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The Nature of the Traumatic Event as a Predictor of Posttraumatic Stress Disorder in Chronic Low Back Pain Patients

Lorie Tulia DeCarvalho

LOMA LINDA UNIVERSITY
Graduate School

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by

Lorie Tulia DeCarvalho

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the requirements for the degree of
Master of Arts in Psychology

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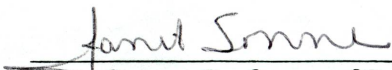

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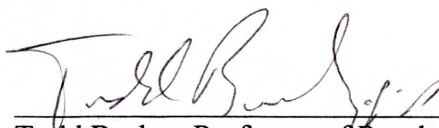
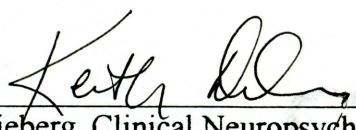


Todd Burley, Professor of Psychology



Keith Drieberg, Clinical Neuropsychologist/ Rehabilitation Psychology,
Loma Linda University Outpatient Rehabilitation Center

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List of Abbreviations

APA: American Psychological Association

CLBP: Chronic low back pain

DSM-IV: Diagnostic and Statistical Manual of Mental Disorders (4^{th} ed).

MPQ: McGill Pain Questionnaire

PDS: Posttraumatic Diagnostic Scale

PTSD: Posttraumatic Stress Disorder

STES: Source of Traumatic Experiences Scale

ABSTRACT OF THE THESIS

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Posttraumatic Stress Disorder in Chronic Low Back Pain Patients

by

Lorie Tulia DeCarvalho

Master of Arts, Graduate Program in Psychology
Loma Linda University, June 2001
Dr. Janet Sonne, Chairperson

The present study investigated the specific nature of the traumatic event in patients with chronic low back pain (CLBP). Specifically, the following questions were asked: (1) Do individuals with CLBP evidence posttraumatic stress disorder?, (2) In patients with CLBP, what is the trauma which predicts the development of PTSD- the specific event which led to the lower back pain, any other traumatic event, or is it the chronic low back pain itself which is traumatic? (3) In CLBP patients who evidence PTSD, do the intensity and duration of the trauma predict the development of PTSD? Participants were 112 patients receiving treatment for their CLBP at Loma Linda University Medical Center and Health Care facilities. The present study involved self-reports of pain intensity, traumatic experiences, and posttraumatic stress disorder.

Participants were grouped into four categories in order to further clarify the nature of the traumatic event, including: (1) with pain only, without previous trauma, (2) with pain who experienced previous general trauma, which did not specifically lead to CLBP, (3) with pain who experienced specific trauma that led to their CLBP condition, but who did not experience any other previous trauma, and (4) with pain who experienced both general trauma *and* specific trauma. The majority (89%) of CLBP patients evidenced some level (mild-severe) of posttraumatic stress disorder, with the average CLBP patient having PTSD at the moderate level. Comparatively, the normative population, on-average, scored in the moderate-severe range for PTSD. The intensity and duration of the trauma did not significantly predict PTSD in these patients. Patients in the "pain w/general trauma only" group had the highest means for PTSD. The level of perceived pain severity was the only significant predictor of PTSD; therefore, CLBP patients who are experiencing more severe CLBP are more likely to manifest PTSD. The results of the present study indicate that, while it is not possible to exclude other factors which may play a role in the development of PTSD, it is clear that the severity of the chronic low back pain significantly predicts PTSD. Furthermore, the experience of pain with previous trauma with CLBP may compound the affective distress that these patients experience, which reflects in higher levels of PTSD.

Introduction

Chronic pain represents the epitome of one of the most challenging problems in the lives of millions of individuals. The challenges come to those health professionals who seek to help the person suffering from pain, both in terms of the complexity of the problem and the sheer number of individuals suffering from such pain. Chronic low back pain (CLBP), one of the most common forms of chronic pain, debilitates millions of individuals every year in the United States, causing minor to severe disability in its victims. CLBP produces tremendous, ongoing pain in more than 11.7 million Americans with 2.6 million persons being permanently disabled by CLBP (Turk & Nash, 1993). Eight percent to ninety percent of any given pain population involves cervical or lower back pain (Rosomoff & Rosomoff, 1991). Turk and Nash (1993) reported that 550 million working days and 100 billion dollars are lost annually because of CLBP. Thus, CLBP has been described as the most expensive benign condition in the United States (Mayer et. al., 1987).

Studies have shown that the experience of severe, unrelenting pain correlates with posttraumatic stress disorder (PTSD) (e.g. Geisser, Roth, Bachman, & Echert, 1996). Additionally, PTSD symptoms are highly correlated with increased affective distress, self-reported pain levels, and functional disability in persons with chronic pain (e.g. Benedikt & Kolb, 1986). As Geisser, Roth, Bachman, and Eckert (1996) pointed out, however, past studies focusing on PTSD and chronic pain have failed to examine the factors that place a person at risk for the development of PTSD. The few studies which have been done have focused on the psychological experiences of patients with accident-related chronic pain (e.g. Buckley, Blanchard, & Hickling, 1996; Geisser et. al., 1996).

Very little attention has been devoted to examining the relationship between chronic pain and PTSD which did not involve motor vehicle accidents or injuries obtained in war. Specifically, there is a paucity of research devoted to examining the relationship between CLBP and PTSD.

The present review is written to address these omissions and to attempt to further improve assessment and treatment of patients with CLBP. First, the review will include overviews of posttraumatic stress disorder (PTSD) and chronic low back pain (CLBP). Second, there will be a discussion of the predictors of PTSD in the general population. Following this, there will be a summary and critique of existing literature on pain-related PTSD, focusing on accident-related trauma versus trauma related to the experience of CLBP. Finally, the review will conclude with the research questions and hypotheses suggested by the review and examined in this thesis.

Definition of Posttraumatic Stress Disorder (PTSD)

Posttraumatic Stress Disorder (PTSD) is an intense response to experiences which threatened the life or safety of oneself or another. PTSD may result from any intense event that would lead to distress in others; such events may include but are not limited to the following: natural disasters, war, accidents, rape, torture, abuse, and the unexpected death of a loved one. Additionally, it is possible that PTSD will result due to one's inability to assimilate or come to grips with what has occurred because he/she is too overwhelmed by the experience (Hales & Hales, 1995).

Therefore, posttraumatic stress disorder arises as the result of extreme trauma which occurs in an individual's life. Trauma may be defined as: "a disordered psychic or behavioral state resulting from mental or physical stress or physical injury" (Webster, 1990).

PTSD is categorically defined in the Diagnostic and Statistical Manual of Mental Disorders (4^{th} edition) (APA, 1994) as a disorder wherein both of the following are present:

(1) the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or threat to the physical integrity of self or others, and

(2) the person's response involved intense fear, helplessness and horror.

According to the DSM-IV, the individual persistently re-experiences the trauma. This may take on different forms: intrusive images, thoughts, or perceptions; dreams; behaviors or feelings related to the event; psychological and/or physiological reactivity to internal or external cues resembling aspects of the traumatic event. As a response to the re-experiencing of the trauma, the individual reacts with 1) persistent avoidance (e.g. of thoughts, feelings, conversations, activities concerning the trauma) and 2) arousal (e.g. sleep difficulties, irritability/ anger control, concentration, hypervigilance, exaggerated startle response). Individuals experience clinically significant distress or impairment for at least one month. With delayed-onset PTSD, the presentation of symptoms is at least 6 months after the stressor has occurred (APA, 1994).

Definition of Chronic Low Back Pain (CLBP)

Chronic low back pain (CLBP) may be defined as pain that is experienced in the lumbar spinal region for at least six months (Crue, 1985).

In a study of 900 patients referred to an orthopedic clinic for the treatment of CLBP, Waddell (as cited in Waddell and Turk, 1992) found that patients' CLBP could be divided into three groups: (1) Simple Mechanical CLBP (e.g. various forms of CLBP that stem from physical activity), (2) Nerve Root CLBP (i.e. scoliosis, kyphosis, lordosis, and ruptured disks which impinge on the nerve roots of the lower back), and (3) Serious Spinal Pathology (i.e. tumor, infections, or inflammatory conditions).

Predictors of PTSD in the General Population

Post-traumatic stress disorder (PTSD) is caused by external traumatic events; however, not every one who experiences trauma develops PTSD. Therefore, it is important to consider those factors which may predict PTSD.

In examining the process which occurs from acute distress to the onset of PTSD, McFarlane and Yehuda (1996) devised a conceptual framework for the development of PTSD in the general population. Essentially, the individual first experiences a trauma, which leads to intrusive memories, and finally results in PTSD. Subsequently, McFarlane and Yehuda identified three factors which have been shown to predict PTSD. They include: the nature of the traumatic event, the characteristics of the traumatized individual, and the nature of the recovery environment. The present literature review will focus upon one of the factors-the nature of the traumatic event.

Nature of the traumatic event

The nature of the traumatic event has been implicated as an extremely important component in the development of PTSD in the general population.

The nature of the trauma may involve the following elements: (1) the severity or intensity of traumatic events, as perceived by the patient, (2) severity of perceived pain, as perceived by the patient, and (3) loss of physical integrity/ bodily injury.

