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Psychometric evaluation of novel measures of partner interfering and supportive behaviors among women with cancer

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Abstract

***Purpose*: The aim of this study was to evaluate the psychometric properties of complementary and novel measures of partner interfering and partner supportive behaviors in cancer care (PIB-C and PSB-C).**

***Methods*: Structured telephone interviews were conducted with 378 women (aged 18–79) in partnered relationships and recruited from the Kentucky Cancer Registry. Psychometric analyses of PIB-C and PSB-C were used to determine scale reliability, and scale construct and predictive validity (correlations with indicators of partner abuse, symptoms of depression, anxiety, and stress after cancer).**

***Results*: Cronbach's alpha and split-half calculations indicated excellent internal consistency of the 20-item PIB-C (0.936 and 0.87, respectively) and 12-item PSB-C (0.930 and 0.89). Three thematic clusters for the PIB-C and two for the PSB-C were identified through factor analyses. Regarding construct validity, higher PIB-C and lower PSB-C scores were associated with a measure of psychological impacts from abuse. Predictive validity was suggested through (1) lower PSB-C associated with depression, (2) higher PIB-C associated with anxiety, and (3) higher perceived stress associated with higher PIB-C/lower PSB-C scores.**

***Conclusion*: Both PIB-C and PSB-C have strong psychometric properties and distinguish partner behaviors more likely to negatively impact women's depression, anxiety, and stress during cancer care/recovery. Use of these measures may assist clinical teams in comprehensively assessing women patients' home environment to best ensure cancer care/recovery.**

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Introduction

Social network members can play a significant role in supporting women as they are diagnosed and treated and recovering from cancer [1,2]. Studies have indicated that support from acquaintances, however, cannot make up for lack of support by a spouse [3], and cancer patients' perceptions of their adjustment to treatment and recovery are influenced by intimate partners [4]. Thus, partners are considered more important providers of social support (SS) for cancer patients than other sources [5].

While research has focused on defining SS, identifying sources, and measuring the benefits of SS on cancer outcomes [6], identification of partner behaviors that may *negatively* influence cancer outcomes irrespective of supportive behaviors appears to be warranted. Manne and colleagues [7–10] recognized that partner behaviors may interfere with patients' treatment/recovery; thus, they included adverse actions when assessing partner impact. There is also evidence that major forms of negative partner behaviors (i.e., intimate partner violence) impact women's cancer-related quality of life [11]. Therefore, we can expect that more subtle, yet negative, partner behaviors are likely to impact women's ability to receive recommended treatment or recover following treatment. Identifying the role and range of partner behavior that may influence patients' ability to be effectively treated and recover from cancer may be significant for assisting patients and their healthcare providers. Partner behaviors may range across a continuum from providing unconditional support, to unconsciously or consciously withholding support, to controlling or directly interfering with treatment choices and the ability to recuperate. Thus, interfering/problematic partner behaviors may have *direct* effects impacting treatment (e.g., interfering with doctor appointments, forgetting prescriptions, and creating problems with treating doctors), as well as *indirect* effects affecting recovery that are physical (e.g., interference with sleep, eating, and getting rest; not taking over physical tasks previously the responsibility of the cancer patient; and not allowing the patients to relax from tasks) or that are psychological (e.g., increasing guilt feelings, making

the patient feel they are a burden or a financial problem; increasing arguments; and demanding a focus on partner's needs rather than the patient's needs). The explanatory models that suggest social networks can prevent stress, thereby impacting a person's physiological systems and enhancing immune system functioning [12,13], have also demonstrated that chronic stress and depression are linked to cancer progression [14]. Thus, investigating a range of partner interfering and supportive behaviors appears warranted.

