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Perceived self-efficacy and functional impairment in clients with chronic low back pain

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chronic low back pain**

Kaczmar, Debra Ann, M.S.

San Jose State University, 1993

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Ann Arbor, MI 48106**

PERCEIVED SELF-EFFICACY AND FUNCTIONAL IMPAIRMENT
IN CLIENTS WITH CHRONIC LOW BACK PAIN

A Thesis
Presented to
The Faculty of the Department of Nursing
San Jose State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

By
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May, 1993

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ABSTRACT

PERCEIVED SELF-EFFICACY AND FUNCTIONAL IMPAIRMENT IN CLIENTS WITH CHRONIC LOW BACK PAIN

by Debra A. Kaczmar

This study examined differences among perceived self-efficacy and functional impairment in clients with chronic low-back pain, and explored the relationship between admission perceived self-efficacy and functional impairment over time. Thirty-one clients completed the Oswestry Low Back Pain Disability Questionnaire and the modified Stanford Arthritis Self-Efficacy Survey at the times of admission, midpoint, and discharge from a multidisciplinary rehabilitation program.

There were statistically significant differences between perceived functional impairment from admission to midpoint ($p = .003$) and from admission to discharge ($p = .001$). There was an increase in self-efficacy for function, pain, and related symptoms over time, and a statistically significant difference between admission and discharge total self-efficacy scores ($p = .006$). Statistical analysis demonstrated a significant difference between beginning and discharge total self-efficacy scores ($p = .006$). There was an inverse relationship between admission self-efficacy and perceived functional impairment at each time interval, with the greatest improvement in function for clients with moderate self-efficacy.

DEDICATION

To Lauren, Erica,

and Ted

who were supportive in their own peculiar ways.

ACKNOWLEDGMENT

A heartfelt "Thank You!"
to Dr. Ann Doordan.

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Chapter 1

INTRODUCTION

Low-back pain (LBP) is one of the most common health conditions in man. It occurs in epidemic proportion in industrialized countries, affecting 80% of adults at some point in their lives (Nachemson, 1985). In the United States, 60% of the population has at least one episode of LBP each year (Waddell, 1987).

Mayer et al. (1986) called LBP "the most expensive 'benign' condition in America today" (p. 54). Each year two to five percent of the population prone to back injuries will seek medical care or be absent from work because of LBP (Waddell, 1987). Grazier, Holbrook, Kelsey, and Stauffer (1984) reported that musculoskeletal disorders, of which LBP is the most common, rank second only to routine health checks and post-operative examinations in numbers of visits to the doctor. They rank third in frequency of hospitalizations, third in frequency of surgical procedures, and third among disease categories in frequency of acute conditions.

LBP is responsible for more work days lost than any other symptom in the United States and is the major cause for workers' compensation insurance claims (Berwick, Budman, & Feldstein, 1989). The escalating costs to industry and government social service programs are estimated at

\$18 billion per year (United States Department of Commerce, 1990). As a response, the United States Department of Health and Human Services (1989) proposed a national health objective for the year 2000. Its goal is to increase the number of work sites that offer back injury prevention programs by 50%.

Despite the high incidence, LBP remains a condition that is poorly understood. It is most commonly defined as pain that affects the area between the lower rib cage and gluteal folds and often radiates to the thighs (Frymoyer, 1988). Even with improved diagnostic techniques, medical science has not been able to identify most causes of LBP (Nachemson, 1989; Snook & Webster, 1987).

Many epidemiologic studies have looked for commonalities among those who develop LBP. Kelsey and White (1980) reviewed early landmark radiographic studies to report that LBP occurs most commonly between the ages of 30 and 50. It does not increase with age and is not related to disk degeneration. Frymoyer (1988) reported that LBP affects men slightly more often than women, but women over 60 years of age are more likely to report the pain. He also found that individuals at highest risk for LBP are those with job-related activities that involve prolonged sitting, exposure to constant vibration, or require repetitive movements, such as lifting, pulling, bending, and twisting.

Fortunately, LBP is usually a self-limiting condition. The majority of people need short-term interventions designed to rest the area and decrease the pain (Nachemson, 1989). McElligott, Miscovich, and Fielding (1989) stated that more than 75% of people with LBP return to work or other daily activities within 12 weeks whether or not the person seeks medical care and irrespective of the type of treatment received. They found that many everyday symptoms of LBP are ignored and are expected to go away naturally.

The problem lies with those who go on to develop disability from chronic low-back pain (CLBP). Only 5% of clients have persisting symptoms after three months of LBP, yet they account for 85% of disability and compensation costs and loss in worker productivity (Snook & Webster, 1987). Quoting 1984 data, Frymoyer (1988) reported that law suits, missed wages, loss of productivity, insurance payments, and medical care related to LBP alone costs \$16 billion annually. He also computed that LBP, at that time, caused disability in 5.4 million Americans. According to statistics from the United States Department of Commerce (1990), CLBP with disability continues to increase dramatically.

Selby (1982) stated that the problems associated with CLBP are compounded by the fact that in most cases it is not possible to determine the cause of the pain, making the

diagnosis and treatment nonspecific. In the majority of cases objective physical findings indicative of chronic disability are absent, yet clients describe persistent pain that does not respond to prescribed treatments (Deyo & Diehl, 1983).

Over time, CLBP becomes less associated with the original injury. Fisk, DiMonte, and Courington (1983); Lichter, Hewson, Radke, and Blum (1984); Mayer et al. (1985); and Sauer and Thurman (1981) have confirmed that quite often the original injury has healed and the client is now most hampered by postinjury deconditioning caused by the client's self-imposed and sometimes excessive efforts to protect the back and muscles from use. Eventually, the client develops stiffness of the spine and muscular weakness. The resulting loss of flexibility and muscle strength causes the client to become less able to withstand everyday activities and causes a greater susceptibility to more LBP injuries (Nachemson, 1989).

In addition to the physical problems caused by a decrease in function, CLBP has a detrimental effect on the psychological state of the client. As the client's history of back pain extends over a period of months and years, psychosocial factors are likely to intervene and further complicate the problem (Hurri, 1989). CLBP, like other chronic conditions, negatively affects the client's sense of

self and often produces behaviors typical of a disability (Lubkin, 1986). The client loses the belief that it is possible to gain control over the pain and the influence it has on everyday life.

A study of psychological changes in clients with CLBP by Nachemson (1985) reported that clients with CLBP have decreased self-esteem and an increase in the incidence of substance abuse. He reported that clients are frequently depressed, have increased body awareness, are emotionally dependent, and adopt the sick role. Selby (1982) and Waddell (1987) confirmed that CLBP is strongly associated with secondary gain. To compound the issue, other research studies indicated that distress from unrelated physical sources and emotional stresses aggravate and perpetuate the discomfort of CLBP (Deyo & Diehl, 1983; Jarvikoski, Harkapaa, & Mellin, 1986).

The personal repercussions of CLBP are worsened by the effect LBP has on a client's ability to work and remain economically independent. Following an episode of LBP, the probability of returning to work decreases in direct proportion to the length of time the client is away from the job. Cairns, Mooney, and Crane (1984); Frymoyer (1988); Lichter et al. (1984); Mayer et al. (1986); McElligott et al. (1989); and Nachemson (1985) have reported that the longer a person remains out of work, the worse the chance of

successful rehabilitation. The same studies reported that approximately only 40% of clients are rehabilitated after six months of CLBP, 15% at one year, and virtually 0% are rehabilitated after two years. An important responsibility of occupational health professionals is to provide timely health care directives that foster the client's belief in an ability to manage CLBP. A compulsory goal is to return the client to the job as soon as possible.

Statement of the Problem

An array of biomechanical tests, demographic variables, psychological surveys, and radiographic procedures have been used to evaluate a client's condition and to predict back-to-work rehabilitation outcomes for clients suffering from CLBP and disability (Frymoyer, Rosen, Clements, & Pope, 1985; Mayer et al., 1985; Nachemson, 1985; Vallfors, 1985). All have had some degree of success. However, because of the complexity of social, legal, and economic variables, and because of the inconsistency of rehabilitation treatment plans, there is no tool or combination of examinations that has been found to be reliable and valid indicators for rehabilitation treatment outcomes for all clients with CLBP (Deyo, 1983; Mayer et al., 1986).

Recently some of the social science concepts, such as locus of control, self-esteem, and motivation have been used in related research studies to determine the impact of

psychosocial variables in mediating the effects of physical disability on the life experiences of clients. Many of these cognitive variables have been shown to be statistically significant in specific population groups (Fisk et al., 1983; Sanders, 1986; Sechrist, Noble-Walker, & Pender, 1987). In many studies, the only variable that has made the difference between success and failure of a particular health intervention has been the client's emotional attitude toward care (Dolce, Crocker, Moletteire, & Doleys, 1986; Simon, Gates, Crawford, & Robinson, 1990; Weitzel, 1989). Results of studies and the realization that CLBP for many clients may never improve is redirecting CLBP research. In recent years, many health care providers have begun to focus less on variables affecting biomechanical issues and more on the psychological, sociological, and health belief variables that influence a client's experience with CLBP (Heinrich, Cohen, Naliboff, Collins, & Bonebakker, 1985).

The shift to study social science concepts in clients with CLBP has produced an abundance of descriptive research. Studies have substantiated that how a client fares during and after any type of rehabilitation therapy is related to the client's belief in an ability to control or influence the consequences of the chronic condition (Lorig et al., 1989; Lubkin, 1986). Most of these studies are based on the

client's anecdotal reports of improved self-efficacy. The same research studies report that the multidisciplinary treatment approach to clients with CLBP results in increased self-efficacy (Hayne, 1984; Klein et al., 1985). However, no research was found that operationalized, at a behavior-specific level, a client's perceived ability to manage CLBP.

