

BEHAVIOUR-FOCUSED PAIN COPING: CONSISTENCY AND CONVERGENCE TO WORK CAPABILITY OF THE SWEDISH VERSION OF THE CHRONIC PAIN COPING INVENTORY

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The aim was to study the psychometric properties of the Swedish version of the Chronic Pain Coping Inventory. The material consisted of a group of 100 subjects recruited from a large population study. Pain status and the absence of pain-related sick leave during the previous year conditioned inclusion. Another group comprised 160 patients on the long-term sick list and who had been referred to a multidisciplinary pain clinic for evaluation. The psychometric properties in terms of internal consistency of the scales were good or very good for all scales of behaviour-focused pain coping. Use of the strategies “Guarding”, “Resting”, “Asking for assistance”, “Relaxation”, “Task persistence”, “Coping self-statements” and “Seeking social support” was significantly related to vocational capability. “Guarding”, “Asking for assistance”, “Relaxation”, “Exercise and stretch” and “Coping self-statements” increased in parallel to increasing pain from localized to intermediate or widespread. No gender difference was found in cases reporting more pronounced pain.

Key words: vocational capability, sick leave, widespread (generalized) pain.

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INTRODUCTION

In most Western populations, chronic pain is a prominent and disabling symptom indicating individual suffering, but it is also one of the most important factors influencing the report of poor self-experienced health and mental distress (1). In countries with developed insurance systems, it leads to escalating costs for sick leave and disability pensions (2).

Both theoretical shortcomings and clinical experience imply that there is no solution to these problems when focusing the pain in the biomedical frame of reference (3–5). The cognitive-behavioural frame of reference is an example of applied systems theory by which it is possible to integrate social environment and individual characteristics in a more comprehensive analysis.

For decades it has been successful for the analysis of the problem of pain and suffering (6). At group level, multimodal interventions have shown positive, but still limited, results concerning improvement of the patients' vocational capability and psychological function (7, 8).

The relative success of the cognitive-behavioural frame of reference in clinical practice calls for further development in several areas. There is still a need for more consistently defined concepts and psychometrically sound instruments for assessment as well as improvements in the intervention strategies (9). This includes for example studies of individual factors of importance in the development of dysfunction as well as studies of the specific effects of the various single components focused in the intervention. Improvements in rehabilitation programmes to be based on a more valid analysis of the patients' specific problems should imply increased efficacy.

Coping, defined by Lazarus & Folkman as “the use of behavioural and cognitive strategies to manage or vitiate stressful life events”, is a key concept in the cognitive-behavioural frame of reference (10). The Chronic Pain Coping Inventory (CPCI) was developed against this theoretical background (9). The CPCI scales of functional and dysfunctional coping practices have shown good or excellent internal consistency and test re-test stability among patients with long pain duration. Both convergent and divergent validity of the scales have been shown by correlation with other well-known scales, e.g. “The Pain Discomfort Scale”, “The Roland Scale” and “The Multidimensional Pain Inventory” (11–13). The factor structure of CPCI has been confirmed in patients having musculoskeletal pain of shorter duration (14). Furthermore, relationships have been found with the adjustment variables of the Multidimensional Pain Inventory: pain severity, interference, affective distress, self-control and social support (13).

The present study included two groups of subjects who suffer from chronic pain. One group comprised subjects from a full-time gainfully employed population sample without self-reported sick leave during the previous year. The other group comprised patients on long-term sick leave due to pain. The internal consistency of the Swedish version of CPCI scales was assessed. The presumed convergence and divergence of the CPCI constructs to work capability of subjects comparable in reported pain was tested.

