Topical review:

Couples Coping with Chronic Pain:

How do intercouple interactions relate to pain coping?

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Abstract

Background and aims: Pain is not merely an isolated experience occurring within the person. It takes place in a wider social context, including the immediate social relationships that the person is a part of. The aim of this paper is to provide an overview of how intercouple interactions might influence pain coping in couples coping with chronic pain. **Methods:** Four different approaches to understanding the influence of intercouple interactions have been proposed in the literature. In this review, we present and discuss the empirical support for each of these models. A literature search on all studies published up until May 2017 (PubMed and PsycINFO) was performed. The search string consisted of 3 steps: Chronic pain AND couple interaction*/partner validation/marital interaction/chronic pain couple*/spouse response* AND coping/adjustment/disability/function/work participation/sick leave/sickness absence/work disability. **Results:** The operant model views partner responses from the perspective of conditioned learning and focuses on how such responses might increase or decrease the occurrence of pain behavior. The notion that partner responses can reinforce pain behavior generally finds support in the literature. However, when it comes to negative partner responses results are mixed, and the model paints a limited picture of the range of interactions that takes place in a couple. The communal coping model focuses on one specific type of coping (i.e. catastrophizing), and emphasizes the interpersonal aspect of pain coping. There is some evidence that a tendency to catastrophize is related both to couple interactions and pain coping, but it has proved difficult to test this model empirically. The interpersonal process model of intimacy is concerned with patient disclosures of distress and subsequent validating and invalidating partner responses. There is some preliminary support that such mechanisms of validation and invalidation can be linked to pain coping. A dyadic approach focuses on processes where the couple negotiates a shared meaning of events and participates in mutual coping of a shared stressor. This approach has not been investigated explicitly, but preliminary support can be derived from studies conducted within other frameworks. **Conclusions:** Each of the four approaches find some support in the research literature, yet none of them can explain the full range of couple interactions. We argue that the different approaches are complementary and that several of the approaches can be integrated in a dyadic understanding of pain coping. **Implications:** All the models indicate that couple interactions

can affect pain coping and that this should be taken into account when developing treatment programs for chronic pain patients.

Highlights

- Couple interactions can influence how pain patients cope with chronic pain.
- Reinforcement processes do take place in pain couple interactions.
- Other mechanisms include validation/invalidation processes and negotiation of meaning.
- Several approaches can be integrated in a dyadic understanding of pain coping.

1. Introduction

In the literature, a biopsychosocial model is often used as a starting point for understanding chronic pain. According to this model pain is the result of a complex process involving biological, psychological and social factors. Much progress has been made towards an understanding of the biological and psychological underpinnings of the pain experience. However, the social aspects have received somewhat less attention [1]. Pain is not merely an isolated experience occurring within the person. It takes place in a wider social context, including the immediate social relationships that the person is a part of. The social context of pain is important because it can provide information about the source of the pain and contribute to pain coping. Several aspects of pain behavior are inherently social, as they communicate pain, and possibly fear and danger, to people surrounding the person in pain. In many cases of chronic pain a biological cause of the pain cannot be found, which make the social and psychological aspects even more salient. This paper will focus on the daily interactions chronic pain patients have with their partners, and the role these interactions play for the patient living with pain.

By focusing on one specific aspect of the immediate social environment of chronic pain patients, this paper aims to contribute to a greater understanding of the coping processes involved in the lives of people with chronic pain. Understanding the role of interactions in close relationships is also important when it comes to developing effective pain treatments. Including the partner in treatment programs has been suggested, for instance by having partners attend a validation training program [2]. Such programs could be more successful if we understood how specific aspects of intercouple interactions relate to the patient's pain experience and coping.

1.1 Scope and definitions. The current paper offers a review of the literature structured around four approaches to understand couple interactions in coping with chronic pain. Some approaches have received more research attention than others, and particularly the operant model has been investigated by numerous research teams. The goal of this paper is to compare existing approaches to the topic, and investigate whether these find support in the

research literature. As the paper focuses on couples, studies on other relevant constructs (e.g. more general social support) have for the most part been excluded.

