.e., MC communication) about a cancer-related concern seem to be associated with greater marital satisfaction and decreased distress. In contrast, when one member of the dyad exerts pressure to talk about a problem whereas the other member withdraws or becomes defensive (i.e., DW communication), lower levels of relationship intimacy [32] and marital satisfaction [34] and increased levels of psychological distress [43] are reported. There is also some evidence that these patterns of communication affect patients and spouses differently. For instance, although MC communication about cancer-related concerns was associated with less distress and more relationship satisfaction in both patients with early-stage breast cancer and their spouses [43], MC communication protected only patients but not spouses against the adverse effects of sexual dysfunction associated with prostate cancer [32,34].

Building on these findings, we sought to highlight the need to study sexual problems in couples affected by advanced disease. More specifically, the purpose of the current study was to examine the association between sexual problems and psychological function (i.e., depressive symptoms) in couples in which the patient initiated treatment for MBC. On the basis of descriptive work and intervention studies targeting communication skills [31,33,44,45], we hypothesized that MC communication and DW communication moderate this association so that only couples with low levels of MC communication and high levels of DW communication report increased depressive symptoms when faced with sexual problems. We also examined whether the associations between sexual problems, communication patterns, and depressive symptoms differ for patients and their partners. On the basis of previous evidence [21,32,34], we hypothesized that communication patterns have a stronger buffering effect for patients than for their partners. This current research aimed to extend previous findings involving couples coping with early-stage disease and to inform future couple-based psychosocial interventions addressing the specific concerns of couples coping with advanced disease.

Methods

Recruitment

The current data are from a larger longitudinal study of MBC couples’ adaptation to pain [21,46] so that all patients in this sample indicated that they had experienced at least some sensation of pain over the last week at the time of recruitment. Patients were eligible if they (i) were initiating treatment for MBC; (ii) had an Eastern Cooperative Oncology Group performance status score of ≤2 (the patient was ambulatory and capable of all self-care but was unable to perform any work activities); (iii) rated their average pain over the last week as ≥1 on the Brief Pain Inventory (BPI) [47], which asked participants to rate their pain on an 11-point scale with anchors labeled 0 (‘no pain’) and 10 (‘worst pain imaginable’); (iv) could speak and understand English; and (v) had a male partner (spouse or significant other) with whom they had lived for at least 1 year.

Research staff approached 343 eligible patients and partners during the patient’s routine clinic visits; 281 couples (82%) provided written, informed consent. Patients who declined participation said they felt too distressed to participate or were not interested. We compared patients who participated with those who declined by using available data on patient age, Eastern Cooperative Oncology Group performance status, race, average BPI score at the time of recruitment, and primary metastatic site. The only significant difference was for pain, \( r(351) = -0.49, p = 0.001 \). Specifically, patients who agreed to participate had more pain (\( M = 4.34, \text{standard deviation (SD)} = 3.02 \)) than those who declined (\( M = 1.44, \text{SD} = 1.34 \)).

Patients and partners who consented were asked to separately complete paper-and-pencil questionnaires and to return them in individually sealed postage-paid envelopes. All participants received $10 gift cards for survey completion. Despite reminder phone calls, 75 (27%) of the 281 couples did not return the questionnaire, and for 15 couples, only one person returned the questionnaire; both the patient and the partner from 191 dyads returned the questionnaire. African American, Hispanic, and Asian patients had a greater likelihood of passive refusal than White patients did \( \chi^2(3, 273) = 5.79, p = 0.02 \). The final sample consisted of 201 patients and 196 partners.

Measures

Sexual problems

We adapted Majerovitz and Revenson’s [48] six-item measure of sexual problems, which was originally developed for couples coping with rheumatic disease. Given our dyadic design, this measure not only assesses perceptions of how sexual problems may affect one’s partner but also allows for dyadic-level analyses because the items are appropriate for both patients and partners to complete. Commonly used sexual function instruments such as the
Female Sexual Function Index [49] tend to assess specific aspects of sexual function (e.g., attaining and maintaining lubrication, ability to achieve orgasm) without taking the participants’ intimate relationship into consideration and tend to be gender specific. Consistent with the sexual concerns frequently reported in the breast cancer literature, such as loss of desire and perceived sexual attractiveness and fear of pain [5,6,15,38,50,51], the current items focused mainly on sexual desire (e.g., ‘I enjoy sex less than I used to’) and the negative effect of cancer on the sexual relationship (e.g., ‘I’m often afraid to have sex to make my (or my partner’s) pain worse’) as opposed to sexual function per se. Study participants rated their agreement with each statement on a five-point Likert-type scale. Higher scores indicated greater problems. The internal consistency of this measure was acceptable [52], with alpha reliability coefficients of 0.58 and 0.50 for patients and partners, respectively. See Appendix A for the patient and partner versions of the measure.

