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Spousal Mindfulness and Social Support in Couples with Chronic Pain

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Abstract

Objectives—Existing research has reported the correlation between patients’ psychological flexibility, of which mindfulness is a component, and their perceptions of the spouses’ support provision. It is quite likely that *spouses’* mindfulness, in particular certain aspects of mindfulness, is also related to the support they provide to patients. The current study examined this issue.

Methods—The sample included 51 couples in which one partner had chronic pain. Patients and their spouses each completed a questionnaire that assessed three facets of their own mindfulness (i.e., non-reactivity, acting with awareness, non-judging). In addition, patients reported on their pain-related psychological flexibility, marital satisfaction, and perceptions of spousal support.

Results—Only one facet of patients’ mindfulness (i.e., non-reactivity) was related to their perceptions of their spouses as being emotionally responsive to them. Spouses’ non-judging and non-reactivity were negatively correlated with punishing spouse responses. In addition, spouses’ acting with awareness was positively correlated with patients’ reports of perceived partner responsiveness and instrumental support and negatively correlated with patients’ reports of punishing spouse responses, often over and above the contribution of patients’ own mindfulness or pain-related psychological flexibility.

Discussion—Spouses’ mindfulness, especially as it pertains to acting with awareness, was most consistently associated with patient perceptions of spousal support. These findings suggest that acting with awareness should be examined further including the possible contributions this type of mindfulness may make to healthy relationship behaviors in the context of pain.

Keywords

mindfulness; couples; chronic pain; spouse responses; social support

Introduction

Mindfulness, or paying attention in a particular way, non-judgmentally, and on purpose, in the present moment,¹ is a key ingredient of interventions for pain including Mindfulness-Based Stress Reduction,^{1, 2} Acceptance and Commitment Therapy for pain,³ and cognitive-behavioral contextual therapy for pain.⁴ Research has shown that one’s own mindfulness

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and one's own pain adjustment are strongly associated^{1, 2, 5, 6} and mindfulness appears to enhance individual emotion regulation and promote more effective pain coping, even after controlling for level of pain and acceptance of pain.^{1, 4, 7} Yet, little research has examined mindfulness in the context of the social environment. Given that patients' relationships with others have an important role in their pain adjustment,^{8, 9} the goal of this study was to examine the extent to which mindfulness relates to social support in a sample of couples with chronic pain.

Mindfulness, acceptance, and willingness are related constructs that are components of the broader concept of psychological flexibility, which has been defined as a process of being aware of one's thoughts and feelings in the present moment without defense (mindfulness/acceptance) while persisting or changing behavior to achieve valued goals or interests (willingness/commitment).¹⁰ Some evidence already suggests that chronic pain acceptance is related to social support. McCracken¹¹ found that greater chronic pain acceptance by the patient was associated with fewer solicitous and punishing spouse responses. McCracken¹¹ suggested that these forms of spousal responding encourage the experiential avoidance of pain (i.e., the opposite of pain acceptance), which in turn may contribute to reduced physical activity and disability. It is possible that mindfulness might have similar associations with support given that mindfulness may be considered another aspect of psychological flexibility. Yet, this hypothesis has not yet been tested in the literature.

It is interesting that the existing research has focused on patients' psychological flexibility and their perceptions of the spouses' support provision. It is quite likely that *spouses'* mindfulness is also related to the kind of support they provide to patients. For instance, greater mindfulness in the spouse may be related to providing better quality support (i.e., more instrumental support, less problematic support). Spouses who are mindful may be able to tolerate distress during emotionally challenging situations and also interact in a non-judgmental manner.¹²⁻¹⁴ Indeed, in the non-patient, close relationships research, an individual's mindfulness contributes to the couple's overall satisfaction^{12, 14} and mindfulness skills training is associated with relationship improvements.^{13, 15}

In this preliminary study, we investigated the associations between patient mindfulness and their perceptions of spousal support given that another study has shown that other components of psychological flexibility – chronic pain acceptance and willingness – are related to support.¹¹ We also hypothesized that *spouses'* mindfulness would be related to greater provision of social support and greater marital satisfaction. In effort to advance the field, we used a measure of mindfulness that taps into different facets of mindfulness,¹⁶ thus allowing for a more specific examination into how each type of mindfulness contribute to the provision of support. Additionally, we controlled for other variables that have been shown to correlate with one's perceptions of support, including patients' chronic pain acceptance¹¹ and pain catastrophizing,^{17, 18} to determine whether spousal mindfulness uniquely accounts for variance in social support. Finally, we explored whether spouses' mindfulness is related to their partners' pain severity and interference.

