J Rehabil Med 2002; 34: 67–72

Taylor&Francis healthsciences

A POPULATION-BASED STUDY OF FACTORS ASSOCIATED WITH COMBINATIONS OF ACTIVE AND PASSIVE COPING WITH NECK AND LOW BACK PAIN

Linda Carroll,[1] Annalyn C. Mercado,[2] J. David Cassidy[1,3] and Pierre Côté[4]

From the [1]Department of Public Health Sciences, University of Alberta, [2]Department of Psychology, University of Saskatchewan, [3]Department of Medicine, University of Alberta, [4]Department of Public Health Sciences, University of Toronto and Institute for Work and Health, Toronto, Canada

Pain coping strategies can be active or passive. Previous studies have examined these strategies separately, however individuals use combinations of both types of coping strategies. We examined the associations between sociodemographic, pain and health-related factors and combinations of active and passive strategies in a general population random sample of 1131 adults. Individuals reporting neck or low back pain during the past 6 months are the subjects of this report ($n = 644$). Multinomial logistic regression suggests that disabling pain was highly associated with passive coping regardless of active coping. Lower education was associated with the combination of low levels of active and high levels of passive coping. Individuals with better self-reported general health were less likely to use high levels of passive coping regardless of their active coping. We conclude that high levels of passive coping are strongly associated with disabling pain and that there is no evidence of an association between pain severity and active coping.

Key words: pain, psychological adaptation, epidemiology.

J Rehabil Med 2002; 34: 67–72

Correspondence address: Dr Linda J. Carroll, Department of Public Health Sciences, 3080 RTF, 8308 – 114 St, Edmonton, AB, Canada T6G 2E1. E-mail: lcarroll@ualberta.ca

(Accepted August 8, 2001)

INTRODUCTION

Neck and low back pain are common problems in the general population (1, 2). In Saskatchewan, a Canadian province of approximately one million residents, over 72% of the population had experienced low back pain over the past 6 months, and 11% had high levels of disability associated with this pain (3). The 6-month period prevalence of neck pain was over 50%, with 5% of the Saskatchewan population reporting neck pain associated disability (4). Clearly, spinal pain is common, and many individuals in the general population have pain problems to cope with.

Coping refers to the strategies used to deal with the negative impact of stress (5, 6). Styles of coping have been classified in many different ways, for example, cognitive vs. behavioural responses (7) or problem solving vs. emotion-focused coping (8). However, a useful way of classifying strategies for coping with pain is into active and passive dimensions, which fits within the current rehabilitation model of spinal pain that promotes active coping and discourages passive coping (9–11). Active coping refers to those coping strategies that involve taking responsibility for pain management and include attempts to control the pain or to function in spite of pain. Passive coping refers to strategies that involve giving responsibility for pain management to an outside source or allowing other areas of life to be adversely affected by pain (12). Previous research has assessed the factors associated with active and passive coping in isolation. Passive coping is generally found to be associated with increased severity of depression (12–14), higher levels of activity limitation (15) and helplessness (12, 16). Active coping has been found to be associated with less severe depression (12, 17), increased activity level (14) and less functional impairment (12), but to be unrelated to pain severity (13).

However, in coping with pain, individuals may use various levels of both passive and active strategies. For example, an individual may limit their social activities because of their pain (a passive strategy) and yet engage in hobbies in order to take their mind off the pain (an active strategy). Examining passive and active strategies in isolation provides us with limited information since knowing how many active strategies are being used provides no information about the concomitant use of passive coping strategies. It may be more informative to conceptualize coping styles, not just as high or low frequency of each type of strategy, but as combinations of both passive and active strategies.

The purpose of the present study was to examine the sociodemographic, pain-related and health-related factors associated with the different possible combinations of active and passive coping in a general population sample of individuals who suffer from neck and back pain.