**Spousal communication patterns**
We adapted the Communication Patterns Questionnaire [53] to be cancer specific by asking participants to rate how the couple typically dealt with cancer-related problems or issues. MC communication consisted of seven items that assessed mutual discussion of an issue, expression of feelings, understanding of views, and feeling that the issue had been resolved. DW communication consisted of six items that assessed how often one member of the couple wanted to discuss a cancer-related problem but the other partner withdrew and did not want to talk about the concern. All items were rated on a seven-point Likert scale [from 1 (unlikely) to 7 (likely)]. Higher scores represented greater use of the particular communication pattern. Internal consistency was acceptable to good [52], with alpha reliability coefficients of 0.77 and 0.76 for MC communication and 0.79 and 0.80 for DW communication among patients and partners, respectively.

**Depressive mood**
Participants completed the well-validated 20-item Center for Epidemiological Studies-Depression (CES-D) scale [54]. Scores ranged from 0 to 60, with higher scores indicating greater distress. A cutoff score of ≥16 indicated ‘caseness’ warranting further psychological evaluation. Internal consistency was good [52] for both patients and partners, with alpha coefficients of 0.89 and 0.90, respectively.

**Descriptive variables**
In addition to the main study variables, demographic, medical, and other descriptive variables were assessed.

**Demographic and medical variables**
Participants reported their race, age, education level, employment status, marital status (married or cohabitating), and length of relationship. Patients also reported the amount of time since their initial diagnosis, stage at diagnosis, primary metastatic site, and history of medical treatments.

**Quality of life**
Patients’ functional and physical well-being were assessed with the respective subscales of the Functional Assessment of Cancer Therapy-Breast Cancer measure [55]. Patients indicated the extent to which they had experienced each symptom or statement during the preceding 7 days on a five-point Likert-type scale [from 0 (not at all) to 4 (very much)]. Higher scores indicated better QOL.

**Relationship satisfaction**
We used the abbreviated seven-item version of the Dyadic Adjustment Scale [56] to assess relationship satisfaction among patients and partners. Scores ranged from 0 to 36; a score of <21 indicated marital distress.

**Data analysis strategy**
We calculated descriptive statistics (e.g., means, SD, and correlations) for each of the study variables and performed paired t-tests to determine whether mean scores differed for patients and partners. Considering that marital satisfaction, sexual problem, overall QOL, pain, and depressive symptoms tend to have shared variance in breast cancer patients [4,12,16,38,57], we controlled for patients’ reports of pain and functional and physical QOL as well as patients and spouses’ relationship satisfaction. To rule out further potential confounds, we tested for significant associations between depressive symptoms and participants’ demographic variables (e.g., age, length of relationship, employment status, and education level) and patients’ medical factors (e.g., time since diagnosis, treatment types, and stage at diagnosis). If associations were above a significance level of \( p < 0.10 \), we included these factors in the main analyses.

