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Social Anxiety, Pain Catastrophizing and Return-To-Work Self-Efficacy in chronic pain: a cross-sectional study

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HIGHLIGHTS

- Return to work after pain-related sick-leave includes social interaction.
- Social anxiety in chronic pain might hinder the interpersonal aspects of return-to-work.
- Social anxiety predicts perceived ability to communicate pain-related needs.
- Social anxiety could be important in the rehabilitation process in chronic pain.

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ABSTRACT

Background and aims: Returning to work after periods of sick-leave due to chronic pain problems, involve a number of situations of interpersonal nature (e.g. meeting supervisors/insurance companies to adapt work setting to present functional level, receive help from colleagues, express pain, etc.). Since chronic pain has shown co-morbidity with social anxiety, it is of interest to investigate restraining factors in return to work among chronic pain sufferers from a social perspective. Catastrophizing is identified in both pain and social anxiety as a mechanism that might fuel a continuous bias in how situations are perceived (threat) and by hindering the development of functional behavior strategies. The presence of social anxiety in chronic pain patients might be seen as a stressor that limits the individuals' ability to effectively communicate pain-related needs to colleagues, and/or employers and therefore act as a hindering factor in return-to-work. Hence, the overall aim of this study was to examine the relationship between social anxiety, pain catastrophizing, and perceived ability to communicate pain-related needs to the work environment in a clinical pain population.

Methods: The study employed a cross-sectional design and involved 247 individuals with chronic pain (82.3% women; M_{age} = 44 years). Measures included the Pain catastrophizing Scale, the Social Phobia Screening Questionnaire and the communication of pain-related needs-subscale of the Return-To-Work Self-efficacy Questionnaire. Analyzes were run to examine whether social anxiety moderated the relation between pain catastrophizing, and perceived ability to communicate pain-related needs while controlling for pain severity/interference and sick leave.

Results: Social anxiety and pain catastrophizing correlated positively with each other and negatively with perceived ability to communicate pain-related needs. No support was obtained for a moderating effect of social anxiety. However, social anxiety and pain interference were each significant predictors of the individual's confidence in being able to communicate pain-related needs to the work environment.

Conclusions: In the context of pain and work-related communication, symptoms of social anxiety was identified as being of similar importance to the outcome as pain interference, while pain severity was not associated with the individual's confidence in communicating one's pain-related needs.

Implications: The results implicate that fears relating to pain-related social situations at work might be central in the process of return-to-work and rehabilitation in chronic pain.

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With about one fifth of the European population reporting chronic pain [1,2], this results in considerable societal costs for sick leave, loss of work force and treatment interventions [3]. In Sweden, musculoskeletal pain constitutes a major cause for sick leave and early retirement [4]. Apart from pain-related functional limitations, individuals with persistent pain commonly report co-morbid emotional problems such as anxiety and depression [5]. Individuals with persistent pain commonly report co-morbid emotional problems such as anxiety and depression which creates an extra burden both for the suffering individual and for the society in terms of extra costs due to disability and treatment failures [5]. There is an urgent need to understand mechanisms involved in co-morbid pain and emotional disorders, and in particular obstacles for returning to work among individuals with these problems.

From a biopsychosocial perspective, both disability and return-to-work are explained by complex interactions among a variety of factors, including pain, physical and emotional impairments, and social disability [6–8]. Not only do such factors contribute to the aetiology of pain, but they also have reciprocal effects on one another that may worsen and perpetuate each other and the intensity and duration of disability [6,9]. The biopsychosocial model of disability in pain has been criticized for its over-emphasis of the 'psycho'—part of the biopsychosocial theory and for under-emphasizing social aspects [10]. Since then, it has been noted that the area is now characterized by a growing emphasis on social factors within occupational disability [11].

One of the best empirically supported pain models describing the mechanisms in persistent musculoskeletal pain is the Fear-Avoidance model (FA) [12,13]. According to the FA model, pain catastrophizing leading to pain-related fear and avoidance is a key-concept in the maintenance of pain. *Pain catastrophizing*, in terms of negative cognitive distortions regarding the meaning of pain and its consequences, are known to predict disability, pain and illness behaviour over time [14,15]. Lately it has been suggested that catastrophizing represents a behavior pattern of repetitive negative thinking [16], working as a maintaining factor with the function to down regulate unpleasant inner experiences. Such patterns may be described, not just in pain but also in several emotional disorders such as in anxiety (worry) and in depression (rumination) [17].