METHODS

Population

The data for this study comes from the index stage of the Saskatchewan Health and Back Pain Survey, a 1-year follow-up study investigating the prevalence and incidence of neck and low back pain in the Saskatchewan population (3, 4). Saskatchewan is a Canadian province of approximately one million inhabitants. Eligible for the survey were Saskatchewan residents between the ages of 20 and 69 ($n = 593\,464$). Excluded were inmates of correctional facilities, residents under the office of the

 ISSN 1650–1977

Table I. *Characteristics of the Saskatchewan adult population, survey respondents and the study sample*

Factor	Population (%) ($n = 593\,464$)	Respondents (%) ($n = 1131$)	Study sample (%) ($n = 644$)
Age group (years)			
20–29	22.6	14.7	14.0
30–39	27.1	21.5	23.4
40–49	22.0	27.6	27.3
50–59	14.6	19.5	20.3
60–69	13.5	16.9	14.9
Gender			
Males	50.4	46.5	46.6
Females	49.6	53.5	53.4
Residence			
City	53.6	55.0	55.5
Town	14.8	15.6	15.7
Rural	19.3	20.6	21.3
Village	6.4	7.4	7.0
Reserve	5.9	1.4	0.6
Marital status			
Married	Unavailable	75.4	76.6
Widowed/Divorced	Unavailable	10.5	10.2
Single	Unavailable	14.1	13.2

Public Trustee, foreign students, workers holding employment or immigration visas and residents of special care homes. Saskatchewan has a universal health-care plan and the Health Insurance Registration File (HIRF), which includes over 99% of the Saskatchewan population, served as the sampling frame. Saskatchewan Health randomly selected an age-stratified sample ($n = 2184$) and mailed the questionnaires to ensure anonymity. Participation was voluntary and the University of Saskatchewan Advisory Committee on Ethics in Human Experimentation approved the study.

Details of the sample size determinations, sampling procedures and a description of this sample are described more fully elsewhere (3, 4). Briefly, the index survey was conducted in September 1995, and consisted of the questionnaire mail-out, followed by a reminder card, then a second questionnaire mail-out to non-responders. Of the 2184 questionnaires mailed out, 129 were returned, undelivered, leaving 2055 eligible individuals in the study population. The response rate was 55% (1131 participants), and those who rated their neck or low back pain as moderate or greater intensity (our population of interest) and completed the pain coping questionnaire are the subjects of this report ($n = 644$). Characteristics of the Saskatchewan adult population, the survey respondents and the study sample are reported in Table I. An analysis of factors associated with participation in the survey indicates that younger individuals, males, unmarried people and those living on Indian Reserves were less likely to participate (4). However, neither presence nor intensity of low back pain (3), nor presence of depressive symptoms (18) was associated with responding to the survey, although the prevalence of intense/low disability neck pain may have been overestimated (4).

Survey questionnaire

The survey instrument included questions about demographic and socioeconomic characteristics (age, gender, marital status, location of residence, education, household income and employment status), smoking, anthropometric characteristics (height, weight), frequency of exercise, depressive symptomatology, health-related quality of life, comorbid medical conditions, pain severity and pain coping strategies.

Explanatory variables: Neck and low back areas were defined on a mannequin diagram included in the questionnaire. Pain was assessed using the Chronic Pain Grade, a seven-item measure that categorizes the severity of the pain according to its intensity and debilitating effects (19). The questionnaire asks about present, worst and average pain intensity, number of disability days and extent of pain-related limitations in activities during the past 6 months. This questionnaire is a reliable instrument with good concurrent, discriminant and predictive validity (19, 20). The Chronic Pain Grade classifies pain severity into five categories: Grade 0—no pain (not included in this study); Grade I—low intensity pain with no or low levels of disability; Grade II—high intensity pain with no or low levels of disability; Grade III—highly disabling and moderately limiting pain; and Grade IV—highly disabling and highly limiting. Due to small numbers, Grades III and IV pain were collapsed into one category, representing disabling pain. In this sample,

Table II. *Vanderbilt Pain Management Inventory: active and passive subscale items*

Active coping subscale items
Engaging in physical exercise or physical therapy
Staying busy or active
Clearing your mind of bothersome thoughts or worries
Participating in leisure activities (such as hobbies, sewing, stamp collecting, etc.)
Distracting your attention from the pain (recognizing you have pain, but putting your mind on something else)
Passive coping subscale items
Saying to yourself, “I wish my doctor would prescribe better pain medication for me”
Thinking, “This pain is wearing me down”
Talking to others about how much your pain hurts
Restricting or canceling your social activities
Thinking “I can’t do anything to lessen this pain”
Focusing on where the pain is and how much it hurts

Table III. *Sociodemographic and health-related factors by coping categories (means, proportions and 95% confidence intervals)**