The primary goal of this study was to determine whether the level of depressive symptoms in couples experiencing sexual problems depends on the degree to which they engage in MC or DW communication, and whether these associations differ for patients and partners. To accomplish these goals, we regressed the participants’ depressive symptom scores on a three-way interaction between sexual problems, communication patterns (i.e., MC or DW), and social role (i.e., patient or partner). Because of the dyadic nature of our data, we used a multilevel modeling technique in which the couple was the unit of analysis [58] by using the PROC MIXED procedure in SAS (Version 9.2, SAS, Cary, NC, USA) [59]. As opposed to the general linear model, multilevel modeling allows testing of non-independent data without biasing the probability estimates. Significant interactions were probed using simple slope analysis as outlined by Preacher et al. [60]. This procedure was developed specifically for multilevel modeling and allows determining at which level of the moderator (i.e., communication pattern or social role) the focal variable (i.e., sexual problems) is significantly associated with the outcome (i.e., depressive symptoms). Significant three-way interactions were decomposed by social role, and the association between sexual problems and depressive symptoms was examined at low (mean - 1 SD) and high (mean + 1 SD) levels of the specific communication pattern. On the basis of probability estimates of normal sampling distributions, 32% of scores fall above or
below 1 SD of the raw mean. Although these scores are less likely to be observed compared with the expected mean value, they are useful in interpreting interaction effects [61]. Because the instruments used to assess our focal and moderator variables (i.e., sexual problems and communication pattern, respectively) do not have standardized clinical values to identify extreme cases, SDs serve in place of such standardized values. For all analyses, predictor variables were centered at their grand mean [58], and effect coding was used for social role (patient = 1 and partner = −1). For significant effects, effect sizes were calculated using the formula $r = \sqrt{\frac{\tau^2}{\tau^2 + df}}^{1/2} \ [62]$. 

Results

Descriptive results

Table 1 summarizes the demographic and medical characteristics of the sample. Mean CES-D scores were 14.51 (SD 9.62) for patients and 13.60 (SD 9.76) for partners. Thirty-seven percent of patients, 32% of partners, and 16% of couples met the CES-D score criterion for caseness.

Table 2 shows the means, SDs, and correlations for major study variables by social role. Of note, all partial correlations were significant at $p < 0.01$, and associations between sexual problems, communication patterns, and depressive symptoms were stronger for partners compared with patients as indicated by larger correlation coefficients. Nonetheless, patients reported significantly more sexual problems than did their partners ($t(50) = 3.01, p < 0.01$, paired $t$-test).

For patients, the mean BPI score was 4.26 (SD 3.03), the mean functional well-being score was 17.69 (SD 6.24), and the mean physical well-being score was 17.97 (SD 6.48). Previous studies of MBC patients have reported mean scores of average pain on the BPI ranging between 1.7 and 5.31 [12, 16, 17, 63, 64], indicating that the current sample is representative of the MBC population regarding their experience of average pain. Additionally, with respect to functional and physical well-being, our sample was fairly comparable with previous MBC samples [65, 66].

Relational satisfaction mean scores were 25.66 (SD 6.24) for patients and 24.80 (SD 5.60) for partners; 22.5% of patients, 21.6% of partners, and 10% of couples met the criteria for marital distress. Relationship satisfaction (patients: $p < 0.05$; partners: $p < 0.001$) and patients’ pain, functional well-being, and physical well-being (all $p < 0.001$) were significantly associated with depressive symptoms. These variables were included as covariates. None of the patients’ medical variables (i.e., time since diagnosis, stage at diagnosis, primary metastatic site, and treatment history) and none of the participants’ demographic characteristics were significantly associated with depressive symptoms; therefore, we did not include these variables in our main analyses.

Multilevel analysis

Mutual constructive communication

As hypothesized, there was a significant three-way interaction between sexual problems, MC communication, and social role ($F_{1,309} = 7.46, p < 0.01$) (Table 3). Simple slope analyses revealed that when patients experienced greater sexual problems, they reported greater depressive symptoms if they reported high levels (mean + 1 SD) of MC communication ($z = 3.85, p < 0.0001$). Patients who reported high levels of sexual problems and high levels (mean + 1 SD) of MC communication did not have increased depressive symptoms ($z = 1.00, p = 0.32$) (Figure 1, top). Simple slope analyses for partners revealed that high levels of MC communication did not protect against increased depressive symptoms when partners reported high levels (mean + 1 SD) of sexual problems ($z = 0.99, p = 0.32$). However, when partners reported low levels (mean − 1 SD) of sexual problems, they reported significantly lower levels of depressive symptoms when they reported high levels compared with low levels of MC communication ($z = 3.16, p < 0.0001$) (Figure 1, bottom). Because the three-way interaction was significant, we did not test lower-order terms [67].