Including negative partner behaviors in research more realistically assesses cancer patients' relationship milieus, but a determination of which behavioral dimensions to assess and how specifically to assess them should provide a better understanding of the impact of these actions. Some approaches to assessment have only used global ratings or a very limited range of a partner's negative impact [15,16]; for example, Pollack only asked how frequently partners argued with pregnant patients about smoking and how much pressure partners applied to get patients to stop smoking [17]. Abbey and colleagues only queried whether patients felt judged or disapproved of by their partners [18]. Although Manne and colleagues have conducted more extensive research of partner impact [7–10], their concept of negative actions was limited more to behaviors indicative of withdrawal/avoidance or overtly critical actions. Understanding the role of *specific* problematic partner behaviors may be necessary to clarify prior inconsistent results in SS research [6]. Uchino and Birmingham stated that clarifying the variability of outcomes from significant others' SS likely requires understanding the *actual exchanges* that take place *regarding health-related functions* [19]. Therefore, the purpose of this research was to establish the usefulness of measures of supportive *and* interfering/controlling behaviors likely required of partners at the time their significant others are diagnosed with, treated for, and spend time recovering from cancer.

This manuscript describes psychometric properties of two scales measuring *specific* partner *supportive* and *interfering* behaviors in cancer care and recovery (PSB-C and PIB-C, respectively) reported by women diagnosed with cancer. As basic elements of construct and predictive validity for the two scales, their association with mental health and abuse impact indicators were assessed.

Materials and methods

Participant recruitment

Women included in the Kentucky Cancer Registry (KCR) and diagnosed with an incident, biopsy-confirmed primary cancer were eligible for participation. Exclusion criteria for participants at recruitment were (1) younger than 18 or older than 79 and (2) if a patient's physician determined they should not be approached to participate. An additional exclusion criterion was present for this subset of analyses establishing psychometric properties of the PIB-C and the PSB-C – no intimate partner either currently or at time of cancer diagnosis – because partner behaviors could only be asked of women with partners.

The KCR contacted patients' physicians to determine whether a patient should not be approached for participation. If no reason was provided within 2 weeks, women were sent a letter describing the study. A postcard was provided for their contact information if they wished to participate or to indicate that they did not wish further contact. Women not returning the cards were called several times to ensure all potential participants received the opportunity.

Contact information was used by the staff at the University's Survey Research Center to call them to conduct interviews. Phone interviews took place within 12 months of women's primary diagnosis of cancer. Interviewers followed a scripted introduction explaining informed consent to which participants were required to give verbal consent. Interviews took approximately 45 min. to complete, and those completing the interviews received a check for $10. This study was approved by the Institutional Review Board at the University of Kentucky (#09-0685-F1V), and a National Institutes of Health Certificate of Confidentiality was granted (MD-09-007).

Among the 1430 women identified by the KCR as Kentucky residents diagnosed with a cancer in the past 12 months, 1099 agreed to be contacted (76.8%), and 511 completed the survey. The overall response rate was 36.0% of the original sample or 46.5% of those agreeing to be contacted. Women were excluded if they did not have a current partner or a partner at diagnosis ($N=133$), leaving 378 for analyses. The mean age of participants was 54.7 (SD = 10.4); range 22–69. The average number of children was 2.0 (SD = 1.35); range 0–10. Table 1 provides all additional participant demographics with percentages provided for categories.

Measures

Demographics

Demographics were obtained from participants during interviews or from KCR files (Table 1).

Partner interfering behaviors and partner supportive behaviors – cancer scales

Two distinct scales had previously been developed from qualitative interviews with female cancer survivors to measure specific partner interfering/controlling behaviors (PIB-C; 20 items) and supportive behaviors (PSB-C; 12 items). Both scales covered instrumental (tangible), expressive (emotional), and structural aspects of support similar to those of prior SS scales, but items for these

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Table 1. Demographic profile of women diagnosed with cancer and interviewed for this study ($N = 378$)

