Development of the Coping Strategies Questionnaire 24, a Clinically Utilitarian Version of the Coping Strategies Questionnaire

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Objective: To use principal-components analysis to obtain a shorter and therefore more clinically useful version of the Coping Strategies Questionnaire (CSQ). Subjects: A British sample of 214 chronic back pain patients attending outpatient spinal assessment. Results: A 4-factor solution was discovered that incorporates Catastrophizing, Diversification, Cognitive Coping, and Reinterpreting factors. Apart from the absence of a Praying and Hoping factor, this solution is similar to those previously found by researchers in this field. Conclusions: The new questionnaire (the CSQ24) is a valid utilitarian version of the CSQ that is easy to score and is appropriate for clinical use.

In recent years, the effective management of chronic musculoskeletal pain, especially chronic low back pain (CLBP), has become a topical area of research. This is primarily because of a significant increase in the number of people seeking treatment for this condition (Clinical Standards Advisory Group, 1994) and a realization that the majority of common treatment options are unsuccessful (Barton, 2000; Clinical Standards Advisory Group, 1994; Evans & Richards, 1996). Specifically, the observation that physically and pathologically similar patients may react very differently to their condition has led to great interest in the cognitive and behavioral coping mechanisms such patients demonstrate. It was through the work of authors such as Lazarus and Folkman (1984) that the concept of psychological coping as a multidimensional construct developed and has since become a prominent area of research.

Interest in the concept of coping has been reinforced by recent meta-analytical research that supports psychological intervention in the form of cognitive–behavioral therapy as one of the few effective treatments for patients with chronic musculoskeletal pain (Van Tulder et al., 2000). Within the research area of coping with chronic musculoskeletal pain, design and validation of self-report measures such as the Coping Strategy Questionnaire (CSQ; Rosenstiel & Keefe, 1983) has received particular attention. The purpose of this study is to revisit the debate regarding the underlying factor structure of the CSQ and to develop a more user-friendly version of the tool.

Although other tools, such as the Chronic Pain Coping Inventory (Jensen, Turner, Romano, & Strom, 1995) and the Ways of Coping Questionnaire (Coyne, Aldwin, & Lazarus, 1981) exist, the CSQ (Rosenstiel & Keefe, 1983) remains perhaps the most popular tool in this field of inquiry, both clinically and experimentally. However, because of the necessity within clinical settings to measure multiple psychosocial constructs, the current length of the tool makes its inclusion as part of a questionnaire battery problematic. For this reason, development of a shorter version of the tool would significantly increase its clinical utility.

The original CSQ, developed by Rosenstiel and Keefe (1983), consisted of seven theoretically derived subscales. However, the authors found that the Increasing Pain Behaviors subscale had an unacceptably low internal reliability score (α = .28), and this finding has also been confirmed in subsequent research (Robinson et al., 1997; Swartzman, Gwadry, Shapiro, & Teasell, 1994; Tuttle, Shetty, & DeGood, 1991). As a result, in this study, a 44-item version of the CSQ was used, comprising the remaining six subscales: Diverting Attention (DA), Catastrophizing (CAT), Reinterpreting Pain Sensations (RPS), Ignoring Sensations (IS), Coping Self-Statements (CSS), Increasing Behavioral Activities (IBA), and Praying and Hoping (PH).

In their initial research, Rosenstiel and Keefe (1983) performed principal-components analysis (PCA) of their sample of 61 CLBP patients and discovered an underlying three-factor structure. The validity of the CSQ was also investigated through correlational analysis between the three factors and other variables, such as pain duration, and regression analysis using variables such as anxiety and disability. No other forms of validity analysis were undertaken. Since then, however, research by Swartzman et al. (1994) and also by Tuttle et al. (1991) has refuted this factor structure using larger samples of whiplash and mixed chronic pain patients, respectively. Both of these studies found similar five-factor structures and revealed items within the CSQ that loaded highly on more than one factor, indicating inaccurate measurement of the construct. The recommendation was that these complex variables be removed from the tool (Tabachnick & Fidell, 1996).