The severity or intensity of traumatic events has been found to predict PTSD. Among post-war veterans, PTSD has been found to be the most common negative outcome, yet not all persons who experienced the trauma associated with combat developed PTSD. Solomon, Laor, and McFarlane (1996) noted that the factors which seemed to predict PTSD were long-term, severe trauma. Thus, more intense traumatic events, experienced for prolonged periods of time, resulted in PTSD in soldiers more often. This finding was similar to that of Sutker et. al. (1995), who concluded that PTSD responses related to severity of the traumatic experience. Layman, Gidzycz, and Lynn's (1996) study of female victims of rape found that more forceful assaults were associated with greater PTSD symptomatology. Additionally, those who sustained physical injuries due to the trauma experienced an additive effect upon their symptoms. In a study of survivors of long-term torture, Basoglu et. al. (1994) found that the perceived severity of the torture experience related to the onset of PTSD symptoms. Shalev (1996) cited numerous studies, which indicated that the intensity and duration of the traumatic event, and the extent of physical injury contributed significantly to the development of PTSD. Thus, the experience of severe, unrelenting pain as a result of the trauma relates to the development of PTSD (Geisser, Roth, Bachman, and Echert, 1996). Geisser et. al. (1996) found that PTSD symptoms were related to increased affective distress, self-report of pain, and functional disability among patients with chronic pain.

Similarly, persons who are significantly injured and experience a loss of physical integrity or bodily injury are more likely to develop PTSD (Blanchard, Hickling, Mitnick et.al, 1995; Davidson & Foa, 1991; Kilpatrick et. al, 1989). Blanchard, Hickling, Mitnick, et. al. (1995) studied victims of motor vehicle accidents and found that the perception of life threat and the extent of patients' physical injuries were major predictors for the development of PTSD. Similarly, in a study of individuals who experienced trauma due to crimes, Kilpatrick et. al. (1989) found that the perception of threat to one's life and whether or not individuals sustained physical injuries were significant predictors of the development of PTSD. Based on the literature for the general population, posttraumatic stress disorder resulted from traumatic events which involved one or all of the following elements: (1) prolonged experience of the traumatic event(s), (2) severity/ intensity of the traumatic events, (3) severe, unrelenting pain, and (4) loss of physical integrity/ bodily injury.

Posttraumatic Stress Disorder and Chronic Pain

Though PTSD has been recognized as "shell shock" and related to wars, especially World War II. (Kizer, 1996), it may occur with *any* serious trauma which involves helplessness and potential loss of one's physical or mental integrity. The experience of chronic pain is a traumatic event involving serious injury and/or threat to one's physical integrity of self, and the person's response involves fear and helplessness. Therefore, one may expect that persons suffering from chronic pain and/or disability may develop PTSD.

Given that patients with severe chronic pain and disability experience repeated endangerment to self, and they witness their own degeneration and dismemberment (e.g. through surgeries), they are significantly at risk for chronic and severe PTSD (Kulk et.al. 1990). In fact, Hickling and Blanchard (1992), in a study of patients being treated for chronic headache pain and pain resulting from motor vehicle accidents, found that 50% of the patients met criteria for PTSD. Patients with chronic pain due to a traumatic injury may be at greater risk for PTSD (Helzer et. al, 1987; Pitman et. al., 1989; Martini et. al., 1990).

Perceived pain in conditions other than CLBP has been found to predict PTSD. Schreiber and Galai-Gat (1993) presented a case study of a patient with chronic pain stemming from the loss of an eye. The implications of their study may have significant application to CLBP. They suggested that pain intensity may be a strong enough stressor in traumatic circumstances to lead to the onset of PTSD. Similarly, nagging physical injuries in chronic pain patients may be constant reminders of the trauma, which would maintain or exacerbate PTSD (Buckley, Blanchard, and Hickling, 1996).

Summary and Critique of Literature

This literature review covered several areas. First, posttraumatic stress disorder was described and defined according to the DSM-IV (APA, 1994). Second, an overview was provided for chronic low back pain (CLBP), which included relevant statistical information and the types of CLBP. Third, there was a description of predictors of PTSD in the general population, including the severity and duration of the situational trauma, perceived levels of pain, and loss of physical integrity/bodily injury. These predictors fell under the heading of the "nature of the traumatic event."

Finally, the review examined the relationship between PTSD and chronic pain.

Clearly, particular studies shared similar strengths and limitations. For example, Schreiber and Galai-Gat's (1993) case study suggested that uncontrolled and prolonged chronic pain may be a strong enough stressor to lead to the onset of PTSD. This valuable study supported that accidents or traumatic injuries are not necessary prerequisites for the development of PTSD in chronic pain patients. Buckley, Blanchard, and Hickling (1996) also made an important contribution to an understanding of the relationship between chronic pain and PTSD. They found that nagging physical injuries in chronic pain patients may be constant reminders of the trauma. Consequently, the presence of an injury could, in itself, maintain or exacerbate PTSD. Unfortunately, both studies had very small sample sizes (n=1 and n=7, respectively) for patients with delayed-onset PTSD. Therefore, the power to detect significant effects and to generalize the findings are seriously limited.

Based on aforementioned empirical findings, the physical experience of chronic pain appears to relate to the development of PTSD. Geisser et. al.'s (1996) findings that severe, unrelenting pain is sufficient to lead to delayed-onset PTSD are very pertinent. However, it is important to note that in this study there was no mention if the control group, consisting of patients who experienced chronic pain which was not due to an accident, was assessed at pre-test for PTSD. The accident-related groups were assessed with a PTSD scale for chronic pain patients who had experienced accidents or injuries; therefore, the non-accident/non-injury control group could not have been adequately assessed for PTSD based on this information. If this were the case, levels of PTSD in patients in the control group were not accounted for.

Furthermore, it is possible that some individuals in the accident-related groups: 1) acquired PTSD prior to their accidents, or 2) experienced pain which led to PTSD (versus the accident itself). Thus, it is not clear what led to PTSD, since the chronic pain was derived from a traumatic event (accident). The question remains: Did PTSD result from the experience of chronic pain itself, or from the accident?

This leads to an important distinction which needs to be made. A pertinent question is: In patients with CLBP, does a situational trauma predict the development of PTSD, or does the experience of CLBP itself predict PTSD? In other words, what exactly *is* the nature of the trauma in patients with CLBP- the traumatic event which led to injury and the pain, or the experience of CLBP?

Rationale for the Proposed Research

The experience of CLBP is traumatic because it involves consistent trauma in the form of physical pain, threat to one's physical integrity, as well as complex psychological, social, sexual, and spiritual experiences. To reiterate the DSM-IV definition of PTSD, the two constituents which must be met for the diagnosis are: (1) the person experienced an event(s) that involved actual or threatened death or serious injury, or threat to the physical integrity of self or others, and (2) the person's response involved intense fear, helplessness and horror (APA, 1994).

First, the person experienced an event(s) that involved actual or threatened death or serious injury, or threat to the physical integrity of self or others. In terms of patients with CLBP, there is the experience of being physically injured and acquiring CLBP over time. Essentially, these patients may have nagging physical injuries, continuous severe pain, and the need to exert consistent caution in their movements and daily activities.

As these persons' physical bodies decompensate, muscles atrophy, nerves become damaged, disability may set in and cause them to lose their abilities to function normally. These individuals may repeatedly face invasive, dangerous procedures and/or surgeries, which fail to alleviate their pain. Thus, there is both a definite threat of and/or actual disintegration of their physical selves.

Second, the person's response involved intense fear, helplessness, and horror. These patients have ongoing complex psychological, social, and spiritual experiences which relate to decreased coping with CLBP. Many of these patients have tremendous fear about getting reinjured or needing more procedures performed on them. Many fear becoming permanently disabled because of their condition. Others fear the mutilation or loss of function which may occur with surgery.

Understandably, it is difficult to ascertain whether or not CLBP leads to PTSD, or if PTSD leads to greater pain in patients with CLBP. However, there is a great deal of support which indicates that the greater the severity of one's perceived pain, the greater the likelihood is of that individual developing PTSD (e.g. Buckley, Blanchard, and Hickling, 1996; Helzer et. al, 1987). Consequently, it may be said that patients with CLBP are at increased risk for developing PTSD.

Research Questions/Hypotheses

As previously stated, very little attention has been given to examining the relationship between the experience of CLBP and the potential development of PTSD. Furthermore, previous studies did not attend to other possible sources of trauma, which could potentially result in PTSD.

Therefore, the central questions raised in the present study are: (1) Do individuals with CLBP evidence PTSD? (2) In patients with CLBP, what is the trauma which predicts the development of PTSD? Specifically, do patients with CLBP who experience pain as the only source of their trauma evidence similar levels of PTSD as those who experienced a traumatic event (e.g. an accident) which led to their CLBP and as those who experienced a situational trauma unrelated to CLBP? (3) In CLBP patients who evidence PTSD, what factors associated with the nature of the trauma (specifically the intensity and duration of the trauma) predict the development of PTSD? And, does a prior history of traumatic events unrelated to a specific injury contribute to the effects of the specific CLBP injury-related trauma, or to the pain?

The following hypotheses are made:

- First, it is hypothesized that as a group, patients with CLBP will evidence PTSD regardless of the source(s) of the traumatic event(s).
- Second, it is hypothesized that the trauma of experiencing pain alone (group 1) will result in clinically significant levels of PTSD in CLBP patients, as will the experience of pain plus general trauma unrelated to current CLBP (e.g. childhood trauma) (group 2), pain plus specific trauma associated with current CLBP (e.g. motor vehicle accidents) (group 3), or as the combination of pain and a history of general and specific trauma (group 4). Further, it is hypothesized that the means for PTSD will be greater for group 1 than for each of the mean levels of PTSD for groups 2,3, and 4.

