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Correlates and consequences of the disclosure of pain-related distress to one's spouse

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Abstract

The communication of pain has received a great deal of attention in the pain literature; however, one form of pain communication—emotional disclosure of pain-related distress (e.g., sadness, worry, anger about pain)—has not been studied extensively. The current study examined the extent to which this form of pain communication occurred during an observed conversation with one's spouse and also investigated the correlates and consequences of disclosure. Individuals with chronic pain (ICPs) and their spouses ($N = 95$ couples) completed several questionnaires regarding pain, psychological distress, and relationship distress as well as video recorded interactions about the impact of pain on their lives. Approximately two-thirds of ICPs ($n = 65$) disclosed their pain-related distress to their spouses. ICPs who reported greater pain severity, ruminative catastrophizing and affective distress about pain, and depressive and anxiety symptoms were more likely to disclose their distress to their spouses. Spouses of ICPs who disclosed only once or twice were significantly less likely to invalidate their partners whereas spouses of ICPs who disclosed at a higher rate were significantly more likely to validate their partners. Furthermore, spouses were more likely to engage in invalidation after attempting more neutral or validating responses, suggesting an erosion of support when ICPs engaged in high rates of disclosure. Correlates of spousal invalidation included both spouses' helplessness catastrophizing, ICPs' affective distress about pain, and spouses' anxiety, suggesting that both partners' distress are implicated in maladaptive disclosure-response patterns. Findings are discussed in light of pain communication and empathy models of pain.

Keywords

couples; chronic pain; emotional disclosure; spouse responses; validation; invalidation; observational methods

1. Introduction

Pain can be communicated through facial expressions and paraverbalizations (e.g., sighs, grunts) [16,17,21,52]. One form of pain communication—the emotional disclosure of pain-related distress (e.g., worry, sadness about pain)—has not been studied extensively [7]. The few studies that have addressed these communications have shown that while most individuals with chronic pain (ICPs) disclose their pain-related distress to intimate others

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[40], many expect negative social consequences related to their disclosure [20,33,35]. Yet, little is known about how these interactions actually unfold. The purpose of this observational study is to identify the extent to which ICPs disclose their pain-related distress and to examine the correlates and consequences of these disclosures in an effort to contribute to interpersonal models of pain and intervention development.

While little research has been conducted on pain-related distress disclosure, the communal coping model [44,46] points to potential correlates of these disclosures. According to this model, people who catastrophize about their pain may engage in behaviors that communicate their needs for support. Indeed, pain catastrophizing is associated with expressing communicative pain behaviors [42,49]. Emotional disclosure of pain-related distress may be another way in which catastrophizing thoughts are behaviorally manifested. Similarly, ICPs may disclose other forms of distress to obtain support. For instance, heightened psychological distress and pain severity contribute to emotional disclosure to others [10,19,28,33,41]. Relationship distress is usually thought to relate to *fewer* self-disclosures to one's partner [39] but relationship distress may also be correlated with disclosing too much [9].

In addition to examining various forms of distress as correlates of disclosure, the current study investigates whether disclosure results in supportive spouse behaviors. Research supports models of validation and pain empathy [15,25,36] by demonstrating that disclosing worries about pain or other forms of distress is related to greater perceived support [19,40]. In contrast, other research shows that ICPs report invalidating and unsupportive responses from their partners [33,35]. Because pain research on disclosure and support has relied on self-report methods, it is still not known how spouses respond to disclosure of pain-related distress in the moment. Likewise, the correlates of spouse responses to these disclosures are not known. Extrapolating from work on affective communication in couples with pain [4,6,27], it is likely that spouses' individual and interpersonal distress relate to more invalidation and less validation of ICPs' emotional disclosures.

In the current study, we investigated the extent to which ICPs disclose their pain-related distress to their spouses during a conversation about pain. To our knowledge, no published studies have used observational measures to assess emotional disclosure of pain-related distress, nor have studies examined the correlates and consequences of this behavior. We hypothesized that ICPs who endorse higher levels of distress including pain catastrophizing, psychological distress, pain and pain behaviors, and relationship distress would be more likely to disclose their distress in an effort to gain support. We also examined the extent to which spouses responded to ICPs' disclosures with validation, invalidation, or other behaviors and predicted that spouses' distress would relate to less supportive responses.

