Relation Between Catastrophizing and Depression in Chronic Pain Patients

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The relation between catastrophizing, depression, and pain was examined in 125 chronic pain patients. The Coping Strategies Questionnaire (CSQ; Rosenstiel & Keefe, 1983) assessed patients' use of cognitive and behavioral strategies to cope with chronic pain. A significant association between catastrophizing and depression was found. In order to address questions of measurement redundancy, 6 clinical psychologists rated the degree to which items on the CSQ reflected depressive symptomatology. All items contained in the Catastrophizing subscale were rated by all psychologists as being reflective of symptoms of depression and were removed from the CSQ. When this subscale was excluded, none of the remaining CSQ subscales were significantly related to depression. The discussion addresses the interpretive difficulties that arise from hypothesizing mediating relations between variables that are conceptually and operationally confounded.

Catastrophizing is a cognitive process characterized by a lack of confidence and control and an expectation of negative outcomes (Chaves & Brown, 1978, 1987; Spanos, Radtke-Bodorik, Ferguson, & Jones, 1979). Recently, catastrophizing has been invoked as an explanatory construct for variations in pain and depression in chronic pain patients (Keefe, Brown, Wallston, & Caldwell, 1989; Rosenstiel & Keefe, 1983). Catastrophizing is considered to be a maladaptive coping strategy that intensifies the experience of pain and depression (Keefe et al., 1989; Rosenstiel & Keefe, 1983).

The role of catastrophizing in the mediation of pain and depression in chronic pain patients has been examined primarily with the Coping Strategies Questionnaire (CSQ; Rosenstiel & Keefe, 1983). The CSQ contains several subscales designed to measure the different ways in which patients attempt to cope with chronic pain. Overall, research has been consistent in demonstrating that catastrophizing is positively correlated with depression but only weakly related to pain severity (Gross, 1986; Keefe et al., 1989; Keefe et al., 1987; Rosenstiel & Keefe, 1983; Turner & Clancy, 1986). Patients' use of adaptive coping strategies has not been associated reliably with reductions in levels of depression or pain severity (Gross, 1986; Keefe et al., 1987).

Linking coping and catastrophizing with pain and depression raises conceptual and methodological issues. At a conceptual level, subsuming catastrophizing within a coping framework is problematic. Generally, coping has been defined as the strategies persons use to minimize the impact of negative life events on their psychological well-being (Lazarus & Folkman, 1984; Pearlin & Schooler, 1978). It is not apparent how catastrophizing can mitigate against negative life events or stressors such as chronic pain. It is difficult to conceptualize catastrophizing as either strategic or goal-directed. Nor does catastrophizing appear to be the antithesis to coping, in that catastrophizing occurs in persons who also report positive coping strategies.

From a methodological perspective, interpretive difficulties arise when measurement instruments include items that are confounded with the variables they are intended to explain or predict. The items in the Catastrophizing subscale of the CSQ resemble the items contained in measures of depression. The question arises as to whether catastrophizing is a unique aspect of pain-related cognition or whether it is symptomatic of depression. Such measurement redundancy issues have been raised in previous research that has examined the relations among stressful life events, social support, and personality (Monroe & Steiner, 1986; Thoits, 1982), stressful life events and depression (Dohrenwend & Shrut, 1985), and chronic illness and depression (Devins & Seland, 1987; Turk & Rudy, 1986).

In this study the relation between specific coping strategies, as measured by the CSQ, and chronic pain patients' current levels of pain and depression, was examined. To assess measurement redundancy, unbiased experts rated CSQ items on how much they reflected symptoms of depression. The relation between the CSQ subscales and depression was reexamined after removing items that reflected depressive symptomatology.

Method

Subjects

One hundred twenty-five patients (54 men and 71 women) diagnosed with chronic low back (n = 101) or neck pain (n = 24) participated in the research. Patients' pain was defined as chronic if it exceeded 6-months duration and was refractory to medical intervention.
The mean duration of pain was 7.2 years ($SD = 8.1$), and the mean age of the sample was 43.4 years ($SD = 11.8$). Most patients had completed high school ($n = 105$), were married or living common-law ($n = 99$), and were unemployed ($n = 88$). There were no significant gender differences for depression, pain, or coping.

**Procedure**

The subject sample was drawn from all consecutive referrals to the outpatient chronic pain clinic of The Rehabilitation Centre, Ottawa, Ontario, Canada, between June 1987 and June 1988. All patients were interviewed and asked to complete questionnaires on depression, pain severity, and coping.

The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was used to measure depression. The sum of all adjectives endorsed on the McGill Pain Questionnaire (MPQ; Melzack, 1975) was used to measure pain severity. Subjects also reported how long they had been experiencing pain.