	N	%
Race[a]		
White	361	95.5
Black	14	3.7
Other	3	0.8
Current marital status[b]		
Married	333	88.1
Separated/divorced	27	7.1
Widowed	6	1.6
Never married	12	3.2
Education[b]		
<High school graduate	27	7.1
High school/GED	123	32.5
Some college/AA	121	32.0
Bachelor's degree	56	14.8
Post graduate	51	13.5
Income (monthly)[b]		
<$1000	20	5.3
$1000–$1999	45	11.9
$2000–$2999	59	15.6
$3000–$3999	51	13.5
$4000–$4999	42	11.1
$5000+	98	25.9
Don't know/refused	63	16.7
Insurance payor[a]		
Private insurance	240	63.5
Medicare	93	24.6
Medicaid	34	9.0
Uninsured	11	2.9
Smoking at diagnosis[b]		
Current smoker at diagnosis	55	14.6
Former smoker	112	29.6
Never smoker	211	55.8
Current psychological IPV[b]	29	8.3
No current psychological IPV[b]	319	91.7
Kentucky region at diagnosis[a]		
Appalachian county	109	28.8
Non-Appalachian county	269	71.2
Cancer site[a]		
Breast	167	44.2
Oral	1	0.3
Stomach	2	0.5
Liver	2	0.5
Gallbladder	1	0.3
Pancreas	5	1.3
Colorectal	15	4.0
Nasal/larynx	3	0.8
Lung	36	9.5
Melanoma	11	2.9
Bone	2	0.5
Brain	5	1.3
Cervix	7	1.9
Endometrial	45	11.9
Ovarian	18	4.8
Bladder/kidney	14	3.7
Thyroid	21	5.6
Leukemia/lymphoma	23	6.1
Stage at diagnosis[a]		
Localized	230	60.8
Regional	99	26.2
Distant metastasis	49	13.0

GED, General Educational Development; AA, associate degree; IPV, intimate partner violence.
[a]From Kentucky Cancer Registry data.
[b]Interview data.

scales are highly specific to partner involvement when a person has cancer. Thus, both scales include potential behaviors specific to the experience of having one's partner diagnosed with, treated for, and recovering from cancer, but with either supportive or interfering/controlling content. For example, as can be seen in Table 2, PIB-C *interfering* items address instrumental aspects (e.g., interfering with doctor appointments and deliberately forgetting to pick up prescriptions), expressive aspects (e.g., making the woman feel her cancer experience is a burden, a financial problem), and structural aspects (e.g., preventing the woman from communicating with others and not taking on responsibilities the patient was typically responsible for). Parallel to PIB-C constructs, Table 3 lists PSB-C *supportive* items that address instrumental aspects (e.g., went with patient to doctor visits), expressive aspects (e.g., comforted through words or physical affection if the patient was upset or feeling down), and structural aspects (took time off to help the patient when needed or skipped a social activity to be present).

Participants in this study reported on their partners' behavior as described by the specific items in the PIB-C and the PSB-C. Because frequency of specific behaviors was considered potentially too difficult to recall, response options for scale items in this study were as follows: not at all = 1, a little = 2, some = 3, and a lot = 4. PIB-C scores ranged from 20 to 80, while PSB-C scores ranged from 12 to 48. Specific items for both scales with their means and standard deviations and factor analysis results for both scales are presented in Tables 2 and 3.

Participants who disclosed any occurrence of a behavior by a partner on the PIB were asked four follow-up items to assess their perception of the impact of interfering/controlling behaviors on their medical care or psychological well-being. These included whether they received appropriate cancer care and medical treatment; felt guilty and not deserving of medical care; felt down, sad, or depressed; and felt their general recovery was affected.

Women's Experience with Battering Scale [20,21]

The Women's Experience with Battering Scale (WEB) has been used as a measure of mental and emotional outcomes potentially resulting from partner abuse. A short three-item version [22] was used in this study: (1) 'your partner made you feel you had no control over your life', (2) 'you hid the truth about your relationship from others because you were afraid of what s/he might do', and (3) 'your partner could scare you without laying a hand on you'. Response options were as follows: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree.