- Third, it is hypothesized that the intensity and duration of the trauma [whether pain alone, pain with a general trauma (e.g. childhood trauma), pain with a specific trauma resulting in CLBP (e.g. motor vehicle accident), or as the combination of pain and a history of general and specific trauma] will predict PTSD.

In order to more thoroughly address the research questions and hypotheses, the present study will include *only* patients suffering from chronic low back pain. More specifically, the population will include CLBP patients: (1) with pain only, without previous trauma, (2) with pain who experienced general trauma, which did not specifically lead to CLBP, (3) with pain who experienced specific trauma, which led to CLBP, and (4) with pain who experienced both general *and* specific trauma.

Method

Participants

Participants were 112 patients receiving treatment for CLBP at Loma Linda University Medical Center and Health Care facilities, including the Center for Pain Management, Rehabilitation Psychology, and Outpatient Rehabilitation Center. All participants were 18 years or older and had suffered from CLBP for a minimum of 6 months (e.g. Crue, 1985; Haythornthwaite, Sieber, & Kerns, 1991).

Fifty-eight out of 170 patients (34%) who had taken their survey packets home failed to mail them back to the graduate student investigator. Thus, the total sample consisted of 112 individuals (78 females; 34 males) between the ages of 20 and 82 years (see figure 1).

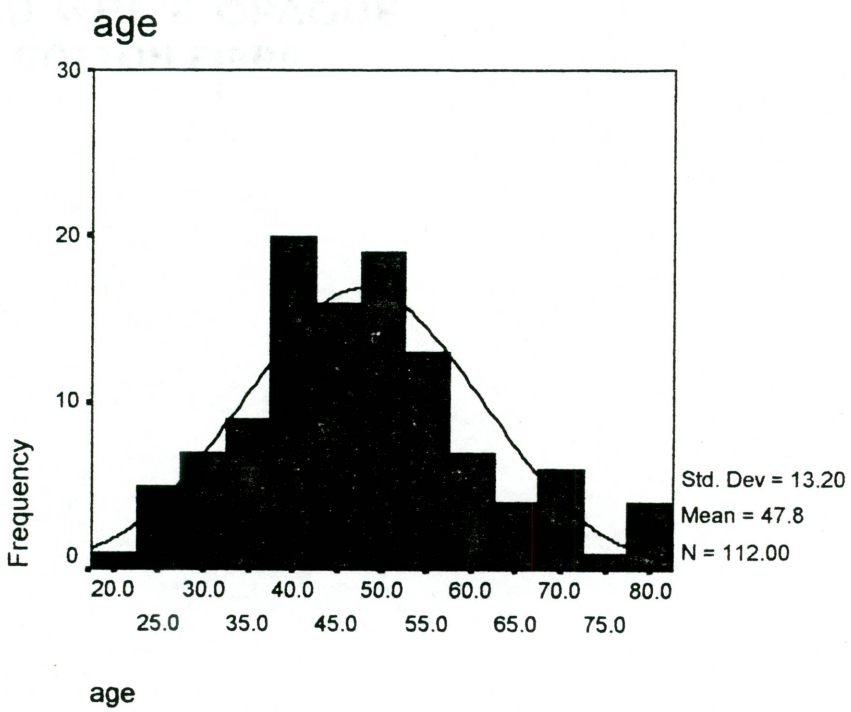


Figure 1. Distribution of age ranges for CLBP sample.

Further demographic information is presented below in Table 1.

Table 1. Demographic Information for CLBP Patients Sampled.

Demographics	Frequency	%	M	SD
Sex				
Females	78	69.6		
Males	34	30.4		
Age	20-82 yrs		47.8	13.2
Education				
High school/GED	43	38.4		
Vocational/trade school	19	17.0		
College degree(s)	29	25.9		
Graduate/masters degree(s)	14	12.5		
Doctorate (M.D., Ph.D., DMD...)	2	1.8		
Other	4	3.6		
Marital Status				
Married	66	58.9		
Single, never married	14	12.5		
Widowed	6	5.4		
Divorced	19	17.0		
Separated	6	5.4		
Other	1	0.9		
Ethnicity				
Caucasian/White	100	89.3		
Hispanic	7	6.3		
Asian American	1	0.9		
African American	1	0.9		
Native American	2	1.8		
Other	1	0.9		

Participants were asked to provide information specific to their chronic low back pain, including the length of time they had been in pain, whether or not they were experiencing lumbar radiculopathy (leg pain), and whether or not they had surgery performed on their lower back in the past. This descriptive information is presented in Table 2.

Table 2. Chronic Low Back Pain Descriptives.

Descriptives	Frequency	%	M	SD
Time in pain (in mos)			111.2	122.9
Leg Pain				
Yes	83	74.8		
No	27	25.2		
Leg Pain (how long? in mos)			82.70	113.1
History of back surgery?				
Yes	48	42.9		
No	63	56.3		

Information about patients' physical diagnoses is provided in Table 3.

Table 3. Chronic Low Back Pain Patients' Physical Diagnoses.

Descriptives	Frequency	%	M	SD
Ruptured Disk/herniated disk(s)	47	42.0		
Strain	11	9.8		
Stenosis	26	23.2		
Spondylolisthesis	13	11.6		
Lordosis	1	0.9		
Kyphosis	3	2.7		
Fracture	5	4.5		
Other	35	31.3		
Scoliosis	5	4.5		
Arthritis	5	4.5		
Degenerative disk(s)	8	7.1		
Bone spurs	2	1.8		
Undefined hip involvement	1	0.9		
Undefined nerve compression	5	4.5		
Broken spine/pelvis/paraplegia	3	2.7		
Bulging disk(s)	2	1.8		
Arachnoiditis/sacroiliac joint dysfun.	3	2.7		
Scar tissue	1	0.9		

* Percentages and frequencies exceed 100% because each of the diagnoses are based on a yes/no response, and some patients had multiple diagnoses.

Descriptives regarding the various treatments patients utilized are presented in Table 4.

Table 4. Chronic Low Back Pain Patients' Treatments Utilized.

Descriptives	Frequency	%	M	SD
Physical/occupational therapy	37	33.0		
Chiropractic	26	23.2		
Craniosacral therapy	4	3.6		
Massage therapy	25	22.3		
Medications	90	80.4		
Pool therapy	29	25.9		
Spinal nerve blocks	27	24.1		
Alternative (acupunture,vitamins...)	33	29.5		
Counseling	24	21.4		

* * Percentages and frequencies exceed 100% because each of the diagnoses are based on a yes/no response, and some patients had multiple diagnoses.

Patients utilizing treatments provided at Loma Linda University Health Care facilities for their CLBP conditions were asked (while in the waiting room area or in the treatment room) by either the graduate student investigator or health care provider if they would be willing to fill out a questionnaire that deals with their chronic low back pain experience. In addition, the graduate student investigator administered the survey packet and recorded participants' responses via the telephone for some patients (n= 5) receiving treatment at Loma Linda University Health Care.

Participants were grouped into four categories: (1) with pain only, without previous trauma, (2) with pain who experienced previous general trauma, which did not specifically lead to CLBP, (3) with pain who experienced specific trauma that led to their CLBP condition, but who did not experience any other previous trauma, and (4) with pain who experienced both general trauma *and* specific trauma.

The placement of individuals into one of these four groups was based on patients' responses to the Source of Traumatic Experiences Scale (STES) (see Appendix D). Essentially, patients who gave a "no" response for question 1 and "no" responses for all of the questions in part two were placed in group 1. Patients who gave a "no" response to question 1 and "yes" responses on the questions in part two were placed in group 2. Patients who gave a "yes" response for question 1 and "yes" responses for questions in part one were placed in group 3. Finally, patients who responded with a "yes" to question 1 and "yes" responses to parts one and two were placed in group 4. Specific demographic information, including sex, age, time in pain, and Posttraumatic Diagnostic Scale (PDS) scores for each of the four groups is presented in Table 5.

Table 5. Chronic Low Back Pain Patients' demographics and PDS scores for the 4 groups.

	GROUP 1	GROUP 2	GROUP 3	GROUP 4
DESCRIPTIVES				
N (no. of subjects)	22	15	30	39
Sex (frequency; %)				
Females	20, 90.9%	12, 80.0%	18, 60.0%	24, 61.5%
Males	2, 9.1%	3, 20.0%	12, 40.0%	15, 38.5%
Age (M, SD)	62, 14.1	43.3, 7.7	44.6, 12.8	44.4, 9.9
Time in pain (mos) (M, SD)	111.1, 117.0	192.0, 195.7	80.7, 88.9	113.7, 110.7
PDS Score (M, SD)	17.0, 12.0	24.4, 12.7	13.1, 11.6	20.2, 13.6

Measures

Demographics. Demographic information was collected in order to describe the sample of participants. Demographics include: (1) gender, (2) age, (3) occupation, (4) education, (5) marital status, and (6) ethnicity (see Appendix A).

Lower back descriptives. Descriptives were collected for patients' lower back condition, as defined by pain lasting for six months or longer. Questions asked focus upon the following areas: (1) length of time or duration of CLBP, (2) physical diagnosis, and (3) history of back surgery, (4) medication information, and (5) treatments for CLBP (see Appendix B).

