

Cognitive Distortion and Depression in Chronic Pain: Association With Diagnosed Disorders

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Previous studies have demonstrated that cognitive distortion is associated with increased levels of self-reported depression among chronic pain patients, suggesting that cognitive models of depression might be useful in this context. However, reliance on self-reports of depression hampers generalization of these results to clinically significant depressive disorders. To address this problem, we examined the association between depression diagnosed according to the *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition, Revised (*DSM-III-R*; American Psychiatric Association, 1987) (i.e., major depression and dysthymia) and scores on the Cognitive Errors Questionnaire (CEQ). Depressed chronic pain patients and depressed nonpain patients reported more cognitive distortion than did nondepressed pain patients and normal controls. These results support the relevance of cognitive theory in the explication of clinically significant depression among chronic pain patients.

Chronic pain is often accompanied by depression. Although some inconsistencies have appeared in the literature, the evidence suggests at least a moderate association (Romano & Turner, 1985). Several explanations of this association have been offered in recent years, but the prevailing model suggests that depression arises in response to the stress of chronic pain. Recent prospective studies support this view (Brown, 1990; C. A. Smith & Wallston, 1992).

Despite the apparently robust association between chronic pain and depression, not all chronic pain patients become depressed. As a result vulnerability factors have been the focus of recent research. A variety of cognitive factors have been examined in this context (see Turk & Rudy, 1992, for a review), and Beck’s (1967) cognitive model has received much of this attention. Briefly, Beck’s model suggests that cognitive errors—the tendency to personalize, overgeneralize, catastrophize, and selectively abstract the implications of negative events—contribute to the development and maintenance of depression. Lefebvre (1981) found that, compared with nondepressed pain patients, depressed chronic pain patients reported higher levels of cognitive distortion. Similar results have been obtained with chronic low-back-pain patients (Smith, Aberger, Follick, & Ahern, 1986) and rheumatoid arthritis (RA) patients (Smith, Peck, Milano, & Ward, 1988). Thus, negative construal of the severity, implications, and course of their pain problem, as well as more generalized cognitive distortion, is associated with greater levels of depression among chronic pain patients.

To date these studies have relied almost exclusively on self-report measures of depression. As a result they are limited in at

least two important respects. First, scores on these inventories may reflect levels of dysphoric mood or variations on personality traits within a nonpathological range, rather than the presence of a clinically significant mood disorder (Kendall, Hollon, Beck, Hammen, & Ingram, 1987). As a result it is possible that these findings will not generalize to patients with diagnosable depressive disorders (cf. Haaga, Dyck, & Ernst, 1991). Second, the use of self-report inventories to assess both depression and cognitive errors creates the possibility that common method variance contributes to, if not accounts for, the observed associations (e.g., Sullivan & D’Eon, 1990). Although Smith et al. (1988) found similar results using self-reports and interview ratings of depression, diagnoses of depressive disorders were not included in their analyses.

To address these limitations, we examined levels of cognitive distortion in patients with depressive conditions diagnosed through structured interviews and with appropriate controls. Four groups were compared: depressed pain patients, nondepressed pain patients, depressed nonpain patients, and nondepressed nonpain controls.

Method

Subjects and Selection Procedures

A total of 63 subjects participated in the study. Chronic pain was defined as pain of at least 6 months’ duration (mean = 95 months) that could not be attributed to an underlying disease process (e.g., cancer, arthritis, etc.). Chronic pain subjects suffered from a variety of conditions, chiefly low back pain. They were recruited from a university medical center pain clinic, a university medical center family practice clinic, and two community hospital low-back-pain clinics.

Patients were classified as depressed if they met *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition, Revised (*DSM-III-R*; American Psychiatric Association, 1987) criteria for major depression or dysthymia. Subjects were excluded if they evidenced a primary thought disorder, bipolar disorder, or organic brain syndrome. Depressed nonpain patients were recruited from a university medical center mood disorders clinic and two private psychiatric practices. Non-

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pain, nondepressed controls were recruited from a university medical center family practice clinic and personnel department. None of the subjects were suffering from a chronic illness (e.g., cancer, heart disease, etc.). All subjects were paid \$10 for their participation.

Through this selection and classification procedure, four groups were formed: chronic pain, depressed patients (CP-depressed, $n = 17$); chronic pain, nondepressed patients (CP-nondepressed, $n = 12$); depressed nonpain patients ($n = 15$); and nondepressed nonpain patients ($n = 19$). Preliminary analyses revealed no significant group differences on demographic variables: The average age was 37.4 yr, 65% of subjects were female, the average years of education was 14.0, 60.5% were employed, and 58.5% were married.