Purpose

The purpose of this study was to examine the differences among clients' levels of functional impairment and their perceptions of their ability to exercise control over the consequences of CLBP at the times of admission, midpoint, and discharge from a prescribed multidisciplinary treatment program. Because perceived self-efficacy has been found to have a significant effect on rehabilitation outcomes in other research studies, it is an important self-concept to examine in clients who have become functionally impaired because of CLBP (Manning & Wright, 1983).

No instrument to measure changes in perceived self-efficacy in clients with CLBP was found in the literature search. Therefore, differences in perceived self-efficacy were measured using a modified version of the Stanford Arthritis Self-Efficacy Scale (SES). The tool was chosen because of its success as an indicator of change in clients' abilities to cope with the consequences of a chronic condition after they participated in a self-management

course for another musculoskeletal condition, rheumatoid arthritis (Lorig, Lubeck, Kraines, Seleznick, & Holman, 1985).

Functional impairment status was measured using the Oswestry Low Back Pain Disability Questionnaire (ODQ). It has been found to be highly useful for determining self-reported level of functional impairment in various areas, such as work and activities of daily living (Fairbanks, Couper, Davies, & O'Brien, 1980; Hurri, 1989).

Research Questions

An objective of the research study was to determine if there were differences in clients' perceptions of self-efficacy and functional impairment before, during, and after completing medically prescribed rehabilitation programs. In addition, the study considered the differences among the client scores for perceived self-efficacy and perceived functional impairment.

The following were the questions addressed by the research study:

1. Are there differences among total scores on the ODQ at the times of admission, midpoint, and discharge from a multidisciplinary rehabilitation treatment program for CLBP?

2. Are there differences among the scores on the Function, Pain, and Other Related Symptoms subscales of the SES and among the total SES scores at the times of

admission, midpoint, and discharge from a multidisciplinary rehabilitation treatment program for CLBP?

3. Is there a relationship between admission total perceived self-efficacy scores and perceived functional impairment scores over time?

Definition of Terms

The following are definitions of terms used in the research study:

1. Chronic Low-Back Pain (CLBP) is a subjective account of discomfort in the area between the lower rib cage and gluteal folds lasting longer than 12 weeks in recurrent phases. It may be associated with physical findings on examination and may be associated with pain radiating down the thigh to the leg (Frymoyer, 1988).

2. Disability is a self-reported limitation in the amount or the kind of activities that can be performed because of CLBP (Snook & Webster, 1987).

3. Low-Back Pain (LBP) is a subjective account of discomfort in the area between the lower rib cage and gluteal folds lasting between zero and six weeks. It is most often seen with physical findings and may be associated with pain radiating down the thigh to the leg (Frymoyer, 1988).

4. Multidisciplinary Rehabilitation Clinic is a free-standing rehabilitation clinic where physician-referred

clients with chronic musculoskeletal conditions that have not responded to conservative treatment receive outpatient care by teams of physicians, physical therapists, occupational therapists, and exercise therapists. Other professionals, such as physiatrists, nurse educators, occupational health specialists, and vocational rehabilitation nurses consult weekly or provide services on contractual basis to address particular client needs (White, 1983).

5. Perceived Self-efficacy is the judgement of one's capability to accomplish a certain level of performance. Perceived self-efficacy refers to personal judgements of performance capabilities in a given domain of activity; it is behavior-specific (Bandura, 1986, p. 391).

Summary

Typically, a client with CLBP has seen a variety of health care professionals, has undergone numerous diagnostic tests, and has tried a significant number of home-remedy and prescribed treatment programs. After spending a lot of time and money on unsuccessful measures, the client commonly loses faith in the ability to accomplish pain management through personal actions. The client becomes progressively more affected by the physical, psychological, and sociological ramifications of CLBP. As time goes on, the ability to improve functional status or return to work

becomes inconceivable. This is the point at which most clients with CLBP are admitted to multidisciplinary treatment centers (Sikorski, 1985; White, 1983).

One of the first steps in determining health care needs for clients with CLBP is to identify those clients who are at greatest risk for continued disability behaviors. By considering differences in a client's perceived self-efficacy scores during the course of therapy, the professional staff members may gain insight into the client's held belief or disbelief that CLBP can be influenced through personal actions.

The next step for the rehabilitation specialists is to tailor health care interventions, counselling, and social support systems to facilitate the client's development of an improved self-concept. This can have a significant effect on a client's experience after rehabilitation and lead to the return of more clients to the job with a minimum of lost time.

Findings from this research may serve as an impetus for larger, controlled rehabilitation nursing research studies that address changes in clients' perceived self-efficacy. More research may support its use with more acutely ill client populations and with those of different ethnic backgrounds.

Chapter 2

CONCEPTUAL FRAMEWORKS AND REVIEW OF THE LITERATURE

The Social Cognitive Theory of Albert Bandura (1986), with roots in the social learning and behavioral theories, serves as a framework from which the experience of CLBP can be considered. The literature review examines information on perceived self-efficacy from the Social Cognitive Theory; pain and chronic illness behavior for CLBP; and the results from rehabilitation treatment programs that use social cognitive theory principles to direct client care.

Social Cognitive Theory

The Social Cognitive Theory provides a mixture of the behaviorism of the social development theories and the integration and processing of the cognitive development theories (Bandura, 1986). It addresses the social functioning and interaction between people and their environments; the functioning of all aspects of a person's internal and external environments is the primary focus. This is in contrast to many other theoretical approaches that place a weighted importance on personality development or other singular components (Schwartz & Goldiamond, 1975; Zastrow & Kirsh-Ashman, 1990).

Bandura (1986) subscribes to the tenet that behaviors result from learning and, therefore, can be unlearned. He states that a person's behavior is molded by imitating

behaviors. When the imitating behavior is rewarded in some way, the person continues the behavior. This modeling effect can cause a person to acquire a new behavior, stop a current behavior, or choose a related behavior. From observing models, a person can learn how to behave and what the consequences for the behavior will be. This allows for positive changes in behavior. The individual is thought to be dynamic and capable of change instead of being perceived as a victim of one's history and personality traits.

The ability of the person to understand the relationship between actions and outcomes of behaviors is another founding principle of the Social Cognitive Theory (Bandura, 1986). The theory states that a person is capable of anticipating the consequences of a behavior and can alter the response to achieve the desired outcome.

The other way a person is able to achieve a desired outcome is by manipulation of the environment. By favorably manipulating the environment, a person gains the ability to control some of the consequences of an action. The environment is instrumental in determining behaviors, but the individual is also instrumental in choosing and altering the environment (Bandura, 1977).

Bandura's Social Cognitive Theory emphasizes the importance of assessing observable behaviors and outcomes (Zastro & Kirst-Ashman, 1990). Descriptive terminology is

used to define behaviors in a useful objective way. In this way, the evaluation of a person's response to an unanticipated significant event or deliberate behavior modification can be more clearly understood.

Perceived Self-efficacy

In a 1986 publication Bandura wrote, "Among the different aspects of self-knowledge, perhaps none is more influential in people's everyday lives than conceptions of their personal efficacy" (p. 390). The estimate of a person's ability to control and manage life's events is considered to be one of the most important aspects of the information people have about themselves. Bandura (1986) defines this perceived self-efficacy as the following:

people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has, but with judgements of what one can do with whatever skills one possesses (p. 391).

Though not a measure of outcome, self-efficacy, more than any other self-concept, is the link between a person's knowledge of a behavior and the person's success at that behavior (Bandura, 1986). Perceived self-efficacy is formed by four principle sources of information: (a) enactive attainment, (b) vicarious experience, (c) verbal persuasion,

and (d) physiological state (Bandura, 1986).

Enactive Attainment

Past successes or failures at tasks have the most influence on a person's perceived self-efficacy. A person who has met with repeated failure at a task will have a low evaluation of self-efficacy. This result is compounded if that person fails in early attempts. If the same person had accomplished a task well or had failed only after having achieved success, that person would have a high self-efficacy judgement. Bandura (1986) states that this self-efficacy transfers over to similar situations and, more importantly, tends to generalize to different activities related to the situation. This generalization causes a person to believe that successes can be achieved in areas of past failures.

Vicarious Experience

Seeing how others fare in a situation influences the person's evaluation of self-performance in the same situation. Comparing oneself to a model can improve perceived self-efficacy if the model teaches the person a more effective way to accomplish a task and if the model demonstrates success despite some failure. When a model's failure at a task is witnessed, the individual is more likely to assume that personal efforts would also result in failure (Bandura, 1986).

Verbal Persuasion

People who are persuaded that they have skills to accomplish tasks can sometimes be persuaded to try things they would not ordinarily do. Bandura (1986) found that people who are encouraged in activities will try longer and harder at a task than they would without the encouragement. This could lead to an improved sense of personal efficacy as capabilities are demonstrated. However, if an individual is persuaded to try an activity and then fails at that activity, the individual's self-efficacy and the belief in the model will decrease further.

Physiological State

Arousal states, which are determined by emotions, influence both the physiological and psychological state of a person in a given situation. Schunk (1984) found that for most behaviors there was an optimal level of arousal at which a person was successful. If the state of arousal was either higher or lower than the optimal level, people were less likely to be successful. Performance anxiety can cause such fear in people. They become so tense thinking that their performance will be inadequate that their performance becomes inadequate.