Demand–withdraw communication

There was also a significant three-way interaction between sexual problems, DW communication, and social role ($F_{1,304} = 15.20, p < 0.0001$) (Table 3). Simple slope analyses for patients revealed that when patients experienced greater sexual problems, they reported greater depressive symptoms if they reported high levels (mean + 1 SD) of DW communication ($z = 4.74, p < 0.0001$). For patients reporting low levels (mean − 1 SD) of DW communication, greater sexual problems were not significantly associated with increased depressive symptoms ($z = 0.40, p = 0.69$) (Figure 2, top). Simple slope analyses for partners revealed that low levels of DW communication did not protect against increased depressive symptoms when partners

Table 1. Demographic and medical characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Patients (N = 201)</th>
<th>Partners (N = 196)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White (%)</td>
<td>185 (92.0)</td>
<td>182 (92.9)</td>
</tr>
<tr>
<td>Age (mean ± SD)</td>
<td>52.20 ± 10.5 (23–78)</td>
<td>54.40 ± 10.85 (24–79)</td>
</tr>
<tr>
<td>(range), years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College ≤ 2 years (%)</td>
<td>141 (70.1)</td>
<td>147 (75.0)</td>
</tr>
<tr>
<td>Employment status (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>50 (24.9)</td>
<td>131 (66.8)</td>
</tr>
<tr>
<td>Part-time</td>
<td>21 (10.4)</td>
<td>7 (3.6)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>63 (31.3)</td>
<td>8 (4.1)</td>
</tr>
<tr>
<td>Retired</td>
<td>52 (25.9)</td>
<td>46 (23.5)</td>
</tr>
<tr>
<td>Unknown</td>
<td>15 (7.5)</td>
<td>4 (2.0)</td>
</tr>
<tr>
<td>Married (%)</td>
<td>199 (99.0)</td>
<td></td>
</tr>
<tr>
<td>Length of marriage (mean ± SD)</td>
<td>25.57 ± 13.02 (1–78)</td>
<td></td>
</tr>
<tr>
<td>(range), years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage at initial diagnosis (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>24 (1.19)</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>51 (25.4)</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>41 (20.4)</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>51 (25.4)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>34 (16.9)</td>
<td></td>
</tr>
<tr>
<td>Years since diagnosis (mean ± SD) (range)</td>
<td>5.43 ± 5.20 (5 weeks–25.6 years)</td>
<td></td>
</tr>
<tr>
<td>Primary metastatic site (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bone</td>
<td>113 (56.2)</td>
<td></td>
</tr>
<tr>
<td>Lung</td>
<td>42 (20.9)</td>
<td></td>
</tr>
<tr>
<td>Liver</td>
<td>38 (18.9)</td>
<td></td>
</tr>
<tr>
<td>Brain</td>
<td>8 (4.0)</td>
<td></td>
</tr>
<tr>
<td>Treatment (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>171 (85.1)</td>
<td></td>
</tr>
<tr>
<td>Hormonal therapy</td>
<td>22 (10.9)</td>
<td></td>
</tr>
<tr>
<td>Palliative radiotherapy</td>
<td>8 (4.0)</td>
<td></td>
</tr>
</tbody>
</table>

SD, standard deviation.
reported high levels (mean + 1 SD) of sexual problems (z = 0.35, p = 0.73). However, when partners reported low levels (mean – 1 SD) of sexual problems, they reported significantly lower levels of depressive symptoms when they reported low levels compared with high levels of MC communication (z = 3.65, p < 0.0001) (Figure 2, bottom).

Again, because the three-way interaction was significant, we did not test lower-order terms [67].

Discussion

Our study results suggest that sexual problems are a significant QOL concern among couples coping with MBC, as sexual problems are associated with depressive symptoms in both patients and their partners. We hypothesized that if MBC couples reported more sexual problems but also engaged in higher levels of MC communication, they would be less likely to report depressive symptoms. We further hypothesized that if MBC patients and their partners reported more sexual problems and higher levels of DW communication, they would be more likely to report depressive symptoms. In addition, we expected these associations to be stronger for patients than for their partners. Consistent with our hypotheses, multilevel analysis revealed that patients reporting high levels of MC communication or low levels of DW communication did not report increased depressive symptoms despite experiencing high levels of sexual problems, even after relationship satisfaction, pain, and physical and functional well-being were controlled for. For partners, communication patterns were significantly associated with levels of depressive symptoms when they experienced lower-order terms [67].