The subjects' use of pain-related coping strategies was assessed with the CSQ. This scale contains 42 items that described different ways of dealing with pain. Respondents rate the frequency with which they engage in various cognitive and behavioral activities on 7-point scales from never (0) to always (6). Summed responses to items form seven subscales of six items each: Diverting Attention, Reinterpreting Sensations, Ignoring Pain Sensations, Coping Self-Statements, Praying and Hoping, Catastrophizing, and Increasing Activity Level. Two further questions assess subjects' perceived ability to control and decrease pain.

To examine the extent to which items of the CSQ overlapped with depressive symptomatology, six clinical psychologists, who were unaware of the measurement redundancy hypothesis, rated CSQ items on how much they reflected depressive symptomatology. Ratings were made on 3-point scales labeled not at all (0), somewhat (1), and very reflective (2) of depressive symptomatology. Interrater reliability was high ($\phi = .94$). Items that were rated by all clinicians as somewhat or very reflective of depressive symptomatology were removed from the CSQ for some of the analyses reported later (see Raphael & Dohrenwend, 1987, for a similar procedure). This procedure eliminated all the items contained in the catastrophizing subscale: I feel my life isn't worth living, I worry all the time about whether it will end, I feel I can't go on, It's terrible and I feel it's never going to get any better, It's awful and I feel that it overwhelms me, and I feel I can't stand it anymore.1

**Results**

Table 1 presents mean ratings of depression, pain severity, and CSQ subscale responses. These data are consistent with previous reports about chronic pain patients (Keefe et al., 1987; Rosenstiel & Keefe, 1983; Turner & Clancy, 1986).2 Depression scores were distributed as follows: 26 patients were not depressed (BDI < 10), 48 were mildly depressed (BDI = 10–16), 30 were moderately depressed (BDI = 17–25), and 21 were severely depressed (BDI > 25). For the different levels of depression, the mean catastrophizing scores were 1.7, 2.0, 2.6, and 3.0, respectively, $F(3, 121) = 6.3, p < .001$.3

A hierarchical multiple regression was performed to determine whether subjects' scores on the CSQ subscales improved prediction of their depression scores beyond that afforded by age, gender, and current level of pain. Table 2 summarizes these results. Age and gender accounted for less than 1% of the variance in depression scores. Pain severity contributed significantly to the prediction of depression, but pain duration did not. In the final step of the analysis, the nine CSQ subscales were entered. Together, the CSQ subscales accounted for 16% of the variance in depression scores. Only the Catastrophizing subscale was significantly related to depression, for which increased catastrophizing was associated with increased depression.

The results of the regression analysis indicate that the relation between coping (as measured by the CSQ) and depression is accounted for primarily by the association between catastrophizing and depression. To control for measurement redundancy, a second regression analysis, which excluded the Catastrophizing subscale, was conducted. This analysis indicated that the CSQ subscales accounted for less than 3% of the variance in depression scores, when the catastrophizing subscale was removed.

To further explore the nature of the relation between catastrophizing and depression, separate scores were computed for the factorial subcomponents of the BDI (Beck, Steer, & Garbin,

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1 There were items from other subscales, such as Praying and Hoping and Diverting Attention, that were rated by some psychologists as reflective of depressive symptomatology. However, items were excluded only if all psychologists agreed that they were at least somewhat reflective of depressive symptomatology. This degree of consensus was obtained only for items on the Catastrophizing subscale.

2 Factor analysis of the Coping Strategies Questionnaire (CSQ) subscales yielded a two-factor structure comparable to that reported by Keefe et al. (1987). The first factor accounted for 43% of total variance and contained the following subscales: Coping Self-Statements, Diverting Attention, Ignoring Sensations, Reinterpreting Sensations, Praying and Hoping, and Increasing Behavior. The second factor accounted for 17% of total variance and contained the following subscales: Catastrophizing, Ability to Control Pain, Ability to Decrease Pain. Previous research with the CSQ has used factor scores to predict pain and depression. Our study differs from previous research in its focus on the relations among specific coping strategies, depression, and pain.

3 Pairwise multiple comparisons with the Newman-Keuls procedure revealed that except for the nondepressed and mildly depressed comparison, all comparisons were significant at $p < .05$. 