Materials and Methods

Participants and Procedure

All methods were approved by the university's Institutional Review Board and written informed consent was obtained from participants prior to participation. The data for this study were collected at the fourth wave of a longitudinal study on couples with chronic pain, when the mindfulness measure was introduced. Couples were recruited for the original study through newspaper advertisements in local papers, announcements made on the university's electronic bulletin board and other traditional bulletin boards. The advertisement explained that the study was being conducted to learn how couples coped with pain over time. The participants of the original study participated in three waves of data collection at six month intervals. At baseline, couples completed surveys on pain, their mood, and their marriage, interviews about life stressors, a psychiatric diagnostic interview, and a video recorded interaction in which they discussed the impact of pain on their lives. At the 6-month follow up, they completed mail-in surveys and at the 12-month follow up, couples completed the baseline protocol again. For the current study, all 108 couples who completed the baseline assessment were sent a postcard inviting them to participate in a fourth and final wave of the study, which was completed an average of 25.96 months ($SD = 11.73$) after their participation in the third wave of data collection. Interested couples were mailed a survey packet that contained consent forms and questionnaires. Each couple was instructed to complete the surveys independently and seal them in separate envelopes before mailing them back in the postage-paid envelope. Couples were compensated \$50 for their time and effort in participating in this phase of the study, at which time they were also debriefed about the purpose of the study. Although couples were recruited from the community, we use the terms "patients" and "spouses" to refer to the partners with pain and their spouses, respectively, for ease of discussion.

Fifty-one couples participated in this phase of the study. The sample was diverse (patients: 52.1% Caucasian, 43.3% African American, 2% Hispanic, 2% Asian; spouses: 59.2% Caucasian, 38.8% African American, 2% Asian). The gender of the patients was balanced with 52.9% male ($n = 27$). Couples were middle-aged, on average (patient $M = 58.84$ years, $SD = 12.23$; spouse $M = 58.14$ years, $SD = 13.19$). Patients reported a mean pain duration of 14.04 years ($SD = 13.15$). There were no significant gender differences on age or pain duration. On average, couples were married for 28.73 years ($SD = 20.12$). The participants reported some college education (patient $M = 15.24$ years; $SD = 3.06$; spouse $M = 14.43$ years, $SD = 2.97$). The three most common pain locations in patients were the lower back (52%, $n = 26$), hip (12%, $n = 6$), and knee (10%, $n = 5$). The three most common diagnoses in patients were Osteoarthritis (29%, $n = 15$), disk problems (18%, $n = 9$), and spine problems (12%, $n = 6$).

Measures

Participants completed the measures below. Patients provided ratings of their own adjustment and their perceptions of spousal support. Patient and their spouses reported on their own mindfulness.