One disadvantage of both studies is the lack of a scoring solution following the empirical removal of 13 and 16 questions, respectively. Swartzman et al. (1994), in testing whiplash patients sampled from general medical practice, also examined a group that may only represent a small percentage of patients in clinical...
settings likely to encounter the CSQ as a measurement tool. These studies are therefore of academic interest but do little to further clinical use of the tool within pain management settings.

Riley, Robinson, and Geisser (1999) performed a series of detailed investigations of the CSQ’s structure using much larger samples of mixed chronic pain patients. The first investigation by Robinson et al. (1997) used 965 chronic pain patients. This study used PCA and derived a nine-factor solution that was then reduced to six, secondary to poor internal reliability of three of the factors ($\alpha < .70$). This new structure involved the removal of 21 questions, and the new revised tool was later named the Coping Strategies Questionnaire–Revised (CSQ-R). A scoring solution program for the CSQ-R was also designed and made available. This large and comprehensive study derived a structure similar to that found by both Swartzman et al. (1994) and Tuttle et al. (1991) and thus adds credence to the argument that within the CSQ, a stable structure that is valid across samples may exist.

In the second study in the series, Riley and Robinson (1997) sought to discover, through comparative analysis using the LISREL package, which of the structures published thus far formed the best fit to the data available. The results showed that the six-factor solution by Robinson et al. (1997) offered the best fit to the data, with this model roughly reproducing the theoretically derived subscales from Rosenstiel and Keefe’s (1983) original research.

The last study by Riley et al. (1999) examined the existence of empirically derived subgroups within different populations of back pain patients and mixed chronic pain patients. This revealed three subgroups of patients: those generally having low scores on all scales, those scoring highly on cognitive coping scales, and those scoring highly on the CAT scale. A maximum-likelihood factor analysis was also performed using CSQ-R data, excluding the CAT subscale on the basis that catastrophizing is a perception rather than a coping strategy (Jensen, Turner, Romano, & Karoly, 1991). Two factors were found, complicating the overall search for a consistent factor structure within the CSQ, but in this context, with no other referenced study using this form of analysis, it was perhaps predictable that a different structure from those published thus far would be discovered.

The final contribution of these studies was the further examination of the correlations between coping strategy constructs and other measures, such as pain, affect, and disability. It appears from the literature that adaptive strategies such as cognitive coping are, as expected, inversely related to measures of pain, negative affect, and disability. Similarly, maladaptive strategies or perceptions, such as catastrophizing, are positively related. There remains a healthy debate regarding these findings, however, and as of yet, little prospective work has been done to analyze changes in coping constructs before and after treatment or over time (Sullivan et al., 2001).

The purpose of the current study was to reexamine the factor structure of the CSQ in a British CLBP population and to empirically derive a version of the CSQ that is easily manually scored. This addresses two shortfalls in the current literature: the lack of clinically utilitarian version of the CSQ that is easy to score and a comprehensive structural analysis of the CSQ using a population significantly culturally different from the American populations that have thus far predominantly been used.

Method

Participants

A sample of 214 participants completed a questionnaire battery including the CSQ and measures of disability (using the RM18; Stratford & Binkley, 1997), anxiety and depression (using the Hospital Anxiety and Depression Scale [HAD]; Zigmond & Snaith, 1983), and pain (using a Visual Analogue Scale [VAS]; Korff, Jensen, & Karoly, 2000). For the purposes of this study, only CLBP patients were examined, all of whom had been referred for specialist spinal assessments by their general practitioners. Participants attended an outpatient spinal assessment clinic in a government-run and government-funded National Health Service hospital. One hundred seventeen of the participants were female and 97 were male, with a mean age of 48.6 years ($SD = 12.6$). The exclusion criteria for this study included pain duration of less than 3 months and a minimum age of 16 years. Patients were broadly categorized into diagnostic groups of simple mechanical low back pain patients (73.5%), sciatic patients with neurological symptoms (23.5%), and stenotic patients (3%). Demographic data regarding race and ethnicity were not collected, but the hospital within which the study took place serves a predominantly White and British population.

Materials

A 44-item version of the CSQ (Rosenstiel & Keefe, 1983) was used, consisting of 42 items designed to assess seven coping strategies and two items assessing the effectiveness of those strategies to control and decrease pain. Each item is scored on a 7-point Likert-type scale from 1 (never do that) to 7 (always do that).

