Effects of Coping on Pain Perception and Life Quality in Chronic Low Back Pain

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Parkland Health and Hospital Systems (PHHS) Orthopedic Spine Clinic is a leading spine center in the Dallas, TX metropolitan area. The mission statement of PHHS is “dedication to the health and well-being of individuals and communities entrusted to our care”. With caring for the Dallas County indigent population, in addition to low income and many State Medicaid/Medicare patients, the treatment of spinal conditions can be taxing for PHHS. One of these spinal conditions is low back pain (LBP).

Low back pain is one of the most common diagnoses in the United States (Chou & Shekelle, 2010). Despite the acuity of most cases, some patients will proceed to develop chronic low back pain (CLBP) with a trend of 40% of patients with continued pain at six months, and 33% with up to two years of pain from initial treatment (Lewis et al., 2005). Chronic back pain has been studied from several aspects and can lead to disabling conditions both physically and mentally. These disabling conditions can also cause an increase in patients’ perceptions of pain as well as a change in their quality of life (Bentsen, Hanestad, Rustoen, & Wahl, 2008).

A variety of treatments for CLBP exist which include acupuncture, massage, physiotherapy, or chiropractic adjustments. In addition, mind-body techniques such as breath therapy, tai chi, yoga, and Rolfings, have been explored (Mehling, Hamel, Acree, Byl, & Hecht, 2005). Cognitive processes have been effective in influencing treatment outcomes for patients with CLBP even suggesting a more significant importance than physical adjustments (Woby, Roach, Urmston, & Watson, 2008). Per Busch (2005), coping, which can be adaptive or
maladaptive, is a cognitive psychology concept influential in comprehending pain continuance.

Patients who live with CLBP must learn to manage their symptoms and adapt their lives. While some patients learn how to affectively perform these tasks to function normally, others can find this adjustment difficult which can then lead to the development of psychosocial consequences (Woby, Watson, Roach, & Urmston, 2005). It has been documented that community-dwelling elderly patients living with chronic pain have increased morbidities including depression, disability, and decreased quality of life (Morone & Greco, 2007). A lower quality of life is also common for those with CLBP. Bentsen, Hanestad, Rustoen, and Wahl (2008) state “the goal of treatment is to optimize patients’ quality of life in terms of less pain and better functioning” (p. 2062). Therefore, the purpose of this study is to educate patients with CLBP on interventions to enhance adaptive coping to improve patients’ pain perception and quality of life.

**Context**

- Back pain has a point prevalence of 12-25% and lifetime prevalence between 49-80% (Woby et al., 2005).
- LBP is responsible for 2% of office visits and ranks fifth as reasons patients present to a physician (Chou & Shekelle, 2010).
- Expenses for CLBP are disproportional in relation to the costs for acute LBP treatments with an estimation of approximately 50-100 billion dollars spent by Americans every year on LBP. Even the cost of medication treatment in these patients is anywhere between five to ten thousand dollars per patient (Whitfill et al., 2010).
- The use of maladaptive coping measures, such as fear avoidance and catastrophizing, may lead to lower treatment outcomes (Chou & Shekelle, 2010).
• Adaptive coping factors such as diversion and endurance, which are more optimistic and self-assuring, result in better prognosis for patients (Gustavsson, Denison, & Koch, 2010).

• By addressing pain with an understanding of influencing factors, nurses especially those in advanced practice settings, can provide a more comprehensive, effective treatment plan for patients (Raak, Wikblad, Raak, Carisson, & Wahren, 2002).

**Project Description**

**Goals / Objectives**

Through the application of adaptive coping mechanisms in patients with CLBP, it is proposed that patients will have the following outcomes:

1. Patients will have a statistical significant reduction in pain perception, through pain ratings on the visual analog scale (VAS), from the beginning to the end of the study.

2. Patients will have a statistical significant reduction in either the frequency, or the dosage, of their pain medications, which may include non-steroidal anti-inflammatories (NSAIDs), narcotics, anti-neuropathic agents, and muscle relaxants.

3. Patients will have a statistical significant increase in their activity level from the start of the program to the end of the study.

4. Patients will have a statistical significant improvement on scores of the Coping Strategies Questionnaire 24 (CSQ24) from the beginning to end of the study.

**Research Questions**

In patients with CLBP, does the use of adaptive coping mechanisms decrease a patient’s pain perception and medication usage, as well as increase their activity level and improve coping scores on the CSQ24?
Methodology

This study will be designed utilizing a randomized, controlled before-after trial. Participants in the intervention group will receive educational instruction and handouts regarding the use of adaptive coping mechanisms which will include diversion and endurance techniques.