Variable	High active–Low passive ($n = 175$)	Low active–Low passive ($n = 121$)	High active–High passive ($n = 168$)	Low active–High passive ($n = 180$)
Age mean (95% CI)	43.5 (41.7–45.4)	44.1 (41.6–46.6)	45.8 (44.0–47.6)	43.9 (42.0–45.8)
Gender % (95% CI)†				
Male ($n = 300$)	29.7 (24.6–35.2)	23.0 (18.4–28.1)	22.3 (17.7–27.5)	25.0 (20.2–30.3)
Female ($n = 344$)	25.0 (20.5–29.9)	15.1 (11.5–19.3)	29.4 (24.6–34.5)	30.5 (25.7–35.7)
Education % (95% CI)†				
Less than high school ($n = 184$)	17.9 (12.7–24.3)	17.4 (12.2–23.7)	27.2 (20.9–34.2)	37.5 (30.5–44.9)
High school ($n = 168$)	28.0 (21.3–25.4)	17.3 (11.9–23.8)	24.4 (18.1–31.6)	30.4 (23.5–37.9)
Post-secondary ($n = 287$)	32.8 (27.4–38.5)	20.2 (15.7–25.3)	26.5 (21.5–32.0)	20.6 (16.0–25.7)
Employment status % (95% CI)†				
Unemployed ($n = 125$)	16.8 (10.7–24.5)	18.4 (12.0–26.3)	25.6 (18.2–34.2)	39.2 (30.6–48.3)
Employed ($n = 509$)	29.9 (25.9–34.0)	18.9 (15.6–22.5)	26.5 (22.7–30.6)	24.8 (21.1–28.8)
Allergies % (95% CI)†‡				
Absent ($n = 331$)	30.2 (25.3–35.5)	20.5 (16.3–25.3)	20.8 (16.6–25.6)	28.4 (23.6–33.6)
Mild ($n = 205$)	28.3 (22.2–35.0)	17.6 (12.6–23.5)	27.8 (21.8–24.5)	26.3 (20.5–32.9)
Severe ($n = 94$)	16.0 (9.2–24.9)	14.9 (8.4–23.7)	39.4 (29.4–50.0)	29.8 (20.8–40.1)
Respiratory problems % (95% CI)†‡				
Absent ($n = 418$)	30.4 (26.0–35.0)	18.9 (15.3–23.0)	25.8 (21.7–30.3)	24.9 (20.8–29.3)
Mild ($n = 154$)	25.3 (18.7–33.0)	18.8 (13.0–25.9)	22.7 (16.4–30.2)	33.1 (25.8–41.1)
Severe ($n = 60$)	13.3 (5.9–24.6)	16.7 (8.3–28.5)	33.3 (21.7–46.7)	36.7 (24.6–50.1)
High blood pressure % (95% CI)†‡				
Absent ($n = 528$)	29.7 (25.9–33.8)	18.4 (15.2–21.9)	24.4 (20.8–28.3)	27.5 (23.7–31.5)
Mild ($n = 77$)	15.6 (8.3–25.6)	20.8 (12.4–31.5)	37.7 (26.9–49.4)	26.0 (16.6–37.2)
Severe ($n = 27$)	14.8 (4.2–33.7)	18.5 (6.3–38.1)	22.2 (8.6–42.3)	44.4 (25.5–64.7)
Gastro-intestinal problems % (95% CI)†‡				
Absent ($n = 426$)	30.8 (26.5–35.5)	19.5 (15.9–23.6)	23.5 (19.6–27.9)	26.3 (22.2–30.8)
Mild ($n = 133$)	25.6 (18.4–33.8)	16.5 (10.7–24.0)	30.8 (23.1–39.4)	27.1 (19.7–35.5)
Severe ($n = 72$)	11.1 (4.9–20.7)	16.7 (8.9–27.3)	31.9 (21.4–44.0)	40.3 (28.9–52.5)
Headaches % (95% CI)†‡				
Absent ($n = 230$)	31.3 (25.4–37.7)	24.8 (19.3–30.9)	23.5 (18.3–29.5)	20.4 (15.4–26.2)
Mild ($n = 261$)	29.1 (23.7–35.0)	18.4 (13.9–23.6)	22.2 (17.3–27.8)	30.3 (24.8–36.2)
Severe ($n = 143$)	16.8 (11.1–23.9)	9.1 (4.9–15.0)	36.4 (28.5–44.8)	37.8 (29.8–46.2)
Exercise per week % (95% CI)†				
0–2 times ($n = 301$)	23.9 (19.2–29.1)	18.6 (14.4–23.5)	23.9 (19.2–29.1)	33.6 (28.2–39.2)
3 or more times ($n = 327$)	30.3 (25.3–35.6)	19 (14.9–23.6)	28.1 (23.3–33.3)	22.6 (18.2–27.6)
Depressed % (95% CI)†§				
No ($n = 472$)	32.2 (28.0–36.6)	19.5 (16.0–23.4)	25.4 (21.6–29.6)	22.9 (19.2–26.9)
Yes ($n = 160$)	13.8 (8.8–20.1)	16.3 (10.9–22.9)	28.1 (21.3–35.8)	41.9 (31.4–49.9)
General health mean (95% CI)†¶	68.4 (66.6–70.2)	64.5 (62.3–66.7)	60.7 (58.5–62.8)	55.7 (53.6–57.9)
Spinal pain grade % (95% CI)†				
Grade I ($n = 355$)	33.2 (28.4–38.4)	25.4 (20.9–30.2)	20.8 (16.7–25.4)	20.6 (16.5–25.1)
Grade II ($n = 123$)	30.1 (31.1–49.1)	12.9 (10.4–24.9)	28.8 (29.6–47.4)	28.2 (28.8–46.6)
Grade III/IV ($n = 126$)	6.3 (2.8–12.1)	7.9 (3.9–14.1)	37.3 (28.9–46.4)	48.4 (39.4–57.5)