Perceived Stress Scale [23]

Three of the four items in the shortened Perceived Stress Scale [24] were administered in this study. The eliminated

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Table 2. Psychometric properties of partner interfering/controlling behaviors potentially impacting cancer treatment/recovery (PIB-C)

		Factors/loading scores[b]		
Since learning of your cancer diagnosis, how much has your partner:	**Item mean[a] (SD)**	**1. Interfere with cancer treatment**	**2. Undermining cancer as serious condition**	**3. Focus on partner not patient**
1. Interfered with getting to doctors' appointments or treatment sessions, e.g., refusing to let you go or take you, canceling without you knowing, confusing you about times?	1.01 (0.16)	*0.954*	0.049	0.056
2. Implied you were not deserving of medical treatment you were receiving?	1.01 (0.15)	0.260	*0.770*	0.032
3. Made you feel as though your medical needs (e.g., appointments, treatments, and prescriptions) were a burden on the family?	1.07 (0.40)	0.429	0.555	*0.591*
4. Made you feel guilty because of the extra care you needed?	1.10 (0.46)	0.379	0.514	*0.635*
5. Refused to handle/take over responsibilities that you were not able to handle because of your physical condition?	1.13 (0.49)	0.266	0.416	*0.599*
6. Created an embarrassing scene in the medical office so you did not want to return or accused you of having a relationship with your doctor?	1.02 (0.22)	*0.913*	0.199	0.075
7. Criticized your doctor's care in front of you or your doctor?	1.05 (0.29)	*0.683*	0.525	0.010
8. Suggested your doctor is not capable of handling your case or made you think your doctor was incompetent when there was no reason to question that?	1.04 (0.32)	0.608	*0.686*	0.041
9. Tried to make you think you really did not have a serious condition?	1.09 (0.44)	0.309	*0.584*	0.413
10. Seemed to intentionally forget to pick up your prescriptions?	1.02 (0.22)	*0.842*	0.121	0.224
11. Suggested that you not receive treatment until you get another opinion when there was no reason to question your medical care?	1.05 (0.31)	0.150	*0.854*	0.086
12. Complained that you were not focusing on him or the family?	1.07 (0.39)	0.321	*0.491*	0.451
13. Discouraged you or kept you from talking with others about your treatment or recovery?	1.03 (0.25)	*0.524*	0.057	0.315
14. Did not allow you to relax or recover from treatments but insisted you go back to your usual tasks?	1.06 (0.35)	0.056	0.092	*0.836*
15. Started more arguments than usual with you?	1.10 (0.45)	0.409	0.357	*0.490*
16. Wouldn't do household chores to help with your recovery, e.g., preparing meals, doing laundry?	1.17 (0.64)	−0.003	−0.019	*0.709*
17. Made it difficult for you to get the physical care you needed for recovery, such as sleep, food, or rest?	1.02 (0.19)	0.275	0.109	*0.562*
18. Made you feel it was your fault you got cancer?	1.03 (0.29)	*0.704*	0.258	0.441
19. Reminded you how much your cancer treatment and recovery has cost the family financially?	1.07 (0.37)	−0.153	*0.669*	0.306
20. Let you know how much their [partner's] life was disrupted by your cancer treatment/recovery?	1.09 (0.43)	0.032	0.558	*0.608*

PIB-C: 21.34 mean; 20–63 actual range; 67.6% variance explained; 0.936 Cronbach's α. Factor 1. 6.19 mean; 6–24 actual range; 47% variance explained; 0.90 Cronbach's α. Factor 2. 8.80 mean; 8–28 actual range; 8% variance explained; 0.89 Cronbach's α. Factor 3. 6.45 mean; 6–23 actual range; 12% variance explained; 0.86 Cronbach's α.

[a]Response options: 1 = not at all, 2 = a little, 3 = some, and 4 = a lot.

[b]Factor loadings in italics represent the subscale on which the item received the highest loading.

item was a reverse-worded item focusing on 'things generally going your way' and was removed to keep the shortened scale more relevant to patients being diagnosed with cancer. The respondents chose a Likert response (never = 1 to very often = 5) to indicate their stress level (1) in the prior month and (2) in the first 2–3 months after their cancer diagnosis for items that tapped (a) feeling unable to control the important things in your life, (b) feeling confident about handling your problems, and (c) feeling that difficulties were piling up so high that you could not overcome them. Scores for each time period were summed across the three items.