A convenience sample, which will be determined by power analysis, of patients from the outpatient orthopedic spine clinic at PHHS that meet inclusion criteria and who consent to their eligibility to participate will be enrolled. The inclusion criteria include: (a) age of 18-75, (b) ability to read and write in English, (c) have CLBP with duration of greater than 3 months, and (d) have pain localized physically from below the scapular region to above the buttocks, with or without radiculopathy (pain into the lower extremities). The exclusion criteria include: (a) acute LBP (< 3 mo) and (b) any postsurgical back pain patients. Simple randomization of eligible participants will be utilized to obtain the intervention group.

Participants will attend an initial consultation administered by the nurse practitioner (NP), who will serve as the primary investigator (PI). At this visit, the CSQ24 (Appendix B) will be utilized for data collection on how patients relate to coping. They will be educated on proper use of the pain visual analog scale (VAS) for use in pain ratings. Also, a review of their medication lists will be obtained with listing of the drug and their dosage and frequency of dosing. The intervention group will receive education and handouts on adaptive coping mechanisms, such as distraction and endurance.

Participants during the study will keep weekly logs of their VAS scores, medication dosage and frequency, and physical activity levels. In addition, they will attend an additional consultation at the conclusion of the study. At this visit, they will retake the CSQ24 and their logs will be collected for review by the PI. During the study, phone calls will be conducted by
the PI, with assistance from the medical assistant; every three weeks to assure patients are continuing to complete their logs.

Statistical analysis will consist of the following tests. The agreements between the instruction of adaptive coping mechanisms (independent variable) and patients’ pain ratings, patients’ medication use, and patients’ activity level (dependent variables) will be assessed by the use of one-way analysis of variance (ANOVA) if the groups have normal distribution. If they are not normally distributed, then the Kruskal-Wallis $H$ test will be performed. The agreements between the instruction and the pre- and post-tests scores on the CSQ24 will be assessed by the use of paired-sample $t$ tests (parametric) versus Wilcoxin-Signed Rank test (nonparametric).

**Timeline and Duration**

1. September 2011: Obtain CSQ24 from author. Prepare educational handouts and patient journals. Finish the study proposal and obtain approvals from the Capstone committee members.

2. September – October 2011: Submit the proposal and consent form to University of Texas Southwestern (UTSW) Medical School and Texas Woman’s University (TWU) Institutional Review Boards (IRB) for approval by mid September 2011. The goal for enrolling participants will be by the end of September 2011. This study should qualify for expedited approvals.

3. October 2011: Recruit participants until the sample size is obtained.
4. November 2011 – January 2012: The tentative date for the initial consult will be November 4, 2011 with the final consultation on January 27, 2012. Phone calls will be conducted every 3 weeks till completion of study for motivational purposes.

5. February 2012: Analysis of data, which will include patients’ logs and their CSQ24 pre- and post-test scores.

6. April 2012: Submission of Capstone project paper to the TWU Committee. Capstone paper and poster presentations are scheduled for April 27, 2012.

**Site and Personnel Required for the Project**

This study will be conducted at the outpatient orthopedic spine clinic of PHHS located in Dallas, TX. Personnel will include the nurse practitioner with ancillary support provided from the medical assistant. There will also be a consultation for a statistician for assistance with analysis of data.

**Support Needed from Institution for Project**

Support from TWU will consist of the approval of the IRB, in addition to the review and approval of the project by the Capstone committee. The approval from the UTSW IRB committee prior to implementation is required. Cooperation from PHHS clinic management and clinical staff, as well as physician support, will be desirable for completion of this project.

**Deliverables to the Institution**

A pilot study which will examine the use of adaptive coping mechanisms in patients with CLBP and its association with reduction in patients’ pain ratings and use of pain medication. As
well, this study will examine if adaptive coping allows for an increase in activity level and improvement on CSQ24 scores.

**Benefits / Anticipated Outcomes**

CLBP is one of the most frequent and expensive diagnosis in the U.S. Improved methods for control of pain are needed. By improving coping mechanisms, providers can have an educational tool to assist patients with pain control. Patients will achieve a reduction in their pain level, an increase in activity levels, and a better quality of life. This then would hopefully reduce the frequency of patients’ visits and the expenses that can be associated with their pain.


Appendix A

Research Questions and Hypothesis

Research Questions

1. Does the instruction of participants in the use of adaptive coping mechanisms result in a significant reduction in pain perception through pain ratings on the visual analog scale (VAS) from the beginning to the end of the study?