* Proportions add to 100% across rows.

† Differences across coping categories significant at $p < 0.05$ using chi-squared tests for categorical data and ANOVA for continuous data.

‡ Absent means the comorbid condition is absent. Mild means that the comorbid condition is present but has no effect or little effect on health. Severe refers to a comorbid condition that has a moderate or severe effect on health.

§ Depressive symptoms measured by CES-D. No depression refers to CES-D score lower than 16, Yes refers to CES-D score 16 or higher.

¶ General health subscale from the SF-36. Score ranges from 0 to 100, with higher scores indicating better health.

11% reported only neck pain, 30% reported only low back pain and 59% reported both neck and low back pain. Because of the high degree of concordance of neck and low back pain, where both types of pain were reported, the higher of the two pain scores was used. For example, if an individual had Grade II neck pain and Grade III low back pain, he or she was considered to have Grade III spinal pain.

Both depression and health have been shown in other studies to be related to coping with pain (12, 16, 21–23), and, although comorbid medical conditions have not been studied as they relate to coping with pain, there is a growing recognition among health-care researchers of the importance of including comorbid medical conditions in case-mix adjustments (24). We assessed the presence of depressive symptoms with the Centre for Epidemiological Studies Depression Scale (CES-D), which was developed to assess depression in the general population and is reliable and valid (25–29). We used a cut-off score of 16 because it has shown adequate sensitivity and specificity with community samples (26, 30) and is the recommended cut-off score for general population studies (25). Individuals scoring 16 or above on the scale are considered to have significant levels of depressive symptomatology. To assess overall health, we used the General Health subscale from the SF-36 (31). This subscale measures the respondent's evaluation of his/her health, with higher scores indicating the perception of better personal health (32). The subscale is valid and reliable with medical population and general practice patients (32).

To assess comorbid medical conditions, respondents rated the presence and severity of specific health problems and diseases (33). Initial investigations suggest that this questionnaire has good reliability and adequate validity (33), and it has been used in previously published

Table IV. *Adjusted odds ratios and 95% confidence intervals of the factors associated with coping style (n = 625)**