The interaction that takes place within a couple can be understood in many ways, and different research traditions have focused on different aspects of such interactions. As the goal of the current paper is to compare traditions, a rather wide definition of couple interaction is used, which includes patient pain behaviors and other expressions of pain, as well as spouse responses to these expressions (e.g. solicitous, negative, validating or invalidating). Similarly, a wide definition of pain coping is used that involves outcome variables such as pain adjustment, pain disability, work participation and negotiation of meaning. Such a wide definition allows for the comparison of findings from various traditions using different outcome measures. Some studies have indicated that intercouple interactions also affect other pain variables such as pain intensity [3]. However, in order to limit our scope, we will primarily focus on variables associated with pain coping.

1.2 Methods

Search strategy

The literature search was conducted on all studies published up until May 2017 through the search engine PubMed and the PsycINFO database. Additional articles were also identified through other sources such as reference lists and personal communication. See Figure 1 for a flow chart of the article selection process.

The search string consisted of 3 steps: Chronic pain AND couple interaction*/partner validation/marital interaction/chronic pain couple*/spouse response* AND coping/adjustment/disability/function/work participation/sick leave/sickness absence/work disability. The search included only papers (original articles) written in English.

Inclusion and exclusion of studies

The main reasons for exclusion were lack of relevance, not relating to any of the four models targeted in the review, and irrelevant patient groups. See Figure 1 for details.

2. Approaches to Understand Couple Interactions in Chronic Pain

2.1 The Operant Model

Fordyce's application of the operant model to the understanding of chronic pain in the 1970's brought a shift in focus from purely biological sources of pain to learning mechanisms that included, among other sources, the social environment [4, 5]. Briefly summarized, operant conditioning explains behavior by looking at the responses specific behaviors evoke from the environment. According to operant conditioning, responses function either as reinforcement that increases the occurrence of particular behaviors or as punishment that decreases the occurrence of the behavior. In the context of chronic pain, an operant perspective focuses on pain behaviors; that is: actions, verbalizations or facial expressions that are responses to pain [4]. Such pain behavior can, for instance, involve a patient who limps, rubs the location of the pain, or moans. From an operant perspective, acute pain (with a biological source) becomes chronic through mechanisms of operant learning where responses from the environment reinforce the patient's pain behavior. Other aspects of chronic pain, such as disability and the experience of pain, are thought to be results of the reinforced pain behavior.

One source of reinforcing responses is the immediate social environment of the person in pain, including the spouse or partner. Two types of responses have received the most attention in the operant literature: solicitous and negative responses [5]. Solicitous responses are expressions of concern, support, and help which can be of both an emotional and an instrumental character [5, 6]. Examples include taking over a patient's activities or encouraging patients not to carry out tasks if they feel pain. Although they originate in good intentions, such responses are assumed to reinforce pain behavior and encourage the patient to take on a sick role [7]. Negative responses on the other hand are assumed to punish pain behavior. Such behaviors can be to express frustration, irritation or despise in response to patient pain behaviors. In line with the theory, these responses should reduce the frequency of pain behaviors and thus be beneficial to the patient [4]. However, it is possible that negative partner responses might also lead to other negative consequences, such as negative emotions or lower marital satisfaction, as they might be interpreted as

rejection by the pain patient.

By focusing on the responses of the social environment, the operant model emphasizes the importance of the immediate social environment of the pain patient in understanding and treating cases of chronic pain. This makes the model relevant for understanding couples coping with chronic pain. An important implication of the operant model is that intercouple interactions have the potential to either increase or decrease pain behavior, and thus contribute to pain coping in either a positive or a negative manner. Further, the model suggests that the helping behavior of a partner, originating in care, might have an unintended detrimental effect on the pain behavior of the patient.