2. Does the instruction of participants in the use of adaptive coping mechanisms result in a significant reduction in either the frequency, or the dosage, of their pain medications, which may include non-steroidal anti-inflammatories (NSAIDs), narcotics, anti-neuropathic agents, and muscle relaxants?

3. Does the instruction of participants in the use of adaptive coping mechanisms result in a significant increase in their activity level between the start and end of the study.

4. Does the instruction of participants in the use of adaptive coping mechanisms result in a significant improvement on pre- and post-test scores of the Coping Strategies Questionnaire 24 (CSQ24).

Null Hypothesis

1. The instruction of participants in the use of adaptive coping mechanisms has no significant reduction in pain perception through pain ratings on the visual analog scale (VAS) from the beginning to the end of the study?

2. The instruction of participants in the use of adaptive coping mechanisms has no significant reduction in either the frequency, or the dosage, of their pain medications, which may include
non-steroidal anti-inflammatories (NSAIDs), narcotics, anti-neuropathic agents, and muscle relaxants?

3. The instruction of participants in the use of adaptive coping mechanisms has no significant increase in their activity level between the start and end of the study.

4. The instruction of participants in the use of adaptive coping mechanisms has no significant improvement on pre- and post-test scores of the Coping Strategies Questionnaire 24 (CSQ24).

**PICO**

1. In patients with CLBP, does the use of adaptive coping mechanisms decrease a patient’s pain perception?

2. In patients with CLBP, does the use of adaptive coping mechanisms decrease a patient’s pain medication dosage or frequency of use?

3. In patients with CLBP, does the use of adaptive coping mechanisms increase their activity level?

4. In patients with CLBP, does the use of adaptive coping mechanisms improve coping scores on the CSQ24 from pre-test to post-test?

**Planned Instrumentation**

The Coping Strategies Questionnaire 24 (CSQ24), a revised version of the CSQ which is perhaps one of the most popular tools in the field of inquiry regarding coping (Harland & Georgieff, 2003), will be used to evaluate patients’ scores on pre- and post-test coping abilities. This tool has remained relatively stable over time and shown construct validity through correlations between the derived CSQ factors and other measures.
The Pain Visual Analog Scale will be used to assess patients’ pain scores. It is a measurement instrument for subjective characteristics or attitudes that cannot be directly measured. When responding to a VAS item, respondents specify their level of agreement to a statement by indicating a position along a continuous line between two end-points. For example, respondents measure their level of pain from a 1-10 (1 = no pain; 10 = worst pain imaginable).

**Proposed Statistical Analyses of Project**

Statistical analysis will consist of the following tests. The agreements between the instruction of adaptive coping mechanisms (independent variable) and patients’ pain ratings, patients’ medication use, and patients’ activity level (dependent variables) will be assessed by the use of one-way analysis of variance (ANOVA) if the groups have normal distribution. If they are not normally distributed, then the Kruskal-Wallis H test will be performed. The agreements between the instruction and the pre- and post-tests scores on the CSQ24 will be assessed by the use of paired-sample t tests (parametric) versus Wilcoxin-Signed Rank test (nonparametric).
Coping Strategies Questionnaire 24 (CSQ24)

Please answer the following questions using the scale below to indicate the frequency with which you use each strategy. Circle the most appropriate answer where 1 = never do that to 7 = always do that.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never do that</th>
<th>Sometimes do that</th>
<th>Always do that</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I try to feel distant from the pain, almost as if the pain was in somebody else’s body.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>2. I try to think of something pleasant.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>3. I don’t think of it as pain but rather a dull or warm feeling.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>4. It is terrible and I feel it is never going to get any better.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>5. It is awful and I feel it overwhelms me.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>6. I feel my life isn’t worth living.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>7. I try not to think of it as my body, but rather as something separate from me.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>8. I tell myself I can’t let the pain stand in the way of what I have to do.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>9. No matter how bad it gets, I know I can handle it.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>10. I pretend it’s not there.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>11. I worry all the time about whether it will end.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>12. I replay in my mind pleasant experiences in the past.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
<tr>
<td>13. I think of people I enjoy doing things with.</td>
<td>1  2  3  4  5</td>
<td>6  7</td>
<td></td>
</tr>
</tbody>
</table>
14. I imagine the pain is outside my body. 1 2 3 4 5 6 7
15. I just go on as if nothing happened. 1 2 3 4 5 6 7
16. I see it as a challenge and don’t let it bother me. 1 2 3 4 5 6 7
17. Although it hurts, I just keep on going. 1 2 3 4 5 6 7
18. I feel I can’t stand it any more. 1 2 3 4 5 6 7
19. I feel like I can’t go on. 1 2 3 4 5 6 7
20. I think of things I enjoy doing. 1 2 3 4 5 6 7
21. I do anything to get my mind off the pain. 1 2 3 4 5 6 7
22. I do something I enjoy, such as watching television or listening to music. 1 2 3 4 5 6 7
23. I pretend it’s not part of me. 1 2 3 4 5 6 7

Please answer this last question using the following scale: 1 = no control and 7 = complete control.