Materials and Procedures

Subjects completed a packet of questionnaires, which included a form for demographic information and the primary measures. The Cognitive Errors Questionnaire (CEQ; Lefebvre, 1981) consists of 48 separate vignettes, each followed by one of four types of illogical or distorted inference (i.e., catastrophizing, overgeneralization, personalization, and selective abstraction). Half of the CEQ items refer to events involving low back pain (e.g., "You have a painful back problem, but have continued to work. Although you got quite a bit done today, you quit work a little early because your back was really hurting. You think to yourself, 'what a terrible day; it seems like I can't get anything done.'"). The remaining items are unrelated to pain. Subjects are asked to indicate on a 5-point scale the extent to which the thought listed resembles the thought they would have had in the same situation. The CEQ generates two total distortion scores, one for general and one for pain-related cognitive distortion. The version of the CEQ used in this study changed the original references to low back pain to unspecified pain problems. The internal consistency of this general pain form of the CEQ was high; Chronbach's α was 0.96 for pain-related distortion and 0.94 for general distortion.

Subjects also completed the Center for Epidemiological Studies Depression scale (CESD; Radloff, 1977) and the Sickness Impact Profile (SIP; Bergner, Bobbitt, Carter, & Gilson, 1981). The CESD has been found to have high levels of internal consistency and construct validity in several populations (e.g., Radloff, 1977), including patients with chronic pain (Blalock, DeVellis, Brown, & Wallston, 1989). The SIP assesses disability along several dimensions, including physical impairment (i.e., ambulation and mobility) and psychosocial functioning (i.e., emotional behavior and social interaction). Previous research has demonstrated the reliability and validity of this measure in many medical illness groups (Bergner et al., 1981).

On completion of the questionnaires, subjects underwent the Schedule for Affective Disorders and Schizophrenia (SADS) semistructured diagnostic interview (Endicott & Spitzer, 1978). The present study utilized the version that reviews symptoms that may have occurred during the past year. The opening questions of the interview identified any chronic pain symptoms and their duration, as well as depressive symptoms. Interviewers were trained by learning the SADS protocol, listening to taped SADS interviews, observing live interviews with patients, interviewing trainers playing the role of patients, and receiving feedback on actual interviews.

Although the interview schedule was designed to be used in conjunction with Research Diagnostic Criteria, subjects' responses to the SADS questions were coded so as to use *DSM-III-R* criteria. On the basis of their responses, subjects were classified as depressed (i.e., as having major depression or dysthymia) or not and as having chronic pain or not.

To evaluate the reliability of the classification procedure, 24 tape-recorded interviews (6 from each group), were audited by a second, blind rater. Interrater agreement was 95%. Of the 17 pain patients classified as depressed, 14 received a diagnosis of major depression and

three received a diagnosis of dysthymia. Corresponding figures for the nonpain group were 13 major depressives and 2 dysthymics.

Results

Validity of Grouping Variables

To evaluate the validity of the chronic pain classification, the two pain groups were compared with the nonpain groups on the SIP physical disability dimension.¹ As in each instance of a priori, directional predictions, this hypothesis was tested through a single degree-of-freedom contrast (Keppel, 1973). As presented in Table 1, the two chronic pain groups reported more physical disability than did the nonpain groups, with contrast $F(1, 59) = 8.5, p < .01$; remainder $F < 1.0$. The mean values suggest that the chronic pain patients were at least moderately disabled (Bergner et al., 1981). To evaluate the validity of the depression classification, the two depressed groups were compared with the nondepressed groups on the CESD. The two diagnosed depression groups reported significantly greater depression, with contrast $F(1, 57) = 100.7, p < .001$; remainder $F(2, 57) = 1.5, p > .1$. Mean values support the interpretation that the depressed patients were experiencing a clinically significant condition (Radloff, 1977). As an additional test of the depression classification, depressed and nondepressed groups were compared on the SIP psychosocial functioning scale. Depressed patients reported greater psychosocial impairment than did their nondepressed counterparts, with contrast $F(1, 59) = 50.6, p < .001$. Again, this level of disability is moderate to high (Bergner et al., 1981). As might be expected, nondepressed chronic pain patients reported an intermediate level of psychosocial disability, with remainder $F(2, 59) = 3.5, p < .04$.

Cognitive Distortion

As predicted and depicted in Figure 1, depressed subjects reported more cognitive distortion in general nonpain situations than did nondepressed subjects, with contrast $F(1, 59) = 18.7, p < .001$. Further, among depressed subjects, the nonpain group reported more general distortion than did the chronic pain group, $F(1, 59) = 6.46, p < .02$. No other group differences were significant; with remainder $F(1, 59) < 1.0$. For pain-related distortion, the two depressed groups displayed more cognitive errors than did nondepressed groups, with contrast $F(1, 59) = 31.6, p < .001$. The two depressed groups did not differ from each other, $F(1, 59) < 1.0$, and no other group differences were significant, with remainder $F(1, 59) < 1.0$.