Spouse self-report measures—*Mindfulness* was measured by the Five Facet Mindfulness Questionnaire (FFMQ).¹⁶ The FFMQ was developed through factor analysis and resulted in five distinct and reliable subscales including observing, describing, acting with awareness, non-judging of inner experiences, and non-reactivity to inner experiences; however, only the three facets of acting with awareness, non-judging, and non-reactivity were examined in this study because these facets have been shown to be the most reliable in non-meditating samples¹⁹ and are correlated with psychological symptoms.¹⁶ When individuals are *acting with awareness* (e.g., “I pay attention to how my emotions affect my thoughts and behavior”), they are attending to their current actions instead of behaving automatically or absent-mindedly. *Non-judging of inner experiences* (e.g., “I believe that some of my thoughts are abnormal or bad and I shouldn’t think that way” [negatively keyed item]) refers to individuals’ ability to refrain from evaluating their internal experiences (e.g., cognitions, sensations and emotions) and *non-reactivity to inner experiences* (e.g., “When I have distressing thoughts or images, I step back and am aware of the thought or image without getting overtaken by it”) refers to individuals’ ability to allow thoughts and feelings to come and go, without getting stuck in any particular thought, feeling or moment.¹⁶ Higher scores indicate greater mindfulness on that particular facet. The measure has good reliability and validity.²⁰ The inter-item reliabilities of the facets in the current sample ranged from adequate to good for spouses (*alphas*; acting with awareness = .86, non-judging = .83). The reliability for spouses’ non-reactivity was somewhat lower (*alpha* = .67); however, since this is the first investigation, to our knowledge, on the association between both partners’ mindfulness in the context of pain, we retained this scale in the analyses to provide preliminary data for future work.

Patient self-report measures—*Marital satisfaction* or well-being was assessed using the Dyadic Adjustment Scale (DAS), which has a possible range of scores from 0 to 151.²¹ The average patient DAS score was 108.59 (*SD* = 18.11), indicating that the patients were, on average, satisfied in their relationships. The inter-item reliability in this sample was excellent (*alpha* = .94).

Spousal Support: In addition, several spousal support variables were assessed. Each of these was assessed with respect to the patients’ perceptions of spousal support. *Perceived partner responsiveness* was measured using the Perceived Partner Responsiveness scale (PPR),²² which assesses the patient’s belief that his or her spouse is cognizant of, sensitive to, and behaviorally supportive of the participant (e.g., “My partner is aware of what I am thinking and feeling”, “My partner really listens to me”). The participants reported on their perception of their partners on a scale from “Not at all true” (1) to “Completely true” (9). The PPR is frequently used in relationship research and has good reliability and validity.²² The patients’ mean PPR score was 107.90 (*SD* = 39.52). The inter-item reliability for this scale in the current sample was excellent (*alpha* = .98).

Spouse responses to pain were measured with the Multidimensional Pain Inventory (MPI)²³. Three spouse responses were used: (i.e., *punishing responses* [e.g., anger] and *solicitous or instrumental support* [e.g., getting the patient medications], 4 and 6 items, respectively). The patients’ mean scores for solicitous spouse responses was 21.86 (*SD* = 9.66), and for

punishing spouse responses was 6.52 ($SD = 5.48$). The reliabilities were good for solicitous spouse responses and punishing spouse responses (α s = .88 and .82, respectively).

Control variables: Patients' *Mindfulness* was also measured by the Five Facet Mindfulness Questionnaire (FFMQ).¹⁶ The spouses' mindfulness was the focus of the current study; however, we examine patients' mindfulness as possible control variables in the associations between spouses' mindfulness and social support since prior research has shown that one's own psychological flexibility is related to one's perceptions of social support.¹¹ The inter-item reliabilities of the three facets of mindfulness for patients in the current sample range from adequate to good (α s; acting with awareness = .79, non-judging = .80, non-reactivity = .74).

In addition, two other sets of variables are included as possible control variables: patients' pain catastrophizing and patients' chronic pain acceptance. *Patients' pain catastrophizing* was measured with the 13-item Pain Catastrophizing Scale (PCS).²⁵ Patients' responded to 13 statements regarding how they feel when they are experiencing pain on a scale of "Not at all" (0) to "All the time" (4). The PCS consists of 3 subscales: magnification, rumination, and helplessness,²⁵ which are summed to generate an overall pain catastrophizing score. Higher scores indicate more pain catastrophizing. The mean PCS was 17.97 ($SD=14.61$). The inter-item reliability for this sample was excellent ($\alpha = .97$).