2. Method

2.1 Participants

Participants in this study were 95 couples in which one partner reported chronic pain, defined as daily pain that has lasted at least 6 months. Couples were ineligible if either participant was under 21, or if either spouse was diagnosed with a terminal illness (e.g., cancer, positive HIV status, AIDS) because of the possibility that this illness would relate to mood and relationships in a different manner. Couples were also excluded during a telephone screening if either spouse exhibited poor cognitive functioning as indicated on an adaptation of the Mini Mental Status Exam [12] or reported current psychotic symptoms on the Structured Clinical Interview for the DSM-IV [11]. Telephone screening for these purposes has been found to be reliable and valid [30,31,34,48]. Research assistants were trained in the telephone interviewing procedure including the administration of the cognitive

functioning and psychotic symptom items through reading manuals and role-plays with the first author. No participants had any reported difficulties understanding spoken or written English, nor did they exhibit any condition that would have prevented them from effectively completing written surveys or taking part in interviews.

All couples were heterosexual and either legally married or in a common-law marriage (at least 2 years living together). Demographics are presented in Table 1. Participants had a variety of chronic pain problems, which had lasted for an average duration of 10.02 years ($SD = 9.99$): the lower back was the most frequently reported site of worst pain ($n = 44$, 46.3%), followed by the knee ($n = 11$, 11.6%), and the neck and hip ($n = 9$, 9.5% each). The most common pain conditions that ICPs reported were disc or spine problems (e.g., degenerative disc disease, scoliosis, spondylolisthesis; $n = 53$, 55.8%), followed by osteoarthritis ($n = 37$, 38.9%), and other muscle and joint conditions (e.g., unspecified muscle pain, cartilage tears, temporal mandibular joint disease; $n = 26$, 27.4%). Additional pain conditions included fibromyalgia ($n = 7$, 7.4%) and bone fractures ($n = 5$, 5.3%). Many participants reported other conditions (e.g., headaches, pelvic pain) in addition to musculoskeletal pain ($n = 44$, 46.3%). Since participants were allowed to report multiple conditions, the total conditions add to greater than 100%.

2.2 Procedure and Measures

This study was approved by the university's Institutional Review Board. Participants were recruited from a large metropolitan area in the Midwestern United States via newspaper advertisements. Potential participants called the laboratory and were screened over the telephone for eligibility. Eligible participants attended a lab session during which they completed consent forms and surveys. Couples then completed video recorded interactions about pain. Prior to the interactions, a research assistant interviewed each partner separately about the positive and negative aspects of living with their own or their partner's pain. These interviews were conducted prior to the interaction task to allow participants to think about the question before entering into a discussion with their partner. After discussing some of these issues for a few minutes, the couple was reunited and instructed to talk about their answers with one another. Two 10-minute interactions were recorded for each couple; one in which the ICP took the lead and the other in which the spouse took the lead. However, couples were instructed to talk and listen to each other as they normally would. Once couples completed this task, they were compensated \$100 for their participation and debriefed. Of the 108 couples who participated in the larger study, video data were not available for 13 couples due to technical difficulties (e.g., poor sound quality, DVD recorder malfunction). There were no significant differences between couples with viewable videos and those without on ICP or spouse gender, race, age, marriage length in years, education in years, marital satisfaction, depressive symptoms and anxiety symptoms, nor were there differences on ICP pain duration or mean pain severity. Results are reported for the 95 couples for which video recordings were available.