Perceived level of pain intensity. Patients completed the McGill Pain Questionnaire (MPQ; Melzack, 1975) (see Appendix C). The MPQ is a 21-item instrument designed to quantitatively measure patients' pain experiences. As the MPQ yields unreliable results when the patient fills out the questionnaire (Melzack, 1975), the graduate student investigator gave the MPQ to all participants in a standardized manner. By doing so, all participants had the directions clearly explained to them, which will reduce error and confounding information (e.g. participants informed the graduate student investigator about his/her pain at that given moment, not previous pain).

Patients choose those descriptive words which describe their feelings and sensations of pain at the present moment. Words are assigned rank values, with a 1 implying mild pain and with 5 meaning that the patient is perceiving his/her pain as excruciating. The rank values are summed to obtain separate scores for sensory (subclasses 1-10), affective (subclasses 11-15), evaluative (subclass 16), and miscellaneous words (subclasses 17-20).

The sum of the rank values for each descriptor in the first 20 items yields a Pain Rating Index (PRI). The total PRI score is a measure of the self-reported pain severity or intensity. The MPQ has good test-retest reliability (70.3% consistency rate) for the PRI score (Melzack, 1975). The total PRI score was used in the present study as a continuous measure of overall perceived pain intensity/severity.

Source of Traumatic Experiences Scale (STES). The STES is an 11-item instrument, which was written by the graduate student investigator for the purpose of determining the participants' experiences with trauma (see Appendix D). Patients were asked whether: (1) their lower back pain is related to an injury, (2) they felt a threat of death or serious injury, (3) they felt a threat to their physical or mental integrity, and (4) they felt intense fear, helplessness, or horror. Additionally, participants were asked how long the event lasted which led to their CLBP injury, to rank their feelings of helplessness, fear, and horror, and to describe their experience which resulted in CLBP.

The second part of the STES deals with participants' experiences with traumatic events, which did not directly result in CLBP. Thus, patients were asked whether: (1) they experienced a threat to their physical or mental integrity, and (2) they felt intense fear, helplessness, and horror. Similarly, participants were asked how long the event lasted, as well as to describe their experience.

The STES was used to separate participants into one of the aforementioned groups, to rank the intensity and duration of the traumatic event(s), and to determine the source(s) of traumatic experiences for patients.

Post-traumatic stress disorder (PTSD). Patients completed the Post-traumatic Stress Diagnostic Scale (PDS; Foa, 1995), a 49-item instrument designed to aid in the diagnosis of PTSD according to DSM-IV criteria (see Appendix E). It also quantifies the severity of PTSD and is particularly useful in populations who are at-risk for PTSD. The PDS was normed on individuals between the ages of 18-65. Responses are measured on a 4-point Likert scale, ranging from 0 (not at all or only 1 time) to 3 (5 or more times per week/ almost always). Scores of 1-10 indicate mild symptom severity of PTSD; scores of 11-20 indicate moderate symptom severity; scores of 21-35 suggest moderate to severe PTSD symptoms; scores of 36-51 indicate that PTSD symptoms are severe. In general, the higher the total score on the PDS, the greater the PTSD symptom severity for the patient. The PDS has good internal consistency (alpha= .92) and test-retest (r= .74).

Procedure

The patients who were phoned (n= 5) were given a brief description of the study, a review of the informed consent form, asked if they had any questions, and asked if they wished to proceed with the survey. The graduate student investigator then went through each page of the survey, asked the questions, and recorded participants' responses on the packet. All patients were debriefed according to APA Ethical Guidelines (APA, 1992).

Most of the patients (n=107) were asked (while in the waiting room or treatment room) by either the graduate student investigator or health care provider if they would be willing to complete a questionnaire about their experience with CLBP. The graduate student investigator reviewed the informed consent form (see Appendix F) with the individual and verified that he/she had no questions and wished to proceed.

After having the patient's consent to be tested, the graduate student investigator reviewed each page of the survey packet with the participant and asked the participant if he/she had any questions prior to filling out the survey. The graduate student investigator gave all participants a choice of either filling out the survey themselves, or having the investigator verbally administer the survey.

If the participant wished to be left alone to fill out the packet him/herself, then he/she received a clipboard and survey packet labeled with a personal identification number. The participant was reminded one last time not to put his/her name anywhere on the survey packet, that the graduate student investigator would be back in a few minutes to check on him/her, and that she would be standing in the hall if he/she had any questions.

After completing the survey, all participants were asked if they wished to receive the results of the study in the future, and if so, that they could put their name and address on a postcard, which would be placed in a separate envelope from their survey packet (in order to preserve their anonymity). The graduate student investigator recorded the name and address of those participants who completed the survey vis-à-vis the telephone. All participants were told beforehand that their identity would remain anonymous, as their survey packet would be placed in a separate envelope from the postcard. All participants were asked how they were doing after filling out the survey and were debriefed. Participants who completed the survey in person were given a debriefing form (see Appendix G) to take home with them.

Participants' identities will be kept anonymous and confidential, as they were asked not to put their names anywhere on the survey packet, and a code number was used as a means of subject identification.

While filling out the surveys, participants were blind to the specific measurement intents of the study. That is, they were not told that the survey was being used in order to determine whether or not they have posttraumatic stress disorder. These precautions were used in order to reduce response sets.

Also, all participants were given identical instructions, choice of method of administration, and clarification about any questions every five minutes during the testing process. This procedure was designed to ensure that there were no inter-subject differences which affected the way participants completed the survey packet. Participants of the present study were treated in accordance with the APA Ethical Principles and Guidelines for research (APA, 1992).

Analyses

To test the first hypothesis that patients with CLBP will evidence PTSD, regardless of the source of the trauma, the mean PDS score across all participants as a group was compared to the normative value using a single-sample t test.

The second hypothesis involved two parts, which focused upon within-group comparisons. First, it was hypothesized that the trauma of experiencing pain alone (group 1) will result in clinically significant levels of PTSD in CLBP patients, as would the experience of pain plus general trauma unrelated to current CLBP (e.g. childhood trauma) (group 2), the experience of pain plus specific trauma associated with current CLBP (e.g. motor vehicle accidents) (group 3), or as the combination of pain and a history of general and specific trauma (group 4). To test this hypothesis, the mean values on the PDS scale for each group were compared to the clinical cut-off scores for the norm sample, using PDS means for each group.

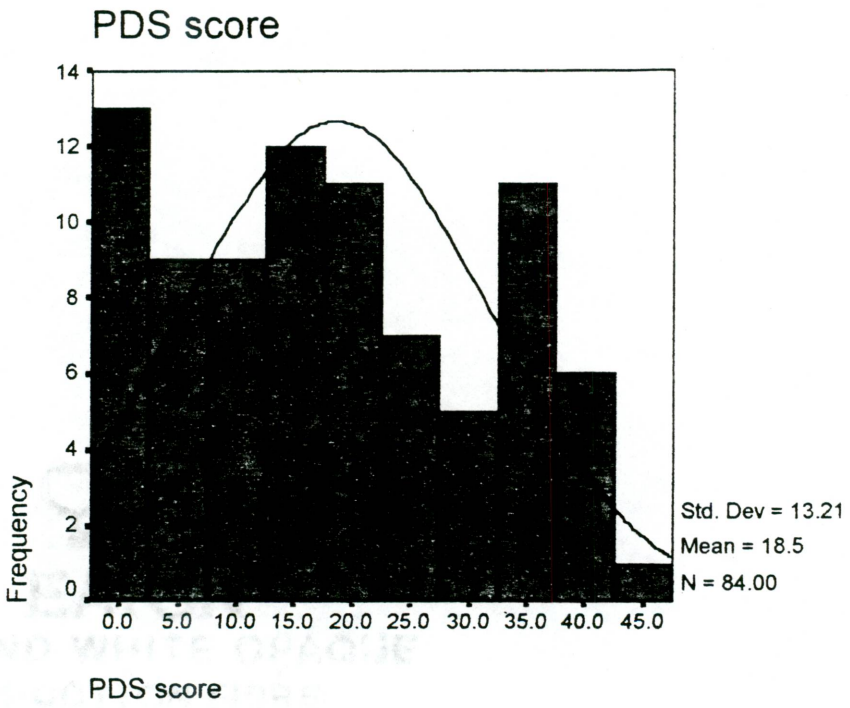
Next, it was hypothesized that the means for PTSD would be greater for group 1 than for each of the mean levels of PTSD for groups 2,3, and 4. A one-way ANOVA and planned contrasts were used to compare the mean PDS scores for the four groups of CLBP patients.

To test the third hypothesis that the intensity and duration of the trauma across all four of the groups would predict PTSD, the perceived pain severity rating (PRI) score obtained from the McGill Pain Questionnaire (MPQ), the duration of the pain obtained from the lower back demographics scale, and the measures of the intensity and duration of any specific trauma and/or any general trauma were entered into a stepwise multiple regression equation to predict scores of the PDS scale.

Results

To test the first hypothesis that patients with CLBP would evidence PTSD, regardless of the source of the trauma, the entire sample mean score for the posttraumatic stress diagnostic scale (PDS) was compared to the mean and standard deviation of the clinical norm sample. A single-sample t-test revealed that CLBP patients evidenced a lower mean PDS score (M= 18.49; SD= 13.21) than the clinical normative sample (M= 23.41) (t=-3.415, p=.001, two-tailed). Therefore, individuals in the clinical norm sample on-average scored in the moderate-severe range for PTSD severity; while chronic low back pain patients on-average scored in the moderate range. This difference in means on the posttraumatic stress diagnostic scale between 18.49 and 23.41 is statistically significant (t= -3.415, p=.001, alpha=.05, two-tailed). However, it is important to note that the CLBP patients did evidence some level (mild-severe) of posttraumatic stress disorder, with nearly 18% of the patients (N=84) scoring in the moderate range (see figure 2).