2.1.1 Research findings. The operant model of chronic pain has led to a great number of studies investigating the effects of solicitous and negative responses to pain behavior. According to the theory, solicitous responses should lead to increased pain behavior, which in turn is expected to be associated with other pain variables such as pain intensity and disability; while negative responses should have the opposite effect. Several reviews examining the operant model have concluded that the body of research generally supports the principles of the operant model [3, 5]. Solicitous responses have indeed been associated with increased pain behavior [8, 9], increased pain intensity [10, 11] and increased disability in chronic pain patients [9, 11, 12]. In line with the theory, studies have also found that distracting responses are associated with decreased pain disability [11], and that negative responses are associated with a decrease in pain behavior and disability [12]. Yet, negative partner responses have also been associated with negative consequences, such as psychological distress [13-15] and pain intensity [14, 15], and some studies have even found increases in pain behavior following negative partner responses, which cannot be explained by the operant model [16, 17].

In terms of moderators of the relationship between partner responses and pain coping, partner responses to pain behavior have been found to have a greater effect on pain variables in satisfied couples than in less satisfied couples [3, 16]. This might indicate that the quality of the relationship affects how intercouple interactions are interpreted. Another important moderator is mood and depressive symptoms [18, 19]. Depression and marital

satisfaction are closely associated concepts, and they have both been found to correlate directly with pain variables [3]. Campbell and colleagues [18] suggest that solicitous behavior might play a dual role by being both a barrier to recovery by increasing disability (operant effect) and a facilitator of recovery by reducing depression. Qualitative data have further challenged the view that solicitous responses are always perceived positively. In one study, patients rated spouse responses that were consistent with a self-management model more favorably than responses traditionally associated with an operant model [20].

As a result of the mixed results, the operant model has been criticized for being too simplistic [4, 16]. The model does not appear to paint a complete picture of the complex and dynamic processes involved in intercouple interactions. Furthermore, the literature within the operant framework has focused almost exclusively on solicitous and negative partner responses while real-life interactions are likely to involve a much greater variety of responses [16].

2.2 The Communal Coping Model

One cognitive approach to interpersonal coping with chronic pain is the communal coping model of catastrophizing. This model focuses on a specific type of pain coping: pain catastrophizing. Pain catastrophizing can be defined as an exaggerated negative orientation towards actual or anticipated pain [21]. Traditionally, catastrophizing has been seen as a maladaptive coping strategy. Catastrophic thinking is closely related to depression and has been shown to predict depression in samples of chronic pain patients [22, 23]. Some researchers have also found a link between catastrophizing and negative pain outcomes such as pain intensity and disability [22].

The communal coping model suggests that catastrophizing is not necessarily a strategy used to cope with pain directly, but rather a way of communicating pain to others, with the intention of receiving help and increasing proximity [5, 21]. As such, catastrophizing is aimed at facilitating interpersonal rather than intrapersonal coping; it can be viewed as a way to reach out to others rather than attempt to cope alone. Sullivan [21] emphasizes that catastrophizing in itself is not maladaptive, but that it can become maladaptive in chronic situations. In the case of acute pain, catastrophizing can be a good and adaptive response to

increase proximity to others.

2.2.1 Research findings. Research indicates that higher levels of catastrophizing are associated with observer ratings of more intense pain [24]. However, as couples interact on a daily basis, frequent use of a negative and exaggerated orientation to pain might also be draining for the partner. Catastrophizing has indeed been associated with negative interpersonal outcomes [21] and symptoms of psychological distress in spouses of pain patients [25].

Cano and colleagues [26] found that disclosures of distress during couple interactions were initially met with validation and support from partners. However, when patients continued to frequently express distress, partners also responded with invalidation and negative reactions. Such frequent disclosures of distress can be interpreted as catastrophizing. Catastrophizing might thus lead to depletion in partner support over time, although the diminished support may not necessarily be specific to pain spousal support [27].