2.2.1 Surveys—The *Pain Catastrophizing Scale* (PCS [43]) was used to assess ICPs' catastrophic thoughts and feelings during painful experiences. The PCS (13 items) is comprised of three subscales: the magnification subscale is comprised of 3 items which measure magnification of the unpleasantness of pain and negative expectations for the outcomes (e.g., "I wonder whether something serious may happen"); the rumination scale is composed of 4 items which assess worry and the inability to inhibit pain-related thoughts (e.g., "I keep thinking about how much it hurts"); and the helplessness scale consists of 6 items that measure the inability to deal with painful situations (e.g., "There is nothing I can do to reduce the intensity of the pain"). Items are rated on a 5-point frequency scale from 0 ("Not at all") to 4 ("All the time"). The PCS has been demonstrated to have good reliability

and validity [43,47]. Spouses also completed the scale with reference to their own catastrophizing about the ICPs' pain [5]. In the current study, Cronbach's α was acceptable to good for all three subscales for ICPs ($\alpha = .75$ to $.88$) and spouses ($\alpha = .74$ to $.87$).

ICPs rated their average, current, least, and most severe pain on 0 ("No pain") to 10 ("Extreme pain") scales. These items were averaged to create the *pain severity* variable, which had good internal consistency ($\alpha = .89$). On average, ICPs reported moderate pain ($M = 5.29$, $SD = 2.06$).

The *Pain Behavior Checklist* (PBCL [21]) was used to assess ICPs' frequency of overt pain behaviors. Both partners completed this measure with reference to the ICPs' pain behaviors. Items are rated on a 0 ("Never") to 6 ("Very often") scale, with higher scores indicating greater levels of pain behaviors. There are four subscales: distorted ambulation (e.g., "Walk with a limp or distorted gait"), affective distress (e.g., "Become irritable"), facial/audible expressions (e.g., "Clench my teeth"), and seeking help (e.g., "Ask someone to do something to help my pain"). In the current sample, Cronbach's α was acceptable to good for most of the subscales and total score for ICPs ($\alpha = .78$ to $.84$) and spouses ($\alpha = .73$ to $.89$), the latter of whom reported on their perceptions of partners' pain behaviors. The seeking help subscale for ICPs showed poor reliability ($\alpha = .39$) and therefore was excluded from analyses.

The *Mood and Anxiety Symptom Questionnaire* (MASQ [50]) was used to assess self-reported depressive and anxiety symptoms in both partners. The MASQ has been found to have good reliability as well as good convergent and discriminant validity [51]. The anhedonic depression subscale (22 items), which measures loss of interest and low positive affect, and the nonspecific depression subscale (12 items), which measures diffuse symptoms of depression (e.g., sadness, hopelessness), were summed to create a composite depressive symptom measure. The anxious arousal subscale (17 items), which measures physiological hyperarousal, and the nonspecific anxiety subscale (11 items), which measures diffuse symptoms of anxiety (e.g., tension, worry), were summed to create a composite anxiety symptom measure. In the current study, Cronbach's α s were excellent for depressive symptoms in ICPs (.94) and spouses (.95), and Cronbach's α was good for anxiety symptoms in ICPs (.89) and excellent in spouses (.90).

The *Dyadic Adjustment Scale* (DAS [38]) was used to assess each partner's relationship distress. Thirty-two statements are rated by the amount of agreement one has with a partner on important issues, such as finances and affection. Lower scores represent greater relationship distress. In the current sample, Cronbach's α was .92 in ICPs and .95 in spouses, indicating excellent inter-item reliability. The mean total score was 103.57 ($SD = 20.11$) in ICPs and 105.58 ($SD = 18.92$) in spouses. Scores below 100 are generally considered to be in the distressed range.

The 6-item Solicitude subscale from the *Survey of Pain Attitudes* (SOPA [18]) was used to assess another form of relationship distress in ICPs: their dissatisfaction with pain-related support. This subscale has also been conceptualized as "support entitlement" [6]. Items include "When I hurt, I want my family to treat me better," "When I am hurting, I deserve to be treated with care and concern," "It is the responsibility of my family to help me when I feel pain," "My family needs to learn how to take better care of me when I am in pain," "My family does not understand how much pain I am in," and "I need more tender loving care than I am now getting when I am in pain." Higher scores indicate greater dissatisfaction with support. Inter-item reliability in the current study was adequate ($\alpha = .74$).