Depression and anxiety markers

To provide an objective indicator of depression and anxiety symptoms experienced since the woman's cancer diagnosis, the following items were used: Since your cancer diagnosis, were you ever told by a medical doctor or mental health professional that you (1) were depressed or (2) had anxiety or panic disorder? Response options were yes = 1 or no = 0.

Statistical analyses

Internal consistency (i.e., reliability) for the PIB-C and PSB-C scales was calculated using Cronbach's alpha and split-half correlation coefficients. To determine thematic subscales, factor analyses were conducted using varimax rotation. Eigenvalues and scree plots determined the optimal number of factors, and the associated amount of variance explained by the total and subscales was calculated. Instances where an item had high loadings on more than one factor were resolved by placing the item on the factor for which it received the highest loading. Subsequent assessment to determine whether the content of an item matched the thematic content of other items on that factor suggested this decision rule was appropriate.

A multivariate analysis of covariance was used to assess potential construct validity of both scales with the WEB as a proxy for emotional outcomes from maltreatment by an intimate partner. The predictive validity of both scales was independently analyzed for their association with perceived stress using multivariate analysis of covariance. Log linear modeling was used to determine the degree to

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Table 3. Psychometric properties of partner supportive behaviors potentially impacting cancer treatment or recovery (PSB-C)

Since learning of your cancer diagnosis, how much has your partner:	Item mean[a] (SD)	Factors/loading scores[b] 1. Helpful through recovery	2. Medically involved
1. Gone on doctors' visits or appointments with you?	3.55 (0.87)	0.099	*0.900*
2. Spent time with you when you were in the hospital?	3.69 (0.82)	0.307	*0.726*
3. Been involved with your medical care to make it a shared experience, like asking your doctor questions or trying to learn more of your illness?	3.61 (0.88)	0.379	*0.771*
4. Done something unexpected that they knew would make you happy or feel better physically?	3.46 (0.86)	*0.574*	0.358
5. Willingly made small sacrifices, such as taking time off from work to help you when you needed it or skipped a social activity to be with you?	3.77 (0.66)	*0.620*	0.511
6. Provided encouragement to do the difficult parts of treatment or recovery?	3.82 (0.54)	*0.821*	0.232
7. Comforted you through words or physical affection if you were upset or feeling down?	3.78 (0.59)	*0.819*	0.187
8. During recovery, just spent time with you, if you wanted that?	3.77 (0.60)	*0.721*	0.418
9. Either provided the resources you needed or made other arrangements to make sure you were taken care of during treatment/recovery?	3.79 (0.67)	0.560	*0.565*
10. Checked on you regularly to handle any needs that came up or to prevent any stress for you?	3.81 (0.56)	*0.742*	0.389
11. Supported your decisions about medical treatment and recovery?	3.90 (0.48)	*0.763*	0.127
12. Been willing to talk with you when you needed to talk about things regarding your treatment/recovery?	3.80 (0.59)	*0.739*	0.334

PSB-C: 44.62 mean; 12–48 actual range; 66.6% variance explained; 0.930 Cronbach's α. Factor 1. 30.09 mean; 8–32 actual range; 57% variance explained; 0.918 Cronbach's α. Factor 2. 14.53 mean; 4–16 actual range; 10% variance explained; 0.844 Cronbach's α.

[a]Response options: 1 = not at all, 2 = a little, 3 = some, and 4 = a lot.

[b]Factor loadings in italics represent the subscale on which the item received the highest loading.

which PIB-C and PSB-C (in separate models) were associated with risk of being diagnosed with depression and/or anxiety after a cancer diagnosis. Because age, number of children, and medical insurance were associated with PIB-C and PSB-C full scores (Table 1), multivariate models were adjusted for these demographics. PIB-C and PSB-C full scores were included as continuous dependent variables in separate models.