Variable	High active–Low passive† OR (95% CI)	Low active–Low passive OR (95% CI)	High active–High passive OR (95% CI)	Low active–High passive OR (95% CI)
Education				
Less than high school	(Reference)	1.00	1.00	1.00
High school		0.81 (0.45–1.47)	0.75 (0.43–1.32)	0.63 (0.37–1.10)
Post-secondary		0.62 (0.29–1.35)	0.68 (0.33–1.43)	0.31 (0.14–.71)
Allergies‡				
Absent	Reference	1.00	1.00	1.00
Mild		0.95 (0.56–1.62)	1.64 (0.99–2.72)	1.12 (0.67–1.82)
Severe		1.46 (0.65–3.26)	3.02 (1.48–6.18)	1.45 (0.67–3.11)
General health§		0.98 (0.96–1.00)	0.96 (0.94–0.98)	0.94 (0.92–0.96)
Spinal pain grade				
Grade I	(Reference)	1.00	1.00	1.00
Grade II		0.59 (0.32–1.07)	1.36 (0.80–2.30)	1.30 (0.76–2.23)
Grade III–IV		1.45 (0.54–3.89)	7.32 (3.18–16.88)	7.42 (3.23–17.0)

* Odds ratios (OR) are adjusted for all other variables in the model. Model Specifications: −2 Log Likelihood = 1075.31; 21 degrees of freedom; $p < 0.001$. Nineteen cases are missing due to missing data.

† High active–Low passive is the reference category for other coping combinations.

‡ Self-reported allergies. Mild refers to allergies that have no effect or little effect on health. Severe refers to allergies that have a moderate or severe effect on health.

§ General health subscale from the SF-36, entered into the model as a continuous variable. Possible scores range from 0 to 100.

studies (13, 18, 34, 35). We also asked questions about demographics (age, gender, marital status, location of residence), socioeconomic factors (education, family income, employment status), cigarette smoking, exercise frequency, and height and weight (which yielded body mass index).

Outcome: The outcome, pain coping strategies, was measured with the 11-item short form of the Vanderbilt Pain Management Inventory (PMI) (Table II), which was developed to assess how patients manage pain (12). The test developers' instructions for this questionnaire ask individuals to endorse coping strategies used when their pain is of moderate or greater intensity. Respondents rate how often they use each strategy on a five-point Likert scale. Scores range from 6 to 30 for the passive scale and 5 to 25 for the active scale. To develop coping combinations, the active and passive coping scales were dichotomized using the median score as a cut-off for high and low scores. Previous studies using the PMI have not employed a cut-off score and combinations of coping strategies have previously not been examined. However, Härkäpää (36) used the same procedure to split sub-scales from the Coping Strategies Questionnaire (21). The median scores on the active and passive coping scale were 16 and 14, respectively. Those with scores below the median on both scales were classified as low active/low passive ($n = 121$); those below the median on the active and above the median on the passive scale were classified as low active/high passive ($n = 180$); those above the median on the active and below on the passive scales were high active/low passive ($n = 175$); and those above the median on both scales were high active/high passive ($n = 168$).

Statistical analyses

Crude associations between the sociodemographic and health related factors and the four coping categories were assessed using chi-squared tests for categorical data and analysis of variance for continuous data, with alpha levels set at 0.05. Where a factor showed a significant overall difference among the four coping categories, we examined the means, proportions and confidence intervals to identify important differences within levels of factors. Multinomial logistic regression models were built to examine associations between the explanatory factors and the four coping categories. Factors were entered into the multivariate model if they were associated with the outcome using the Wald statistic with $p < 0.10$, and were retained in the final multivariate model if the p value of the Wald statistic was < 0.05. Age and general health were entered as continuous variables and all other variables were dichotomous or categorical. The High Active/Low Passive coping style was used as the reference category because it was conceptualized as potentially the most effective coping style. The analysis assesses the associations between explanatory factors and each of the three coping styles in comparison to the association between those factors and High Active/Low Passive coping. We report the strength of associations as odds ratios (OR) and 95% confidence intervals. The analysis was done with SPSS (37).

RESULTS

Univariate analyses

We found no difference across coping combinations for age (Table III). Significant differences across coping combinations were found for gender, education, employment status, exercise frequency, depressive symptoms, general health, allergies, respiratory problems, high blood pressure, gastro-intestinal problem, headaches and pain severity. A comparison of the means and frequencies and their 95% confidence intervals suggests some important differences across groups within levels of the above factors. All confidence intervals overlapped across coping combinations for men, suggesting no important differences across coping combinations. Low active/low passive coping was the combination endorsed least frequently by women. Severe headaches and depression were more frequent in the two groups with high passive coping than in the low passive coping groups. The low active/low passive coping group had much less Grade II pain (high intensity, low disability pain) than the other three groups, and the two low passive coping groups had much less disabling pain (Grades III/IV) than the high passive coping groups. The two high passive groups also had more Grades III/IV pain than Grade I pain, and the two low passive groups had more Grade I than Grades III/IV pain.