Patients' pain acceptance was measured by the Chronic Pain Acceptance Questionnaire (CPAQ).²⁶ The CPAQ is a 20-item questionnaire that includes two subscales: activity engagement (pursuit of life activities regardless of pain; 11 items) and pain willingness (willingness to discontinue avoidance of or attempts of control pain; 9 items). The patient rates the truth of the statement on a scale of "Never true" (0) to "Always true" (6), with higher scores indicating greater chronic pain acceptance. The mean activity engagement and pain willingness scores were 37.78 ($SD = 13.23$) and 28.66 ($SD = 11.26$), respectively. The inter-item reliability of both scales was excellent ($\alpha = .89$ for each).

Finally, to explore the extent to which spouses' mindfulness was related to patients' pain adjustment, we included two additional patient variables. *Pain Severity* in the patient was assessed using the average of two items: the patient's reported average pain and patient's current pain severity from the Brief Pain Inventory (BPI)²⁴ as this average proved to be the most reliable composite for this sample. The patient rated their pain from 0 indicating "No pain" to 10 indicating "Pain as bad as you can imagine". The BPI has been used in a variety of clinical pain samples and has good reliability and validity²⁴. The average pain severity reported by the patients was 4.77 ($SD = 2.58$) and the inter-item reliability of this measure was good ($\alpha = .88$).

Pain interference for the patient was measured using the 9 interference items from the Multidimensional Pain Inventory (MPI)²³. This scale has been used in a variety of samples and has good reliability and validity²³. The average reported pain interference in this sample was 29.98 ($SD = 14.84$). The inter-item reliability for this scale in the current sample was excellent ($\alpha = .96$).

Data Analysis Plan

Preliminary analyses were first conducted to identify any differences between participants who completed and those who did not complete this phase of the study to estimate the generalizability of the results. Comparisons were made on demographic variables as well as the dependent variables.

Analyses were also conducted to test the normality of the variables as well as to identify outliers in the dataset.

Analyses were then conducted to examine the intercorrelations among the patient control variables (i.e., the 3 facets of patient mindfulness, pain acceptance, and pain willingness) to determine whether data reduction was necessary due to conceptual overlap and possible multicollinearity.

In order to provide descriptive information, the correlations among patient variables were presented. Then, the correlations of spouses' mindfulness with patients' reports of mindfulness, psychological flexibility, and perceptions of spousal support were presented. In addition, as noted above in the Measures section, pain adjustment variables (i.e., pain interference and pain severity) were included as an exploratory analysis.

Last, hierarchical regression analyses were conducted to examine the extent to which spousal mindfulness facets were uniquely related to perceived social support and marital satisfaction above and beyond the contributions of the patients' mindfulness and psychological flexibility. Spousal support variables were selected for these analyses when they were correlated with both a spouses' mindfulness facet and either patients' mindfulness or psychological flexibility score. We also included the latter two variables in the regressions when they were marginally related ($P < .10$) to the social support and patient marital satisfaction variables to provide a conservative test of our hypothesis that spouses' mindfulness contributes unique variance to social support. Based on these requirements, the dependent variables investigated were punishing spouse responses, partner responsiveness, and patient marital satisfaction. In the first step of the analysis, patients' mindfulness and/or psychological flexibility were entered. In the second step, the spouses' mindfulness variable was entered. If multiple spouse mindfulness variables were eligible, they were examined individually to provide information regarding each facet, as little research has been conducted on mindfulness facets to date. Semi-partial correlations were also provided, which indicate the unique relationship of each variable entered in the model with the social support and patient marital satisfaction variables.

Results

Preliminary Analyses

Completer analyses—Analyses were conducted to determine whether participants who completed this phase of the study were significantly different at baseline from those who did not. Patients' who completed this fourth wave of data collection reported fewer punishing spouse responses compared to baseline (non-completers $M = 8.57$, $SD = 6.47$, completer $M = 5.59$, $SD = 5.36$; $t(106) = 2.58$, $P = .01$) but there were no other significant differences

between completers and non-completers on pain adjustment or social support variables. In addition, there were some demographic differences at baseline such that non-completer patients and spouses were younger ($M = 49.16$, $SD = 13.25$ and $M = 49.10$, $SD = 13.30$, respectively) than completer patients and spouses ($M = 55.92$, $SD = 12.22$ and $M = 55.36$, $SD = 12.92$, respectively), $t(106) = -2.74$, $P < .01$, and $t(106) = -2.47$, $P < .05$, respectively. There were no significant mean group differences in average marriage duration, pain duration, and patient and spouse education.