A recent daily diary study of chronic pain couples provides further nuances to the influence pain catastrophizing might have on spouse responses [28]. First, it revealed how the pain catastrophizing was at its highest when the spouse was there to witness the distress. Second, fluctuations in patient pain catastrophizing were closely related to fluctuations in pain behaviors observed by the spouse. And finally, in terms of the effectiveness of this communicative strategy, pain catastrophizing did indeed predict an increase in spouse response, but as demonstrated in previous findings [26], both positive and negative spouse responses were reported [28]. Despite a more consistent association with positive spouse responses, this could still be reflecting an underlying maladaptive cycle where pain catastrophizing is reinforced by positive consequences consistent with the communal coping model.

How the catastrophizing of a patient is received by a partner might depend on whether the partner also has a tendency to catastrophize. Some studies have indicated that high-catastrophizing individuals might be more sensitive to others' expressions of pain [21]. In one study, where the participants were organized into four catastrophizing concordance

groups, high-catastrophizing patients who were in relationships with low-catastrophizing partners displayed more pain behavior than patients in all the other groups [29]. Gauthier and colleagues suggest that these patients might feel the need to 'increase the volume' of their pain communication in order to compensate for the lack of concordance in catastrophizing [29].

In another study based on daily phone interviews over a week with married chronic pain patients, catastrophizing was associated with increased pain and negative affect [30]. However, when individuals reported satisfaction with spouse responses, they were less likely to experience increased negative affect due to catastrophizing. This might indicate that satisfaction with partner responses acted as a buffer against the detrimental effects of using a maladaptive coping strategy (i.e. catastrophizing). Alternatively, satisfying spouse responses might have represented a successful outcome of the use of catastrophizing to initiate interpersonal coping processes. When met with less satisfying responses, on the other hand, the patients might view their attempts to seek support as unsuccessful, which might lead to negative affect.

Buenaver et al [31] investigated whether the relationship between catastrophizing and negative pain outcomes was mediated by perceived partner responses to the patient's pain. They found a small mediating effect of perceived partner responses on pain outcomes. Further, they found associations between catastrophizing and both positive and negative perceived partner responses, which imply that catastrophizing might evoke both sympathetic, supportive responses, and critical, frustrated responses in partners. This could be further understood in light of a study where support entitlement was found to moderate the relationship between catastrophizing and support [32]. In patients who felt less entitled to receive pain-related support, greater catastrophizing was associated with greater pain-related support.

In summary, it is not completely clear whether available research findings support or contradict the communal coping model. Buenaver and colleagues [31] argue that the model is "more a theoretical framework for predicting catastrophizing's effects than a specific model with operationalized variables" (p. 241). The model has explanations for findings

whether they show negative or positive effects of catastrophizing, which makes it difficult to derive specific, testable hypotheses from the model. As such, it does not give a complete understanding of intercouple interactions in chronic pain.

2.3 The Interpersonal Process Model of Intimacy

Another alternative to the operant view of couple interactions in chronic pain is the interpersonal process model of intimacy. This model was originally developed to understand the phenomena of intimacy throughout the lifespan [33]; however, it has recently been applied to interpersonal processes in chronic pain [34]. The model describes the development of intimacy as a dynamic process where one person's self-disclosure of emotions is met with either validating or invalidating responses from a partner.

Validating responses are warm and empathic responses that validate the experience of the other person. Such responses contribute to emotion regulation in both partners and allow for the processing of stressful or aversive stimuli [34]. According to the theory, validating responses also deepen the relationship and encourage the exchange of support and affection [33]. Examples of invalidation on the other hand are hostility or ignoring the partner's expressions of emotion. Such responses communicate rejection and disregard for the other person and disrupt emotion regulation. Applied to couple interactions in chronic pain, the model would suggest that validating responses might contribute to effective pain coping, through their enhancement of emotion regulation, while invalidating responses might disrupt pain coping efforts.