Results

Internal consistency and factor analysis

The 20-item PIB-C had excellent internal consistency (Cronbach's $\alpha = 0.936$; split-half reliability = 0.873). Variance explained by each factor, mean scores, and alphas are provided in Table 2. Factor analyses indicated three independent factors (items loading at 0.49 or above): 'interference with treatment', 'focus on self (meaning the partner), not patient', and 'Undermining seriousness of the condition'. Total variance explained was 67.6%.

Of women disclosing any PIB-C behavior occurring at least 'a little' (20.6%; 78/378), 39.7% reported that partner actions negatively influenced their cancer care/recovery at least a little (31/78), 2.5% indicated that these behaviors had a negative impact on their receiving appropriate cancer care, 5% indicated a negative impact of feeling guilty and not deserving of medical care, 16.3% indicated an impact of feeling depressed, and 12.3% indicated a general negative impact on their recovery phase.

Cronbach's α (0.930) and the split-half Spearman coefficient (0.89) also indicated excellent internal consistency for PSB-C. The variance explained by factors, mean scores, and Cronbach's alpha are provided in Table 3. Total variance explained was 66.6%, and the 12-item mean score was 44.62. Relative to the total possible score for this scale, this cohort scored relatively high on overall partner support. A factor analysis indicated two factors (items loading at 0.57 and above): 'helpful throughout recovery' and 'involved medically in cancer care'.

Construct validity

In a general linear model, higher PIB-C scores were associated with higher WEB scores ($F = 54.08$; $p < 0.0001$), and lower PSB-C scores were correlated with higher WEB scores ($F = 118.60$; $p < 0.0001$), even when adjusting for the opposite scale (PSB-C and PIB-C in the same model). Thus, higher levels of partner interfering behaviors (and lower support) are associated with negative psychological impacts associated with abuse.

Predictive validity

Women diagnosed with depression by a medical professional after diagnosis (70/378 = 18.5%) had significantly lower PSB-C scores (mean = 42.74; $X^2 = 4.04$; $p = 0.04$) than women not diagnosed with depression (mean = 44.76). PIB-C scores were not significantly different between these two groups (depressed = 22.81; not depressed = 21.21) ($X^2 = 2.58$; $p = 0.11$).

Conversely, women identified with clinical levels of anxiety by professionals following diagnosis (16.7%; 63/378) had higher PIB-C scores ($X^2 = 5.42$; $p = 0.02$) than women not diagnosed with anxiety. PSB-C scores did not discriminate between patients with and without clinical anxiety ($X^2 = 0.61$; $p =$ ns).

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Self-report of perceived stress in the prior month appeared related to partner behaviors in the expected directions, as demonstrated by a positive relationship with the PIB-C ($F = 9.99$; $p < 0.0001$) and a negative relationship with the PSB-C ($F = 10.94$; $p < 0.0001$). This same pattern held for stress at 2 months following their cancer diagnosis (PIB-C: $F = 10.01$; $p < 0.0001$; PSB-C scale $F = 5.38$; $p < 0.0003$). All statistical relationships remained significant when scales were adjusted for the opposite scale.

Discussion

Psychometric information is provided about two novel measures assessing partner interfering and supporting actions specific to a woman's experience of being diagnosed with cancer, receiving treatment, and recovering from cancer. Preliminary data provide support for the use of these scales for research and clinical purposes. First, both scales demonstrate excellent internal consistency. Second, the data reveal coherent factor structures for the scales. Third, preliminary convergent validity is evident with the significant relationship of the scales with a measure of negative psychological impact usually found in physically abusive relationships. And fourth, preliminary predictive validity is suggested through significant relationships of the scales with mental health variables. These scales are unique in their specificity of the assessed behaviors as ones highly likely to be required of partners when their significant other has cancer, rather than globally assessing support during this health crisis.

Factors on the scale of supportive behaviors appear to be distinguished by a temporal dimension; that is, one factor included items of a partner's early involvement in medical *decision-making and treatment*, while the other factor included supportive behaviors during the subsequent *recovery period*. It is possible that behaviors aligned along a temporal dimension because supportive behaviors during treatment may reflect increased responsiveness by partners during the initial crisis of a cancer diagnosis, while supportive behaviors during recovery may reflect long-term actions directed toward easing the woman's life and taking on responsibilities that may need to be maintained for months or years.