Multivariate analyses

Although important in the crude analysis, gender, employment status, respiratory and gastro-intestinal problems, high blood pressure, headaches and exercise frequency were not significant

in the final multivariate model. We found that neck/low back pain severity, general health, allergies and education were significantly and independently associated with coping combinations (Table IV). Grades III/IV pain (disabling pain) was over 7 times more highly associated with both high active/high passive and low active/high passive coping than was Grade I pain (low intensity pain with low levels of disability). There was no important association between pain severity and the low active/low passive coping combination in the adjusted analysis. In comparison with the reference group (high active/low passive), those in the other coping combinations viewed themselves as having poorer health. The association with general health was especially strong in the low active/high passive combination (OR = 0.94, 95% CI 0.92–0.96, $p < 0.001$). Severe allergies were three times more common than no allergies in high active/high passive copers and having a low level of education (less than high school) was highly associated with low active/high passive coping.

DISCUSSION

Our analysis suggests that neck or low back pain, general health, allergies and education are associated with combinations of passive and active coping strategies. Our crude analysis of gender and coping suggested that women are more likely than men to use the high active/high passive coping combination (data not shown). Brown & Nicassio also reported that women use both passive and active coping strategies more than men (12), however their analyses did not control for pain severity. Härkäpää (36) found that women used more preventative action (e.g. using good posture), coping self-statements/ignoring pain, hoping and praying, and diverting attention to cope with pain than men. These categories encompass both "passive" and "active" coping strategies. Jensen et al. (38) also found a trend toward greater use of passive coping strategies in women. However, when we adjusted for other demographic and socioeconomic factors, health, medical disorders and pain, we no longer observed an association between gender and coping. Previous studies have not measured this broad range of factors, and it may be that the apparent relationship between gender and coping found in previous studies is due to failure to adjust for this broad range of important covariates.

In our multivariate model, we found that individuals with higher education were less likely to use low active/low passive coping than those who did not complete high school. One possible explanation is that individuals with lower levels of education are less aware of current trends towards active and away from passive strategies in rehabilitation. Alternatively, it may be that those with lower levels of education have fewer social or economic resources that would allow them to engage in active coping strategies. However, if this were true, we would have expected to find a relationship between lower education and the low active/high passive coping combination as well. The high active/low passive coping group perceived themselves as having the best general health, and the association between poorer general health and low active/high passive coping was especially strong.

Disabling neck/low back pain was strongly associated with the two coping combinations involving high use of passive coping strategies, regardless of levels of active coping. This confirms and strengthens earlier reports of the importance of passive coping in pain severity (13, 15 16) and suggests that active coping is relatively unimportant. Although causal inferences cannot be drawn from cross-sectional data, these findings also lend some support to the idea that a decrease in the use of passive coping strategies may be more effective in chronic pain management programmes than treatments aimed at increasing active strategies (14, 39). Interestingly, we found no independent relationship between coping combinations and intense, non-disabling pain (Grade II). Additionally, although severe or disabling neck/low back pain is highly associated with depression (18), we found no unique association between depression and any of the coping combinations.

These findings raise questions about the causal direction of the relationship between disabling pain and coping. Although this analysis does not permit causal inferences, one could speculate that passive coping facilitates the development of disabling neck or low back pain. However, if this is the case, the lack of observed relationship between coping and Grade II pain suggests that use of high levels of passive coping leads to decreased function (inability to work or carry out usual activities) but does not necessarily lead to increased pain intensity. Another causal possibility is that experiencing disabling levels of spinal pain leads to greater use of passive coping strategies such as negative thinking, an increased focus on pain, restricting activities and complaining about pain. Again, if this is the case, pain-related functional disability, but not increased pain intensity, facilitates the development of greater use of passive coping. This question deserves further exploration in longitudinal studies.