Validating and invalidating responses resemble solicitous and negative responses in the operant framework, yet there are some important distinctions. First of all, the two frameworks derive opposing predictions when it comes to the effect of positive social attention and concern. The operant model predicts that all forms of attention and support will reinforce pain behavior. The intimacy framework contrarily predicts that such responses might enhance pain coping if they validate the pain patient's experience of distress. This makes the emotional content of the partner's response relevant. A solicitous helping response might well be provided while still communicating contempt and disregard for the patient's experience, whereas validating responses will by definition communicate warmth

and acceptance. Research findings have indeed shown that emotional validation and solicitousness are two separate constructs [34, 35]. Invalidating and negative responses on the other hand are more closely linked. The predictions of the intimacy model might explain some of the mixed research findings on the effects of negative responses on pain outcomes. As opposed to the operant model, the interpersonal process model would predict that negative responses would be harmful for pain coping.

2.3.1 Research findings. The significance of affective interaction in chronic pain couples was presented by Johansen and Cano about 10 years ago [36], and later research has investigated validating and invalidating responses in chronic pain couples from various perspectives. In one study, spousal characteristics were found to be related to the way in which support was delivered, where variables indicative of an empathic climate were related to empathy and support variables [35]. Spouses who for instance reported greater marital dissatisfaction were less likely to respond with validation towards their partner, as were spouses who reported personal experiences with pain.

In a study where chronic pain couples were observed when talking about how pain had affected their lives, disclosures of distress occurred in two-thirds of the conversations [26]. Furthermore, such disclosures were most frequently met with validating partner responses. The study also found that none of the measured relationship variables, such as relationship satisfaction, were correlated with disclosure, validation or invalidation, which appears to contradict the notion that validating and invalidating responses are related to intimacy. Cano and colleagues suggest that this might be because the conversation was not centered on the relationship but rather on the impact of pain.

In line with the model, validation training was in a recent study found to increase the frequency of validating responses while decreasing invalidating responses, and this had a positive effect on emotions in the person with pain [2]. Further, a significant association was in another study found between invalidation from the partner and pain disability [37]. A possible consequence of a pattern of invalidating responses is marital conflict. Marital conflict has in turn been associated with negative pain outcomes, and the association appears to be mediated by negative partner responses [17]. Negative spouse behaviors have

even been found to be more predictive of patient impairment than spouse solicitous behaviors [17]. From an intimacy perspective, such negative behaviors might be interpreted as invalidating responses. Holtzman and DeLongis' [30] telephone interview study can also be reinterpreted in an intimacy perspective. They found that satisfaction with spouse responses reduced the likelihood of feeling overwhelmed and helpless when dealing with their daily pain [30], which could be a result of improved emotion regulation as a result of validating partner responses.

In summary, research findings provide some support for the intimacy approach to couple interactions in chronic pain, but it is still too early to conclude about the importance of intimacy processes for pain coping in chronic pain couples.

2.4 Illness Beliefs and Dyadic Coping

Some research on couple interactions in chronic pain couples have looked at variables other than those derived from the above frameworks. Illness beliefs is one example. One strain of research has looked into illness beliefs in both pain patients and partners, and how they affect pain outcomes. A study found that partner pain beliefs about various aspects of the patient's illness were correlated with pain outcomes in the patient [38]. It could of course be that these illness beliefs simply reflect variation in aspects of the pain patients' illnesses, but the possibility remains that the illness beliefs of partners indirectly affect how pain patients relate to their own illness.

Another team of researchers used interviews to explore illness beliefs in chronic pain patients and their significant others [39, 40]. They compared employed pain patients with patients on sick leave and found that illness perceptions of significant others might function as an obstacle to recovery and work participation for pain patients. If, for instance, the significant other holds the belief that activity and work participation will make the patient worse, this might enhance tendencies in the patient to avoid such activities. Brooks and colleagues [39] found that pain patients who were out of work, self-limited their activity and were supported in their beliefs by significant others. They further argue that, as pain conditions are not visible to the pain patient's surroundings, significant others might see themselves as 'true witnesses' of the patient's pain, which could lead them to

overemphasize the patient's disability in order to justify their positions as out of work.