Testing for normality and outliers—Data were checked for univariate and multivariate outliers and multivariate assumptions of normality. There were no univariate or multivariate outliers and the variables met the multivariate assumptions of normality. Missing data were replaced with the item mean and in all cases made up less than 10% of the scale being used.

Data reduction—High correlations were found between the patients' two CPAQ scales ($r = .67$, $P < .0001$) and between patients' pain catastrophizing score and both the pain willingness and pain acceptance subscales ($r = -.71$ and $r = -.71$, $P < .0001$, respectively). To reduce multicollinearity in the regression analyses reported below, a principal components analysis with varimax rotation was conducted to determine if these three variables loaded on one factor. The analysis confirmed that these three variables loaded on one factor (factor scores: pain willingness = .89, pain acceptance = .89, pain catastrophizing = $-.91$), which accounted for 80% of the variance. The factor scores from this analysis were saved as an indicator of "pain-related psychological flexibility". Higher scores indicate greater flexibility.

Bivariate correlations: Patients' mindfulness, pain-related psychological flexibility, pain adjustment, and perceptions of social support

In order to provide descriptive information, the correlations among the patients' variables are presented first. Patients' acting with awareness and non-judging mindfulness were significantly and positively correlated with patients' pain-related psychological flexibility ($r = .43$, $P < .01$ and $r = .36$, $P < .01$, respectively). Patients' acting with awareness was associated with the patients' pain interference (see Table 1; $r = .31$, $P < .05$).

The only patient mindfulness facet to be related to spousal support was non-reactivity, which correlated with greater perceived partner responsiveness ($r = .41$, $P < .01$). Patients' pain-related psychological flexibility was significantly correlated with greater spouse marital satisfaction and fewer punishing spouse responses (see Table 1; $r = .31$, $P < .05$ and $r = -.30$, $P < .05$, respectively). Patients' pain-related psychological flexibility was also significantly correlated with less pain severity and pain interferences (see Table 1; $r = -.59$, $P < .01$ and $r = -.80$, $P < .01$, respectively).

Bivariate correlations: Spouses' mindfulness and patients' pain-related psychological flexibility, pain adjustment, and perceptions of social support

Next, correlations between spouses' mindfulness and patients' pain-related psychological flexibility are presented. The corresponding facets of patients' and spouses' mindfulness (e.g., patient non-judging and spouse non-judging) were not significantly correlated with

each other (P s = .20 – .90). Spouses' non-reactivity mindfulness was significantly and positively correlated with patients' pain-related psychological flexibility ($r = .32, P < .05$).

Our primary hypothesis was that spouses' mindfulness would be related to the spouses' support of the patients and patients' marital satisfaction. Higher levels of spouses' acting with awareness ($r = -.28, P < .05$), non-reactivity ($r = -.34, P < .05$), and non-judging ($r = -.28, P = .05$) were significantly correlated with patients' perceptions of fewer punishing spouse responses (see Table 1). In addition, spouses' acting with awareness was positively correlated with patients' perceptions of instrumental support and perceived partner responsiveness ($r = .36, P < .01$ and $r = .36, P < .01$, respectively).

Similarly, we expected that the spouses' facets of mindfulness would be related to the patients' marital satisfaction. However, only spouses' non-reactivity was significantly correlated with greater marital satisfaction in the patient ($r = .30, P < .05$). No other significant associations were found.