The RM18 (Stratford & Binkley, 1997) is an 18-item measure designed to assess the physical disability of a patient with low back pain. Each item simply consists of a statement such as “Because of my back, I try not to bend or kneel down.” Participants tick items that apply to them, and the score is simply a count of the ticked items (0–18).

The VAS simply consists of a 10-cm unmarked line with the statement “No Pain” at one end and “Worst Possible Pain” at the other end. Participants indicate on the line their average pain level over the last week. The line is then measured to the mark in millimeters, deriving a 0–100 pain score (Korff et al., 2000).

The HAD (Zigmond & Snaith, 1983) is a 14-item self-report questionnaire, with each item measured on a 4-point Likert-type scale. Anxiety and depression are each measured using seven items from the questionnaire, yielding scores from 0 to 21 for each scale.

Design and Procedure

Data collection occurred within the hospital’s outpatient department, with all patients completing the questionnaire battery immediately prior to a spinal assessment. Patients were given questionnaires to complete independently, but assistants were available to help those patients with reading difficulties. The assistants, who had received training in the use of a standardized scoring protocol, then scored the questionnaires. The study sample consisted of the first 214 patients to complete the questionnaire battery as part of new audit practice within the hospital’s spinal unit.

Results

After preliminary analysis was performed to screen for normality, linearity, and outliers, we performed PCA with a varimax rotation, entering the 42 items of the CSQ (Rosenstiel & Keefe, 1983). The two effectiveness items were excluded from the analysis, in agreement with Robinson et al. (1997) and Tuttle et al. (1991), as they are not thought to measure coping strategies but...
rather their effectiveness. From all the derived factors that emerged, only those with eigenvalues greater than 1 were considered. Analysis of the scree plot suggested a three-, four-, five-, or six-factor solution, and, therefore, two–seven possible factor solutions were investigated. Of the solutions examined, a six-factor solution accounting for 51% of the variance proved to be the most interpretable.

The criteria used for item selection were the same as those used by both Swartzman et al. (1994) and Robinson et al. (1997), with an item being retained if its primary loading was greater than .40 and its highest loading on any other factor was at least .20 less than its primary loading. These criteria led to the exclusion of 16 items, with Factor 6 failing to retain any suitable items, resulting in a five-factor solution.

Factor 1 replicated the CAT subscale from Rosenstiel and Keefe’s (1983) original research and, therefore, retained this label. Factor 2 consisted of four items from the DA subscale and two from the IBA subscale. All items in this factor were considered to represent some form of diversion, whether behavioral or cognitive, and it was therefore labeled Diversion. Factor 3 closely resembled the original RPS subscale, with five items being retained, as well as one item from the IS subscale (“I pretend it’s not there”). This item can also be considered to reflect a reinterpretation mechanism; consequently, this factor was simply named Reinterpretation. Factor 4 retained four items from the CSS subscale and one item from the IS subscale (“I just go on as if nothing happened”). This item can logically be interpreted as a coping statement, and the factor was therefore labeled Cognitive Coping. Factor 5 consisted of three items from the PH subscale and subsequently this label was retained.

The internal consistency of each factor was then assessed using Cronbach’s alpha, resulting in the removal of Factor 5 secondary to an unacceptably low alpha level (α < .70). Because of Factor 5 being omitted, an additional three items were excluded, and a total of 23 of the 42 items were consequently retained in four factors. Table 1 shows the item loadings within each factor and the alpha

Table 1
Results of Varimax-Rotated Component Analysis With Comparisons to Previous Factor Solutions

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<tr>
<th></th>
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<tbody>
<tr>
<td>5. It is terrible and I feel it is never going to get any better.</td>
<td>.760</td>
<td>CAT</td>
<td>CAT</td>
<td>CAT</td>
</tr>
<tr>
<td>11. It is awful and I feel it overwhelms me.</td>
<td>.742</td>
<td>CAT</td>
<td>CAT</td>
<td>CAT</td>
</tr>
<tr>
<td>25. I worry all the time about whether it will end.</td>
<td>.705</td>
<td>CAT</td>
<td>CAT</td>
<td>CAT</td>
</tr>
<tr>
<td>13. I feel my life isn’t worth living.</td>
<td>.654</td>
<td>CAT</td>
<td>CAT</td>
<td>CAT</td>
</tr>
<tr>
<td>37. I feel like I can’t go on.</td>
<td>.694</td>
<td>CAT</td>
<td>CAT</td>
<td>CAT</td>
</tr>
<tr>
<td>33. I feel I can’t stand it any more.</td>
<td>.795</td>
<td>CAT</td>
<td>CAT</td>
<td>CAT</td>
</tr>
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Factor 2: Diversion (α = .84)