An anxiety disorder that has shown co-morbidity with chronic pain is *social anxiety disorder* with the central fear of being negatively evaluated by others in social situations [18]. Social triggers are described to activate a threat response in terms of physiological and emotional arousal, increases self-focused attention and catastrophic assumptions which commonly leads to escape- and avoidance-behaviors of overt social situations [19]. Since many situations that people with prolonged pain are involved in, are of interpersonal character (e.g. ask for/receive help due to functional limitations, communicate pain), it is motivated to examine social anxiety in chronic pain patients in the context of return to work and prolonged sick-leave. Catastrophizing and overt avoidance seem to be central components to both conditions.

In contrast to catastrophizing, a buffering factor associated with return to work and sick leave in chronic pain, is an individual's self-efficacy [20]. Self-efficacy is a concept characterized by an active involvement by the individual and an overarching belief that one has the ability to control the situation. High levels of self-efficacy are associated with higher functional level among chronic pain patients [21]. A specific aspect of self-efficacy is termed *return-to-work-self-efficacy*, which refers to an individual's confidence in his/her ability to meet work-demands, adapt work-tasks to pain and to communicate pain-related needs. Low levels of return-to-work-self-efficacy have been linked to increased risk of prolonged sick-leave [22]. Difficulties in communicating ones needs are typical also in social anxiety since this behavior usually activates catastrophic thinking regarding social expectations from others. In chronic pain patients, with high levels of pain catastrophizing and symptoms of social anxiety, the summarized effect of these factors might limit the individual's ability to effectively communicate pain-related needs to a colleague, or employer, therefore hindering a functional work-setting. Over time, such obstacles could be risk-factors for prolonged sick-leave and failures of return-to-work among individuals with chronic pain.

Based on the knowledge in high comorbidity between emotional problems and chronic pain, and shared characteristics in terms of catastrophic thinking, this poses the question whether social anxiety might moderate the link between catastrophizing and perceived ability to communicate pain-related needs in a chronic pain population.

1. Aim

The current study sought to examine social anxiety in chronic pain by focusing on aspects of these concepts that from a theoretical point of view might constitute shared entities. By focusing on catastrophizing and self-efficacy related to one's ability to communicate pain-related needs, two factors central to both pain and social anxiety were examined in the analyzes. In addition the study examined if social anxiety could moderate the association between pain catastrophizing and self-efficacy regarding the communication of pain-related needs.

2. Methods

2.1. Design

The current study is a cross-sectional study conducted as a survey among patients at a pain clinic.

2.2. Participants and setting

The study is based on self-selection. Respondents were 247 individuals with different forms of chronic pain, such as musculoskeletal pain (back, neck), generalized pain (e.g. fibromyalgia), neuropathic pain, specific pain (orofacial pain, genital pain), referred to a pain clinic in Sweden. .195 (82.3%) were women. Participants were 20–64 years old ($M = 44.4$). About half of the sample (50%) had a college-education and 28% had a university-degree which is fairly representative for the Swedish population (45% college-education, 34% university degree), [23]. The study is part of the Social-Anxiety-Pain (SAP) project at Örebro University. The SAP project is run in collaboration with Uppsala Pain Clinic, which is connected, to the National Register for Pain Rehabilitation (NRS) [24]. The NRS collects and analyses data from different pain rehabilitation centers in Sweden in order enable systematic quality assurance of the specialist care for complex chronic pain. The NRS is also used for research. The SAP project started in 2011 with the aim of examining comorbidity between chronic pain and social anxiety. The Uppsala pain clinic receives about 1000 referrals per year, but far from all of them enter the treatment program that was the starting point for the current study. Approximately 400 patients receive treatment interventions each year at the clinic and were invited to participate in the current study during the period when data was collected (2011-2012).

2.3. Measures

The current study includes data on social anxiety, pain catastrophizing, return-to-work-self-efficacy, pain severity, pain interference, and sick- leave. From the NRS the measures of pain-catastrophizing, pain-severity and pain-interference were used.

The remaining measures were collected within the SAP project. Data on sick-leave was collected through the patients medical journal as current sick-leave and at what percentage. Swedish versions for all scales were used.