The *Multidimensional Pain Inventory* (MPI [23]) was used to assess spouse responses to pain, which could also be conceptualized as a measure of pain-specific spousal support. It is

conceivable that ICPs who report receiving instrumental help from their partners (i.e., solicitous spouse responses; 6 items) or who report fewer emotionally punitive responses (punishing spouse responses; 4 items) would be more likely to disclose and that spouses who report engaging in helpful responses would be more likely to be validating. Spouses completed an equivalent measure on which they reported their responses to ICPs' pain [22]. In the current study, Cronbach's α was good for ICPs' reports of solicitous and punishing spouse responses but just under the acceptable range for spouses (ICP α s = .83 to .84; spouse α s = .67 to .68).

2.2.2 Observational Task—As described above, couples engaged in interactions about the pain, from which *disclosures of pain-related distress* and *spouse responses to these disclosures* were identified using a coding manual developed for this study. Prior to the discussion, trained research assistants privately interviewed each participant for approximately 5-10 minutes about the impact of pain on their lives. Instructions included: "The next task is for you and your spouse to discuss how the pain has affected your lives. I'd like to take a few moments now to talk to you about that. How do you think the pain has affected your life?" Interviewers could follow up with questions to probe for couples' thoughts and feelings (e.g. "How has his/her or your pain affected the time you spend together, what you talk about, who does the chores or how they are done, time spent with kids, family, friends, hobbies or leisure time?", "In your opinion, what are the positive and negative consequences of the pain?").

When the couple was reunited for the interaction task, the couple was instructed to discuss their thoughts and feelings that were expressed during the individual interview: "You will now have two conversations about how the pain has affected your lives. You will each get a chance to talk about your views, thoughts, and feelings. For the first conversation, Mr. Smith will talk about how his pain has affected your life together. We want the conversations to be as natural as possible so if you, Mrs. Smith, have anything to say while Mr. Smith is speaking, please join in. We'll interrupt you when your time is finished." The task did not explicitly direct ICPs to disclose their distress because such direction would have artificially inflated the disclosure rate; however, the interactions afforded many opportunities for the disclosure of pain-related distress. In addition, because it was often the case that the second interaction was a continuation of the first with similar content, disclosures and responses were tallied across the two interactions for use in analyses.

Coding occurred in two stages using a cross-classification coding procedure [1]. First, the coder identified when the ICP disclosed pain-related distress to his or her spouse. Once the ICP's pain-related distress was coded, the coder then proceeded to code the spouse's response to this distress.

Disclosures of pain-related distress included verbalizations of worry (i.e., pain catastrophizing; e.g., "My mind is thinking so much about my back that I can't think about anything else"), anger (e.g., "It frustrates me. Anytime I make any effort to try to do anything, my body won't let me"), sadness and guilt (e.g., "Guilt because not only is my life changing, but it also changes those around me"; "I keep wondering if everybody is going to up and leave me because they can't stand being around this person anymore"), or other negative emotions directly stemming from the pain experience.

Responses to pain-related distress included validation or invalidation of the ICP's pain-related distress, and neutral pain talk. Validation of the ICP's pain-related distress consisted of behaviors and verbalizations that conveyed an acceptance and attempted understanding of the ICP's experience in a clear and non-judgmental manner [13,14]. Examples included mindful listening behavior (i.e., watching the ICP with concern while the

ICP is talking), reflecting and acknowledging (e.g., “You’re really afraid that the pain is not going to get any better”), responding with an intended action (e.g., “It sounds like there are things I can do to help you deal with this, what would be best for me to do to help right now?”), or caring problem-solving (e.g., “Maybe you could try taking a break when the pain becomes too intense”). Invalidation consisted of spousal statements or behaviors that convey contempt, disrespect, and nonacceptance of the ICP’s pain experience. Examples include non-verbal behaviors (e.g., eye rolling, frustrated sighing), inattentiveness to a patient’s emotion (e.g., checking cell phone instead of listening to the ICP), missed opportunities for validation (e.g., ICP discloses distress but spouse does not respond or changes the subject), telling the patient what they should be thinking/feeling (e.g., “Stop feeling so sad about it—it’s not that bad”), or putting the patient down (e.g., “You’re acting like a baby”). Problem-solving that was delivered in a contemptuous or negative tone would also be coded as invalidation. Responses coded as neutral talk consisted of simple conversation geared toward gaining an understanding of the nature and impact of the pain on the patient. Examples include dialogue with regards to how the pain affects school/work, play, interactions with others, sleep, etc.