This report has some limitations. First, a median split to dichotomize the scores may not be the most valid method of assessing high or low use of active and passive coping strategies and should be validated in future studies. However, using this strategy for dichotomizing high and low use of coping strategies highlighted associations between use of passive and active strategies and pain intensity, general health and a measure of socioeconomic status (education). This suggests that a median split has some validity in separating high and low use of coping strategies. A second limitation of this study is the 45% non-response rate, which raises the question of response bias. However, the sociodemographic characteristics of our sample were similar to that of the general population; wave analysis (40) shows no evidence of response bias due to low back pain, Grades I, III or IV neck pain, or depressive status; and we do not believe that selective responding constitutes a major bias in our results (3, 4 18). Despite these limitations, the present study provides important information regarding the coping process in the general pain population by verifying the importance of looking at combinations of coping strategies rather than coping

strategies in isolation. Given the current emphasis on coping strategies in the rehabilitation of patients with neck and back pain, this study highlights the need for further research into the question of what role coping plays in recovery from pain, whether coping behaviour can be modified, and if so, what modifications should be recommended.

ACKNOWLEDGEMENTS

The authors acknowledge the technical assistance of Ms S. Tomchuk, Ms D. Fedosoff, Ms J. Krieger, Mr R. Wallace, and Saskatchewan Health. This research was funded in part by a grant from the Chiropractors' Association of Saskatchewan.