Table 2. Correlations, means, SDs, and paired t-tests on major study variables for patients and partners

<table>
<thead>
<tr>
<th>Variable</th>
<th>CES-D</th>
<th>Sexual Problems</th>
<th>MC</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CES-D</th>
<th>.23***</th>
<th>.43***</th>
<th>- .42***</th>
<th>.46***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexual Problems</td>
<td>.35***</td>
<td>.37***</td>
<td>- .24**</td>
<td>.25**</td>
</tr>
<tr>
<td>MC Communication</td>
<td>- .20**</td>
<td>- .16*</td>
<td>.34***</td>
<td>- .59**</td>
</tr>
<tr>
<td>DW Communication</td>
<td>.26***</td>
<td>.18*</td>
<td>- .44***</td>
<td>.38***</td>
</tr>
</tbody>
</table>

B, raw coefficient; SE, standard error; df, degrees of freedom. Social role: patient = 1; partner = –1. Effect size r = (t2/ (t2 + df))1/2.

Table 3. Sexual problems, communication patterns, and social role on depressive symptoms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mutual constructive communication pattern</th>
<th>Demand–withdraw communication pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>SE</td>
<td>t</td>
</tr>
<tr>
<td>Intercept</td>
<td>15.96</td>
<td>2.46</td>
</tr>
<tr>
<td>Pain</td>
<td>0.21</td>
<td>0.16</td>
</tr>
<tr>
<td>Physical well-being</td>
<td>-0.07</td>
<td>0.09</td>
</tr>
<tr>
<td>Functional well-being</td>
<td>-0.49</td>
<td>0.09</td>
</tr>
<tr>
<td>Dysic adjustment</td>
<td>-0.05</td>
<td>0.09</td>
</tr>
<tr>
<td>Sexual problems</td>
<td>2.65</td>
<td>0.95</td>
</tr>
<tr>
<td>Communication pattern</td>
<td>-0.16</td>
<td>0.07</td>
</tr>
<tr>
<td>Social role</td>
<td>-1.24</td>
<td>0.94</td>
</tr>
<tr>
<td>Sexual problems × communication</td>
<td>0.17</td>
<td>0.10</td>
</tr>
<tr>
<td>Sexual problems × social role</td>
<td>1.03</td>
<td>1.42</td>
</tr>
<tr>
<td>Communication × social role</td>
<td>-0.24</td>
<td>0.10</td>
</tr>
<tr>
<td>Sexual problems communication × social role</td>
<td>-0.43</td>
<td>0.15</td>
</tr>
</tbody>
</table>

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levels of sexual problems; however, when the levels of sexual problems were high, there was no evidence that the level of MC or DW communication moderated the association between sexual problems and depressive symptoms.

Our results for patients are consistent with the previous findings reported for early-stage breast cancer [31,33] and prostate cancer [34] patients, suggesting that MC communication processes may facilitate adjustment to cancer-related sequelae such as sexual problems, that DW communication processes may hinder adjustment, and that these processes may be more helpful to patients than to partners [32,34]. Of note, our study extends these previous findings, emphasizing that sexual problems such as dissatisfaction are important to couples dealing with MBC because the more sexual problems they have, the more likely they are to experience depressive symptoms.

Our findings also support the idea that although the members of a dyad may be equally distressed, the factors affecting and maintaining each person’s depressive symptoms may differ. For instance, patients reported significantly more sexual problems than their partners did, but the association between sexual problems and depressive symptoms was stronger for partners than for patients. Furthermore, despite the strong associations between communication patterns and depressive symptoms for partners, MC and DW communication buffered against the association between high levels of sexual problems and depressive symptoms only for patients. Consequently, sexual problems may have stronger implications for partners, who may interpret sexual problems as indicators of deterioration in patients’ health and thus experience depressive symptoms regardless of communication patterns. Alternatively, partners’ need for sexual satisfaction may simply not be compensated for by communication processes. Because the nature of our sample did not allow us to separate the effects of social role from those of gender, this finding may mainly reflect a gender difference such that sexual problems may be more important to men than to women in managing emotional distress.