Two graduate students were trained as coders. They attended weekly meetings with the first author to review codes and procedure. They also read and memorized the coding manual and practiced coding on video recorded interactions from another study. The primary coder (final author) watched and coded each couple’s interaction and twenty-five percent ($n = 24$) of these couples were randomly selected to be recoded by the third author to test for inter-rater agreement. A conservative approach to resolving disagreement was taken. In cases of disagreement, the first author instructed coders to recode the video in question by reviewing the video and the coding manual. Coders were not provided feedback regarding each coder’s original rating. To guard against the temptation to change a code just because it had been reassigned, the coders were also aware that they would be given videos to review and recode even when coders already agreed. Coders were told that they could retain their original codes or change their codes accordingly, and they were instructed not to discuss their codes. Agreement was excellent for pain-related distress ($\kappa = .98$) and spouse response codes ($\kappa = .80$).

3. Results

Preliminary analyses showed that gender, race, education, income, age, age at pain onset, pain duration, and marriage duration were not significantly associated with disclosure, $p > .25$. Therefore, these variables were not covaried in the analyses below.

3.1 Frequency of pain-related distress disclosures

Emotional disclosure of pain-related distress was evident in approximately two-thirds of the sample ($n = 65$ couples; 68%). Within these discloser couples, the range of disclosing was 1–9 times. In fact, the distribution of disclosure was substantially positively skewed. Of the 65 ICPs who disclosed, 49% ($n = 32$) disclosed their pain-related distress once or twice, another 32% ($n = 21$) disclosed 3 to 4 times, and 18% ($n = 12$) disclosed more than 4 times.

3.2 Correlates of disclosure of pain-related distress

To test the first hypothesis that distress is correlated with disclosure, we conducted point-biserial correlations, which are designed to test associations between dichotomous (i.e., disclosure) and continuous variables. Distress variables included pain catastrophizing (i.e., rumination, magnification, helplessness), pain severity, pain behaviors (i.e., facial/audible expressions, distorted ambulation, affective distress), depressive and anxiety symptoms, relationship dissatisfaction, perceived entitlement to support, and perceived spouse

responses to pain. Because of the skewed distribution in disclosure, the disclosure variable was dichotomized (i.e., presence or absence of disclosure).

ICPs' ruminative catastrophizing ($r = .21, p < .05$), pain severity ($r = .27, p < .01$), affective distress pain behaviors ($r = .21, p < .05$), depressive symptoms ($r = .24, p < .03$), and anxiety symptoms ($r = .27, p < .01$) were associated with an increased likelihood of disclosing pain-related distress. The magnitude of these associations represents small to medium effects. The other forms of catastrophizing and pain behaviors were not significantly related to disclosure nor were relationship distress, support entitlement, or perceived spouse responses to pain. Based on previous research showing that catastrophizing and support entitlement interact in predicting different forms of social support [6], we also tested whether catastrophizing and entitlement interacted in predicting disclosure; however, the results were not significant.

We followed up the analyses about the characteristics of ICPs who disclosed *at least once* with additional analyses to identify the correlates of disclosure *frequency*. The former were conducted on the entire sample ($N = 95$) whereas the latter could be conducted only on the sub-sample who disclosed ($n = 65$). Even among the sub-sample who disclosed, the number of or 2 disclosures vs. more than 2 disclosures) fo disclosures remained substantially positively skewed. Thus, disclosure was dichotomized (i.e., 1 r these analyses, which resulted in fairly equal numbers of couples in the low discloser and high discloser groups (i.e., $n = 32$ and $n = 33$, respectively). ICPs' ruminative catastrophizing ($r = .26, p .05$), magnification catastrophizing ($r = .33, p < .01$), pain severity ($r = .25, p < .05$), depressive symptoms ($r = .31, p < .02$) were associated with greater disclosure. The magnitude of these associations represents small to medium effects. The other distress and social support variables were not significantly related to disclosure frequency.