REFERENCES

1. Bovim G, Schrader H, Sand T. Neck pain in the general population. Spine 1994; 19: 1307–1309.
2. Mäkelä M, Heliövaara M, Sievers K, Knekt P, Maatela J, Aromaa A. Musculoskeletal disorders as determinants of disability in Finns aged 30 years or more. J Clin Epidemiol 1993; 46: 549–559.
3. Cassidy JD, Carroll LJ, Côté P. The Saskatchewan Health and Back Pain Survey. The prevalence of low back pain and related disability in Saskatchewan adults. Spine 1998; 23: 1860–1867.
4. Côté P, Cassidy JD, Carroll L. The Saskatchewan Health and Back Pain Survey. The prevalence of neck pain and related disability in Saskatchewan adults. Spine 1998; 23: 1689–1698.
5. Lazarus RS. The stress and coping paradigm. In: Eisdorfer C, Cohen D, Kleinman A, Maxim P, eds. Models for clinical psychopathology. New York: Spectrum; 1981. p. 177–214.
6. Lazarus RS, Folkman S. Stress, appraisal, and coping. New York: Springer; 1984.
7. Moos RH, Schaefer JA. Coping resources and processes: current concepts and measures. In: Goldberger L, Breznitz S, eds. Handbook of stress: theoretical and clinical aspects (2nd ed.). New York: Free Press; 1991. p. 234–257.
8. Lazarus RS. Emotion and adaptation. London: Oxford University Press; 1991.
9. Bigos S, Boyer O, Braen G, Brown K, Deyo R, Haldeman S, et al. Acute low back problems in adults. Clinical practice guideline No. 14. AHCPR Publication No. 95-0642. Rockville, MD: Agency for Health Care Policy and Research 1994, Public Health Service, U.S. Department of Health and Human Services.
10. Fordyce WE. Back pain in the workplace: management of disability in nonspecific conditions: a report of the task force on pain in the workplace of the International Association for the Study of Pain. Seattle: IASP Press, 1995.
11. Spitzer WO, Skovron ML, Salmi LR, Cassidy JD, Duranceau J, Suissa S, et al. Scientific monograph of the Quebec Task Force on whiplash-associated disorders: redefining "whiplash" and its management. Spine 1995; 20 Supplement 8S.
12. Brown GK, Nicassio PM. Development of a questionnaire for the assessment of active and passive coping strategies in chronic pain patients. Pain 1987; 31: 53–64.
13. Mercado AC, Carroll L, Cassidy JD, Côté P. Coping with neck and low back pain in the general population. Health Psychol 2000; 19: 333–338.
14. Zautra AJ, Burleson MH, Smith CA, Blalock SJ, Wallston KA, DeVellis RF, et al. Arthritis and perceptions of quality of life: an examination of positive and negative affect in rheumatoid arthritis patients. Health Psychol 1995; 14: 399–408.
15. Snow-Turek AL, Norris MP, Tan G. Active and passive coping strategies in chronic pain patients. Pain 1996; 64: 455–462.
16. Smith CA, Wallston KA. Adaptation in patients with chronic rheumatoid arthritis: application of a general model. Health Psychol 1992; 11: 151–162.
17. Brown GK, Nicassio PM, Wallston KA. Pain coping strategies and depression in rheumatoid arthritis. J Consult Clin Psychol 1989; 57: 652–657.
18. Carroll L, Cassidy JD, Côté, P. The Saskatchewan Health and Back Pain Survey: the prevalence and factors associated with depressive symptomatology in Saskatchewan adults. Can J Publ Health 2000; 91: 459–464.
19. von Korff M, Ormel J, Keefe FJ, Dworkin SF. Grading the severity of chronic pain. Pain 1992; 50: 133–149.
20. Smith BH, Penny KI, Purves AM, Munroe C, Wilson B, Grimshaw J, et al. The Chronic Pain Grade questionnaire: validation and reliability in postal research. Pain 1997; 71: 141–147.
21. Rosenstiel AK, Keefe FJ. The use of coping strategies in chronic low back pain patients: relationship to patient characteristics and current adjustment. Pain 1983; 17: 33–44.
22. Spinhoven P, Linssen ACG. Behavioral treatment of chronic low back pain. I. Relation of coping strategy use to outcome. Pain 1991; 45: 29–34.
23. Spinhoven P, Ter Kuile MM, Linssen ACG, Gazendam B. Pain coping strategies in a Dutch population of chronic low back pain patients. Pain 1989; 37: 77–83.
24. Greenfield S, Sullivan L, Dukes KA, Silliman R, D'Agostino R, Kaplan S. Development and testing of a new measure of case mix for use in office practice. Med Care 1995; 33: AS47–AS55.
25. Radloff LS. The CES-D Scale: a self-report depression scale for research in the general population. Appl Psychol Measurement 1977; 1: 385–401.
26. Boyd JH, Weissman MM, Thompson WD, Myers JK. Screening for depression in a community sample. Understanding the discrepancies between depression symptom and diagnostic sales. Arch Gen Psychiatry 1982; 39: 1195–1200.
27. Devins GM, Orme CM, Costello CG, Binik YM. Measuring depressive symptoms in illness populations: psychometric properties of the Center for Epidemiologic Studies Depression (CES-D) scale. Psychol Health 1988; 2: 139–156.
28. Orme JG, Reis J, Herz EJ. Factorial and discriminant validity of the Center for Epidemiological Studies Depression (CES-D) scale. J Clin Psychol 1986; 42: 28–33.
29. Weissman MM, Sholomskas D, Pottenger M, Prusoff BA, Locke BZ. Assessing depressive symptoms in five psychiatric populations: a validation study. Am J Epidemiol 1977; 106: 203–214.
30. Myers JK, Weissman MM. Use of a self-report symptom scale to detect depression in a community sample. Am J Psychiatry 1980; 137: 1081–1084.
31. Ware JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992; 30: 473–483.
32. Ware JE, Snow KK, Kosinski M, Gandek B. SF-36 Health Survey: Manual and Interpretation Guide. Boston: The Health Institute, New England Medical Center, 1993.
33. Jaroszinski G, Cassidy JD, Côté P, Carroll L, Yong-Hing K. Development and validation of a comorbidity scale. Canadian Orthopaedic Research Association, Quebec, June 1996.
34. Côté P, Cassidy J, Carroll L. Is lifetime history of neck injury in a traffic collision associated with prevalent neck pain, headache and depressive symptomatology? Accident Analysis and Prevention 2000; 32: 151—159.
35. Côté P, Cassidy J, Carroll L. The factors associated with neck pain and its related disability in the Saskatchewan population. Spine 2000; 25: 1109–1117.
36. Härkäpää K. Relationships of psychological distress and health locus of control beliefs with the use of cognitive and behavioral coping strategies in low back pain patients. Clin J Pain 1991; 7: 275–282.
37. SPSS for Windows, Version 10.0. Chicago, IL: SPSS Inc., 1999.
38. Jensen I, Nygren A, Gamberale F, Goldie I, Westerholm P. Coping with long-term musculoskeletal pain and its consequences: is gender a factor? Pain 1994; 57: 167–172.
39. Turner JA, Whitney C, Dworkin SF, Massoth D, Wilson L. Do changes in patients' beliefs and coping strategies predict temporomandibular disorder treatment outcomes? Clin J Pain 1995; 11: 177–188.
40. Tennant A, Badley EM. A confidence interval approach to investigating nonresponse bias and monitoring response to postal questionnaires. J Epidemiol Community Health 1991; 47: 15–29.