Influence of Perceived Self-efficacy on Behavior

Perceived self-efficacy is related to cognitive perceptual concepts such as motivation, self-image, self-

concept, and locus of control (Bandura, 1986). All are self-concepts that are considered influences on behavior. Perceived self-efficacy is different from most self-concepts because it is behavior-specific and is not generalized. It is not a measurement of outcome. Schunk (1984) states that perceived self-efficacy is one of the determinants of performance, but it operates partially independently of the skills needed to achieve an outcome. The individual who has high perceived self-efficacy has the belief that a task can be accomplished, whether or not the task is attempted.

Bandura's concept of perceived self-efficacy is important to the understanding and the predicting of future health care practices. If people believe that they have an ability to perform an action to promote health and if they believe that the action will improve their health, they may engage in the healthy behavior change if health is a value to them (Lorig, Chastain, Ung, Shoor, & Holman, 1989; Pender, Walker, Sechrist, & Frank-Stromborg, 1990). Because perceived self-efficacy changes, health practice beliefs may be modified through teaching and planned experiences (Bandura, 1986).

Pain

Despite the myriad of publications that address the experience of pain, most experts agree that little is known about the phenomenon (Lubkin, 1986; McCaffery & Beebe,

1989). There are many theories that attempt to describe the neurologic mechanisms that underlie the sensation of pain. At this time, the specificity, pattern, and the gate control theories are the most frequently cited in the literature (Fields, 1987). These theories are not mutually exclusive. All make a contribution to the understanding of the large number of factors that influence the phases of a person's pain experience.

Since only the sufferer perceives the pain, it can have no precise definition. McCaffery and Beebe (1989) define pain as, "whatever the experiencing person says it is, existing whenever s/he says it is" (p. 3). The Merriam-Webster Dictionary (1986) defines pain as the following:

The sensation one feels when hurt mentally or physically; especially distress, suffering great anxiety, anguish, grief, etc., as opposed to pleasure, or, a sensation of hurting or strong discomfort in some part of the body caused by an injury, disease or functional disorder and transmitted through the nervous system (p. 1621).

Regardless of the preferred definition, pain appears to have three basic components: a stimulus, either physical or emotional; a resulting physical response for the body; and an affective response to the perception of the stimulus (Fields, 1987). Since specific neurological structures are

involved in all pain experiences, there is the tendency to assume a direct and invariant relationship between the three components. All people exposed to the same stimulus do not perceive the same degree of pain even though virtually all humans have pain receptors and a pain center in the brain (Linchitz, 1987). This finding has been substantiated by studies that considered pain associated with acute and chronic conditions (Bonica, 1974; Lubkin, 1986). The cause of the client's pain, the response elicited by the pain, and what that pain means to the client forms a triad.

Reception of the Stimulus

Pain fibers, specifically C-fibers and A-delta fibers, in the skin, muscle, bone, mucous membranes and tendons detect and conduct painful stimuli (Fields, 1987). A-delta fibers are larger and conduct impulses very rapidly. They are most often involved in acute pain stimuli and localize the source of the pain. C-fibers are very small and transmit pain sensations more slowly and less directed. C-fibers are most often associated with stimuli that cause aching pains.

Pain sensations are transmitted by nociception to the brain. At the same time A-delta fibers send information to the spinal cord motor neurons. Efferent nerve fibers then carry motor impulses back through the reflex arc causing contractions of the muscles or stimulation of the mucous

membranes (Fields, 1987).

Perception of the Stimulus

The person becomes aware of the pain when the impulses interact with the reticular limbic and cortical centers. The perception of pain is dependent on many factors. Physiologically, it is dependent on factors that lower or raise consciousness, such as endorphins, medications, sleep deprivation, and hyperarousal states (Linchitz, 1987).

Psychological factors also affect a person's perception of pain. Since perception of pain is controlled by the cerebral cortex, pain is the product of a person's past experience with pain, cultural influences, the meaning placed on pain, and the person's emotional state at the time of the experience (McCaffery & BeeBe, 1989).

Reaction to a Stimulus

Reaction to a painful stimuli is the interaction between the physiological and psychological systems (Bonica, 1974). As pain is perceived the body's autonomic nervous system responds. Lower intensity pains stimulate the sympathetic nervous system enabling the body's flight or fight reaction (Fields, 1987). The parasympathetic system responds during periods of severe pain in which the body is unable to resist the stimuli.

The nature of a person's reaction to pain is dependent on learned behaviors. It is also dependent on the meaning

of illness within that person's cultural and social groups. Whether a person cries or accepts the pain stoically is determined by motivational forces and expectations (Linchitz, 1987; Waddell, 1987).

Chronicity

Despite all of the behavioral manifestations of pain, most pain is assessed and evaluated in terms of its chronicity. Acute pain is considered pain that lasts less than six months (Melzak, 1983). It can range from very mild discomfort to excruciating pain. Most often acute pain results from mechanical injury to tissues and organic chemical injuries. It is associated with autonomic activity which is in proportion to the stimulus; i.e., the more severe the pain, the greater the body's response (Sternbach, 1978). Anxiety may occur with the pain causing negative perceptual and reactive responses, but the responses are proportional to the amount of injury (Atkinson, 1983; McCaffery, 1979; Melzak, 1983). As the stimulus subsides, the pain lessens. Pain relieving treatments may or may not be requested by the person.

In general, chronic pain is pain that lasts for a longer period of time than is usually expected for that condition (Frymoyer, 1988; Lubkin, 1986). As with acute pain, chronic pain intensity can vary between very slight to severe. It can also occur intermittently. Chronic pain can

be caused by diseases and conditions that manifest pathology to the peripheral nervous system. Chronic pain has a benign pathology if the stimulus or response is not dangerous to the client and causes no change in the client's activities of daily living. This type of pain is also termed chronic benign pain. When pain causes the client to alter a former lifestyle, the pain is considered chronic intractable benign pain (Lubkin, 1986; McCaffery, 1979). CLBP with disability is an example of chronic intractable benign pain.

Chronic Low Back Pain with Disability

Considerable effort has been devoted to finding differences between clients with CLBP who continue to function and clients with CLBP who become disabled. Both have back disorders, but the response and perception of the pain between the two groups of clients is dissimilar.

Numerous descriptive studies have identified common characteristics among clients with CLBP and disability (Frymoyer et al., 1985; Natchemson, 1989; Waddell, 1987). Hurri (1989) found that those clients disabled with CLBP were depressed, less confident, more rigid, and had a more negative self-image than those clients who returned to work despite CLBP. Those who were disabled expressed many more psychosomatic health complaints and were more prone to stress-generated conditions, such as headaches and peptic ulcers.

The same descriptive studies also revealed that most clients with CLBP were males with less than 12 years of education. They were dissatisfied with their working conditions and colleagues and expressed a desire not to be sent back to work. This group smoked more cigarettes, drank more alcohol, were more frequently unmarried or divorced, and were less active socially and physically (Frymoyer et al., 1985; Hurri, 1989; Natchemson, 1989; Waddell, 1987).

Regardless of the cause of the pain or the person's demeanor before it began, CLBP often produces the changes in behavior as identified in the forementioned descriptive studies (Frymoyer, 1988; Nachemson, 1985; Waddell, 1987). The illness behaviors that occur in clients with CLBP are a learned set of actions and reactions that are often shaped by secondary gains. The behaviors may provide solutions to unconscious needs (Lubkin, 1986). Financial support from disability insurance, removal from a disliked working environment, extra attention from others, and forced changes in personal relationships are only a few identified secondary gains noted in the CLBP population (Frymoyer, 1988; Jamison, Matt, & Parris, 1988).

It is often difficult to determine if the CLBP caused the changes in behavior, or if the behavior tendencies were present before the injury. As with other chronic pain states, the physical and psychological boundaries of CLBP

become vague and blend together (Atkinson, 1983; Jamison et al., 1988; Kleinke & Spangler, 1988).

Over time, chronic pain, chronic disability and chronic illness behavior become increasingly dissociated from the original injury (Lichter et al., 1984; Mayer et al., 1986; Waddell, 1987). This is true for CLBP. With time, the resulting illness behaviors can become a self-sustaining condition. As the client searches for a "cure" for CLBP, a condition for which a cause cannot be identified using current technology, the client may be prescribed an unlimited number of treatments that fail. This may reinforce illness behaviors and increase the pain (Deyo, 1983).

Multidisciplinary Physical Rehabilitation Clinics

Because of the influence psychosocial well-being has on determining function and outcome for clients with CLBP, a multitude of health care disciplines become involved in their health care. This led to the creation of multidisciplinary physical rehabilitation clinics. Typically, physical therapists, occupational therapists, vocational rehabilitation nurses, exercise therapists, nutritionists, medical doctors, psychologists, psychiatrists, and social workers are among the professionals that may comprise the team involved in a client's plan of care (Fredrickson, Trief, Van Beveren,

Yuan, & Baum, 1988).

All multidisciplinary clinics are somewhat different in structure, yet there are fundamental commonalities.

Fredrickson et al., (1988); Lichter et al., (1984); and White (1983) concur that the emphasis is threefold: (a) to educate, (b) to maintain or improve physical ability, and (c) to improve the level of independence and coping skills of the client. The philosophy of the multidisciplinary physical rehabilitation clinics promotes active efforts by the clients to improve their functional status within the limits of discomfort. Pain relief is a secondary consideration. The goal is to help clients learn to handle their pain without reliance on pain medication and excessive medical care.