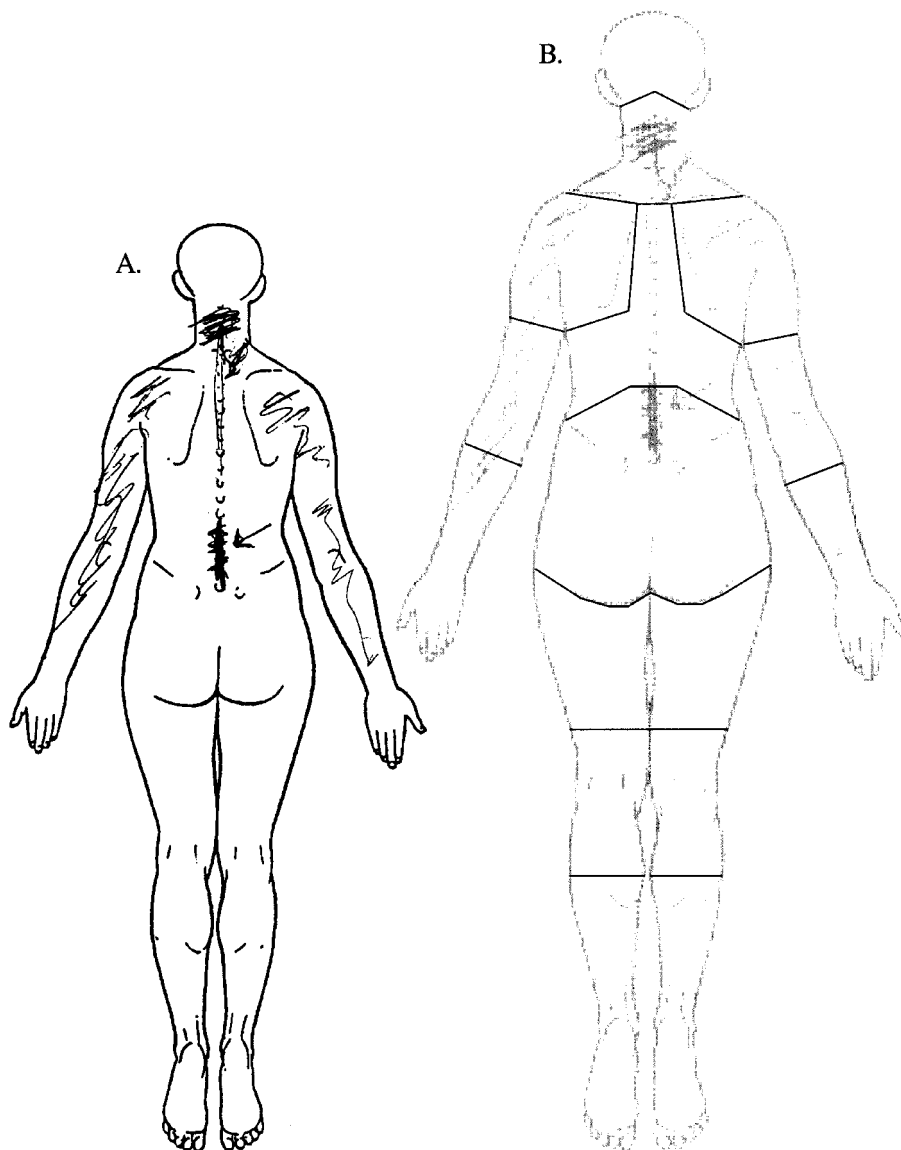


Fig. 1. The back view of a completed pain drawing (A). (B) shows calculation of the total number of areas shaded, the "Total body pain" (TBP), with a score of 9. The instruction given to the subject was: Please shade the figure where your pain is located. If you have pain in more than one location, shade the figure accordingly. Finally, mark the most troublesome area with one arrow.

MATERIAL AND METHODS

Subjects

One group (50 men and 50 women) was consecutively recruited among the participants in a large population study, the Malmö Shoulder Neck Study, during October 1995 ([MSNS] 1). These subjects participated in a prospective 1-year study of the monthly pain variation (to be published elsewhere). The answers from the initial examination, made 6 months after participation in the MSNS, were used in the present study. The participants were included so that they reflected the prevalence of chronic pain in the general population as reported in a slightly modified version of the Standardized Nordic Questionnaire for Analysis of Musculoskeletal Symptoms (15). Inclusion was conditioned by gainful work ≥ 30 h per week and the absence of self-reported pain-related sick leave during the previous year. Their age was 49 to 56 years, the youngest strata in the MSNS population. Forty-eight women and 46 men (96% and 92%, respectively) responded with a completed questionnaire.

The other group included 160 dysfunctional patients referred to the

Multidisciplinary Pain Clinic at the University Hospital in Malmö, from January 1996 to June 1997 (24 men and 136 women). They had been on sick leave for extended periods of time. Some had temporary disability pensions and some had previously been through unsuccessful work-rehabilitation programmes. Ages ranged from 22 to 60 years (median 44, quartiles 37 and 50). The median pain duration reported was 5 years. Description of the pain location can be found in the section "sampling procedure" below.