Hierarchical regression analyses

Dependent variable: Punishing spouse responses—In the first set of these analyses, punishing spouse responses was examined as the dependent variable and spouses' acting with awareness, non-reactivity, and non-judging were each tested as independent variables based on the variable selection process described in Data Analysis Plan above. As shown above, patients' psychological flexibility was correlated with punishing spousal responses at $p < .05$, so it was included in step 1 of a regression predicting punishing spouse responses from spouses' mindfulness. Patients' mindfulness variables were not significantly correlated with punishing spouse responses, so they were omitted from step 1. Spouses' acting with awareness contributed an additional 11% of the variance in punishing spouse responses above the contributions of patients' pain-related psychological flexibility (see Table 2; $F[1,48] = 6.33, P < .05$). Spouses' non-reactivity did not account for a significant portion of the variance ($R^2 = 7\%$, $F[1,48] = 3.85, P = .06$) in punishing spouse responses once patients' pain-related psychological flexibility was included in the model. Similarly, spouses' non-judging did not account for a significant portion of the variance ($R^2 = 5\%$, $F[1,48] = 3.01, P = .09$) in punishing spouse responses once the contributions of patients' pain-related psychological flexibility was included in the model.

A full model, including all three spousal mindfulness variables, was also considered to determine which of the spouse mindfulness facets might contribute the most variance in punishing spouse responses. The set of three spousal mindfulness variables contributed an additional 16% of the variance in punishing spouse responses above the contributions of patients' pain-related psychological flexibility ($F[3,46] = 3.34, P < .05$). An examination of the semi-partial correlations in the full model suggests that spouses' acting with awareness accounts for largest portion this variance (5%), although it was not a unique predictor of punishing spouse responses once the other spousal mindfulness facets were entered (see last set of analyses in Table 2).

Dependent variable: Perceived Partner Responsiveness—In the second set of these analyses, patients' non-reactivity was included in the first step and spouses' acting

with awareness was included in the second step. Patients' psychological flexibility was not included because it was not significantly associated with partner responsiveness. Spouses' acting with awareness accounted for an additional 12% of the variance in perceived partner responsiveness over patients' non-reactivity ($F[1,48] = 8.51, P < .01$) (see Table 3).

Dependent variable: Marital satisfaction—Finally, a third set of these analyses, predicting patients' marital satisfaction from spouses' non-reactivity while accounting for patients' non-judging and pain-related psychological flexibility, was tested. In this model, spouses' non-reactivity did not account for a significant portion of the variance ($R^2 = 6\%$, $F[1,47] = 3.25, P = .08$) in patients' marital satisfaction once patients' non-judging and pain-related psychological flexibility were included in the model (see Table 4).

Dependent variable: Instrumental support—Instrumental support was not examined because it did not meet the requirements stated in the Data Analysis Plan. Specifically, as demonstrated in the correlation section, instrumental support was not associated with patients' mindfulness or psychological flexibility. Thus, it was not necessary to examine whether patient variables would account for the significant correlation between spouses' acting with awareness and patients' reports of instrumental support.

Dependent variable: Pain severity and interference—Pain severity and pain interference were not examined because they did not meet the requirements stated in the Data Analysis Plan. Specifically, as demonstrated in the correlation section, neither were associated with spousal mindfulness facets.

Discussion

The purpose of this study was to examine the extent to which spouses' mindfulness related to patients' perceptions of spousal support. Although patients' psychological flexibility has been shown to be related to their perceptions of spousal support,²⁷ there has been no examination of the extent to which *spouses'* mindfulness is associated with spousal support in chronic pain. It is important to address this gap in the literature given that the social environment is integral in shaping health outcomes^{28, 29}. We found that spouses' self-reported mindfulness was correlated with patients' perceptions of fewer punishing responses, greater instrumental support, and greater marital satisfaction. It is conceivable that spouses who report greater mindfulness may be able to recognize and tolerate their negative reactions to their partner's pain so that they can engage in more supportive behaviors or prevent themselves from acting out their hostility or frustration. Alternatively, perceptions of greater support may lead patients to act in some way that sets the stage for greater mindfulness in their spouses. Additional research using longitudinal or experimental methods is needed build upon the preliminary findings reported in the current study and to understand the likely nature of mindfulness-social interaction association.