Individualized physical exercise programs are designed to increase flexibility, strength, and endurance. The goal of the physical therapy is to counter the effects of the deconditioning syndrome. Various educational programs including nutrition, stress reduction, and pain management are components of most centers. Professional staff members model, teach, and reinforce desired behaviors during treatment sessions while promoting the client's ability to assume self-care. General health wellness behaviors are emphasized to enhance the client's control of the pain and the resulting disability.

The multidisciplinary clinic approach to CLBP is different from the traditional forms of care in that the clinics address illness behavior as well as pain (Gottlieb, Koller, & Alperson, 1982). Although there are variations, most of the programs attempt to change behavior by altering self-perception and attitudes so that the clients assume responsibility for their health. The methods used to achieve behavior change include behaviorism, operant conditioning, and cognitivism (Hall & Iceton, 1983; Waddell, 1987).

Active participation by the client in designing the health program and evaluating interventions and outcomes is mandatory at these centers. The client is usually involved in directing all treatments and is an active participant in client care conferences. The client is expected to attend regularly and comply with a treatment contract that outlines the client's responsibilities for the plan of care (White, 1983). Positive reinforcement, in the form of awards and incentives, are often publicly displayed. In many centers the client is responsible for documenting all progress in physical conditioning. In this way, the client sees evidence of positive trends. Over time, the client learns to take on additional responsibilities for controlling the effects of CLBP.

These interventions designed to slowly increase a

client's ability to manage CLBP have been found to foster the client's sense of achievement and perceived self-efficacy (Simon et al., 1990). This is consistent with Bandura's theory (1982) that states that to improve perceived self-efficacy, interventions must be planned and regulated by the client.

Frequently, incorporated into multidisciplinary centers is an active low-back school which has been found to be one of the best interventions for clients with CLBP (Hurri, 1989; Moffett, Chase, Portek, & Ennis, 1986; Selby, 1982; Sikorski, 1985). The basic philosophy of low-back schools is that clients who become educated about the back and how to maintain and improve function will be more compliant with treatment plans. They will become active participants in their own care and accept more responsibility for determining their care (Hall & Iceton, 1983).

During low-back classes clients are taught principles of proper body mechanics and basic anatomy that are relevant to low-back preventive and protective health practices. Teaching in a group situation has been shown to be helpful with having clients discuss their experiences with pain (Berwick et al., 1989; Hurri, 1989; Selby, 1982). Hall and Iceton (1983) found that it leads to the client expressing internal control over the pain and anticipating success at treatments. Also, fear of failure was decreased after

clients learned from staff and others with CLBP what initiates the pain, how to control the severity of the pain and ways to cope with the pain (Selby, 1982). Clients learn from others and incorporate strategies into their experience with CLBP. Self-care skills and actions that increase a client's ability to cope with life situations are also modeled and practiced in most low-back school curricula (Hall & Iceton, 1983).

Analyzing findings from studies concerning the efficacy of specific interventions is difficult because of the vast differences in treatment modalities. Each published study focused on different outcomes after a different treatment regimen. A review of low-back school programs and multidisciplinary CLBP clinics by Linton and Kamwendo (1987) found that the most common outcomes measured were physical function and subjective pain measurement. Many studies were not randomized, had relatively small sample sizes, and used investigator-developed questionnaires that had not been field tested.

Contradictory outcomes were reported in studies that analyzed low-back schools as a primary treatment of CLBP (Berwick et al., 1989; Fisk et al., 1983; Langhorst, Van de Stadt, Vogelaar, Van der Korst, & Revo, 1983). In a randomized prospective study, Berwick et al. (1989) stated that because there is little reported change in physical

function of clients with CLBP after educational and physical therapy interventions, low-back school programs have limited use.

Linton and Kamwendo (1987), Langhorst et al. (1983), and Linguist et al. (1984) also raised doubts about the efficacy of low-back schools for clients with CLBP. These studies considered a decrease in pain with an increase in function as the desired outcome. The psychological and emotional changes resulting from low-back school education were not considered in the data collection, nor did the studies evaluate the effectiveness of low-back schools in combination with multidisciplinary CLBP clinics. All four studies included anecdotal evidence stating that clients liked the low-back school approach. Other studies that considered low-back school as a primary treatment for CLBP reported decreased pain and increased functional ability (Berquist-Ullman & Larsson, 1977; Hurri, 1989; Moffet et al., 1986; Simon et al., 1990; Sirles, Brown, & Hilyer, 1991).

Less controversy has been recorded in studies that looked at outcomes after enrollment at multidisciplinary centers. Despite an 8 week range of treatments, almost all studies reported decreased pain and increased activity levels (Fredrickson et al., 1988; Lichter et al., 1984; Vallfors, 1985; Waddell, 1987; White, 1983). The clinics

have been successful for 50% to 70% of clients with CLBP for whom success rates using traditional medical model approaches has been documented between 0% and 15% (Fredrickson et al., 1988; Lichter et al., 1984; Vallfors, 1984; Waddell, 1987).

Although most of the research studies mentioned the importance of evaluating subjective and behavioral influences, only a few of the multidisciplinary studies used measurable operationalized concepts. The studies that posed questions regarding the client's perception of treatment, progress, and probable outcome were global in nature. This type of reporting tends to lack reliability (Lobiondo-Wood & Haber, 1990).

Subjective retrospective studies from different multidisciplinary treatment centers indicated that between 85% and 100% of the clients felt that back school was useful and between 44% and 82% felt that their pain had decreased because of personal actions (Hurri, 1989; Langhorst et al., 1983; White, 1983). Anecdotal reports from other researchers supported the findings that clients liked the multidisciplinary approach to CLBP and felt that they had learned ways to help cope with CLBP (Hayne, 1984; Klein et al., 1985).

No research on perceived self-efficacy for clients involved in treatment programs for CLBP has been published,

despite the fact that many of the theoretical concepts serve as a framework for interventions at multidisciplinary CLBP clinics. Rather, many researchers have focused on related psychological dimensions such as self-esteem, feelings of well being and the self-concept of the client with CLBP (Sanders, 1986; Sirles et al., 1991).

Well-being was one of the outcomes measured in a randomized two-group study by Sirles et al. (1991). They evaluated client responses to a 6 week course of physical training and education. The course asserted that CLBP could be managed or controlled through knowledge and coping skills. It also emphasized that clients needed to accept that the discomfort may never go away. After treatment, scores on psychological well-being increased while scores on depression, anxiety, and perception of pain decreased. Gottlieb et al. (1982) also reported higher levels of reported self-confidence in clients after participation in a rehabilitation program that used similar interventions.

Aberg (1984) compared a control group of clients with CLBP who were on a waiting list for entry into an in-patient multidisciplinary treatment program with those who were enrolled in therapy. Physical function, pain severity, and psychological adaptation were among the outcomes studied. The only reported significant difference between the two groups was in attitudes. Significantly more people in the

treatment group indicated that they believed they could control their pain through their actions. Those in the treatment group also believed that they could decrease the 33 number of future injuries.

Similar results were obtained in a 1991 study by Dehlin, Berg, Andersson, and Grimby (1981). Their study of Scandinavian nurses aides who had sustained low back injuries examined the effects of an exercise and education program on psychological perceptions of work and pain. The clients were divided into physical therapy, back school, and non-treatment control groups. Few physical changes resulting from physical modalities were reported on follow-up surveys. However, significant changes in the clients' perceptions and attitudes toward the pain were recorded. After therapy, all but those in the control group indicated a belief that they could influence their pain through personal action.

Newman, Seres, Yospe, and Garlington (1978) evaluated clients with CLBP before and after a 4 week stay at an in-patient pain center. The clients participated in an active exercise program, learned various relaxation techniques, and were counselled by psychiatrists and psychologists. After 80 weeks the clients were called back for evaluation. Despite the reports from most clients that their pain increased, the majority of the clients stated that they were

better able to cope with the CLBP, were taking less analgesics and were spending less on medical costs.

Hall and Iceton (1983) studied more than 6,000 clients who participated in small group instruction aimed at changing clients' attitudes toward CLBP. The program used ergonomic principles while stressing the psychological aspects of CLBP. They found that those who scored the highest on a tool that asked questions regarding the physiology and psychology of back pain retained more information on later retesting. More importantly, this group had better outcomes and significantly higher beliefs in their ability to influence the consequences of CLBP than did the control group and the lowest scoring participants.

Simon et al. (1990) reported on the experience of clients with CLBP after a series of five low-back school classes with a limited multidisciplinary approach. Anatomy of the spine, importance of exercise, stress management, and participation in exercises were among the topics covered during the 90 minute sessions taught by a nurse, physical therapist, clinical psychologist, and an orthopedic surgeon. On follow-up surveys, 80% of those who completed the surveys and 100% of the clients contacted by telephone reported that back school decreased their pain, helped them to adapt their activities, and increased their ability to cope with the CLBP. In a similar study Moffett et al. (1986) found that

participation in back school increased clients' self-awareness long after subjective effects of therapy wore off.

Related Literature on Perceived Self-Efficacy

There are several studies that relate perceived self-efficacy to specific aspects of physical health. Two studies (Lorig et al., 1985; Lorig, Seleznick, et al., 1989) considered client rehabilitation analogous to the multidisciplinary approach to CLBP. In these studies, clients with arthritis, another chronic neuromuscular illness, were evaluated before and after treatment at a comprehensive arthritis clinic. Clients were taught self-care skills to remain active and decrease their symptoms. Psychological counselling addressing illness behaviors was also a part of the course. Only one-half of the clients reported a decrease in pain and disability after the program. Exit interviews with all participants revealed that those clients who benefited from the course had a higher belief in their ability to influence their experience with arthritis than the group that had no change in their condition. These clients reported an enhanced ability to cope with pain and exhibited less illness behaviors.