2.3.1. Social anxiety

Social anxiety was measured with the Social Phobia Screening Questionnaire (SPSQ) [25]. In the current study, we only used the first part, which contains 14 questions about distress in different social situations (e.g. speaking or performing in front of a group of people, and expressing opinions in front of others). The participants rated themselves on a five-point scale with the response options: *No distress* (0) to *severe distress* (4). In a validation study using a diagnostic interview as a reference, the sensitivity of the SPSQ was found to be 100% and the specificity 95%. Lastly, this 14-item distress scale has been found to correlate highly with two well-established measures of social anxiety, the Social Phobia Scale, $r = 0.77$, and the Social Interaction Anxiety scale, $r = 0.79$ [25,26], which indicates an adequate concurrent validity for this scale. Norm data for the social distress scale is M = 20.7 (SD = 8.9) for the general population [25] and M = 30.4 (SD = 8.7) for a clinical sample with social anxiety [27]. The social distress scale has been shown to have good internal consistency ($\alpha = .90$). The Cronbach's alpha for this scale was in the current study .93.

2.3.2. Pain catastrophizing

Pain catastrophizing was measured with the Pain Catastrophizing Scale (PCS) [28], which is a 13-item self-inventory measuring pain-related catastrophizing. The instrument includes 3 subscales; helplessness ("*When Iḿ in pain, I constantly worry that the pain will not recover*"), magnification ("*When Iḿ in pain, I worry that there is something seriously wrong with me*") and rumination ("*When Iḿ in pain, I canḱ stop thinking about the pain*"). The participants rated on a 5-point scale to what degree they have these thoughts when in pain (0 = not at all, 4 = all the time). Norm data for the pain catastrophizing scale is 20.9 (SD = 12.50) for a clinical sample back pain patients [29]. The scale has shown good reliability [28,30,31], and good internal consistency ($\alpha = .87$) [28]. In the present study Cronbach alpha was .93.

2.3.3. Return-To-Work-Self-Efficacy

Return-To-Work-Self-Efficacy was measured with the Return-to-work-self-efficacy questionnaire (RTWSE-19) [22], which is a 19-item self-inventory that measures an individuals confidence in being able to return to normal working conditions after an episode of pain. The participants rated themselves on an 11-point scale with the response options ranging from 0 (not convinced at all) to 10 (completely convinced). In a factor analysis by Shaw et al. [22], the scale was shown to include three sub-scales; ability to face work demands, ability to adapt work tasks, and ability to communicate needs to employer and co-workers. In the present study, a chosen focus was on those aspects of return-to-work self-efficacy that might be affected by the presence of social anxiety, i.e. fears related to the social situation and being judged in a social context. Therefore, only the sub-scale on communication of pain-related needs was used. This part includes 7 items on how the individual grade his/her ability express and communicate pain and pain-related needs to his/her working environment (e.g. describing pain treatments to a supervisor, discussing factors that contribute to pain with a supervisor. explaining limitations to co-workers). A Swedish translation of the RTWSE scale was used which was validated within a large prevention trial conducted by our research group [32]. Prior to the start of this trial the questionnaire was translated by a person proficient in English and Swedish and thereafter back translated to ensure commensurability. Cronbach alpha for the communication sub-scale is reported to .81 [22] and was somewhat higher in the current study (.93).

2.3.4. Pain severity and pain interference

The Multidimensional Pain Inventory, (MPI) [33], was designed to measure chronic pain and its consequences from different perspectives. In the present study items included in two of the five subscales in part 1 were used. These were 2 items on *pain severity* (e.g. "*how much pain do you have right now?*") and 11 items on *pain interference* (e.g. "To *what degree are your daily activities affected by pain?*"). The participants graded each item on a 6-point scale ranging from 1 (not at all) to 6 (extremely high). These subscales have been shown to be both valid and reliable [34,35]. They have been shown to have good internal consistency (pain severity $\alpha = .80$; interference $\alpha = .86$). In the current study the Cronbach alpha was for pain severity 0.84 and for interference .87.

2.4. Procedure

All patients registered at a NRS-associated clinic are routinely asked to fill in the NRS-questionnaire. On the first appointment to the Uppsala Pain Clinic each patient received written information about the study and was asked to fill in both the NRS and the additional data for the SAP project. For those who choose to participate, an informed consent was written. All participants were volunteers.