3.3 Frequency of spousal validation and invalidation as consequences of disclosure

Spouses of disclosing ICPs engaged in a variety of responses and some had the opportunity to respond in different ways if their partners disclosed more than once. Of the 65 spouses who had an opportunity to respond to a disclosure, most spouses responded with validation at least once (60%; $n = 39$) and approximately 22% ($n = 14$) responded with invalidation at least once.

Because some spouses had an opportunity to respond to multiple disclosures, we also examined the number of spouses who responded with validation only, invalidation only, both types of responses, or neither of these responses. Interestingly, approximately 45% ($n = 29$) of spouses responded with validation only, 15% ($n = 10$) responded with both validation *and* invalidation, and only 6% ($n = 4$) responded with invalidation only. Thirty-four percent (n responded with none of these behaviors, meaning they responded with neutral talk.

3.4 Correlates of spouse responses

Analyses were then conducted to examine the correlates of validation and invalidation. These variables were each dichotomized to represent the presence and absence of these responses, which resulted in a validation variable consisting of 39 spouses who engaged in this behavior at least once and 26 who did not engage in this behavior. The invalidation variable consisted of 14 spouses who engaged in this behavior at least once and 51 spouses who did not. As noted above, some spouses engaged in both types of responses if the ICP disclosed more than once.

First, we examined whether the frequency of disclosure was correlated with the likelihood of being validated (vs. all other responses) or invalidated (vs. all other responses) by one's spouse. As indicated previously, the number of disclosures among the sub-sample of 65

ICPs who disclosed was substantially positively skewed. Thus, disclosure was dichotomized (i.e., 1 or 2 disclosures vs. more than 2 disclosures) for these analyses. A chi-square analysis demonstrated that the frequency of disclosure was associated with spousal validation, $X^2 (N = 65, df = 1) = 9.86, p < .002$ (see Table 2). A goodness of fit test (i.e., one sample binomial test) confirmed that spouses of high disclosers were more likely to engage in validation than other responses, $p < .01$. In contrast, spouses of low disclosers were equally likely to engage in validation or other responses, $p < .37$. In addition, a significant association was found between invalidation and disclosure, $X^2 (N = 65, df = 1) = 12.65, p < .0001$ (see Table 2). However, the pattern of association for invalidation was different than what was observed for validation. Only 1 spouse engaged in invalidation when ICPs disclosed their distress only once or twice; it was much more common for spouses to respond with neutral or validating behaviors in these cases, $p < .001$. Spouses of high disclosers were just as likely to engage in invalidation as they were in other behaviors, $p > .29$. A closer inspection of the raw data showed that vast majority of spouses of high disclosing ICPs attempted other responses prior to expressing invalidation (10 of 13; 77%). In only 3 couples did spouses respond to an initial disclosure with invalidation.

Point-biserial correlations were also conducted to examine the correlates of the presence or absence of validating and invalidating responses. ICP and spouse helplessness catastrophizing ($r = .32, p < .01$ and $r = .28, p < .03$, respectively), affective distress pain behaviors as reported by ICPs ($r = .25, p < .05$), and spousal anxiety ($r = .27, p < .03$) were associated with the presence of invalidation. The magnitude of these associations represents small to medium effects. No other variables were significantly related to invalidation. Furthermore, none of the variables were significantly associated with validation. When examining the variable that indicated whether spouses engaged in validation only, there were still no significant associations between validation and the other variables. Likewise, there were no significant correlates of the neutral only category.

4. Discussion

Research has focused on facial expressions, paraverbalizations, and other pain behaviors that may communicate pain [16,17,21,52]. However, less attention has been paid to the emotional disclosure of pain-related distress to loved ones and we are unaware of any studies that have examined this distress using observational methods. The current study demonstrated that this type of pain communication is quite common, occurring in approximately two-thirds of couples who engaged in the pain discussion task. Interestingly, this number is similar to the proportion of participants who self-reported disclosing pain-related distress in another study [40]. These results suggest that ICPs may be accurate reporters of their disclosure behavior, although research is needed that assesses both self-reported and observed disclosure behavior to make direct comparisons. Nevertheless, the fact that the majority of couples engaged in this behavior argues that models of pain should explicitly include the disclosure of pain-related distress as a form of communication about the experience of pain. In addition, the pain discussion task used in the current study might be added as another methodological tool in studies of pain communication.