<table>
<thead>
<tr>
<th>Item</th>
<th>Loading</th>
<th>DA</th>
<th>DISS</th>
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<tbody>
<tr>
<td>3. I try to think of something pleasant.</td>
<td>.616</td>
<td>DA</td>
<td>DISS</td>
</tr>
<tr>
<td>26. I replay in my mind pleasant experiences in the past.</td>
<td>.737</td>
<td>DISS</td>
<td>DA</td>
</tr>
<tr>
<td>27. I think of people I enjoy doing things with.</td>
<td>.712</td>
<td>DISS</td>
<td>DA</td>
</tr>
<tr>
<td>38. I think of things I enjoy doing.</td>
<td>.700</td>
<td>DISS</td>
<td>DA</td>
</tr>
<tr>
<td>39. I do anything to get my mind off the pain.</td>
<td>.641</td>
<td>DA</td>
<td></td>
</tr>
<tr>
<td>40. I do something I enjoy, such as watching television or listening to music.</td>
<td>.642</td>
<td>DISS</td>
<td>DISS</td>
</tr>
</tbody>
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Factor 3: Reinterpreting (α = .77)

<table>
<thead>
<tr>
<th>Item</th>
<th>Loading</th>
<th>RS</th>
<th>RP</th>
</tr>
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<tbody>
<tr>
<td>4. I don’t think of it as pain but rather a dull or warm feeling.</td>
<td>.604</td>
<td>RS</td>
<td>RP</td>
</tr>
<tr>
<td>1. I try to feel distant from the pain, almost as if the pain was in somebody else’s body.</td>
<td>.557</td>
<td>RS</td>
<td>DP</td>
</tr>
<tr>
<td>16. I try not to think of it as my body, but rather as something separate from me.</td>
<td>.567</td>
<td>RS</td>
<td>RP</td>
</tr>
<tr>
<td>29. I imagine the pain is outside my body.</td>
<td>.572</td>
<td>RS</td>
<td>RP</td>
</tr>
<tr>
<td>41. I pretend it’s not part of me.</td>
<td>.599</td>
<td>RS</td>
<td>RP</td>
</tr>
<tr>
<td>24. I pretend it’s not there.</td>
<td>.598</td>
<td>RS</td>
<td>IPS</td>
</tr>
</tbody>
</table>

Factor 4: Cognitive Coping (α = .75)

<table>
<thead>
<tr>
<th>Item</th>
<th>Loading</th>
<th>IS</th>
<th>IG/CS</th>
</tr>
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<tbody>
<tr>
<td>20. I tell myself I can’t let the pain stand in the way of what I have to do.</td>
<td>.691</td>
<td>IS</td>
<td>IG/CS</td>
</tr>
<tr>
<td>23. No matter how bad it gets, I know I can handle it.</td>
<td>.582</td>
<td>IS</td>
<td>IG/CS</td>
</tr>
<tr>
<td>31. I see it as a challenge and don’t let it bother me.</td>
<td>.584</td>
<td>IS</td>
<td>IG/CS</td>
</tr>
<tr>
<td>32. Although it hurts, I just keep on going.</td>
<td>.751</td>
<td>IS</td>
<td>IG/CS</td>
</tr>
<tr>
<td>30. I just go on as if nothing happened.</td>
<td>.594</td>
<td>IS</td>
<td>IG/CS</td>
</tr>
</tbody>
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scores obtained. Also in Table 1, a comparison of the retained items within each factor is made between this study and the results found by Tuttle et al. (1991), Swartzman et al. (1994), and Robinson et al. (1997).