In the current study, spouses' acting with awareness was most consistently related to spousal support. Not only was this facet of mindfulness significantly correlated with punishing spouse responses, instrumental support, and perceived partner responsiveness but it also accounted for significant variance in punishing responses and partner responsiveness after

accounting for patients' mindfulness and pain-related psychological flexibility (it was not necessary to control for these patient variables when statistically predicting instrumental support as the patient variables were not correlated with this support variable). Acting with awareness can be conceptualized as being both intrapersonally and interpersonally receptive and responsive and this interpersonal attunement may also influence the provision of support.^{14, 16} Further research is needed to determine how this type of mindfulness may be cultivated by spouses and how it is behaviorally manifested or conveyed to patients.

As an exploratory analysis, we examined whether spouses' mindfulness was associated with patients' pain severity and pain interference. The null findings in this regard suggest that while spouses' mindfulness may play a role in social support provision and the quality of pain-related interactions, it is unlikely that spouses' mindfulness has a direct effect on the partner's pain severity and interference. Yet, as this is a cross-sectional study, more research needs to be conducted. An interesting line of research could be developed to test how spouse mindfulness may impact interactions over time and may influence other quality of life indicators in the transition from acute to chronic pain.

The current findings contribute to the literature in at least two ways. First, the findings are consistent with existing research showing that the spouses' beliefs and thoughts are associated with psychosocial adjustment in patients with chronic pain^{30, 31} but also show that this particular aspect of spouses' cognitive-emotional functioning plays an important role in patients' social environments. Additional research is needed on the predictors of spousal support since social support is associated with a host of pain adjustment variables including patients' pain coping, pain adjustment, and psychological distress.^{32–36} The study also advances the field by demonstrating that certain types of mindfulness in the spouse – in particular, acting with awareness—are correlated with spousal support. Similarly, this facet of mindfulness has been found to strongly relate to less psychological distress in individuals,¹⁶ perhaps because acting with awareness, as opposed to experiential avoidance and ruminative strategies, enhance emotion regulation and promote more effective coping.^{1, 4, 7}

Note that the associations between spousal mindfulness and spousal support were not due to a single informant problem because spouses reported on their own mindfulness whereas their patient-partners reported on their own marital satisfaction and their perceptions of the spouses' support provision. In addition, patients' facets were not related to their reports of spousal support, with the exception of patient non-reactivity and perceived partner responsiveness. However, because this is one of the first studies to examine the associations of spouses' mindfulness and spousal support, the results should be viewed as preliminary and several limitations should be acknowledged. The relatively lower inter-item reliability of the spouses' non-reactivity subscale may have resulted in attenuated correlation coefficients. Replications are necessary to determine if the associations with this subscale as well as with spouses' observing are indeed stronger than was demonstrated in this study. Future studies may also be conducted to examine the extent to which the individual mindfulness facets and the separate social support variables map onto latent factors of mindfulness and social support, respectively. Further, although the examination of the facets of mindfulness may be helpful in predicting social support and spouse responses to pain, a

global measure of mindfulness might also be worth examining. Future research should examine the value of the facets of mindfulness compared to global measures of mindfulness in predicting social support and spouse responses to pain. Finally, the current study relied on a self-selected sample of participants who completed other waves of a longitudinal study. Although the participants in this study were very similar to those who initially enrolled, self-selection may limit the generalizability of the results, especially since couples who completed the study were older and had been married longer than those who did not. Similarly, it is not known whether the results generalize to samples of distressed couples since the mean level of marital satisfaction was in the average range.

Nevertheless, the current study has implications for research and clinical work with couples with chronic pain and other illnesses. In particular, it appears that particular facets of mindfulness, namely, acting with awareness, non-judging, and non-reactivity, are worthy of further study and as possible targets of mindfulness-based interventions for pain. The close relationships research has demonstrated that an individual's mindfulness contributes to the couple's overall satisfaction^{12, 14} and couple-based mindfulness skills training is associated with relationship improvements.^{13, 15} A fruitful area of research may involve investigating potential mechanisms through which each partner's mindfulness contributes to social support provision. For instance, greater mindfulness may set the stage for more accepting attitudes about pain, more benign interpretations of observed pain behaviors, and more empathic social interactions about pain, which in turn may help improve patients' pain management efforts. Another possibility for future research is to conduct interventions or experiments to determine whether addressing both partners' mindfulness skills results in healthier emotion regulation and pain adjustment as well as more adaptive social support delivery, rather than focusing on the patients' skills alone. This work would be in line with calls to build couples-based acceptance and mindfulness interventions to manage chronic illness.³⁷