Figure 2. Chronic low back pain patients' distribution of PDS scores.



Furthermore, 89% of the CLBP patients in this sample evidenced some level (mild, moderate, moderate-severe, or severe) of posttraumatic stress disorder. Thus, it is important to note that, although the analysis does not provide sufficient support for the first hypothesis that chronic low back pain patients would have similar levels of PTSD as the clinical norm sample of individuals experiencing traumatic events, the chronic low back pain patients' PDS scores are still clinically significant and do indicate *some* level (mild-severe) of PTSD.

To test the first part of hypothesis two, the mean values on the PDS scale for each of the four groups [(1) pain only, (2) pain with previous general trauma, (3) pain with specific trauma, and (4) pain combined with a history of general *and* specific trauma] were compared to the clinical cut-off scores for the norm sample. Figure 3 illustrates the mean plots for the four groups.

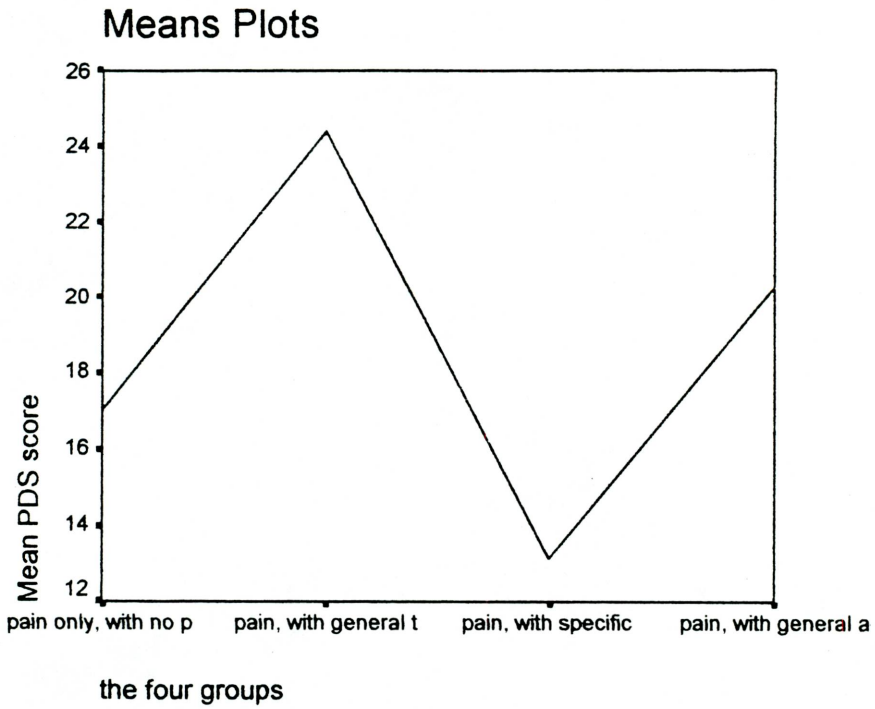


Figure 3. Mean plots of PDS scores for the four groups.

The results indicated that group 3 (pain with specific trauma) had the lowest mean (M= 13.13; SD= 11.60). Group 2 (pain with general trauma) had the highest mean (M= 24.39; SD=12.68) and was the only group over the clinical cut-off for PDS scores. Therefore, CLBP patients who had experienced some general trauma in their lives had greater PTSD levels than the clinical norm sample.

To test the second part of hypothesis two, a one-way ANOVA was used to compare the mean PDS scores for the four groups of chronic low back pain patients. This analysis revealed that the difference among the four groups on the PDS mean values approached statistical significance (F (3, 76)= 2.630, p=.056; [see table 6]).

Table 6. One-way ANOVA results for PDS scores.

Oneway

Descriptives

PDS score

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
pain only, with no previous trauma	10	17.0000	11.9536	3.7801	8.4489	25.5511
pain, with general trauma only	13	24.3846	12.6790	3.5165	16.7228	32.0464
pain, with specific trauma only	24	13.1250	11.5958	2.3670	8.2285	18.0215
pain, with general and specific trauma	33	20.2424	13.5509	2.3589	15.4375	25.0474
Total	80	18.3750	13.0475	1.4588	15.4714	21.2786

Test of Homogeneity of Variances

PDS score

Levene Statistic	df1	df2	Sig.
.234	3	76	.873

ANOVA

PDS score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1264.987	3	421.662	2.630	.056
Within Groups	12183.763	76	160.313		
Total	13448.750	79			

Planned contrasts did not support the hypothesis that group 1 would have larger scores on the PDS than the other three groups (see table 7).

Table 7. Planned contrasts for the four groups.

Contrast Tests

		Contrast	df	Sig. (2-tailed)
PDS score	Assume equal variances	1	76	.170
		2	76	.419
		3	76	.480
		4	76	.012
		5	76	.321
		6	76	.039
	Does not assume equal variances	1	20.054	.168
		2	16.452	.397
		3	16.664	.477
		4	22.886	.014
		5	23.449	.338
		6	53.467	.038

Contrast Coefficients

	the four groups			
Contrast	pain only, with no previous trauma	pain, with general trauma only	pain, with specific trauma only	pain, with general and specific trauma
1	1	-1	0	0
2	1	0	-1	0
3	1	0	0	-1
4	0	1	-1	0
5	0	1	0	-1
6	0	0	1	-1

Contrast Tests

		Contrast	Value of Contrast	Std. Error	t
PDS score	Assume equal variances	1	-7.3846	5.3257	-1.387
		2	3.8750	4.7656	.813
		3	-3.2424	4.5705	-.709
		4	11.2596	4.3602	2.582
		5	4.1422	4.1460	.999
		6	-7.1174	3.3967	-2.095
	Does not assume equal variances	1	-7.3846	5.1628	-1.430
		2	3.8750	4.4600	.869
		3	-3.2424	4.4557	-.728
		4	11.2596	4.2389	2.656
		5	4.1422	4.2344	.978
		6	-7.1174	3.3417	-2.130

Post-hoc tests (Tukey's honestly significant difference) revealed that the largest difference between the groups was between groups 2 and 3 (the "pain with general trauma only" and "pain with specific trauma only", respectively [see table 8]).

Table 8. Tukey's HSD results for the four groups.

Dependent Variable: PDS score
Tukey HSD

(I) the four groups	(J) the four groups	Mean Difference (I-J)	Std. Error	Sig	95% Confidence Interval	
					Lower Bound	Upper Bound
pain only, with no previous trauma	pain, with general trauma only	-7.3846	5.3257	.512	-21.3742	6.6050
	pain, with specific trauma only	3.8750	4.7656	.848	-8.6434	16.3934
	pain, with general and specific trauma	-3.2424	4.5705	.893	-15.2482	8.7634
pain, with general trauma only	pain only, with no previous trauma	7.3846	5.3257	.512	-6.6050	21.3742
	pain, with specific trauma only	11.2596	4.3602	.056	-.1939	22.7131
	pain, with general and specific trauma	4.1422	4.1460	.750	-6.7487	15.0331
pain, with specific trauma only	pain only, with no previous trauma	-3.8750	4.7656	.848	-16.3934	8.6434
	pain, with general trauma only	-11.2596	4.3602	.056	-22.7131	.1939
	pain, with general and specific trauma	-7.1174	3.3967	.164	-16.0400	1.8051
pain, with general and specific trauma	pain only, with no previous trauma	3.2424	4.5705	.893	-8.7634	15.2482
	pain, with general trauma only	-4.1422	4.1460	.750	-15.0331	6.7487
	pain, with specific trauma only	7.1174	3.3967	.164	-1.8051	16.0400

PDS score

Tukey HSD[a,b]

the four groups	N	Subset for alpha = .05
		1
pain, with specific trauma only	24	13.1250
pain only, with no previous trauma	10	17.0000
pain, with general and specific trauma	33	20.2424
pain, with general trauma only	13	24.3846
Sig.		.065

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 16.071.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

A significant finding was that the mean value for the "pain only" group was smaller than two of the other groups (i.e. "pain w/general trauma only" [group 2] and "pain with general & specific trauma" [group 4]). An interesting note is that groups 2,3, and 4 were comprised of individuals who were, on average, in their mid-40's. By contrast, participants in group 1 were, on average, 62 years of age.

To test the third hypothesis, that the intensity and duration of the trauma would predict the severity of PTSD, stepwise regression was performed and indicated that the PRI score was the only significant predictor of PTSD severity ($R=.519$, $p<.05$). Approximately 27% of the variance in PTSD severity scores was accounted for by the pain severity level (see table 9).

Table 9. Stepwise Regression Results.

Descriptive Statistics

	Mean	Std. Deviation	N
PDS score	17.3429	13.7668	35
intensity of threat, fear, helplessness, horror	3.4857	1.8688	35
duration of event	1.91	1.34	35
time in pain (mos)	88.3143	80.6539	35
PRI Total score	49.7429	39.4405	35

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	PRI Total score		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: PDS score

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.519[a]	.269	.247	11.9464

Model Summary[b]

Model	Change Statistics				
	R Square Change	F Change	df1	df2	Sig. F Change
1	.269	12.151	1	33	.001

a. Predictors: (Constant), PRI Total score

b. Dependent Variable: PDS score

The intensity of the threat, fear, helplessness, and/or horror which individuals experienced did not predict levels of PTSD (R= .107). Similarly, the duration of the traumatic event and duration of the chronic low back pain did not predict PTSD severity (R= -.216 and R=.157, respectively). Moreover, separate correlations between the PRI scores and PDS scores were performed on each of the four groups, which indicated that statistically significant correlations of R=.519 and R=.572 ($p<.05$) were revealed in groups three (pain with specific trauma only) and four (pain with general and specific trauma), respectively (see table 10).