The Chronic Pain Coping Inventory

The CPI was translated from the American version into Swedish, and a bilingual native English-speaker corrected the translation. The items were supposed to be identical to the original. After a pilot study, including 20 patients, the wording of one item was adjusted to the final version (see appendix). The CPI is self-administered, with 65 items suggesting various types of behaviour for coping with pain. The item concerning pain medication showed a lack of consistency in relation to other information sources, and therefore was dropped.

Table I. Number of areas shaded on pain drawings, Total Body Pain (TBP) in relation to vocational function group and gender

	General population group		Patient group		
	TBP 1-3	TBP 4-10	TBP 1-3	TBP 4-10	TBP 11-16
Number:	49	33	21	55	84
Females (%)	43	66	62	84	92
Total Body Pain:					
Median	2	6	2	7	14
Interquartile	1.5-3	4.5-7.5	1-3	5-8	12-16
Range	1-3	4-10	1-3	4-10	11-16

The 64 items are scored as the number of days per week (range 0 to 7) each strategy was used at least once to prevent or handle pain. The items are combined into eight scales covering two conceptually predefined dimensions of coping. The first is "Sickness-focused coping", which includes the scales "Guarding", "Resting", and "Asking for assistance". The second is "Wellness-focused coping", which includes the scales "Relaxation", "Task persistence", "Exercise and stretch" and "Coping self statements". An additional scale scored the use of "Seeking social support". The scale scores were calculated, in accordance with Jensen et al., as the mean of the single item scores included in each scale (9).

Sampling procedure

The participants still working answered the CPCI as a postal questionnaire, which also contained items about sensory and affective pain components as well as inventories assessing pain attitudes, pain behaviour and quality of life. Missing data on return of the questionnaire by post were immediately completed by telephone.

The patients completed the CPCI on-site in connection with an out-clinic pain evaluation and rehabilitation screening. They also answered questions about sensory and affective pain components, medical, social and demographic aspects, and inventories assessing pain attitudes, pain behaviour and quality of life. The questionnaires were immediately checked for missing data and when necessary, completed on-site.

Pain drawings

Both groups were divided into pain subgroups in accordance with the total number of areas they had shaded on pain drawings, called Total Body Pain (TBP [range 0-16], Fig. 1 [1]). Cut-off points were defined by the median number of locations shaded on pain drawings (i.e. 3) and the TBP maximum (i.e. 10) in the population sample. One subject shading 13 areas was considered an "outlier". Eleven subjects did not shade the pain drawings, indicating no pain, and were therefore excluded from the analysis. Thus, both groups included subgroups with well-located pain, one to three areas (TBP1-3), and with an intermediary pain distribution, 4 to 10 areas (TBP4-10). The patient group additionally included a subgroup with widespread pain in 11 to 16 areas (TBP11-16, Table I). The lower back and the neck were the most frequently shaded areas occurring at 46% and 40% of the pain drawings, respectively.

Data analysis

Data were analysed by use of the statistical software SPSS[®] V8.0.0 for Windows[®]. Internal consistencies of the scales were calculated as Cronbach's α . Group comparisons were made with multivariate ANOVA in the GLM module of the software with the ranked scale scores of the eight CPCI scales as dependent variables. The ranks were used in order to compensate for non-normal distributions. The analysis was carried out in two parts. The first focused behavioural pain coping in relation to vocational capability, degree of pain and gender. This analysis included men and women from the TBP1-3 and TBP4-10 subgroups of both populations. The second analysis was made on the patient population only and included men and women from all 3 pain subgroups. In this analysis, the possible relation of behavioural pain coping to age in 4 strata of 10 years (range 20-60 years) was also tested.

The TBP, group (i.e. vocational capability), gender and age-strata variables were simultaneously entered as independent factors in the ANOVA. After initial analysis of all main effects and possible

interactions, the ANOVA model was modified. Only statistically significant ($p < 0.05$) main effects and interaction terms were retained in the final solution.

In order to localize gender differences, additional analyses were made separately in each of the TBP1-3 and TBP4-10 subgroups. In the patient group, analysis for trend and relevant post-hoc tests was made concerning the pain and age-strata variables. Post-hoc p -values are given with Bonferroni corrections for multiple comparisons.