Nonetheless, we emphasize a need for couple-based interventions that address patients’ and partners’ sexual concerns to alleviate depressive symptoms for both after a diagnosis of MBC. Teaching effective communication patterns characterized by mutual engagement and open exchange of thoughts, concerns, and feelings with the goal of joint problem-solving may be particularly effective components of such programs. In addition to targeting communication skills, interventions that enhance both emotional intimacy and sexual satisfaction may improve psychological adjustment among couples coping with metastatic disease. To date, only a small number of couple-based intervention studies in the cancer literature exist, and an even smaller number of programs target both psychosocial and sexual adjustment. Of note are the studies of Baucom et al. [31] and Scott et al. [33]. In a relationship enhancement intervention involving women with early-stage cancer and their partners, Baucom et al. [31] demonstrated improvements in the sexual drive of both patients and partners compared with couples receiving usual care. The relationship enhancement program targeted dyadic coping, including communication skills training involving mutual disclosing of thoughts and feelings and joint problem-solving. Scott et al.’s CanCOPE program [33] including couples coping with early-stage breast or gynecological cancer also targeted coping and communication skills; however, the authors found improvements in the sexual adjustment of women but not of men. Similarly to these programs, we recommend that, rather
than treating problems associated with emotional and sexual intimacy as separate concerns, programs integrate these components to alleviate distress in both members of a dyad. On the basis of the current findings, such interventions need to be available to couples coping with advanced disease as well.

Despite its promising findings, our study has some limitations. First, the data were cross-sectional, and we cannot rule out a reverse or bidirectional association of the findings. Thus, it is possible that participants who were more depressed reported more sexual problems. Because the current data are part of a longitudinal study, we will be able to examine the directions of these associations in future studies. In addition, the construct validity of the measure we used to assess sexual problems may be debatable because of its moderate to low reliability coefficients. A measure validated for couples coping with breast cancer would have been desirable. Because of the scarcity of dyadic sexuality measures in chronic disease, future research is needed to develop a more appropriate measure. Despite the fairly low reliability of the sexual problems measure, we discovered significant effects, which is remarkable considering that measurement reliability is inversely related to statistical power [68]. Thus, our hypothesis tests were conservative, and future work with a more specific measure may result in larger effect sizes compared with our current findings. In addition, we did not explicitly ask if participants were sexually active at the time of survey completion; however, given a response rate of 92% for patients and 88% for spouses on this particular measure, it is unlikely that a response bias based on sexual activity status influenced our results. This study only included heterosexual couples, and future research is needed to determine whether these findings generalize to MBC patients with same-sex partners. Last, we assessed how participants discussed cancer-related concerns in general as opposed to sexual problems in particular. We acknowledge that other communication types (besides MC and DW communication) that were not assessed may be relevant to managing sexual problems. Thus, future research assessing additional communication patterns and patterns that are specific to sexual concerns may build on our groundwork and perhaps explain the role (potentially gender) differences we found. Such research will also be helpful for fine-tuning targets for future studies. Despite these limitations, ours is one of the few studies to have examined sexual problems in MBC, and to our knowledge, it is the only study that has included both members of the couple. Because of the data analytic procedure we employed, we were able to not only examine couple-level data within the same model but also test for differential associations for patients and their partners.

In conclusion, this study has laid some important groundwork for a neglected topic in an understudied population. We have demonstrated that sexuality and particularly sexual problems are a concern among MBC couples and are associated with both patients’ and partners’ depressive symptoms. We also examined the role of MC and DW communication patterns, and found that high levels of MC communication and low levels of DW communication may protect against depressive symptoms associated with sexual problems in patients but not in their partners. Future interventions targeting communication patterns may alleviate depressive symptoms associated with sexual problems and facilitate couples’ successful adaptation to a chronic and life-threatening disease.

Appendix A. Sexual Problems Scale adapted from Majerovitz and Revenson [48].

Instructions

Many people with cancer find that their illness has had an effect on their sexual lives. Please circle the response that best describes how you currently feel about each statement.

**Patient version**

1. I am often in the mood for sex. (Reversed scored)
2. I feel that my spouse is not as interested in sex as I would like him to be.
3. My illness makes me less sexually appealing to my spouse.
4. I enjoy sex less than I used to.
5. I feel like sex is a responsibility, not a pleasure.
6. I am often afraid to have sex for fear of making my pain worse.

**Partner version**

1. I am often in the mood for sex. (Reversed scored)
2. I feel that my spouse is not as interested in sex as I would like her to be.
3. My spouse’s illness makes her less sexually appealing to me.
4. I enjoy sex less than I used to.
5. I feel like sex is a responsibility, not a pleasure.
6. I am often afraid to have sex for fear of making my spouse’s pain worse.

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**Conflict of interest**

The authors have no conflicts of interest to disclose.

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