2.5. Ethical issues

The SAP project was approved by the Regional Ethical Committee in Uppsala.

2.6. Statistical analysis

The Statistical Package for Social Sciences, SPSS 20.0 for Windows was used for all statistical analyses (SPSS Inc., Chicago, IL). In a first step of the analyses descriptive data for pain catastrophizing, social anxiety, ability to communicate pain-related needs (RTWSE), pain severity, pain interference, and data on sick leave was reported. Pearson's r was conducted to investigate relations between variables of interest. To investigate the moderating effect of social anxiety to the relation between pain catastrophizing and RTWSE the PROCESS tool developed by Andres F. Hayes [36], implemented in SPSS was used. Before the regression based approach was run, the data was checked for multicollinearity between the five predictors pain catastrophizing, social anxiety, pain severity, pain interference, and data on sick-leave by using Pearson's r. The inter-correlations should in this case not be above .80 or .90 [36]. The analyzes were controlled for pain severity, pain interference and data on sick leave. The PROCESS tool was used to center the outcome, the predictors and the moderator, create the interaction variable (social anxiety × pain catastrophizing) and to conduct simple slopes analysis in case of a significant interaction effect.

3. Results

Descriptive data for pain catastrophizing, social anxiety, RTWSE, pain severity, pain interference, and data on sick-leave are presented in Table 1. The n differs somewhat for the separate subscales due to missing data, which was greater for the RTWSE-subscale and smaller for pain severity. The data are in line with cut-offs on the PCS in clinical samples (PCS = 24) [30]. People in the current study reported lower social anxiety in comparison to clinical levels in a general population (M = 20.7, SD = 8.9) [25]. Mean scores of the communication subscale of RTWSE were somewhat lower than what has been reported for acute pain samples (M = 7.0) [24]. Around 24% of the total sample was on 100% sick leave.

Table 1
Descriptive statistics (N = 247).

Variables	Women		Men		Total	
	M(SD)	n	M(SD)	n	M(SD)	N
Pain Catastrophizing (0–52)	22.83(10.80)	189	25.44(14.68)	41	23.29(11.59)	230
Social Anxiety (0–56)	14.78(11.78)	189	12.83(12.11)	42	14.43(11.84)	231
RTWSE* (0–70)	42.22(18.46)	178	38.69(19.45)	36	41.63(18.63)	214
Pain Severity (1–6)	4.15(0.91)	190	4.16(1.16)	44	4.15(0.96)	234
Pain Interference (1–6)	4.43(0.93)	186	4.51(0.98)	44	4.44(0.94)	230
Sick-leave 100%						
Yes (*n*, %)	46(25.1)		16(39)		62(27.7)	
No (*n*, %)	137(74.9)		25(61)		162(72.3)	

* RTWSE = The Return-to-work self-efficacy questionnaire subscale: ability to communicate pain-related needs

Table 2
Correlations between Pain Catastrophizing, Social Anxiety, RTWSE, Pain Severity, Pain Interference, and Data on Sick-leave.

	1	2	3	4	5	6
1. Pain Catastrophizing	–	–	–	–	–	–
2. Social Anxiety	.39** (*n* = 228)	–	–	–	–	–
3. RTWSE	−.25** (*n* = 213)	−.28** (*n* = 212)	–	–	–	–
4. Pain Severity	.23** (*n* = 219)	17** (*n* = 219)	−0.11(*n* = 204)	–	–	–
5. Pain Interference	.33** (*n* = 221)	.22** (*n* = 227)	−.26** (*n* = 209)	.44** (*n* = 225)	–	–
6. Sick-leave, 100% (Yes/No)	.16* (*n* = 224)	.12ns (*n* = 229)	−0.03ns (*n* = 210)	.16* (*n* = 227)	.28** (*n* = 228)	–

ns = non-significant; RTWSE = the Return-To-Work Self-Efficacy questionnaire subscale: ability to communicate pain-related needs.
* $p < 0.05$
** $p < 0.01$.

Table 3
Linear model of predictors of perceived ability to communicate pain-related needs.