The current study also examined the correlates and consequences of the disclosure of pain-related distress. Previous research has demonstrated that distress begets disclosure [19,28,41]. Specific to pain, the communal coping model of pain catastrophizing [45,46] posits that distress will be communicated in some way to close others (e.g., through certain pain behaviors) as a way to seek social support. In line with this work, ICPs in the current study who reported heightened pain severity, distress and worry about pain (i.e., ruminative catastrophizing, affective distress pain behaviors), and general psychological distress (i.e., depressive and anxiety symptoms) were more likely to disclose their pain-related distress to

their spouses. In addition, pain severity, ruminative and magnification catastrophizing, and depressive symptoms were related to the greater frequency of disclosures. Thus, it appears that certain types of affective distress may be a driving force in emotional disclosure. In contrast, Porter et al.[35] found that pain catastrophizing was associated with self-reported refraining from disclosing pain-related distress. Perhaps there were differences across these studies in participants' histories of experiencing invalidation from loved ones [24]. It is quite likely that fewer expectations of the negative consequences of disclosure may also predict whether one discloses their distress to loved ones.

In terms of spouses' responses to ICPs' disclosures, spousal validation was much more common than invalidation and many spouses used both strategies when given the opportunity to do so. Furthermore, ICPs who disclosed a great deal were significantly more likely to be validated by their spouses than to receive other types of responses. Yet, none of the self-report distress or relationship variables were significant correlates of validation. It is possible that validating or neutral responses are the expected types of responses to disclosures of pain-related distress and indeed, most spouses engaged in these behaviors. Thus, it may be difficult to find predictors of such normative behaviors. However, invalidation occurred less frequently and thus, it may be a unique marker of interpersonal difficulties. These findings are in line with previous research showing that the negative qualities of interpersonal interactions are more strongly associated with adjustment than positive qualities [3,8].

Disclosing only once or twice was associated with a significantly reduced likelihood of receiving an invalidating response from one's spouse. More times than not, invalidation was expressed after other strategies were attempted, which suggests that spouses became frustrated after repeated disclosures. Furthermore, greater helplessness catastrophizing and affective distress about pain on the part of the ICP were associated with the spouses' expression of invalidation. These findings fit with the observation that spouses may be worn down by repeated exposure to their partner's distress or by perceiving that one's efforts are ineffective at reducing the partner's distress [37]. These results imply that, while ICPs might be encouraged to disclose some of their distress to their partners, they should also be cautioned to disclose judiciously so as not to erode their partner's support.

In addition, spouses' helplessness catastrophizing and anxiety symptoms were associated with their invalidation of the ICPs' disclosures. Empathy models [2,15] suggest that experiencing intense personal distress when witnessing another person's pain may interfere with one's ability to provide an empathic response. It is possible that worry and anxiety increased spouses' selffocus, thereby making it difficult to fully attend to ICPs' distress during the discussion. Alternatively, anxious spouses may intentionally respond with invalidation in an attempt to deflect their partners' distress and reduce their own negative affect. Research on the underlying motivations for invalidation is clearly needed.

Several other findings have implications for research. In terms of catastrophizing, rumination and magnification was associated with disclosure and helplessness was associated with invalidation, suggesting that future research should examine differential associations among types of pain catastrophizing and behavioral manifestations of catastrophizing, such as disclosure of pain-related distress. Furthermore, while facial/audible expressions and distorted ambulation as indicators of distress, were expected to be related to disclosure and spouse responses, this was not the case. Perhaps, these pain behaviors independently communicate a great deal of information to close others [52] such that disclosure is not necessary. Indeed, the only pain behavior subscale that was significant was the affective distress subscale, which does not explicitly assess whether the distress about pain was communicated. It was surprising that none of the relationship variables correlated

with disclosure, validation, or invalidation given that emotional disclosure and validation have been linked to relationship quality and social support [25,26,32,36]. Relationship quality and dissatisfaction with support might have emerged as important correlates if the interaction task centered on the relationship rather than the impact of pain more generally.