RESULTS

The internal consistency for seven of the eight CPCI scales was very good, as shown by Cronbach's $\alpha > 0.80$. The "Relaxation" scale had lower but still good internal consistency ($\alpha = 0.72$, Table II).

The ANOVA analysis including the subjects with localized (TBP1-3) and intermediate pain (TBP4-10) from both the general population and patient groups (the vocational capability variable) showed that the CPCI scales of behavioural pain coping were related to both vocational capability and pain reports (Fig. 2).

The patients had higher CPCI scale scores on all three scales on the Sickness-focused coping dimension ($p < 0.001$, power 0.9-1.0). On the Wellness-focused coping dimension, patients had higher scores on the "Relaxation" scale, lower scores on the "Task persistence" scale ($p < 0.001$, power 1.0 and 0.9, respectively) and higher scores on the "Coping self-statements" scale ($p = 0.01$, power 0.7). Finally, the patients had higher

Table II. Internal consistencies of the Chronic Pain Coping Inventory scales (* $n = 243$)

Dimension and scale	Cronbach's α
Sickness-focused coping	
Guarding	0.83
Resting	0.85
Asking for assistance	0.83
Wellness-focused coping	
Relaxation	0.72
Task persistence	0.82
Exercise and stretch	0.92
Coping self-statements	0.87
Other coping	
Seeking social support	0.90

* General population group $n = 83$ and patient group $n = 160$.

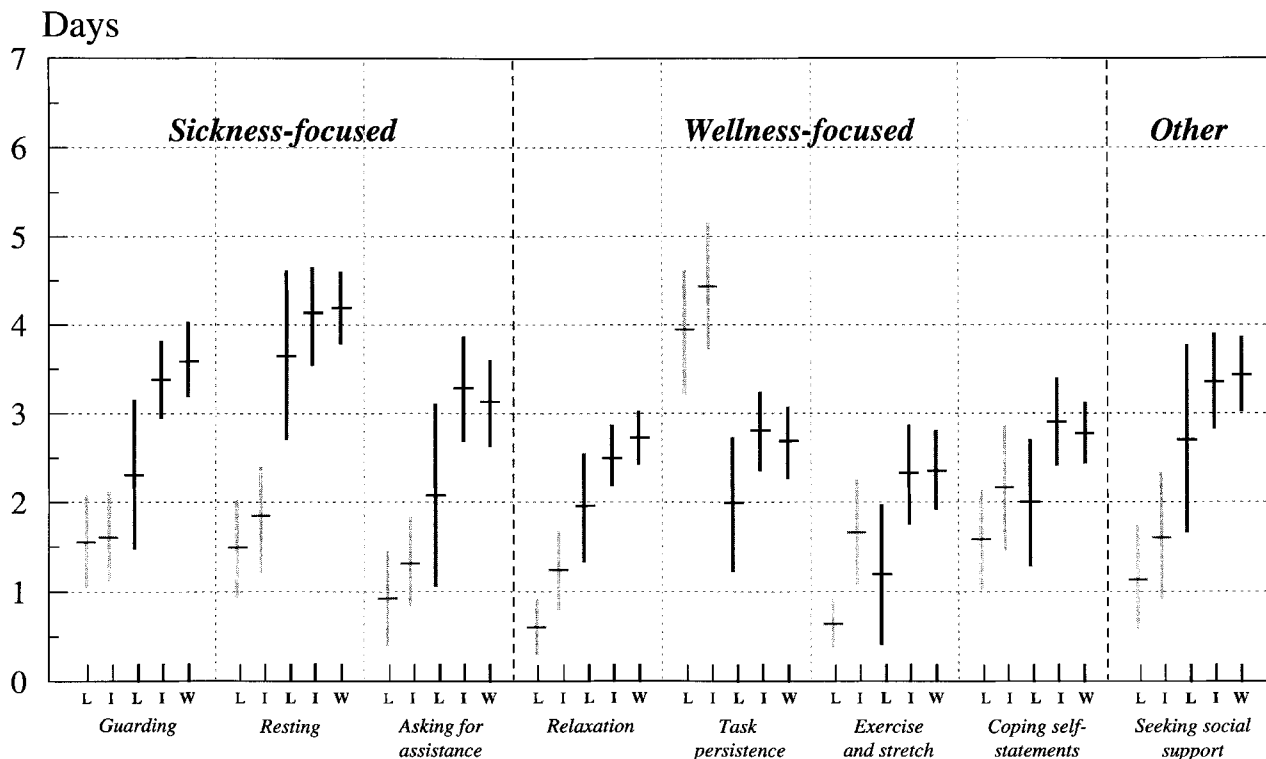


Fig. 2. Scores (mean and 95% CI) in the Chronic Pain Coping Inventory in relation to vocational functioning and pain load. Grey represent the general population group and black the patient group with localized (L), intermediate (I) and widespread (W) pain, respectively.

scores on the “Seeking social support” scale ($p < 0.001$, power 1.0).