Outcome variable	Model	*B*	SE B	*t*	95% CI for *B*	
					Lower bound	Upper bound
RTWSE	Constant	8.50	1.01	8.45**	6.52	10.48
	Catastrophizing	−0.31	0.24	−1.26	−0.79	0.18
	Social Anxiety	−0.69	0.29	−2.36*	−1.26	−0.11
	Interaction (SA × Cat)	0.19	0.27	0.72	−0.34	0.73
	Pain Severity	0.12	0.23	0.53	−0.33	0.57
	Pain Interference	−0.71	0.22	−3.26**	−1.14	−0.28
	Sick-leave	0.26	0.46	0.56	−0.65	1.16

RTWSE = The Return-To-Work Self-Efficacy questionnaire subscale: ability to communicate pain-related needs; SA = Social anxiety; Cat = Catastrophizing; R^2 for the Model = .16.
* $p < .05$
** $p < .01$
*** $p < .001$.

Apart from the association between pain severity and pain interference, the strongest correlation was found between pain catastrophizing and social anxiety, showing a medium positive correlation (see Table 2). The pain-related measures showed positive correlations with pain catastrophizing (medium) and social anxiety (weak) and were negatively correlated with perceived ability to communicate pain-related needs (weak). In addition, social anxiety and pain catastrophizing were also negatively correlated with perceived ability to communicate pain-related needs (weak).

The overall predictive model was significant [$F(6, 183) = 5.18$, $p < .0001$]. When controlling for *pain severity, pain interference and sick leave* no support was obtained for a moderating effect of social anxiety (see Table 3). However, social anxiety and pain interference were both significant predictors. The model explained 16% of the variance in return to work perceived ability to communicate pain-related needs.

4. Discussion

The current study examined pain catastrophizing, social anxiety and communication aspects of return to work self-efficacy in individuals with chronic pain, and the associations between these factors. All factors except sick leave were moderately/weakly correlated with the outcome. The explorative model explained 16% of the variance in perceived ability to communicate pain-related needs. An interesting finding was that symptoms of social anxiety was identified as a unique predictor of higher importance than pain severity and of similar importance as pain interference for the outcome of perceived ability to communicate pain-related needs. Further, the descriptive data of the current sample was in line with previous studies on pain catastrophizing [29]. However, social anxiety did not moderate the relation between pain catastrophizing and the perceived ability to communicate pain-related needs as expected. The model might have gained by including a more generic measure of catastrophizing. By defining catastrophizing as a pattern of repetitive negative thinking, the concept might become less sensitive for specific content. This is further commented on later on.

That social anxiety predicted lower degree of perceived ability to communicate pain-related needs is interesting since there is little understanding of what implications social anxiety might have for individuals with chronic pain (e.g. [37], for a review). However, since the present data is limited to a cross-sectional setting causality cannot be inferred. Among pain patients with symptoms of social anxiety, expressing pain-related needs may be seen as an increased risk of being negatively evaluated by others. This might

result in the patient trying to 'hide' her pain in order to try to influence the social evaluation in a positive way and the person thereby becomes less effective in communicating needs. On the other hand, according to the Communal Coping Model of Pain Catastrophizing, it is also possible to view pain behaviors (communicating pain) as a safety behavior that partly relieves distress and social demands and increases social support [38]. However, the current results could not be used to validate the Communal Coping Model. Since social anxiety negatively correlated with an individual's confidence in communicating pain-related needs, this merely indicates that the present results do not support the latter model but could be in favor of the former.

The present sample (*chronic* pain patients) reported lower scores on the outcome variable of perceived ability to communicate pain-related needs, in comparison to a clinical sample of individuals with *acute* work-related pain [22]. This might imply that an individual's belief in her ability to communicate pain may lower as time goes on. This tendency with decreased self-efficacy among certain groups of pain patients has been described by others in terms of lowered expectations of recovery in the course of pain [39].

The present results are in line with previous research on the comorbidity between chronic pain and social anxiety disorder [37]. Yet, the mean of social anxiety in the current sample is lower when compared to social anxiety in a clinical sample before treatment [25]. One explanation could be that the sample was self-selected and not randomly selected. However, taking into account that there was a large dispersion around the mean of social anxiety this seems to illustrate a heterogeneous sample characteristic on this variable that might be due to a small subgroup of people with high levels on social anxiety.