Revealed factors of the scale of interfering/controlling behavior also yielded interpretable themes. The first factor dealt with interference for receiving recommended treatment, for example, creating problems with the doctor and interfering with medical appointments. The second factor thematically captured the partner's view that the woman's medical crisis created problems for *him*, for example, her medical needs were a financial burden and his life was disrupted by her illness. The third factor identified a partner's attempts to undermine the woman's health crisis as not particularly serious, for example, questioning her need for medical care and implying she did not deserve medical treatment. The distinctiveness of the three factors suggests that problematic partner behaviors may manifest through different mechanisms.

The different relationships that the PIB-C and the PSB-C demonstrated with mental health indicators suggest both scales are needed when assessing partner behaviors. Supportive behaviors were implicated in depression, while interfering behaviors were implicated with anxiety. Conceptually, an increase in anxiety would be expected with the introduction of aversive experiences with which the woman now has to cope. In contrast, low support indicates a *lack* of positive interactions, which more likely results in depression rather than anxiety. Thus, supportive and interfering behaviors both appear to be related to stress, but in opposite directions and through different mechanisms.

Some limitations deserve note. This work represents a first attempt to measure specific partner behaviors using a population-based approach to identify cancer cases and conduct phone-based surveys in a state-wide sample of women recently diagnosed with cancer. Our response rate (46.5%) was somewhat lower than ideal yet is respectable in light of recent challenges to phone-based surveying. Study power may have been an issue for psychometric analysis; however, we identified novel measures with good internal consistency and coherent subscale structures.

Even though the sample of female cancer patients was drawn from the entire state of Kentucky, generalizability from this sample may be limited by region and race. In addition, because the majority of these cancer patients were diagnosed with localized disease, they may not represent the full range of patients. These results are generalizable only to women and disproportionately to those surviving at least 12 months after cancer diagnosis. Thus, the data obtained from this project definitely need to be confirmed through further research with broader samples including men, greater racial/ethnic representation, and a greater range of cancer diagnoses.

Finally, the scales were only administered one time to participants and during a 6-month window following diagnosis and initial treatment. Further research using these scales may determine an optimal window for collecting data about partner behaviors that best identifies couples in need of intervention. In addition, it may be important to know whether the scales produce different information over time, such that administration very close to diagnosis and initial treatment may not be as useful as administration during the longer phase of recovery.

Conclusion

This study found that both the PIB-C and the PSB-C have excellent internal consistency and identifiable factors with

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relevant thematic content. Initial efforts at establishing constructive and predictive validity were encouraging. Both PIB-C and PSB-C appear to have strong psychometric properties that distinguish partner behaviors more likely to negatively impact women's depression, anxiety, and stress during cancer care/recovery.