In the interest of clinical utility, we examined the relation between the final two effectiveness items secondary to observations that participants often scored identically on these items. A highly significant correlation ($p < .01$) was found between the two items, with 42% of scores being identical. Examination of the wording of these two items and the above analysis indicates that these items may measure the same construct; as a result, we decided to eliminate one of these items. Within pain management settings, emphasis is placed on maintaining function and coping with pain rather than on reducing pain, which, in many cases, may be unrealistic. For this reason, because patients may not be able to decrease their pain but may increase their functional level and cope better, which results in an element of perceived control over pain, the ability to decrease pain item was dropped from the tool in favor of the ability to control pain item. This resulted in the retention of a total of 24 of the 44 items examined. We therefore named the new tool the Coping Strategies Questionnaire 24 (CSQ24).

All participants in the study completed a battery of questionnaires at the same time they completed the CSQ, and correlations between these other measures and the derived factors were then analyzed (see Table 2). The results of this analysis are similar to relationships found in previous studies, confirming the construct validity of the CSQ24. CAT was positively related to measures of pain, disability, anxiety, and depression. As in Robinson et al.’s (1997) study, RPS did not have any significant relations. Cognitive Coping was negatively related to disability and depression, though not to pain, whereas Diversion was positively related to disability and anxiety.

### Discussion

The PCA of the CSQ’s structure in this study indicates a four-factor solution significantly similar to those found by Tuttle et al. (1991), Swartzman et al. (1994), and Robinson et al. (1997). The fact that a culturally different population was used and similar results were found encourages the view that the CSQ is a stable measurement tool. It is recognized, however, that because of this study’s sample size, further confirmatory analysis of the factor structure in this population would be beneficial.

The main advantage of this study over that of Robinson et al. (1997), who performed a comprehensive and large analysis, is that a stable version of the tool, the CSQ24, that can be easily manually scored was produced. Another advantage of the current study is the use of clinically common and highly validated outcome measures in the construct validity analysis. Previous studies have used less common and less reliable measures, with Robinson et al. (1997), for example, using the original Beck Depression Inventory (Beck, Ward, & Mendelson, 1961), which has previously been criticized because it may overestimate the incidence of depression in chronic musculoskeletal pain populations (Estlander, Takala, & Verkasalo, 1996; Wilson, Mikhail, D’Eon, & Mins, 2001). Robinson et al. also used the McGill Pain Questionnaire (Melzack, 1975), which omits a simple 0–100 pain rating, a highly validated tool (Korff et al., 2000; Orgon, Krismer, Sollner, & Katner-Rumplmair, 1996), and has been criticized for being too complex and inappropriate for clinical use (McCaffery & Beebe, 1994). Similarly questionable tools were used by Tuttle et al. (1991), and the study by Swartzman et al. (1994) did not include any analysis of construct validity.

The construct validity of the CSQ24 is demonstrated by the correlations found between the derived CSQ factors and the other measures. As in other studies (Robinson et al., 1997; Tuttle et al., 1991), maladaptive strategies, such as catastrophizing, were positively related to measures of pain, disability, and negative affect, including both anxiety and depression. Inverse relations were found between Cognitive Coping, an adaptive factor containing items from the original CSS and IS subscales (Rosenthal & Keefe, 1983), and measures of disability and depression. These findings broadly agree with those of Robinson et al. (1997).

The other relations found are also similar to those reported by Robinson et al. (1997), with Reinterpretation not being associated with any other measure and Diversion being positively correlated with both disability and anxiety. As such, these results are useful in confirming the argument that diversion strategies may be contingent on the presence of factors associated with pain, such as disability and negative affect, as our study failed to find a direct correlation between Diversion and pain itself. The reason for the lack of any associations between the objective measures and the Reinterpretation factor remains unclear.

The results of this study support the use of the CSQ24 as a stable assessment tool in CLBP populations. This study has allowed the development of an easily scored version of the CSQ, the CSQ24. The shorter length of this version allows for greater clinical utility, as the CSQ24 can form part of a battery of other tools, such as those used in this study, without being too lengthy for normal clinical use. The CSQ24 itself can be taken from Table 1, and it is recommended that the order of the questions within the original CSQ be maintained. Because the Cognitive Coping factor only retained five items whereas all other factors retained six, it is suggested that 20% be added to scores gained for this factor to allow direct comparison of scores clinically.

### References


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