Concerning the factor pain distribution, subjects in the intermediate pain subgroup scored higher than the localized pain subgroups on the scales “Guarding” and “Asking for assistance” on the *Sickness-focused* coping dimension ($p = 0.03$ and 0.02 , respectively, power 0.7). *Wellness-focused* coping also differed among pain subgroups. The intermediate pain subgroup had increased scores on the “Relaxation” and “Exercise and stretch” scales ($p < 0.001$, power 0.9) as well as on the “Coping self-statements” scales ($p = 0.03$, power 0.7).

The interaction term “vocational capability group” * “pain subgroup” unfortunately had a power of 0.05 in the ANOVA analysis.

A separate analysis in the patient group included all 3 pain subgroups. Visual inspection of the CPCI scale scores showed increased scores for the intermediate and widespread pain subgroups compared to subjects with localized pain, but the difference only reached statistical significance on the *Sickness-focused* scale “Guarding” and the *Wellness-focused* scale “Exercise and stretch” ($p = 0.01$, power 0.8). Although the strategy “Relaxation” in the *Wellness-focused* coping dimension showed a significant trend, only the difference between TBPI-3 and TBPI1-16 pain subgroups reached statistical significance ($p = 0.01$, power 0.8).

Gender differences in pain coping were only found in the

vocationally active group reporting localized pain (TBPI-3). Women, more frequently than men, used the *Sickness-focused* behavioral pain coping strategy “Asking for assistance” and the *Wellness-focused* “Relaxation” and “Coping self-statements” ($p = 0.01$, 0.04 and 0.02 and power 0.8, 0.6 and 0.7, respectively). The explained variance (η^2) by factor gender was 15, 10 and 15%, respectively.

A possible age difference in pain coping was tested in the patient group. The youngest age group tended to use “Guarding” less than the older groups (p for linear trend = 0.06 , power 0.9). The difference was localized to women in the youngest age group (20–29 years). The explained variance (η^2) by the factor age was 8%.

DISCUSSION

The study showed that the CPCI with high discriminative power disclosed that the behavioural pain coping strategies “Guarding”, “Resting”, “Asking for assistance”, “Relaxation”, “Task persistence” and “Seeking social support” separate vocationally active subjects from subjects on long-term sick leave. Furthermore, use of the strategies “Guarding”, “Asking for assistance”, “Relaxation”, “Exercise and stretch” and “Coping self-statements” increased with increasing degree of pain among vocationally active subjects and also among patients.

Two papers on the psychometric properties of the CPCI have

been previously published (9, 14). Hadjistavropoulos et al. (14) examined a pain clinic population reporting remarkable localized pain of short duration, a population quite different from the one examined by Jensen et al. (9) as well as from ours. Although the factor structure was confirmed, it was also found that items on the sickness-focused coping dimension as well as of the relaxation scale loaded better on other scales than in the original solution. Since our material seemed to be similar to that studied by Jensen et al. considering pain duration, gender and pain location, we kept the scale compositions originally suggested.

Our results on the use of coping strategies in relation to vocational capability are consistent with those obtained by Jensen et al., who found the psychological function aspects depression and distress to be associated with the pain coping strategy scales "Guarding", "Resting", "Asking for assistance" and "Task persistence" (9). Additionally, we found the scales "Relaxation" and "Seeking social support" to be related to vocational capability in a similar way as the sickness-focused coping strategies.

Consistent with the original report, the "Exercise and stretch" scale was not directly related to functioning; and the "Coping self-statements" scale was only slightly so (9). In support of the validity of these results, from a physiological point of view, structured exercise and stretch is not necessarily meaningful more than two to three times a week if the focus is preservation of physical capacity. Low energy exercise, however, might be useful in a daily training programme for dysfunctional pain patients when the aim is to counteract their activity intolerance by positive reinforcement of performed activity. Concerning the "Coping self-statements" scale, a conceptual overlap with psychological functioning, e.g. psychological distress, is proposed by Jensen et al. (9). With reference to the definition of coping given by Lazarus, assessment of the functional consequence of this non-overt behaviour is required in order to establish its role as a possible coping strategy.