Couples' illness beliefs might be the result of a process of negotiation where the members of the couple together explore possible meanings of the patients' illness. This aspect of couple interactions capture something more than the communication of needs or exchange of support, which has not been explored in the above-mentioned theories. Yet these processes constitute an important part of how couples cope with the strains of chronic pain. One approach to understand these processes might be to conceptualize couple pain coping in terms of dyadic coping. Dyadic coping is an approach to coping which emphasizes that dyads face shared stressors, such as chronic pain, as "interpersonal units rather than as individuals in isolation" [41] (p.104). It recognizes that the coping efforts of couples are marked by mutuality and interdependence. From this perspective, the chronic pain of one member of a couple is a stressor that both members share, and that is coped with by the couple as a unit. As part of dyadic coping, members "negotiate the emotional aspects of their shared experience" and "engage in collaborative coping efforts, such as joint problem-solving" [41]. Such an approach could include the insights gained from the intimacy perspective, as exchanges of disclosure and validation or invalidation can be considered a part of dyadic coping. Applying the understanding of dyadic coping to chronic pain couples would nevertheless add something new as it has a wider scope than does the interpersonal process model of intimacy.

2.4.1 Research findings. To our knowledge, few studies on chronic pain couples have taken this approach in the past. Revenson and DeLongis [41] mention a couple of studies. One study investigated the role of more general social support in coping and pain severity for a sample of rheumatoid arthritis patients [42]. They found that support influenced both the choice of specific coping strategies and the effectiveness of the chosen coping strategy. They also mention the telephone study described earlier [30]. Both of these studies might indicate that the influence of social interactions on coping goes through processes of negotiation and mutuality. However, neither of them explicitly employed a dyadic coping framework.

3. Discussion

The aim of this paper was to provide an overview of how couple interactions might influence pain coping in chronic pain couples. As presented, this has been studied within various theoretical frameworks. The operant model focuses on partner responses to pain behavior, more specifically on solicitous and negative responses. Empirical findings generally tend to support the main principles of the operant model; some partner responses might contribute to the reinforcement of pain behaviors. However, the definition of solicitous behavior in many studies is problematic because it is often based on the expectation that a behavior will be reinforcing. Newton-John [16] argues that for a behavior to be labeled solicitous, a following systematic increase in pain behavior must be found, and that such an association cannot be assumed. Many studies fail to do this.

When it comes to the effects of negative partner responses, research findings have been mixed. Not all studies find a reduction in pain behaviors as a result of such responses, and some even find an increase in pain behavior. This might indicate that the influence of such negative responses on pain coping does not always follow operant terms. Some important moderators have also been found. For instance, the moderating effect of marital satisfaction might indicate that the patient's perception and understanding of the situation could influence how a partner's responses are interpreted. So although the operant model can explain some aspects of couple interactions in pain coping, it explains far from all.

The communal coping model focuses on pain catastrophizing and emphasizes the communicative and interpersonal facets of pain coping. Few studies test the communal coping model directly. There is some support for the notion that catastrophizing might facilitate an interpersonal approach to coping, and that successful interpersonal processes are related to better pain coping. However, the model has been criticized as it does not lead to clear predictions as to how catastrophizing will affect pain coping in pain couples. Patient catastrophizing is sometimes met with positive and sometimes with negative partner responses [26], and relationship factors such as concordance in catastrophizing orientation influence a person's pain behavior [29]. The model is also limited in scope as it focuses on only one type of coping; that is catastrophizing. Nevertheless, some aspects of the model might be applied to other areas of coping, and the main contribution of the model is its emphasis on individual coping attempts as a part of a more dynamic, interpersonal coping

process. Moreover, it emphasizes the communicative aspect of pain behavior, which is understated in the operant framework.

The interpersonal process model of intimacy emphasizes disclosures of distress and subsequent responses in the process of pain coping. A few studies on validating and invalidating partner responses have recently been presented. Findings indicate that validation is associated with decreases in negative affect [2] and that invalidation is associated with higher pain disability [37]. As it leads to opposite predictions from those of the operant model when it comes to the effect of negative/invalidating partner responses, the model might explain some of the mixed results observed within the operant framework. Thus, the model contributes to a greater understanding of how such interactions might influence pain coping. All in all, the intimacy approach seems promising. However, only a few studies have been conducted within this framework, and there is much left to explore. Also, the model only covers one aspect of intercouple interactions; that is, disclosures of distress and subsequent responses, which precludes the full scope of possible couple interactions that might influence pain coping.