<table>
<thead>
<tr>
<th></th>
<th>No control</th>
<th>Complete control</th>
</tr>
</thead>
<tbody>
<tr>
<td>24. How much control do you have over pain?</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

Note: This is not the exact tool but an example of what the CSQ24 would look like. A letter requesting permission has been sent to the author of the CSQ24 and permission is still pending at this time.
Demographic Instrument

Please mark the answer that best represents you with an X on the line.

1. My age is: ______

2. I see myself as:
   ___ White
   ___ Hispanic
   ___ African American
   ___ Asian
   ___ Other

3. I am a:
   ___ Male
   ___ Female

4. My insurance is:
   ___ Medicaid or Parkland Health First
   ___ Medicare
   ___ Parkland Health Plus
   ___ Homeless/ Tax Support
   ___ I do not have any insurance coverage

5. The last grade I finished was:
   ___ Less than 12th grade
   ___ High School Graduate
   ___ Some College
   ___ Associate degree
   ___ Bachelors degree
   ___ Graduate degree (Masters or Doctorate)
Appendix C

Proposed Informed Consent to Participants

TEXAS WOMAN’S UNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

Title: Effects of Coping on Pain Perception and Life Quality in Chronic Low Back Pain

Investigator: Robert Metzger 214-590-9801
Advisor: Susan Chaney, Ed.D. 214-689-xxxx

Explanation and Purpose of the Research

You are being asked to participate in a research study for Mr. Metzger’s capstone project at Texas Woman’s University. The purpose of this research is to determine the effect of adaptive coping mechanisms on patients’ pain perception and quality of life.

Research Procedures

For this study, some participants will partake in an instructional class on adaptive coping mechanisms to be conducted by the researcher. You will be provided with staff to clarify questions. Your medication list will also be recorded in regards to certain pain medications you are prescribed or use over the counter. You will be asked to take two surveys, one at the beginning of the project and another at the end of the project. Your time commitment in the study is approximately 3 months. During this three month period, you will be asked to keep weekly journals of how you rate your pain, the amount of medication you are using, and your physical activity levels. You will be contacted by phone every 3 weeks to assure you are maintaining your journals.
Potential Risks

Potential risks related to your participation in the study include fatigue and physical or emotional discomfort during the completion of the survey or journals. To avoid fatigue, you may take a break as needed. If you experience any physical or emotional discomfort regarding the questions, you may stop answering the questions at anytime. The investigator will provide you with a referral list of names and phone numbers that you may use as you feel as though you need to discuss this physical or emotional discomfort with a professional.

Another possible risk to you as a participant in this study is a release of confidential information. Confidentiality will be protected to the extent that is allowed by law. The survey will take place in a specialty orthopedics clinic. No personal identifying information will be collected on the survey or journal to protect your identity. Only the researcher will have access to these records. The surveys and journals will be stored in a locked file cabinet in the researcher’s office. The hard copies will be shredded within five years of the completion date of the study. It is anticipated that the results of this study will be published in the investigator’s capstone project as well as in other research publications. However, no names or other identifying information will be included in any publication.

The researcher will try to prevent any problem that could happen because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.
Participation and Benefits

Your involvement in this research study is completely voluntary, and you may discontinue your participation in the study at any time without penalty. The only direct benefit of this study to you is that at the completion of the study a summary of the results will be mailed to you upon request.*

Question Regarding the Study

You will be given a copy of this signed and dated consent form to keep. If you have any questions about the research study you may ask the researcher; the phone number is at the top of this form. If you have any questions about your rights as a participant in this research or the way this study has been conducted, you may contact the Texas Woman’s University Office of Registration and Sponsored Programs at 940-898-3378 or via e-mail at IRB@twu.edu.

____________________________________________    _________________________
Signature of Participant                      Date

*If you would like to receive a summary of this study, please provide an address to which this summary should be sent:

____________________________________________
____________________________________________
____________________________________________
____________________________________________