Weitzel (1989) examined health promoting behaviors in people who attended a health fair. Using Pender's Health Promotion Model, Weitzel examined peoples' views on health status, self-efficacy, locus of control, importance of

health, and health-promoting behaviors. The study indicated that perceived self-efficacy and health status were the most powerful predictors of participation in health behaviors.

Bernier and Avarð (1986) studied peoples' beliefs in their ability to lose weight. The study supported other research indicating that people who express self-efficacy or who develop higher levels of perceived self-efficacy after interventions have more health promoting behaviors than those who do not have a belief in their ability (Condiotte & Lichtenstein, 1981; Manning & Wright, 1983). In this study, the people with the highest perceived self-efficacy remained longer in a weight reduction treatment center and had more weight loss.

Summary

The cognitive and perceptual factors included in Bandura's self-efficacy theory are considered to be amenable to change. This ability is an important consideration when examining a client's response and perception to interventions to treat CLBP. The self-efficacy theory is consistent with the research that states that among the most significant variables that affect a client's experience with CLBP are the client's perception of health status, the interpretation of the symptoms by the client, the client's expectations of prescribed treatments, and the client's belief in an ability to control and manage CLBP (Alonzo,

1984; Waddell, 1987).

As evidenced in the research literature, pain management, rather than pain eradication, is the goal of most multidisciplinary rehabilitation programs. Yet studies continue to measure subjective accounts of pain and objective changes in physical function. Since physical improvement is difficult to achieve in clients with CLBP, it may be helpful for rehabilitation specialists to use Bandura's concept of self-efficacy as a means to track the client's changing belief in an ability to influence the consequences of CLBP through personal actions.

Chapter 3

METHOD

Chapter 3 describes the methodology used to examine changes in perceived self-efficacy and functional impairment for clients with CLBP. This chapter includes a description of the following: (a) research design, (b) setting, (c) sample and selection criteria, (d) human subject guidelines, (e) instruments, (f) data collection procedures, and (g) calculations used for the analysis of the results.

Research Design

This quantitative study examined the changes over time in clients' perceived functional impairment and their perceptions of their ability to exercise control over the consequences of CLBP at the times of admission, midpoint, and discharge from a prescribed multidisciplinary rehabilitation treatment program. In addition, the study examined the relationship between perceived self-efficacy and perceived functional impairment over time.

Setting

The study took place at an out-patient orthopedic physical rehabilitation clinic. The multidisciplinary clinic was one of 12 independently owned and community-based franchises. The site at which the study took place was a clinic typical of the other facilities in the corporation.

The mission of the clinic was to promote active efforts

by the client to improve functional status within the limits of discomfort; pain relief was a secondary consideration (Lichter et al., 1984). This was attempted through the teaching and reinforcement of general health and wellness behaviors designed to enhance the client's control over the consequences of CLBP. Self-care rehabilitation measures, body mechanics, and preventive measures were included in the teaching programs. A desirable outcome was to return the client to work after a 10 to 12 week integrated program of physical therapy, exercise, and simulated occupational retraining.

The clinic's administrative staff included a general manager, office manager, receptionist, and a corporate representative who visited the site on a regular basis. A physical therapist, occupational therapist, and exercise therapist comprised the core of the multidisciplinary health care team assigned to each client. In addition, the client's team expanded to include occupational health nurses, vocational rehabilitation nurses or therapists, registered dietitians, psychologists, and others determined by client need. With the exception of the exercise therapists, all therapists were registered and professionally licensed by the State of California and attended corporate sponsored training sessions specific to their specialty areas. All client care was guided by the

medical director for the facility and the client's referring physician.

The open floor plan of the facility promoted client independence while providing optimal supervision by staff members. The staff and clients used the informal setting to teach and learn from others, to share problem-solving approaches, and to use others as behavioral models.

One-third of the floor space contained exercise equipment for reconditioning and strengthening exercises designed to help the client improve mobility, strength, and endurance. A larger area of the clinic was used for occupational rehabilitation and vocational retraining. In this area, the occupational therapists simulated the client's work experience by recreating the job site and home environment. The client also received low-back fitness instruction, health education classes, and relaxation therapy teaching.

Sample and Selection Criteria

The sample for this study was drawn from the cohort of clients accepted for treatment at the clinic during the months of July, August, and September, 1992. Historically, the clients admitted for therapy during this time were similar in number and medical diagnoses to clients admitted throughout the year.

According to corporate policy, all clients admitted for

treatment had to be physician-referred and 18 years of age and older. All had to have a chronic injury of an orthopedic nature; clients with acute injuries were not eligible for therapy according to the policy. Clients accepted for treatment presented with a variety of musculoskeletal injuries, pain experiences, and degrees of disability. No restrictions were placed on type of injury, length of time since the injury, employment status, gender, ethnicity, or other demographic data.

The sample for this study was restricted to include clients with CLBP who were fluent in the English language. This was necessary because none of the instruments had been translated and tested in languages other than English. All clients in the sample had to have a medical prescription to attend low-back school education classes and at least three therapy sessions per week for a minimum of 10 weeks.

Thirty-four clients began the study. Three clients were unable to complete the study. Two clients developed acute injuries and were discharged from treatment before study data was obtained, and one client was discharged from the study because of an inability to understand English well enough to complete the surveys independently.

Protection of Human Subjects

The Human Subjects Institutional Review Board of San Jose State University reviewed the study proposal,

instruments, and methodology. Approval was granted in July, 1992 (Appendix A). The corporate president and the medical director of the rehabilitation clinic granted permission to use their client population for the study (Appendix B). After receiving written instructions and verbal explanations from the researcher, the clients signed consent forms describing the study and their human subject rights before participating in the study (Appendix C).

Instruments

The instruments used for data collection were the Oswestry Low Back Disability Questionnaire (ODQ), the Self-efficacy Scale (SES), and the Client Data Survey. The ODQ and the SES questionnaires contained a total of 47 items. Each item required the participant to choose a number from a Likert-type scale that best described the participant's situation at that point in time. The client was also asked to complete a Client Data Survey that asked for pertinent demographic information, occupation, employment status, and injury details.

Oswestry Low Back Pain Disability Questionnaire

The Oswestry Low Back Pain Disability Questionnaire (ODQ) (Appendix D) was developed as a means to assess limitations the client experiences in 10 activities of daily living (Fairbanks et al., 1980). It has been found to be a valid and reliable indicator of a client's ability to

function with CLBP because the scores closely reflected the clients' observed disabilities and symptoms (Fairbanks et al., 1980; Hurri, 1989; Mayer et al., 1986).

The original testing of the tool's usefulness involved a group of 25 clients who were suffering from their first attack of LBP. The questionnaire was completed at weekly intervals and the gradual expected spontaneous improvement in their functional impairment was reflected in the improvement of their mean scores (t -test, $p < .005$). At the same time, a different group of 22 clients with CLBP were asked to complete the ODQ under the same conditions and on 2 consecutive days. A correlation coefficient of .99 ($p < .001$) was found in the test-retest trials. Similar findings were demonstrated in subsequent research (Hurri, 1989; Mayer et al., 1986). To test for internal consistency, the completed ODQ scores for the second cohort of 22 clients with CLBP were divided into five groups. Mean scores for each of the 10 categories were calculated for each client group. Results indicated that the mean score for each section rose with the pain section, showing a good internal consistency (Fairbanks et al., 1980).

The ODQ included questions concerning pain intensity, physical mobility, and sexual and social functioning. The client chose one of six statements that best described the client's current level of functional impairment for each

activity. Each answer choice was assigned a number value of 0 to 5. The number values for the client's 10 responses were added together and multiplied by 2 to get a percentage score. As determined by the authors of the ODQ, scores of 0% to 20% indicated minimal disability, 20% to 40% indicated moderate disability, and 40% to 60% indicated severe disability. Clients who scored 60% to 80% were considered crippled because of LBP while those who scored 80% to 100% were either bedridden or misrepresented their symptoms (Fairbanks et al., 1980).

Self-Efficacy Scale

A modified version of the Stanford Arthritis Self-Efficacy Scale (SES) (Appendix E) was used to obtain the clients' perceived self-efficacy scores on pain, physical activities, and other symptoms that may result from CLBP, such as fatigue and frustration related to the consequences of CLBP. The tool was chosen for use in this research because it met tests of construct with research on another musculoskeletal condition, rheumatoid arthritis. Also, it was chosen because its success in measuring changes in clients' perceived self-efficacy after they participated in a chronic arthritis treatment program that was similar to the treatment program for CLBP (Lorig et al., 1989).

Construct validity testing was performed using baseline and 4 month data from 97 clients with rheumatoid arthritis.

Significant correlations were found between baseline health status and baseline self-efficacy scores, between baseline self-efficacy scores and health status 4 months later, and between 4 month self-efficacy and 4 month health status (Lorig et al., 1989). Concurrent validity testing was conducted with a group of 43 clients with arthritis who completed the perceived physical function component of the tool by mail. A trained observer, unaware of the scores on the tools, rated clients' abilities to perform the tasks listed on the survey. The observer's actual performance scores were consistent with the clients' perceived ability to perform the tasks (Lorig et al., 1989). A test-retest reliability study utilizing Pearson correlations revealed item reliabilities ranging from .71 to .85 and subscale reliability scores of .85 to .90 (Lorig et al., 1989).