We found only limited gender differences in pain coping. Women with localized pain used "Asking for assistance", "Relaxation" and "Coping self-statements" more than men did. No gender difference was found in the other pain strata or in the patient group. This could be interpreted as if gender difference in pain coping is of little importance when the pain experience becomes more pronounced or when it reduces work capability.

Since women and men differ significantly concerning the number of painful areas, it is highly recommended that this is under control when studying gender differences in pain (1, 16). If not considered, confounded relationships with gender might appear. Thus, if data on "Total Body Pain" are not available, true gender differences cannot be distinguished from differences in pain load (1).

We are aware of the limited number of pain dimensions used to define the TBP subgroups. In a large general population, however, we found TBP to be highly correlated to assessments of the sensory pain dimensions, pain temporality and intensity on VAS scales (to be published) as well as to negative affect (1). Obviously, we cannot exclude that the patient group could

comprise subjects with more pronounced nociception, despite the plausible comparability to the general population sample concerning TBP.

Although we examined subjects from different, but clearly characterized pain and vocational activity groups, representative of the different stages of chronic pain and dysfunction, we emphasize the cross-sectional nature of the study. The dynamics can only be clarified in prospective studies. Hypothetically, wellness-focused coping either might never have been learned or lost during the development of chronic pain. Similarly, it is unknown whether sickness-focused coping is actually becoming more prominent during functional deterioration or if it was always prominent among subjects who end up as chronic patients.

CONCLUSIONS

The psychometric property in terms of the internal consistency of the scales was established for the Swedish translation of the CPCI with the original factor structure. All behaviour-focused pain coping efforts and one "Exercise and stretch" were found to be related to vocational capability. Use of the strategies "Guarding", "Asking for assistance", "Relaxation", "Exercise and stretch" and "Coping self-statements" increased in parallel to increasing pain from localized to intermediate or widespread. We found no gender difference in behaviour-focused pain coping efforts when the pain was more pronounced.

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Appendix

Description of the Chronic Pain Coping Inventory (CPCI):

For this presentation, the 65 items are listed under the 9 scales of coping efforts and dimensions. The items covering different coping efforts are mixed in the CPCI instrument. We have omitted “pain medication” from our version. The remaining 64 items are scored 0–7 by the proband.

Initially, the probands were asked to focus on one specific week and to mark the number of days (0–7) during that week that the pain experience was bothersome or forced them to change activity. Furthermore, they were asked to locate the specific week in time using five categories: 1 – The present week. 2 – A week during the previous month. 3 – A week between 1 and 2 months ago. 4 – A week between 2 and 3 months ago. 5 – A week more than 3 months ago.

Illness-focused coping efforts:

Guarding, 9 items.

Operational definition: Restricting the use or movement of a body part.

11 – Avoided using part of my body (e.g. hand, arm, leg). 15 – Held on to something when getting up or sitting down. 33 – Limited my walking because of pain. 35 – Walked with a limp to decrease the pain. 39 – Held part of my body (e.g. arm) in a special position. 41 – Avoided putting weight on feet or legs. 46 – Limited my standing time. 48 – Avoided some physical activities (e.g. lifting, pushing, carrying). 56 – Avoided activity.

Resting, 7 items.

Operational definition: Engaging in a “resting” activity in response to pain, such as lying down, sitting down, slowing down, or going to a dark or quiet room.

5 – I took a rest. 7 – I went to bed early to rest. 18 – I rested as much as I could. 40 – Rested in a chair or recliner. 47 – Lay down on a bed. 58 – Went into a room by myself to rest. 64 – Lay down on a sofa.

Asking for assistance, 4 items.

Operational definition: Asking someone for assistance with some activity when in pain, such as household chores or lifting.

9 – Asked someone to do something for me. 25 – Asked for help with a chore or task. 42 – Asked for help in carrying, lifting or pushing something. 62 – Asked someone to get me something (e.g. medicine, food, drink).

Medication use, 1 item.

(This coping effort was omitted from our version).