Table 10. Correlational data for the PRI and PDS.

Correlations

		PDS score	intensity of threat, fear, helplessness, horror	duration of event	time in pain (mos)	PRI Total score
Pearson Correlation	PDS score	1.000	.107	-.216	.157	.519
	intensity of threat, fear, helplessness, horror	.107	1.000	-.218	.369	.375
	duration of event	-.216	-.218	1.000	-.014	-.220
	time in pain (mos)	.157	.369	-.014	1.000	.341
	PRI Total score	.519	.375	-.220	.341	1.000
Sig. (1-tailed)	PDS score	.	.271	.107	.183	.001
	intensity of threat, fear, helplessness, horror	.271	.	.104	.015	.013
	duration of event	.107	.104	.	.467	.102
	time in pain (mos)	.183	.015	.467	.	.022
	PRI Total score	.001	.013	.102	.022	.
N	PDS score	35	35	35	35	35
	intensity of threat, fear, helplessness, horror	35	35	35	35	35
	duration of event	35	35	35	35	35
	time in pain (mos)	35	35	35	35	35
	PRI Total score	35	35	35	35	35

Thus, these separate analyses clarified that it was in groups 3 and 4 that pain severity levels and PTSD severity levels were significantly correlated such that greater levels of pain severity significantly predicted greater levels of PTSD.

Discussion

Major findings of the present study

The first significant finding of the present study is that 89% of the CLBP patients in the sample had some level of posttraumatic stress disorder, ranging from mild to severe. Clearly, the fact that these patients do develop PTSD is an important clinical finding that is pertinent to treating individuals in this population.

Second, the present study revealed specific predictors of PTSD in patients with chronic low back pain. More specifically, the present study indicated that levels of perceived pain severity predict levels of posttraumatic stress disorder in CLBP patients. Therefore, as patients' chronic low back pain increases in severity, the likelihood of these patients manifesting PTSD also increases. This finding is consistent with previous investigations. In particular, the present study supports the findings of two studies. First, it supports Geisser, Roth, Bachman, and Echert's (1996) finding that the experience of severe, unrelenting pain as a result of trauma relates to the development of PTSD. Second, it supports Schreiber and Galai-Gat's (1993) case study findings that pain intensity may be a strong enough stressor to lead to PTSD.

In terms of predictors of PTSD, it was also found that CLBP patients who had experienced some type of specific trauma that led to their lower back injury and pain had the least amount of PTSD when compared with the other groups. Conversely, CLBP patients who had experienced some general trauma in their lives had greater PTSD levels than the other groups, as well as than the clinical norm sample. It is possible that the experience of a previous general trauma may augment the meaning of the pain.

It is possible that there is an additive or compounding effect which takes place when patients experience chronic low back pain subsequent to a general trauma. With regard to the lower levels of PTSD for patients with a specific trauma, one possible explanation is that these patients expect to experience physical pain; therefore, they may feel more in control psychologically in their situation than patients who have experienced a general trauma who feel more of a sense of uncontrollability. In comparison, it is conceivable that participants in group 1 (mainly comprised of individuals over 62 years of age) manifested lower levels of PTSD than the other three groups because older persons expect, and are therefore less emotionally distressed by their physical pain. In fact, research has indicated that perceived uncontrollability can ultimately increase patients' levels of affective distress and anxiety, thus contributing to higher levels of PTSD.

Furthermore, it was found that the intensity and duration of the trauma, as well as the duration of CLBP, did *not* significantly predict the severity of PTSD. This finding is inconsistent with previous studies. In particular, Solomon, Laor, and McFarlane (1996) found that more intense traumatic events, experienced for prolonged periods of time resulted in PTSD more often in soldiers. However, this study is not specific to chronic pain syndromes but to intense trauma related to war; thus, it may be that the traumatic experiences of CLBP patients are too different from those of veterans of war. Although, numerous studies involving traumas other than war have been cited, which indicated that the intensity and duration of the traumatic event, as well as the extent of physical injury contributed significantly to the development of PTSD (Shalev, 1996).

Limitations of the present study

When examining the population of CLBP patients as a whole versus within the four-group structure, it may be said that the severity of CLBP is a sufficient predictor of PTSD in this population. However, based on the findings of the present study, it is clear that, as a smaller subgroup of this population (the pain only group), there was no support for the finding that pain severity alone would sufficiently predict PTSD.

When further examining the results of the present study, there are several possible explanations for the differences in results between the CLBP sample as a whole versus as four distinct groups. The first possible explanation for this discrepancy is that there was an insufficient number of subjects (N=10) who completed the PDS scale in the "pain only" group (group1), while groups 2,3, and 4 had more subjects (N=13, 24, and 33, respectively). There was a total of 80 out of 112 subjects who completed the PDS scale. Given the small sample size for group one, it is probable that this group lacked sufficient power to obtain significant results in terms of the intensity and duration of the traumatic event(s) or the duration of the pain.

A second possible explanation is that the subjects in group one who completed the other parts of the survey, but did not fill out the PDS scale, may have been in severe enough pain that they were unwilling to complete the remainder of the survey. This may have potentially ruled out some valuable information that they would have provided. In fact, the graduate student investigator did encounter several patients in the testing process who refused to complete the rest of the survey because they were in excruciating pain.

Therefore, without the PDS scale being filled out by these particular patients in the pain only group, there is significant information that is lacking, which may have impacted the outcome of the analysis.

A third possible explanation lies in methods of the administration of the assessments. Specifically, the methods of collecting data were improved and tightened over the course of data gathering according to patients' needs (i.e. giving patients an option of phone versus waiting room; having instruction sheets for patients; having physicians solicit participation; allowing certain patients to take the survey packets home). Methods of data collection for these patients may vary considerably from other populations, as patients with chronic low back pain may be more resistant to filling out more paperwork, especially when their pain levels are increased.

A fourth consideration is that the PDS scale was normed on 248 patients between the ages of 18-65 years who had experienced significant traumatic events in their lives (i.e. Veterans in VA hospitals, anxiety disorder and PTSD treatment clinic patients, women's shelter patients, and emergency/trauma center patients). The age range in the CLBP sample of 112 patients was between the ages of 20-82 years. Therefore, it is conceivable that the elderly patients (65 years and older) had difficulty understanding the questions presented on the PDS, or that the experiences of patients in the CLBP sample may be incomparable to those of patients in the PDS normative sample.

Implications for future treatment

The most significant implication is that these CLBP patients suffer from posttraumatic stress disorder; therefore, the present study concerns the potential of interventions designed to reduce the likelihood of CLBP patients manifesting PTSD.

McFarlane and Yehuda's (1996) conceptual model for the development of PTSD in the general population included the nature of the traumatic event as a factor predisposing individuals to developing PTSD. The nature of the traumatic event may include the intensity of the trauma, severity of perceived pain, and loss of physical integrity or bodily injury. The results of the present study indicate that the severity of chronic low back pain is a significant predictor of PTSD in this population.

The most typical psychological treatments utilized in treating patients with CLBP are: cognitive-behavioral therapy, relaxation training, and biofeedback. The findings of the present study further support the utilization of these treatments as means of decreasing levels of perceived pain in CLBP patients. Therefore, greater attention to the reduction of physical pain in CLBP patients may be necessary, as an effort to minimize the probability of these patients manifesting PTSD as a result of higher levels of chronic low back pain.

The presence of severe pain in patients with CLBP may be considered a risk factor in the development of PTSD, which warrants further investigation. In the future, clinicians responsible for treating patients with CLBP should thoroughly assess these individuals and identify those patients who have higher or more severe levels of perceived pain, as these individuals may develop PTSD. Moreover, clinicians should address issues related to the specific trauma relating to the back pain (if pertinent), as this may assist in reducing levels of PTSD in this population.

Implications for future research

Further research to determine risk factors in addition to pain severity involved in the development of PTSD for CLBP patients is warranted.

Furthermore, there is a lack of measurement instruments for assessing PTSD specifically in the CLBP patient domain. Thus, another possible implication for the future would be the development of tools to thoroughly identify CLBP patients who are at greater risk for developing PTSD. As greater support arises in this area, it may be that specialized treatments may be identified and developed for best treating CLBP patients who are at-risk for developing PTSD. Research that is performed to tease out the impact of general versus specific trauma is warranted. Finally, future research studies should address age as a factor involved in patients' affective responses to their chronic pain condition.

Further replication with a tightening of the research design in order to assess PTSD in patients with CLBP is warranted. Up to the present time, there has been a paucity of research relating to these issues; consequently, future research in examining the impact of severity of pain, intensity and duration of traumatic events, duration of pain, and other factors needs to be addressed as an attempt to decrease the likelihood of CLBP patients developing PTSD.

Summary

In summary, most patients with chronic low back pain tend to manifest at least some level of PTSD. Chronic low back pain patients, on-average, tend to have moderate levels of PTSD severity, while the general population of individuals who have experienced severe traumatic events in their lives tend to have moderate to severe levels of PTSD. Levels of pain severity appear to predict levels of PTSD in patients with chronic low back pain; therefore, as CLBP patients experience higher levels of low back pain, the likelihood of developing PTSD also increases in these patients.