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Bivariate correlations among patient and spouse variables

	Punishing Spouse Responses	Instrumental Support	Perceived Partner Responsiveness	Marital Satisfaction	Pain Severity	Pain Interference
Patient variables						
Acting with awareness	-.18	-.06	.14	.26	-.22	-.31*
Non-reactivity	-.18	.10	.41**	.24	.06	.05
Non-judging	-.02	-.20	.16	.33*	-.26	-.27
Psychological flexibility	-.30*	-.22	.17	.31*	-.59**	-.80**
Spouse Variables						
Act with awareness	-.28*	.36**	.36**	.18	.11	.05
Non-reactivity	-.34*	.001	.25	.30*	-.09	-.26
Non-judging	-.28*	.09	.26	.18	-.16	-.19

Note:

*
p < .05,**
p < .01

Table 2

Hierarchical regressions predicting punishing spouse responses

Variable	b	SE	Beta	t	Semi-partial Correlation
<i>Step 1</i>					
Pain-Related Psychological Flexibility	-1.63	.75	-.30	-2.18*	-.30*
<i>Step 2</i>					
Pain-Related Psychological Flexibility	-1.91	.72	-.35	-2.66*	-.34*
Spouses' Acting with Awareness	-.31	.12	-.33	-2.52*	-.33*
<i>Step 1</i>					
Pain-Related Psychological Flexibility	-1.63	.75	-.30	-2.18*	-.30*
<i>Step 2</i>					
Pain-Related Psychological Flexibility	-1.14	.77	-.21	-1.49	-.20
Spouses' Non-Reactivity	-.33	.17	-.27	-1.96	-.26
<i>Step 1</i>					
Pain-Related Psychological Flexibility	-1.63	.75	-.30	-2.18*	-.30*
<i>Step 2</i>					
Pain-Related Psychological Flexibility	-1.43	.74	-.26	-1.93	-.26
Spouses' Non-Judging	-.22	.12	-.23	-1.73	-.23
<i>Step 1</i>					
Pain-Related Psychological Flexibility	-1.63	.75	-.30	-2.18*	-.30*
<i>Step 2</i>					
Pain-Related Psychological Flexibility	-1.21	.81	-.22	-1.48	-.19
Spouses' Acting with Awareness	-.19	.16	-.20	-1.19	-.15
Spouses' Non-Reactivity	-.32	.17	-.26	-1.85	-.23
Spouses' Non-Judging	-.13	.16	-.14	-.83	-.11

Note:

*
p < .05,**
p < .01

Table 3

Hierarchical regressions predicting perceived partner responsiveness

Variable	b	SE	Beta	t	Semi-partial Correlation
<i>Step 1</i>					
Patients' Non-Reactivity	3.37	1.07	.41	3.16**	.41**
<i>Step 2</i>					
Patients' Non-Reactivity	3.32	.99	.40	3.34**	.40**
Spouses' Acting with Awareness	2.37	.81	.35	2.92**	.35**

Note:

*
p < .05,**
p < .01

Table 4

Hierarchical regressions predicting marital satisfaction

Variable	b	SE	Beta	t	Semi-partial Correlation
<i>Step 1</i>					
Pain-Related Psychological Flexibility	3.01	2.60	.17	1.15	.15
Patients' Non-Judging	.92	.48	.27	1.91	.26
<i>Step 2</i>					
Pain-Related Psychological Flexibility	1.50	2.68	.08	.56	.07
Patients' Non-Judging	.95	.47	.28	2.00	.26
Spouses' Non-Reactivity	1.00	.56	.25	1.80	.24

Note:

*
p < .05,**
p < .01