Operational definition: Taking an opioid, NSAID, benzodiazepine, or sedative for pain (scored separately). Respondents will be asked to indicate all the medications they took for pain during the past week, and indicate the number of days they took these medications. The medications will later be coded as containing opioid/narcotics, NSAIDs, benzodiazepine, or sedative/hypnotics, and number of days each is taken will be scored separately for each category.

Please list each medication you took for pain during the past week, and indicate the number of days you took each medication during the past week.

Wellness-focused coping efforts:

Relaxation 7 items.

Operational definition: Purposefully engaging in a specific relaxation exercise in order to reduce muscle tension or the perception of muscle tension. The exercise must include at least one of the following: imagery, listening to music, listening to a relaxation tape, meditation, biofeedback, self-hypnosis, deep, slow breathing, progressively tensing then relaxing muscle groups, consciously focusing on specific muscle groups to relax them. The exercise may not include lying or sitting down simply to “rest”.

1 – Imagined a calming or distracting image to relax. 12 – Focused on relaxing my muscles. 24 – Listened to music to relax. 31 – Listened to a relaxation tape to relax. 36 – Meditated to relax. 50 – Used self-hypnosis to relax. 59 – Used deep, slow breathing to relax.

Task persistence, 6 items.

Operational definition: Ignoring pain and purposefully continuing an activity despite pain. Allowing one’s plans, not pain, to guide behaviour. Any situation in which a person changes activities because of pain does not fit this definition.

2 – Kept on doing what I was doing. 4 – Ignored the pain. 28 – I didn’t let the pain interfere with my activities. 34 – Just didn’t pay attention to the pain. 51 – I just kept going. 63 – Did not let the pain affect what I was doing.

Exercise and stretch, 12 items.

Operational definition: Engaging in muscle strengthening or stretching activity. For stretching, the person must hold the stretch for at least 10 seconds. For exercise, the person may indicate the use of one of a number of muscle strengthening or aerobic conditioning exercises.

3 – Stretched the muscles in my legs (and held the stretch) for at least 10 seconds. 13 – Sat on the floor, stretched, and held the stretch for at least 10 seconds. 17 – Exercised to strengthen the muscles in my arms for at least 1 minute. 26 – Stretched the muscles in my neck (and held the stretch) for at least 10 seconds. 29 – Exercised to strengthen the muscles in my legs for at least 1 minute. 32 – Engaged in aerobic exercise (exercise that made my heart beat fast and made me sweat) for at least 15 minutes. 38 – Lay on my back, stretched, and held the stretch at least 10 seconds. 43 – Exercised to improve my overall physical condition for at least 5 minutes. 52 – Exercised to strengthen the muscles in my stomach for at least 1 minute. 55 – Stretched the muscles where I hurt and held the stretch for at least 10 seconds. 60 – Exercised to strengthen the muscles in my back for at least 1 minute. 61 – Stretched the muscles in my back, and held the stretch, for at least 10 seconds.

Coping self-statements, 11 items.

Operational definition: Purposefully thinking positive thoughts about the pain problem. These thoughts can include how one is able to cope or manage the pain, how it will decrease with time, how one is better off somehow because of the pain problem, how one is advantaged when compared to others, how one is similar to (or could be similar to) other people who are coping well with pain or with any

adversity/handicap, or thinking about other people for hope and inspiration.

10 – Reminded myself that things could be worse. 14 – Told myself things will get better. 19 – Thought about someone with problems worse than mine. 21 – Told myself that I am adjusted to my pain problem better than many other people. 23 – Thought about all the good things I have. 27 – Told myself my pain will get better. 30 – Thought about a friend who has coped well with a problem. 37 – Reminded myself that I had coped with the pain before. 45 – Reminded myself that there are people who are worse off than I am. 49 – Reminded myself about things that I have going for me that other people don't have, such as intelligence, good looks, and good friends. 54 – Reminded myself that others have coped well with pain problems.

Other coping:

Seeking social support, 8 items.

Operational definition: Finding a friend or loved one to talk to on the telephone or in person when in pain. The topic of conversation may or may not relate to pain.

6 – Made arrangements to see a friend or family member. 8 – I got support from a friend. 16 – I got support from a family member. 20 – I talked to someone close to me. 22 – Called a friend on the telephone to help me feel better. 44 – Talked to a friend or family member for support. 53 – Got together with a friend. 57 – Got together with a family member.

The Swedish translation of the CPCI can be obtained from the first author.