In addition, CLBP patients who have experienced some type of specific trauma that led to their lower back injury and pain tend to have the lowest levels of PTSD when compared with CLBP patients with pain only, pain with general trauma, or pain with general *and* specific trauma. Conversely, CLBP patients who have more severe levels of pain and who experienced a general trauma(s) in their life, are much more likely to develop PTSD. Finally, the intensity and duration of the trauma, as well as the duration of CLBP, do *not* significantly predict the severity of PTSD.

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Appendix A

CHRONIC LOW BACK PAIN SURVEY

Demographic Measures

1. Sex: Female____ Male_____

2. Age:_____

3. Occupation:_____

4. Please check the highest education level which you have attained:

____high school diploma/GED
____vocational/trade school
____college degree(s))
____graduate school masters degree(s)
____doctorate (e.g. M.D., Ph.D., D.M.D., D.V.D.)_____
____other_____

5. Are you presently (please check ONLY ONE):

Married_____ Divorced_____
Single, never married_____ Separated_____
Widowed_____ Other (please specify)_____

6. Please check your ethnicity:

Caucasian/White_____ African American_____
Hispanic_____ Native American_____
Asian American_____ Other (please specify)_____

Appendix B

Lower Back Pain Descriptives

Please answer the following questions as they are true for your own experience with back pain.

1. I have had lower back pain for_____ months.

2. I have sciatica/ leg pain due to my chronic low back condition: YES___ NO____ If so, how long?_____

3. Physical diagnosis and tests (i.e. MRI, CAT scans, myelograms, x-rays, nerve conduction tests) indicate that I have:

   Herniated/ruptured disk(s)____ spondylolisthesis_____
   Strain_____ lordosis_____ kyphosis_____ fracture_____
   Stenosis (narrowing of disk canal)_____ other (please specify)_____

4. I have had surgery on my back: _____yes_____no

5. Please list any medications which you are presently taking for your chronic low back pain condition:_____

6. How often do you take this medication(s) and how much are you taking?_____
   _____

7. Are you getting *any* physical relief from the medications? YES____ NO____

8. Are you experiencing any physical, mental, or emotional side effects while you are taking this medication(s)? YES____NO____

9. If you answered "yes" to #9, please list the side effects which you are experiencing_____
   _____

10. Did you take any medication(s) before filling out this survey? YES____NO____

11. If you answered "yes" to #11, please list those medication(s):_____

12. What treatment(s) are you having right now for your chronic low back pain?

Physical therapy or occupational therapy: YES____ NO____
Chiropractic: YES____NO_____
Craniosacral Therapy: YES_____ NO_____
Massage therapy: YES_____ NO_____
Medication: YES____NO_____
Pool therapy: YES____NO_____
Spinal nerve blocks: YES____NO_____
Alternative healing (e.g. homeopathic, naturopathic, vitamins, acupuncture, other.):
YES____NO____
Counseling: YES_____NO_____; Other:

Appendix C

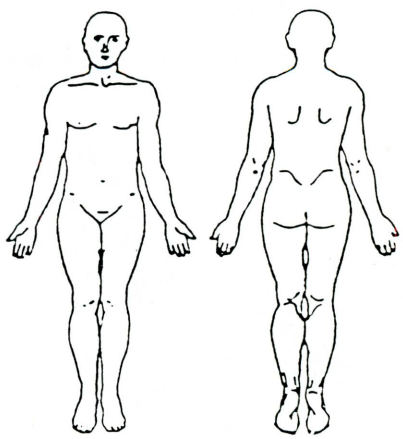
The MPQ

McGill Pain Questionnaire

Patient's ID# _____ Date _____ Time _____ am/pm

PRI: S _____ A _____ E _____ M _____ PRI(T) _____ PPI _____
(1-10) (11-15) (16) (17-20) (1-20)

1 FLICKERING	11 TIRING	BRIEF
QUIVERING	EXHAUSTING	MOMENTARY
PULSING	12 SICKENING	TRANSIENT
THROBBING	SUFFOCATING	RHYTHMIC
BEATING	13 FEARFUL	PERIODIC
POUNDING	FRIGHTFUL	INTERMITTENT
2 JUMPING	TERRIFYING	CONTINUOUS
FLASHING	14 PUNISHING	STEADY
SHOOTING	GRUELLING	CONSTANT
3 PRICKING	CRUEL	
BORING	VICIOUS	
DRILLING	KILLING	
STABBING	15 WRETCHED	
LANCINATING	BLINDING	
4 SHARP	16 ANNOYING	
CUTTING	TROUBLESOME	
LACERATING	MISERABLE	
5 PINCHING	INTENSE	
PRESSING	UNBEARABLE	
GNAWING	17 SPREADING	
CRAMPING	RADIATING	
CRUSHING	PENETRATING	
6 TUGGING	PIERCING	
PULLING	18 TIGHT	
WRENCHING	NUMB	
7 HOT	DRAWING	
BURNING	SQUEEZING	
SCALDING	TEARING	
SEARING	19 COOL	
8 TINGLING	COLD	
ITCHY	FREEZING	
SMARTING	20 NAGGING	
STINGING	NAUSEATING	
9 DULL	AGONIZING	
SORE	DREADFUL	
HURTING	TORTURING	
ACHING	PPI	
HEAVY	0 NO PAIN	
10 TENDER	1 MILD	
TAUT	2 DISCOMFORTING	
RASPING	3 DISTRESSING	
SPLITTING	4 HORRIBLE	
	5 EXCRUCIATING	



E = EXTERNAL
I = INTERNAL

COMMENTS:

Appendix D

Source of Traumatic Experiences (STES)

PART ONE: Trauma related to your chronic low back pain.

This section relates to trauma related to the event(s) which led to your lower back being injured. Please check YES or NO for each of the statements below as it applies to your experience.

1. YES____ NO_____ My lower back pain is related to an injury.

IF YOU ANSWERED "NO" TO ITEM #1, PLEASE SKIP DOWN TO PART TWO.

2. YES____ NO_____ When I was injured, I experienced or witnessed something that involved actual or threatened death or serious injury.
3. YES____ NO_____ When I was injured, I felt a threat to my physical or mental integrity, or that of someone else.
4. YES____ NO_____ When I was injured, I felt intense fear, helplessness, or horror.
5. How long did the event which led to your CLBP last?_____
6. On a scale of 0-5 (0= not intense; 5= extremely intense), how would you rate the intensity of the threat, fear, helplessness, and/or horror that you experienced?_____
7. Please briefly explain how you were injured:

_____

_____

PART TWO: Trauma unrelated to chronic low back pain.

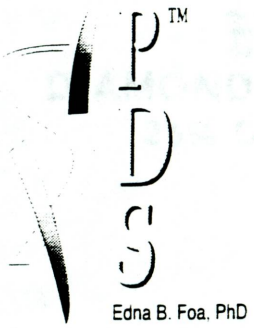
This section relates to any other traumas which do NOT relate to your lower back. Please check YES or NO for each of the statements below as it applies to your experience.

7. YES____ NO_____ In the past, I had an experience unrelated to my lower back condition wherein I experienced or witnessed something which involved actual or threatened death or serious injury.
8. YES____ NO_____ In the past, I had an experience unrelated to my lower back condition wherein I felt a threat to my physical or mental integrity, or to that of someone else.
9. YES____ NO_____ In the past, I had an experience unrelated to my lower back condition wherein I felt intense fear, helplessness, or horror.
10. How long did the event (described in items 7-9) last?_____
11. Please describe the situation(s) in which you answered "YES" to items 7-9 above._____

Appendix E

The PDS

Hand-Scoring Answer Sheet



Name or Identification Number

Test Date

National Computer Systems P. O. Box 1416 Minneapolis MN 55440 Phone 1-800-627-7271

Part 1

Many people have lived through or witnessed a very stressful and traumatic event at some point in their lives. Below is a list of traumatic events. Put a checkmark in the box next to ALL of the events that have happened to you or that you have witnessed.

(1) ☐ Serious accident, fire, or explosion (for example, an industrial, farm, car, plane, or boating accident)

(2) ☐ Natural disaster (for example, tornado, hurricane, flood, or major earthquake)

(3) ☐ Non-sexual assault by a family member or someone you know (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)

(4) ☐ Non-sexual assault by a stranger (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)

(5) ☐ Sexual assault by a family member or someone you know (for example, rape or attempted rape)

(6) ☐ Sexual assault by a stranger (for example, rape or attempted rape)

(7) ☐ Military combat or a war zone

(8) ☐ Sexual contact when you were younger than 18 with someone who was 5 or more years older than you (for example, contact with genitals, breasts)

(9) ☐ Imprisonment (for example, prison inmate, prisoner of war, hostage)

(10) ☐ Torture

(11) ☐ Life-threatening illness

(12) ☐ Other traumatic event

(13) If you marked Item 12, specify the traumatic event below.

_____

IF YOU MARKED ANY OF THE ITEMS ABOVE, CONTINUE. IF NOT, STOP HERE.

Part 2

(14) If you marked more than one traumatic event in Part 1, put a checkmark in the box below next to the event *that bothers you the most.* If you marked only one traumatic event in Part 1, mark the same one below.