Before the tool was administered to clients with CLBP in this study, nine questions that were specific to arthritis were modified to better represent specific alterations in function that can be a result of CLBP. The tool was then presented to a random group of 8 clients who were not participants in the study. Their suggestions for revising the instructions, the writing style, and the content of the newly developed items were recorded and brought to the attention of one of the original Stanford University researchers who agreed with the changes.

The SES was formatted to enhance readability. It was printed on colored paper which has been found to be more acceptable to clients (Fairbanks et al., 1980). Boldfacing and underlining were also added to help highlight salient information. The new version of the tool (Appendix D) was administered again to the same 8 clients and 4 new clients. No problems understanding the directions or individual items were reported by the clients.

With the exception of the revisions, the SES contained the same Pain, Function, and Other Related Symptoms subscales items predetermined by the original researchers. Clients were asked to indicate how sure they thought they could perform specific tasks in each subscale. They were asked to assign a number from 1 (very unsure) to 10 (very sure) to each task statement on the tool. The number values for the items in each subscale were added and the mean scores for the three subscales were calculated in accordance with the authors' instructions. As determined in the original study by Lorig et al. (1989), clients who had mean scores of 1 to 3 (very unsure) had low perceived self-efficacy for that subscale. Clients who had mean scores of 4 to 7 (moderately unsure) had moderate perceived self-efficacy for that subscale. Mean scores of 8 to 10 (very sure) indicated that the client had high perceived self-efficacy for that subscale.

Client Data Survey

A brief personal data survey was developed by the nurse researcher and attached to each set of instruments (Appendix F). Answers to questions regarding gender, age, marital status, and level of education were requested. Clients were also asked about their occupations and their experiences with CLBP. The clients completed and updated their Client Data Survey every time the tools were issued.

Data Collection Procedure

Before the study began, the medical director, administrative director, and the general manager were given the study proposal that was approved by the Human Subjects Institutional Review Board of San Jose State University, copies of the tools, and the client consent forms. After the study received approval from the medical director and administrative director, the researcher contacted the general manager by telephone to answer questions regarding the implementation of the research project. The researcher met with two staff members who assisted with data collection. The purpose of the study and the data collection procedures were reviewed with them. A regular telephone conference schedule was established between the two staff members and the researcher to facilitate the study.

Each client who qualified for the study and agreed to

participate was assigned a number-coded survey packet during the admission interview process or during the first day of therapy. Each packet included three copies of the number-coded SES, ODQ, and the Client Data Survey. The green copy of the tools was completed by the client before treatment, the red copy was completed by the client during the fourth to sixth weeks of treatment, and the yellow copy of the tools was used to collect data at the end of the client's course of therapy. Color-coding helped the client remember whether the survey had been completed and safeguarded against confusion when the dates were unintentionally omitted.

Also enclosed in the packet were envelopes, two consent forms, and a cover letter describing the methodology and purpose of the study as it pertained to the client (Appendix G). The client was given the cover letter and the two consent forms. The client was asked to sign the consent forms that indicated that the client read the instructions and voluntarily elected to participate in the study. One form was kept by the client and the other was mailed to the nurse researcher. The assurance that the client could withdraw from the study at any time was reiterated.

Once the client had adequate time to read the forms and had all questions answered, the client was asked to complete the survey in one of the admission interview rooms in the

facility. These rooms provided a quiet, comfortable and private environment.

After completion, the self-administered tools were placed in a sealed envelope by the client and were mailed directly to the researcher. The researcher maintained a log that listed every client, the client's assigned code number, and the dates the surveys were to be administered again. To facilitate subsequent data collections, the client completed the surveys during regularly scheduled clinic visits. The client was asked to complete the second coded survey after 4 to 6 weeks, the midpoint of treatment. The final coded survey was completed in the same manner at the time of discharge. Confidentiality was maintained and the log sheet identifying participating clients and their code numbers was destroyed by the nurse researcher in October 1992.

Analytical Procedures

The instruments were scored after all of the 31 discharge date surveys were submitted to the researcher. The results of the ODQ were scored according to the authors' specifications (Fairbanks et al., 1980). Each response to the 10 activities received a score of 0 to 5. A score of 0 on an item indicated no functional disability while a score of 5 indicated the highest degree of disability. The 10 scores were added together, multiplied by 2, and assigned a percentage score. Fairbanks, et al. (1980) considered

clients with mean scores of 0% to 20% to be in the Minimal Disability category. Moderate Disability category scores were between 20% and 40%, while Severe Disability category scores were between 40% to 60%. Mean scores of 60% to 80% and 80% to 100% were considered the Crippled and Extreme Status Disability categories, respectively.

The responses on the SES were divided into the three subscales. Items 1 to 27 were included in the Function subscale and items 28 to 32 were included in the Other Related Symptoms subscale. The Pain subscale included items 33 to 37. The client ranked each of the 37 items on a scale of 1 to 10. Each subscale was scored separately by calculating the mean of the subscale items. For each item a score of 1 indicated that the client had the lowest perceived self-efficacy while a score of 10 indicated that the client had the highest degree of perceived self-efficacy. Mean scores of 1 to 3 in the subscales earned a Low Perceived Self-efficacy rating. Mean scores of 4 to 7 indicated Moderate Perceived Self-efficacy while mean scores of 8 to 10 indicated High Perceived Self-efficacy ratings. All sets of tools were scored in the same manner. The results of each number-coded set of responses were compared and recorded chronologically on a log sheet.

Descriptive statistics were used to calculate the results of Research Questions One, Two, and Three.

To calculate the results for Research Question One, parametric tests of significance were used. Paired t -tests were chosen for this study because they: (a) test the difference between the means of two sets of scores obtained from the same sample population under different conditions, (b) analyze samples that are related through matching in the study design, and (c) are particularly useful when only small samples are available for analysis (Huck, Cormier, & Bounds, 1974; LoBiondo-Wood & Haber, 1990). The paired t -tests were calculated using SPSS/PC+ statistical software (Norusis, 1991).

For Research Question Two, descriptive statistics were used to illustrate the differences among the means of the Function, Pain, and Other Related Symptoms subscales of the SES over time. The clients' scores for each subscale at a particular testing time were added together and divided by the sample number (31) to yield a mean score for that subscale at that testing time. In addition, a paired t -test analyzed the differences between the beginning and discharge total SES scores.

Research Question Three considered the relationship between beginning total perceived self-efficacy scores and perceived functional impairment scores over time. Following criteria established by Lorig et al. (1989), the client's mean scores for the three SES subscales were added together

giving the client a cumulative value for perceived self-efficacy for the designated activities on SES tool. Clients with cumulative SES scores of 22.50 to 30 were grouped into the High Perceived Self-efficacy category. Clients with cumulative scores between 10.5 and 22.49 were considered to be in the Moderate Perceived Self-efficacy category, while those with cumulative scores less than 10.5 were placed in the Low Perceived Self-efficacy category. Admission scores considered in each of the High, Moderate, and Low Perceived Self-efficacy categories were compared with their corresponding mean ODQ scores over time. The corresponding ODQ scores for the clients in each category were computed by summing all scores and dividing by the number of subjects. These calculations were actuated on the tools completed at the times of admission, midpoint, and discharge from therapy.

Chapter 4

FINDINGS AND INTERPRETATION OF DATA

The purpose of this study is to examine the differences among clients' levels of functional impairment and their perceptions of the ability to exercise control over the consequences of CLBP over time. This chapter includes the findings and the interpretation of the data collected on the tools that were administered at three points of time to 31 clients who participated in a CLBP rehabilitation program.

Descriptive data analysis was used to examine: (a) the results of the Client Data Survey, (b) the differences among SES subscale scores over time, and (c) the relationship between perceived self-efficacy and functional impairment over time. Parametric tests (paired t -tests) were used to determine if the differences between the means on the ODQ and the differences between the admission and discharge SES scores were the results of chance or whether they were statistically significant. The level of significance for the research questions was set at $p = <.05$.

Client Data Survey

Thirty-four clients met the study criteria; two were excluded during the initial interview process because of acute injuries and one was excluded because of language difficulties. Table 1 and Table 2 list the Client Data Survey demographic and employment information.

Table 1

Demographic Characteristics (N = 31)

Characteristics	Responses (<u>n</u>)	Percentage (%)
Gender		
Male	26	83.9%
Female	5	16.1%
Age		
20-30	6	19.4%
30-40	14	45.2%
40-50	7	22.6%
50-60	3	9.7%
60-70	1	3.2%
Marital status		
Single	9	29.0%
Married	22	71.0%
Years of education ^a		
8-10	4	13.8%
10-12	6	20.7%
12-14	15	51.7%
14-16	4	13.8%

Note. Percentages do not equal 100% due to rounding.

^aTwo respondents did not complete the question (n = 29).

Table 2

Employment History (N = 31)

Characteristics	Responses (<u>n</u>)	Percentage (%)
Occupation ^a		
White collar jobs	3	11.1%
Blue collar jobs	23	85.2%
Housewife	1	3.7%
Employed		
Never employed	1	3.2%
0-16 hours	26	83.9%
16-40 hours	1	3.2%
40 hours or more	3	9.7%
Months unemployed		
Never employed	1	3.2%
0-1	3	9.7%
1-3	4	12.9%
3-6	12	38.7%
6-9	3	9.7%
9-12	4	12.9%
12 or more	4	12.9%

Note. Percentages do not equal 100% due to rounding.

^aFour respondents did not complete the question (n = 27).

The ages of the clients ranged from 21 to 61 years with a mean of 38.4 years. The number of years of education ranged from 8 to 16 years with a mean of 11.8 years; two clients did not answer the question. Eight clients did not answer a question asking about the number of dependents. The average number of dependents for the 23 respondents who answered the question was 1.3.