Pain interference was associated with lower confidence in one's ability to communicate pain-related needs. When pain is judged as a major limitation, it seems plausible that the individual perceive his/her ability to communicate pain-related needs lower than what is the case at higher functional levels. In addition, since pain interference is closely associated with pain catastrophizing, it might be assumed that a cognitive pattern in terms of a negative interpretation bias might influence both the individuals' perception of the degree to which pain interferes with his/her functional level and with his/her confidence in communicating pain-related needs.

The level of pain catastrophizing was associated with increased pain interference and pain intensity, which is commonly reported ([14,28,42]). That pain catastrophizing was positively correlated with social anxiety, was not surprising either. Catastrophizing, rumination and worry might be described as different variants of coping with emotional distress where a behavior characterized by cognitive over-engagement in the perceived threat is used to regulate aversive emotional experiences. Such a behavior is reinforced in terms of operant learning since the threat is dealt with by the cognitive over-occupation of the specific content (e.g. pain). However, it has several drawbacks. First, it is a time-consuming strategy that negatively impacts on all other areas of the individuals' life. Secondly, the fears are repeatedly activated in the brain in several aspects (semantically, emotionally) and the strategy of regulating/decreasing them therefore logically will fail in the long run. This perspective on catastrophizing is in line with findings showing that the behavior of repetitive negative thinking is associated with less optimal emotional processing and problem solving and therefore maintenance of clinical conditions e.g. fear (of both pain and social threat) [40]. In the context of chronic pain and in the process of return-to work, an abstract mode of self-focus, might result in the person becoming worse in generating concrete ideas for solutions to a problem. In such terms catastrophizing seriously threatens problem solving and thereby the individuals ability to adequately address the problem of pain [40].

In sum, the model explained part of the variance in perceived ability to communicate pain-related needs, but additional factors/mechanisms seem to be central to the outcome. Previous studies on return to work have proposed integrative biopsychosocial models including several components such as an individual's capacity for problem solving, creativity, and attachment to friends and family [20].

4.1. Limitations

A number of methodological limitations ought to be considered. The study was solely based on cross-sectional data and causal inferences regarding the role of specific factors for return to work self-efficacy cannot be drawn. In addition, the participants were self-selected and data on non-responders is missing, the representativeness of the sample is highly uncertain and continued studies using randomization are needed.

The only method used for data collection was self-assessment. It is possible that additional strategies (e.g. interviews) might have resulted in nuanced information regarding the difficulties experienced by the patients. However, when examining social difficulties, direct interactions between the participant and an interviewer might be biased in terms of the patients' sensitivity regarding how one might be judged by others. The answers may therefore simply mirror his/her opinion how to respond to others expectations [41]. Catastrophizing was only measured related to pain and not to social situations, which may have resulted in a different pattern than the one obtained here. Finally, one has to keep in mind that confidence in oneś ability to communicate is not the same thing as actual ability, and ability to communicate pain-related needs to oneś working environment does not guarantee that return to work is actually successful. Lastly, sick leave was included as a control variable in the present analyses but was not associated with perceived ability to communicate pain-related needs. Sick leave was only measured as categorical variable including those on 100% sick leave. Hence, those on part-time sick leave were categorized as working, which may have resulted in a biased variable and the loss of variance between those on sick-leave and those who were not. However, the majority of individuals on sick leave had a level of 100% sick leave. Those on part-time sick leave commonly stated a working-level of 50% or more, which was assumed to indicate a functional level characterized by a different pattern than among those not working at all. This factor may also be moderated by the time period of sick leave, where longer periods might lower the individuals' return to work self-efficacy.

Despite these limitations, the current study has several strengths and adds knowledge within the fairly unstudied area of pain and social anxiety.

4.2. Conclusions and future needs

In the context of pain and return to work, symptoms of social anxiety seem to be a relevant aspect to bear in mind. While the main goal in most rehabilitation programs continues to be focused on pain relief and functional pain coping strategies, less interest has been given to the interplay between the chronic pain sufferer and his/her working environment in terms of ability to communicate pain-related needs. Data on social anxiety and the role of such symptoms for the development and maintenance of pain symptoms over time is still scarce and further studies using a prospective design is highly warranted. In order to match the functional needs of individuals at risk for long-term sick leave, it is of major importance to identify what interpersonal mechanisms operate the context of return-to-work.

Conflict of Interest

The authors declare that they have no conflict of interest.

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