Discussion

Overall, these results suggest that cognitive distortion is associated with interview-assessed, clinically significant depression in chronic pain. This conclusion is strengthened by the significant, independent checks on the classification of both chronic pain and depression. Thus, previous evidence of an association between self-reports of depression and cognitive distortion (Le-

¹ Differences in degrees of freedom reflect missing or incomplete data. Two nonpain nondepressed subjects did not complete the CESD.

Table 1
Levels of Disability and Depression

Dependent measure	Group							
	Chronic pain depressed		Chronic pain nondepressed		Depressed nonpain		Nonpain	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Disability								
SIP physical	7.1	7.9	8.4	14.2	3.4	5.0	0.3	0.6
SIP psychosocial	24.1	11.2	11.4	10.7	30.6	16.3	1.9	2.9
Depression								
CESD	28.5	8.4	9.6	7.2	28.9	11.5	4.1	3.6

Note. SIP = Sickness Impact Profile; CESD = Center for Epidemiological Studies Depression scale.

febre, 1981; Smith et al., 1986, 1988) is not limited to subclinical variations in dysphoria or personality, nor can it be dismissed as simply reflecting method variance common to self-reports of depression and dysfunctional thinking.

Interestingly, depressed chronic pain subjects were characterized by high levels of cognitive distortion in pain-related situations and less pronounced distortion in nonpain situations. In contrast, depressed nonpain subjects displayed equally high levels of distortion in both types of situations. This suggests some situational specificity to the cognitive characteristics of depressed chronic pain patients that is not apparent in typical depressed persons. The tendency of depressed nonpain patients to generalize their distorted thinking to a hypothetical situation (i.e., if they had a pain problem) is consistent with the cognitive model of depression (Beck, 1967). From this perspective, the cognitive specificity of the depressed pain patients is somewhat unusual. The equivalent CESD scores for these two groups suggests that the cognitive specificity is not due to the relative severity of depressive symptoms. It is possible that this pattern reflects depressed pain patients' tendency to view the pain problem as the cause of their more general difficulties, a common feature of many pain patients' construal of their condition (Turk & Rudy, 1992).

Several important methodological considerations require qualification of the present findings. For example, other self-report measures of dysfunctional thinking in chronic pain have been criticized as reflecting symptoms of depression rather than its correlates or causes (Sullivan & D'Eon, 1990). However, the format and item content of the CEQ is sufficiently distinct relative to depressive symptoms, that this problematic discriminant validity is not compelling as an alternative explanation of the present results (cf. Haaga, 1992). Nonetheless, the use of information-processing measures of cognitive distortion that do not employ self-reports of dysphoric thoughts would provide a more compelling test of the cognitive model of depression in chronic pain (Ingram & Kendall, 1986).

The cross-sectional, correlational design of the present study precludes causal interpretations. However, some studies of chronic pain suggest that initial levels of dysfunctional thinking are associated with subsequent changes in depression (e.g., Keefe, Brown, Wallston, & Caldwell, 1989; C. A. Smith & Wallston, 1992; T. W. Smith, Christensen, Peck, & Ward, 1993) and other indices of the impact of chronic pain (Gil, Abrams, Phillips, & Williams, 1992). In any case the fact that cognitive distortion is associated with clinically significant levels of depression among pain patients suggests that this model of the

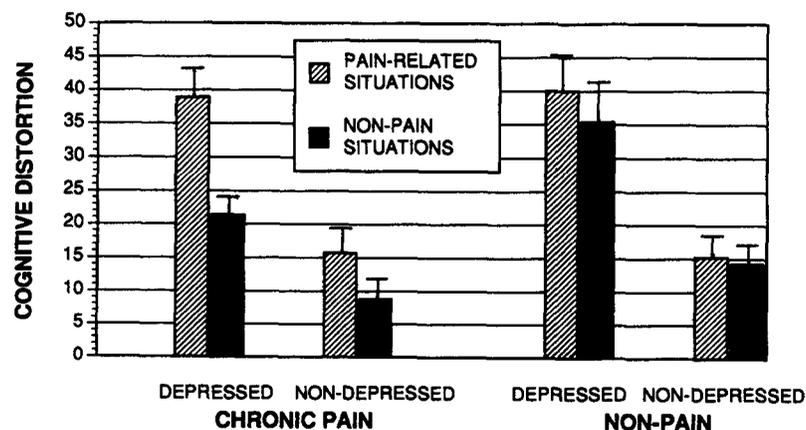


Figure 1. Means (and standard errors) for levels of cognitive distortion in pain and general situations among depressed and nondepressed and pain and nonpain groups.

origin and treatment of depression warrants further research. The results of such studies may help to explain the development of depression in response to chronically painful conditions and guide its treatment.

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