Three (11.1%) of the 27 clients who listed an occupation had been employed in highly skilled professional positions. The other 23 clients (85.2%) had been employed in clerical, agricultural, and unskilled labor jobs. For those who had held jobs outside the home (96.3%), the length of time out of work ranged from 1 month to 24 months. The mean was 6.5 months.

There was a substantial difference in the length of time the respondents experienced CLBP. A range of 3 months to 144 months of CLBP was reported. The mean was 18.8 months and the median was 6 months. Table 3 lists the characteristics of CLBP obtained from the Client Data Surveys.

The Client Data Surveys contained a section for clients to add any pertinent information not included in the questionnaires. Four clients added their comments to the final surveys. Clients wrote, "I feel better" and "I might be able to do better now." Another client wrote, "I'm

getting better, but I still have pain." The fourth client wrote, "CHART has helped but I still can't go back to work like this."

Table 3

Chronic Low Back Pain Characteristics (N = 31)

Characteristics	Number of Responses (<u>n</u>)	Percentage (%)
Months of CLBP		
3-6	11	35.5%
6-9	7	22.6%
9-12	3	9.7%
12-15	6	19.3%
15 or more	4	12.9%
Work-related CLBP ^a		
Yes	26	92.9%
No	2	7.1%

Note. Percentages do not equal 100% due to rounding.

^aThree respondents did not complete the question (n = 28).

Research Question One

The first research question was: Are there differences among total scores on the ODQ at the times of admission, midpoint, and discharge from a multidisciplinary rehabilitation treatment program for CLBP?

The admission ODQ scores for the respondents ranged from 14% to 64%. The mean score was 36.29% with a standard deviation of 15.04. The scores on the ODQ completed at the midpoint (during the fourth through the sixth weeks of therapy) ranged from 10% to 56%. The mean score was 30.90% with a standard deviation of 12.77. At the time of discharge, ODQ scores ranged from 4% to 46%. The mean score was 28.65 with a standard deviation of 11.26. The pooled standard deviation for the three scores was 13.12.

The Paired t -Test Summary Tables 4 and 5 indicate that there were statistically significant differences among total client scores on the ODQ from admission to midpoint and from admission to discharge from rehabilitation therapy. However, there was no statistically significant difference in the scores on the ODQ from the midpoint to the time of discharge.

Table 4

Paired t-Test Summary Table: Total ODQ Means and Standard Deviations by Time Periods (N = 31)

Total ODQ Mean Scores	<u>M</u>	<u>SD</u>
Admission	36.29%	11.26
Midpoint	30.90%	12.77
Discharge	28.65%	11.26

Table 5

Paired t-Test Summary Table: Differences Among Total ODQ Scores by Time Periods (N = 31)

Total ODQ Scores	<u>t</u>	<u>p</u>
Admission to Discharge	3.28	.003
Midpoint to Discharge	1.69	.102
Admission to Discharge	3.28	.001

Research Question Two

The second research question was: Are there differences among scores on the Function, Pain, and Other Related Symptoms subscales of the SES and among the total SES scores at the times of admission, midpoint, and discharge from a multidisciplinary rehabilitation treatment program for CLBP? The SES yielded three scores on perceived self-efficacy for the Function, Other Related Symptoms, and Pain subscales. Means were calculated for each subscale over time. A paired t -test was then used to analyze the differences between the admission and discharge total SES scores. These findings are reported in Table 6.

Function

Perceived self-efficacy scores for the Function subscale ranged from 3.14 to 9.88. The mean for the admission score was 6.25 with a standard deviation of 1.90. The mean score during the midpoint of treatment was 6.76 with a standard deviation of 1.55. The discharge mean score was 7.04 with a standard deviation of 1.40. The pooled standard deviation was 1.64.

Pain

The range for the scores on the Pain subscale was from 2.2 to 10. The mean for the admission score was 6.18 with a standard deviation of 2.10. The mean at the midpoint of treatment was 6.34 with a standard deviation of 1.99. The

discharge mean score was 7.13 with a standard deviation of 1.51.

Other Related Symptoms

The range for the scores on the Other Related Symptoms subscale was from 1.2 to 10. The mean for the admission was 5.72 with a standard deviation of 2.29. The mean during the fourth to the sixth week of treatment was 6.22 with a standard deviation of 2.01. The discharge mean score was 6.73 with a standard deviation of 1.53.

Table 6

SES Total and Subscale Mean Scores by Time Periods (N = 31)

Time Periods	Cumulative Mean SES	SES Subscale Mean Scores		
		Function	Pain	Other Related Symptoms
Admission	18.15	6.25	6.18	5.72
Midpoint	19.32	6.76	6.34	6.22
Discharge	20.90	7.04	7.13	6.73

The largest difference between the admission and discharge scores occurred in the Other Related Symptoms category. A limited sample size precluded testing for statistical significance for subscale scores over time. Analysis using a paired t -test revealed a statistically significant difference between the admission and discharge total SES subscale scores [$t(30) = 2.94, p = .006$].

Research Question Three

The third research question was: Is there a relationship between admission total perceived self-efficacy scores and perceived functional impairment scores over time? Clients' mean SES subscale scores were added together to obtain total SES scores. Clients with total SES scores greater than 22.5 were included in the High Perceived Self-efficacy category while those scoring less than 10.5 were included in the Low Perceived Self-efficacy category. The majority of clients (65%) scored between 10.5 and 22.5 and were classified in the Moderate Perceived Self-efficacy category.

An inverse relationship between perceived self-efficacy and perceived functional impairment was confirmed; clients who had the highest total mean perceived self-efficacy scores on the SES at the time of admission had the lowest mean perceived functional impairment scores on the ODQ. This finding was evidenced at the three data collection

times. In addition, those clients with the highest total SES scores on admission had less improvement in functional impairment than did clients in the moderate or lowest groups. The clients with the highest scores reported a .67 point difference from admission to discharge while those with moderate and low total SES scores reported 10.45 and 11.0 point differences respectively. Table 7 summarizes the outcomes.

Table 7

Functional Impairment Over Time According to Admission
Self-efficacy Category (N = 31)

		Mean ODQ Scores		
		Admission	Midpoint	Discharge
Admission SES				
Category	<u>n</u>			
High	9	22.89	19.78	22.22
Moderate	20	40.35	33.60	29.90
Low	2	56.00	54.00	45.00

Note. High SES scores were greater than 22.5.

Moderate SES scores were between 10.50 and 22.49.

Low SES scores were less than 10.50.

Summary

The results of Research Question One indicated that there were statistically significant differences among scores on the ODQ when admission to midpoint and when admission to discharge scores were analyzed using paired t-tests. There was no significant difference when midpoint to discharge ODQ scores were compared.

The use of descriptive statistics for Research Question Two made it possible to demonstrate increases in clients' SES scores on the Function, Pain, and Other Related Symptoms subscales over time. It was not possible to analyze the differences among each subscale data for statistical significance because of the limited sample size. However, when the results of the three SES subscales were totaled and analyzed using a paired t-test, there was a statistically significant difference between the admission and discharge scores.

Research Question Three results showed that at all three testing times, there was an inverse relationship between the admission perceived self-efficacy category and perceived functional impairment; those clients with the highest total perceived self-efficacy had the lowest mean scores on the ODQ for functional impairment. In addition, those clients with the high total SES scores on admission did not report as great a positive change in functional

impairment as did the clients with moderate and low total SES scores at the time of admission.

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

This study examined differences over time in perceived self-efficacy and perceived functional impairment in clients with CLBP. It also examined the relationship between perceived self-efficacy and functional impairment. Thirty-one clients completed the ODQ, SES, and the Client Data Surveys at the times of admission, midpoint, and discharge from a multidisciplinary physical rehabilitation program.

Results were examined using statistical tests to analyze means, standard deviations, and differences between two means (paired t -tests). There were statistically significant differences among perceived functional impairment and total SES scores over time. An inverse relationship between admission perceived self-efficacy scores and perceived functional impairment scores was apparent at the three data collection times and is consistent with findings from other related self-efficacy studies (Bernier & Avar, 1986; Lorig et al., 1985; Manning & Wright, 1983).

Discussion

The Social Cognitive Theory of Albert Bandura (1986) and the concept of perceived self-efficacy provided a framework for examining clients' abilities to manage the consequences of CLBP. Principles from Bandura's theory were

used to examine clients' perceived ability to control the consequences of CLBP. Schunk (1984) stated that perceived self-efficacy is a result of behavior which is influenced by Bandura's four sources of information: (a) one's successes and failures, (b) how one fares in comparison to others, (c) hearing words of encouragement from others, and (d) a person's state of arousal. In this study, all were considered important influences for perceived self-efficacy for particular rehabilitation outcomes because they helped clients combine knowledge and skills learned during therapy into behaviors.

The inverse relationship between perceived self-efficacy and functional impairment outcomes was consistent with the results from other research. The relevance of examining the relationship between perceived self-efficacy to CLBP functional impairment outcomes has been supported in similar studies that focused on other variables such as weight loss, pain control during childbirth, and arthritis self-management (Bernier & Avar, 1986; Lorig et al., 1985; Manning & Wright, 1983). Historically, the effectiveness of protocols directed to increase a person's belief in an ability to manage CLBP has been evaluated by client's anecdotal reports of improved self-efficacy (Hayne, 1984; Klein et al., 1984).