There are several limitations that must be addressed. First, although couples engaged in disclosure at rates similar to those in self-report studies, it is possible that the nature of the interaction forced some ICPs to share their feelings about pain who would not have otherwise disclosed these feelings to their partners during everyday life. A diary or in-home observational study may be able to have greater ecological validity. Second, the associations described in the current study consisted of small to medium effects. However, it should be noted that most of these findings were for cross-method relationships using self-report and observational data. Third, this study did not address the extent to which spousal validation and invalidation might reinforce or punish emotional disclosure because emotional disclosure of distress has not typically been discussed in operant terms and is instead more often portrayed as a construct involved in emotion regulation and intimacy [7]. Yet it is conceivable that disclosure and spouse responses function in an operant manner. Longitudinal and experimental research will be needed to address the potential reinforcement properties of pain-related distress disclosures and provide additional evidence regarding the value of enhancing either disclosure or validating responses. Finally, disclosures were not differentiated by specific emotion, in part, because many disclosures consisted of blends of emotions including anger, worry, and sadness; however, future research should address whether the function of disclosure differs by type of emotions expressed and whether spouses respond differentially to specific emotions.

In conclusion, the current study is the first to assess verbal emotional disclosure of pain-related distress using observational methods. Most ICPs expressed their worry, anger, or sadness about their pain. Yet, the expression of pain-related distress did not figure prominently during interactions about pain, as nearly 50% of ICPs who disclosed did so only once or twice across the twenty minutes of interaction time. Nevertheless, the findings suggest that disclosure is meaningful in that distress in one or both partners appears to fuel disclosure as well as invalidating responses. Based on these results, while ICPs should be encouraged to share their feelings about pain with their partners, each partner may also need to be coached about how to manage his or her own distress in order to communicate about pain effectively. Additional research is needed to test whether equipping couples with more adaptive communication and coping skills would result in more harmonious exchanges that could benefit the health of both partners. The current study also offers direction for theoretical development. Disclosure of pain-related distress was conceptualized in the current study as another form of pain communication that can elicit support from others, but it is possible that disclosure has unique functions as well. For instance, emotional disclosure may be more likely to elicit emotional support whereas other forms of pain communication may elicit instrumental support. The expression of distress may also serve a stress-relieving function by allowing participants to process difficult thoughts and feelings [29] or it may be more likely to enhance intimacy and closeness with one's partner [25,26] in ways that pain ratings or pain behaviors cannot. It is recommended that future studies address these issues to contribute to the further development of pain communication models and couple-based interventions.

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Table 1

Demographics

Characteristic	ICPs		Spouses		
	n	%	n	%	
Gender	Male	45	47.4	50	52.6
	Female	50	52.6	45	47.4
Race	Caucasian	44	46.3	48	50.5
	African American	44	46.3	44	46.3
	American Indian/ Alaskan Native	2	2.1	0	0
	Asian	0	0	2	2.1
Ethnicity	Mixed	5	5.3	1	1.1
	Hispanic/Latino	9	9.5	9	9.5
		M	SD	M	SD
Age	51.67	12.47	51.62	13.07	
Education (years)	14.44	2.88	14.00	2.66	
Annual Income	\$45,970	\$23,964			
Marriage Length (years)	20.77	15.14			

Table 2

Crosstabulations of spouse responses to low and high disclosing ICPs.

	Spousal Validation		
Disclosure Group	Absent	Present	Total
Low Disclosers	19	13	32
High Disclosers	7 _a	26 _b	33
Total	26	39	65
	Spousal Invalidation		
Disclosure Group	Absent	Present	Total
Low Disclosers	31 _a	1 _b	32
High Disclosers	20	13	33
Total	51	14	65

Note. Low Disclosers made one or two disclosures. High Disclosers made more than two disclosures. Cells in the same row that do not share the same subscript are significantly different from one another.