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Table 2
Regression Analysis for the Prediction of Depression

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>df</th>
<th>F ratio</th>
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<tr>
<td>Demographics</td>
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<tr>
<td>Age</td>
<td>.04</td>
<td></td>
<td>2,122</td>
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<tr>
<td>Gender</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>MPQ Pain Rating Index</td>
<td>.23*</td>
<td>.06</td>
<td>4,120</td>
<td>1.9</td>
</tr>
<tr>
<td>Years of pain</td>
<td>.03</td>
<td></td>
<td></td>
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<tr>
<td>CSQ subscales</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Diverting Attention</td>
<td>-.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinterpreting Sensations</td>
<td>-.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catastrophizing</td>
<td>.38**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignoring Sensations</td>
<td>-.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coping Self-Statements</td>
<td>-.18</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Praying and Hoping</td>
<td>-.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increasing Activity</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to Control Pain</td>
<td>-.04</td>
<td></td>
<td></td>
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<tr>
<td>Ability to Decrease Pain</td>
<td>-.10</td>
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</tbody>
</table>

Note. MPQ = McGill Pain Questionnaire; and CSQ = Coping Strategies Questionnaire. Residual scatterplots and normal probability plots did not reveal evidence of violated assumptions.

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

Discussion

These results parallel those of both clinical (Chaves & Brown, 1987; Gross, 1986; Keefe et al., 1987) and experimental (Spanos et al., 1979) pain research that indicate that catastrophizing cognitions are related to reports of increased pain and depression. Persons who reported frequent catastrophizing cognitions also reported high levels of depression. However, there was no significant relation between the use of adaptive coping strategies and level of depression. These findings are consistent with previous research that has examined the role of coping in mediating the negative impact of stressful life events. Several investigations have reported significant relations between what has been termed maladaptive coping and depression, but they have failed to find significant relations between adaptive coping and depression (Billings & Moos, 1981; Coyne, Aldwin, & Lazarus, 1981; Holahan & Moos, 1985).

Item content overlap, or measurement redundancy, may underlie the relation between catastrophizing and depression. The six clinical psychologists rated all the items of the Catastrophizing subscale as reflecting symptoms of depression. When the relation between the CSQ subscales and depression was reexamined, excluding the Catastrophizing subscale, the remaining CSQ subscales were not significantly related to depression. This suggests that catastrophizing indexes the cognitive and affective components of dysphoria rather than measuring distinct aspects of pain-related cognition. The pattern of corre-

Table 3
Correlations Among Catastrophizing and Subcomponents of Depression

<table>
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<th></th>
<th>1</th>
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<th>3</th>
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<tr>
<td>1. Catastrophizing</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>2. BDI-N</td>
<td>.51</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>3. BDI-P</td>
<td>.40</td>
<td>.69</td>
<td>—</td>
</tr>
<tr>
<td>4. BDI-S</td>
<td>.25</td>
<td>.49</td>
<td>.57</td>
</tr>
</tbody>
</table>

Note. BDI = Beck Depression Inventory; N = Negative Attitudes Toward the Self; P = Performance Impairment; and S = Somatic Disturbance. All correlations are based on a sample size of 125 and are significant at $p < .01$, two-tailed. The correlation between catastrophizing and the total BDI score was $r = .42, p < .001$.4 The zero-order correlation between pain intensity and catastrophizing was $r = .27, p < .01.$

1988; Tanaka & Huba, 1984). These included (a) negative attitudes toward the self, (b) performance impairment, and (c) somatic disturbance. Table 3 presents the zero-order correlations among catastrophizing and the subcomponents of depression. These data show that the correlations among catastrophizing and the first two subcomponents of the BDI exceed .40, which suggests that these three measures may be tapping the same construct. Catastrophizing was also significantly correlated with the somatic component of depression but to a lesser degree. When the cognitive component of depression (negative attitudes toward the self) was partialled out, the correlation between catastrophizing and the somatic component of the BDI ($r = .02$) was not significant.

A separate hierarchical multiple regression analysis was performed with subjects’ current level of pain intensity as the dependent variable. Age and gender were entered in the first step of the analysis, followed by the CSQ subscales. The CSQ subscales accounted for 12% of the variance in pain ratings, but the analysis did not attain statistical significance, $F(1,113) = 1.70, p < .08$. The beta weights revealed that the Catastrophizing subscale was the only CSQ subscale significantly related to pain ratings, for which increased catastrophizing was associated with higher pain ratings.4
lations between catastrophizing and the subcomponents of depression supports this interpretation.

The degree of conceptual and operational overlap between depression and catastrophizing limits the usefulness of catastrophizing as an explanatory construct for variations in pain and depression in chronic pain patients. Cognitive models of depression view negative cognitions as distinct from, but causally related to, symptoms of depression (Beck, 1976). Similarly, it has been suggested that avoiding catastrophic thinking may result in lower levels of emotional distress (Keefe et al., 1987; Rosenstiel & Keefe, 1983). However, exaggerated negative cognitions are also part of the diagnostic criteria for depression (American Psychiatric Association, 1987), and of self-report measures of depression (Beck et al., 1961). If catastrophizing is a cognitive manifestation of depression, then the study of catastrophizing is unlikely to shed light on the factors that mediate depression in chronic pain patients.

References


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