- ☐ Accident
- ☐ Disaster
- ☐ Non-sexual assault/someone you know
- ☐ Non-sexual assault/stranger
- ☐ Sexual assault/someone you know
- ☐ Sexual assault/stranger
- ☐ Combat
- ☐ Sexual contact under 18 with someone 5 or more years older
- ☐ Imprisonment
- ☐ Torture
- ☐ Life-threatening illness
- ☐ Other

In the box below, briefly describe the traumatic event you marked above.

_____

_____

_____

_____

_____

_____

Below are several questions about the traumatic event you just described above.

(15) How long ago did the traumatic event happen? (circle ONE)

1 Less than 1 month
2 1 to 3 months
3 3 to 6 months
4 6 months to 3 years
5 3 to 5 years
6 More than 5 years

For the following questions, circle Y for Yes or N for No.

During this traumatic event:

(16) **Y N** Were you physically injured?

(17) **Y N** Was someone else physically injured?

(18) **Y N** Did you think that your life was in danger?

(19) **Y N** Did you think that someone else's life was in danger?

(20) **Y N** Did you feel helpless?

(21) **Y N** Did you feel terrified?

Part 3

Below is a list of problems that people sometimes have after experiencing a traumatic event. Read each one carefully and circle the number (0–3) that best describes how often that problem has bothered you IN THE PAST MONTH. Rate each problem with respect to the traumatic event you described in Item 14.

0 Not at all or only one time
1 Once a week or less/once in a while
2 2 to 4 times a week/half the time
3 5 or more times a week/almost always

(22) 0 1 2 3 Having upsetting thoughts or images about the traumatic event that came into your head when you didn't want them to

(23) 0 1 2 3 Having bad dreams or nightmares about the traumatic event

(24) 0 1 2 3 Reliving the traumatic event, acting or feeling as if it was happening again

(25) 0 1 2 3 Feeling emotionally upset when you were reminded of the traumatic event (for example, feeling scared, angry, sad, guilty, etc.)

(26) 0 1 2 3 Experiencing physical reactions when you were reminded of the traumatic event (for example, breaking out in a sweat, heart beating fast)

(27) 0 1 2 3 Trying not to think about, talk about, or have feelings about the traumatic event

(28) 0 1 2 3 Trying to avoid activities, people, or places that remind you of the traumatic event

(29) 0 1 2 3 Not being able to remember an important part of the traumatic event

(30) 0 1 2 3 Having much less interest or participating much less often in important activities

(31) 0 1 2 3 Feeling distant or cut off from people around you

(32) 0 1 2 3 Feeling emotionally numb (for example, being unable to cry or unable to have loving feelings)

(33) 0 1 2 3 Feeling as if your future plans or hopes will not come true (for example, you will not have a career, marriage, children, or a long life)

(34) 0 1 2 3 Having trouble falling or staying asleep

(35) 0 1 2 3 Feeling irritable or having fits of anger

(36) 0 1 2 3 Having trouble concentrating (for example, drifting in and out of conversations, losing track of a story on television, forgetting wh you read)

(37) 0 1 2 3 Being overly alert (for example, checking t see who is around you, being uncomfortab with your back to a door, etc.)

(38) 0 1 2 3 Being jumpy or easily startled (for example when someone walks up behind you)

(39) How long have you experienced the problems that you reported above? (circle ONE)
1 Less than 1 month
2 1 to 3 months
3 More than 3 months

(40) How long after the traumatic event did these problems begin? (circle ONE)
1 Less than 6 months
2 6 or more months

Part 4

Indicate below if the problems you rated in Part 3 have interfered with any of the following areas of your life DURING THE PAST MONTH. Circle Y for Yes or N for No.

(41) Y N Work

(42) Y N Household chores and duties

(43) Y N Relationships with friends

(44) Y N Fun and leisure activities

(45) Y N Schoolwork

(46) Y N Relationships with your family

(47) Y N Sex life

(48) Y N General satisfaction with life

(49) Y N Overall level of functioning in all areas of your life

Appendix F

LOMA LINDA UNIVERSITY

Graduate School
Department of Psychology

INFORMED CONSENT

11130 Anderson Street
Loma Linda, California 92350
(909) 558-8577
FAX: (909) 558-0171

The Physical and Emotional Effects of Chronic Low Back Pain

Purpose and Procedure

The purpose of this study is to evaluate the physical and emotional effects of chronic low back pain on your life. The goal of the study is to gather information that will assist health care providers to better meet the needs of individuals suffering from lower back pain. If you are willing to participate, the graduate student investigator at Loma Linda University, Lorie T. DeCarvalho, M.S., will ask you to complete a survey packet, which is about 6 pages in length. It should take you approximately 20 minutes to complete while you sit in the waiting room. In the questionnaire, you will be asked questions about general demographics, some questions regarding your experience with any traumatic event(s), and your physical and emotional experience with chronic low back pain.

Risks

It is possible that you may experience some uncomfortable feelings when answering some of the questions, which ask you to describe your experience with chronic low back pain. The committee at Loma Linda University that reviews human studies (Institutional Review Board) has determined that participating in this study involves no greater risk than that encountered in every day life. You will be given an opportunity to discuss any such reactions with the graduate student investigator immediately following your completion of the questionnaire.

If you have any questions, concerns, or comments about the questionnaire, you may contact Lorie DeCarvalho, M.S. or the faculty advisor, Janet Sonne, Ph.D. at (909) 558-8710 at Loma Linda University's Department of Psychology. If either of us are unavailable, please feel free to leave a message with your first name and telephone number. Your call will be returned as soon as possible.

Benefits

Although you may receive no direct benefit, your participation in this study will assist the graduate student and health care professionals in understanding more about how chronic low back pain affects patients at the physical and emotional levels. In turn, your participation can help health care providers best provide for the needs of patients with chronic low back pain.

LOMA LINDA UNIVERSITY
INSTITUTIONAL REVIEW BOARD
APPROVED _____ VOID AFTER _____
#45697 CHAIR _____

Participants' Rights

Your participation in this study is completely voluntary. You have the right to stop responding to the questions in this survey at any time.

You have the right to ask the graduate student investigator any questions regarding this study or the conditions of your participation.

Confidentiality/ Anonymity

All of the information that is collected in this study will be kept strictly confidential and anonymous. This informed consent form will be kept separate from your survey packet, and each which will be coded by a number (not your name) and grouped with that of other participants. Your personal identity will not be disclosed. Any publication or presentation resulting from this study will refer only to the group results. Therefore, please do not put your name anywhere on the questionnaire packet, or on the informed consent form.

Additional Costs/Reimbursement

There is no cost to you for participating in this study, nor any reimbursement for your effort.

Impartial Third Party Contact

If you wish to contact an impartial third party not associated with this study regarding any concerns or complaints that you may have, please feel free to contact Jean Fankhenel at the Office of Patient Relations, Loma Linda University Medical Center, Loma Linda, CA 92354, phone (909) 558-4647 for information or assistance.

Informed Consent Statement

Once you have read the contents of this informational letter, your completion of the survey will indicate your voluntary consent to participate in this study. This consent does not waive your rights, nor does it release the investigators, institution, or sponsors from their responsibilities. You may call the graduate student investigator, Lorie T. DeCarvalho, M.S. or the faculty advisor, Janet Sonne, Ph.D., at Loma Linda University, Department of Psychology during routine office hours at (909) 558-8710 if you have additional questions or concerns. You will be given a copy of this letter.

LOMA LINDA UNIVERSITY
INSTITUTIONAL REVIEW BOARD
APPROVED_____ VOID AFTER_____
#40097 CHAIR_____ M.D.

Appendix G

Participant Debriefing Script

Dear Participant:

Thank you again for your participation in this study. You have just filled out a questionnaire. I would like to let you know why you filled it out.

First, you filled out two pages about demographics so that the overall sample could be described. These were to gain an understanding of the individuals who participated in this study. Second, you completed a pain questionnaire, which involved you telling me words that described your experience with chronic low back pain. This was done in order for us to get an idea of how much pain you are currently experiencing. Next, you filled out the STES, which is a measure of the various traumatic experiences that you have experienced in your life. Finally, the last form your filled out, the PDS, was another measure of how chronic pain is currently affecting your emotional well-being. The PDS is specifically designed to assess for symptoms of post-traumatic stress disorder.

The purpose of this study is to see how chronic pain affects individuals' overall physical and emotional well-being.

I would like to stress to you that your identity is anonymous on this survey, and this process is absolutely confidential. No one, including myself, will ever know who you are based on your responses to this questionnaire because all of the questionnaires will have ID numbers on them, not names.

Again, if you have any questions, concerns, or comments about this survey, please contact the graduate student investigator, Lorie T. DeCarvalho, M.S. or the faculty advisor, Janet Sonne, Ph.D. at Loma Linda University's Department of Psychology at (909) 558-8710. If either person is unavailable, please feel free to leave a message with your first name and telephone number. In addition, you are going to receive a pre-stamped postcard, which you may mail to me if you want to receive the results of this study in the future. You may keep this page for your future reference.

Thank you so much for your time and participation in this study. Your participation may help health care professionals to better meet the needs of patients with chronic low back pain.

Best wishes.

Appendix H

FRONT OF POSTCARD:

I wish to receive information about the results of this study when it is completed. Please mail me a summary.

Name:_____
Address:_____

BACK OF POSTCARD:

Mail to: Lorie T. DeCarvalho, M.S. (Graduate Student Investigator)
Department of Psychology
Loma Linda University
Loma Linda, CA 92354