Finally, we outlined a possible fourth approach to pain coping in chronic pain; dyadic coping. Such an approach focuses on the negotiation of meaning and mutual coping efforts of a shared stressor. Several of the studies reviewed in this paper can be understood from a dyadic coping perspective. For instance, Gauthier and colleagues [29] found that pain behavior was related to the tendency to catastrophize in both patient and partner, and that some high-catastrophizers might “increase the volume” of their pain communication in order to get through to their low-catastrophizing partners. In dyadic terms, this can be understood as a process of negotiation of meaning. A dyadic approach might integrate some of the findings from other frameworks and improve our understanding of a more complete scope of couple interactions.

It is evident from the review that some of these approaches have received considerably more attention than others. This is largely due to the recency of some of the approaches. For instance, much more research has been conducted within the operant framework than the interpersonal process model of intimacy. It is important to keep in mind that lack of

evidence of support for a model does not imply lack of support. It is thus clear that more research is needed into several aspects of couple interactions in coping with chronic pain.

So how do the different models relate to one another? Are they mutually exclusive or complementary? We argue that each of these models contribute a piece of the puzzle when it comes to understanding the influence of couple interactions on pain coping, but that neither of them by themselves paint a complete picture. The operant model shows that couple interactions can contribute to reinforce certain patterns of pain behavior, but does not include communicative aspects of pain behavior and cognitive factors such as intention or meaning. The communal coping model focuses on one very specific aspect of pain coping, but does in turn expand the understanding of pain coping and pain behaviors to include interpersonally directed intentions in individual coping efforts. The interpersonal process model shows that interactions in pain couples might have other functions than to directly manage pain, but that these interactions might indirectly affect pain coping. Through its understanding of invalidating responses, it functions as a corrective to the operant model and thus explains the findings that the operant framework has left unexplained. A dyadic approach might integrate several of the other approaches. The intimacy processes of disclosures and empathy described by the interpersonal process model and the interpersonal focus of the communal coping model fit well with the understanding of coping as a dyadic process. The operant model, on the other hand, has a more mechanic understanding of couple interactions in which stimuli in the patient leads to responses from the partner; which in turn reinforces or punishes the preceding stimuli. This is not in line with a dyadic emphasis on negotiation of meaning.

Limitations. Much of the literature presented in this review is cross-sectional and correlational, which makes it difficult to draw causal conclusions and determine directionality. Furthermore, not all studies include data reported by partners themselves. Some examine patient perceptions about their partners, while others are based on observations made by clinicians. These are all methodological aspects that could influence the results, and calls for caution in the interpretation and generalization of the presented findings. Finally, most of the literature is based on samples of married, heterosexual couples, and the results are therefore not necessarily generalizable to different kinds of dyads.

4. Conclusion

Intercouple interactions might influence pain coping in a number of ways. In some cases, partner responses can reinforce or punish pain behavior in the patient. In other cases, partner responses can validate or invalidate the patient's experiences and thus influence emotion regulation processes. Couple interactions can also influence a patient's choice of coping strategies and the effectiveness of specific coping strategies.

Four different approaches to couple interactions in pain coping have been presented. Each of these approaches find some support in the research literature, yet none of them can explain the full range of couple interactions. We argue that the different approaches are complementary and that several of the approaches can be integrated in a dyadic understanding of pain coping. All the models indicate that couple interactions can affect outcomes associated with pain coping and that this should be taken into account when developing treatment programs for chronic pain patients. One way of doing this is could be to include the partner in the treatment process. Several successful examples have demonstrated the effectiveness of such approaches for patients' pain coping [43-45], which again emphasizes the significance of intercouple interactions for pain coping, and the potential it has for improving patient outcome.

Ethical issues

The study is a review of already published studies, and no ethical approval was therefore deemed necessary to obtain.

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