References

1. Luszczynska A, Pawlowska I, Cieslak R, Knoll N, Scholz U. Social support and quality of life among lung cancer patients: a systematic review. *Psycho-Oncology* 2013;**22**(10):2160–2168.
2. Nausheen B, Gidron Y, Peveler R, Moss-Morris R. Social support and cancer progression: a systematic review. *J Psychosom Res* 2009;**67**(5): 403–415.
3. Coyne JC, Delongis A. Going beyond social support – the role of social relationships in adaptation. *J Consult Clin Psychol* 1986; **54**(4):454–460.
4. Berg CA, Upchurch R. A developmental-contextual model of couples coping with chronic illness across the adult life span. *Psychol Bull* 2007;**133**(6):920–954.
5. Dagan M, Sanderman R, Schokker M, *et al.* Spousal support and changes in distress over time in couples coping with cancer: the role of personal control. *J Fam Psychol* 2011; **25**(2):310–318.
6. Altschuler A, Ramirez M, Grant M, *et al.* The influence of husbands' or male partners' support on women's psychosocial adjustment to having an ostomy resulting from colorectal cancer. *J Wound Ostomy Continence Nurs* 2009;**36**(3):299–305.
7. Manne S, Kashy DA, Siegel S, Myers Virtue S, Heckman C, Ryan D. Unsupportive partner behaviors, social-cognitive processing, and psychological outcomes in couples coping with early stage breast cancer. *J Fam Psychol* 2014;**28**(2):214–224.
8. Manne S, Myers S, Ozga M, *et al.* Holding back sharing concerns, dispositional emotional expressivity, perceived unsupportive responses and distress among women newly diagnosed with gynecological cancers. *Gen Hosp Psychiatry* 2014;**36**(1):81–87.
9. Manne SL, Ostroff J, Winkel G, Grana G, Fox K. Partner unsupportive responses, avoidant coping, and distress among women with early stage breast cancer: patient and partner perspectives. *Health Psychol* 2005;**24**(6):635–641.
10. Manne S, Schnoll R. Measuring supportive and unsupportive responses during cancer treatment: a factor analytic assessment of the Partner Responses to Cancer Inventory. *J Behav Med* 2001;**24**(4):297–321.
11. Coker AL, Follingstad DR, Garcia LS, Williams CM, Crawford TN, Bush HM. Association of intimate partner violence and childhood sexual abuse with cancer-related well-being in women. *J Womens Health (Larchmt)* 2012;**21**(11):1180–1188.
12. Cutrona CE, Russell DW. Type of social support and specific stress: toward a theory of optimal matching. In *Social Support: An Interactional View*, Sarason BR, Sarason IG, Pierce GR (eds). John Wiley & Sons: Oxford, England, 1990; 319–366.
13. Denaro N, Tomasello L, Russi EG. Cancer and stress: what's matter? From epidemiology: the psychologist and oncologist point of view. *J Cancer Ther Res* 2014;**3**(1):1–11.
14. Baum A, Trevino LA, Dougall AL. Stress and the cancers. In *The Handbook of Stress Science: Biology, Psychology, and Health*, Contrada ABRJ (ed.). Springer: New York, 2011; 411–424.
15. Ell K, Nishimoto R, Morvay T, Mantell J, Hamovitch M. A longitudinal analysis of psychological adaptation among survivors of cancer. *Cancer* 1989;**63**(2):406–413.
16. Ell K, Nishimoto R, Mediansky L, Mantell J, Hamovitch M. Social relations, social support and survival among patients with cancer. *J Psychosom Res* 1992;**36**(6):531–541.
17. Pollack HA. Sudden infant death syndrome, maternal smoking during pregnancy, and the cost-effectiveness of smoking cessation intervention. *Am J Public Health* 2001; **91**(3):432–436.
18. Abbey A, Andrews FM, Halman LJ. Provision and receipt of social support and disregard: what is their impact on the marital life quality of infertile and fertile couples? *J Pers Soc Psychol* 1995;**68**(3):455–469.
19. Uchino BN, Birmingham W. Stress and social support processes. In *The Handbook of Stress Science: Biology, Psychology, and Health*, Contrada IR, Baum A (eds). Springer Publishing Co.: New York, NY, 2011; 111–121.
20. Smith PH, Smith JB, Earp JAL. Beyond the measurement trap – a reconstructed conceptualization and measurement of woman battering. *Psychol Women Q* 1999;**23**(1): 177–193.
21. Smith PH, Earp JA, DeVellis R. Measuring battering: development of the Women's Experience with Battering (WEB) Scale. *Womens Health* 1995;**1**(4):273–288.
22. Coker AL, Smith PH, Whitaker DJ, Le B, Crawford TN, Flerx VC. Effect of an in-clinic IPV advocate intervention to increase help seeking, reduce violence, and improve well-being. *Violence Against Women* 2012; **18**(1):118–131.
23. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav* 1983;**24**(4):385–396.
24. Warttig SL, Forshaw MJ, South J, White AK. New, normative, English-sample data for the Short Form Perceived Stress Scale (PSS-4). *J Health Psychol* 2013;**18**(12):1617–1628.

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