This research supports the potential usefulness of

tools that can measure perceived self-efficacy in clients with CLBP. In future studies, combined perceived self-efficacy scores on the SES subscales may be useful indicators of how well clients performed after interventions designed to treat functional impairment for CLBP. In this study, clients with the highest total mean SES subscale scores had the lowest mean scores for functional impairment.

Results

Both the ODQ and the SES scores were sensitive to time intervals. This was consistent with findings from Manning and Wright (1983) who reported that perceived self-efficacy predicts behavior after treatment better than it predicts behavior during treatment. There was no statistically significant difference among the midpoint to discharge scores in functional impairment on the ODQ, yet there were significant differences among the admission to midpoint and the admission to discharge scores. A possible explanation is that at the time of admission clients commonly report limited activity tolerance that is made worse by postinjury deconditioning (Natchemson, 1989). As clients learn some body mechanics principles and perform simple exercises to improve flexibility and strength, the clients often report marked improvement in some activities of daily living. Consistent with other research, most clients begin to see and feel the benefits of exercise and therapy only after

they have been involved in physical exercise for several weeks (Sechrist et al., 1987).

However, the second set of measurements occurred at the time when many clients began to work assiduously on more physically demanding back-to-work skills. If clients were feeling some of the temporary negative effects of added weight training or endurance exercises, it is likely that the clients' scores were affected. Figures 1 and 2 depict the changes over time in perceived functional impairment and perceived self-efficacy.

Figure 1. Client Mean Percentage Scores on the ODQ

Figure 2. Client Mean Scores on the Function, Other Related Symptoms, and Pain Subscales of the SES.

Statistically significant differences among total SES scores in perceived self-efficacy and functional impairment as measured on the ODQ tools occurred after the clients had been in the setting for a total of 12 weeks of rehabilitation therapy. This finding was comparable to other studies that looked at the relationship between self-concepts and outcomes. Studies by Hallal (1992) and Waddell (1987) found that long term therapies or instructions were more effective in promoting change in health behaviors and change in self-concept than were short term sessions.

Because of the limited sample size and the relative homogeneity of the clients' symptomatology, it was not possible to test the results of each SES subscale for statistical significance. The greatest difference in scores occurred in the Other Related Symptoms subscale. This finding is consistent with the principles of CLBP management (Fredrickson et al., 1988; Lichter et al., 1984; White, 1983). Clients are taught how to manage the consequences of their CLBP. They are taught how to manage their fatigue, stay active without aggravating their pain, and handle the frustrations of back pain. In contrast, they are reminded that their pain may never subside and some of their functional impairment may never decrease. It will be important for future studies to advance the preliminary results of this study through the use of larger sample

groups. Determining which subscale is the best indicator of future outcomes can direct therapy interventions.

Instruments

Although the SES Function subscale had high internal consistency reliability in the original Stanford Arthritis Self-efficacy Study, further work with more developed measures may be needed to confirm these findings for different population groups. In this study, individual item review for the Function subscale of the SES showed some inconsistencies. For example, some clients would consider themselves less able to sit for 30 minutes, but more capable of sitting for longer periods. Critics of Bandura's concept of perceived self-efficacy argue that discerning the difference between being able to perform a task and being adept at the task is important, but is difficult to assess (Lorig et al., 1989). Critics purport that people tend to answer perceived self-efficacy questions according to what they do and not what they think they can do (Dolce et al., 1986; Manning & Wright, 1983). Some inconsistencies in the SES Function subscale scoring by the clients that were not readily explained may be due to confusion with terminology. One client who spoke and read English could not complete the study because of difficulty in understanding the terminology in the survey. The client, whose native language was Spanish, was unable to understand the difference between

the perceived ability to accomplish a task and the actual ability to perform the task.

It should be noted that the ODQ was validated in earlier studies by Fairbanks et al. (1980), Hurri (1989), and Moffett et al. (1986) and worked well for this research. Conversely, the original SES required editing during the limited pilot test for this study. In this study, many clients expressed an inability to understand the original directions and the terminology even though the original SES was validated by researchers and practitioners in the Stanford Arthritis Clinic and home settings (Lorig et al., 1989).

Sample

Personal characteristics of the small study population were consistent with other studies that found that most people with CLBP were: (a) male, (b) 35 to 45 years of age, (c) with less than 12 years of education, and (d) employed in unskilled labor positions (Frymoyer et al., 1985; Hurri, 1989). The study population differed from other studies in relation to marital status. Hurri (1989) found that clients with CLBP were more frequently unmarried or divorced. Data from this study indicated that the majority of clients (71%) were married at the time of the study. Clients were not asked to indicate if they had been divorced in the past. Variations can be explained by the small

sample population used for this study.

Another interesting characteristic of the study population was the fact that all but two clients were receiving workers' compensation insurance benefits during the study period. It was not known how many of the 31 clients were on extended benefits, had pending legal actions, or were expecting to have the benefits reduced or stopped depending on the outcomes of the therapy. Many studies have considered the influence workers' compensation insurance benefits have on clients' self-reports of their experience with CLBP. These studies reported that the better the compensation awards, the greater the amount of self-reported discomfort and disability (Melzak, Katz, & Jeans, 1985; Tollison, Satterthwaite, & Kriegel, 1990).

No assumptions can be made about the possible influence workers' compensation benefits had on clients' self-reports in this study. However, the four personal comments on the exit surveys convey a sense of concern about residual pain and back-to-work expectations. Other issues such as fear of reinjury, job dissatisfaction, premature retirement, limited employment opportunities, or a reluctance to change the new family structure also may have distorted the client's self-report if the client believed that the responses to the surveys would lead to another disruption.

All elements of the client's CLBP were influenced by

innumerable factors (Alonzo, 1984; Frymoyer et al., 1985). These factors determined the perceived intensity of the pain, the person's tolerance to the pain, and the particular behavioral response to the pain. Some elements were situational while other factors were integrated in the person's physical and emotional state before the pain began. Therefore, the self-concept of perceived self-efficacy was an important variable in this high risk group as it has been in other groups (Shunk, 1984). Clients who fell into the high risk category of CLBP were not alike and should not be treated similarly. Nurses need to know how to assess and what to assess to avoid imposing a client uniformity myth.

Limitations

Among the limitations for this study were: (a) the characteristics of the sample population, (b) the self-report method of data collection, and (c) the one-group research design. All results must be interpreted with these limitations in mind.

Because of the vast number of people with CLBP and the myriad of variables that can influence how a person copes with the consequences of CLBP, a population size well beyond the scope of this study would be required to make conclusions about changes in perceived self-efficacy and functional impairment that result from participation in a multidisciplinary rehabilitation treatment program for CLBP.

The convenience sample was small and relatively homogeneous; most of the sample were unemployed males who had a high school education. Almost all had worked at unskilled labor jobs. Women were under-represented and, by design, all non-English speaking clients were omitted from the study population. No attempt was made during this study to translate the tool into other languages by using interpreters or rewriting the text. It is not known how the tool would be interpreted when translated into different languages. Also, there is no way to know how the three clients who did not complete the study or those who were excluded would have altered the results. Generalization to other populations and geographical areas cannot be assumed. The volunteer sample population was not an adequate representation of clients with CLBP.

Another limitation was the method of data collection. The study relied on self-report data which can have problems with validity and reliability (Lobiondo-Wood & Haber, 1990). The validity of the self-reports for clients with CLBP has been found to be unreliable by Mayer et al. (1985) and Waddell (1987). They found that self-reports were greatly influenced by the clients' desires to achieve particular outcomes. It was not known if the results of this study were intentionally prejudiced by the personal circumstances of the clients.

However, considering the nature of CLBP and its relationship with perceived self-efficacy, self-reporting was the logical method of data collection for this study. Physical findings in clients with CLBP are not always discernable and objective tests cannot be used to validate subjective accounts of pain and other symptoms associated with CLBP. To obtain the most comprehensive evaluation, tests for perceived self-efficacy would need to be administered in conjunction with other tools and physical examinations. In this study, the SES was used in conjunction with the ODQ.

The research objective dictated a one-group design. This method had several potential sources of error, such as controlling for client demographic and medical history data, placebo effects, and independent biological or psychological changes that occurred with the passage of time. These factors prohibited important causal inferences (Huck et al., 1974; Lobiondo-Wood & Haber, 1990). The health care approach at the clinic gave clients a good deal of attention and presented a new treatment approach to most of the clients. Influencing factors that are not related to the treatment program must be considered when interpreting results. In a one-group design, however, controlling for these factors was not possible.

Inherent in the nature of the one-group design was the

inability to make causal inferences because of the lack of a randomized sample and a control group. Every client accepted into the study received similar care, but how well the client interacted with the team members and other clients was dissimilar. Correcting for these deficiencies was not possible in this study. The non-random convenience sample limited generalization, yet it did allow some understanding of the differences among variables over time.

Recommendations

Among the recommendations for future studies are: (a) revising the Function subscale on the SES, (b) increasing sample size, (c) collecting data over a longer period of time, and (d) isolating some of the non-specific components of the therapy program and approach that may have influenced the results.

It is recommended that the Function subscale of the SES be revised and piloted with another population of clients with CLBP. A more refined tool could prove to be more useful in evaluating clients' perceptions of function. It is recommended that special attention be paid to the problem of distinguishing terminology that describes an outcome behavior from terminology that describes an ability to perform an outcome.

To improve the SES tool's effectiveness, the Function subscale behaviors could be modeled after the activities in

the ODQ. The midpoint of the answer choices on the ODQ could be used to describe the activity in question. This would also shorten the length of the Function subscale thereby making the tool easier to complete. Refining the assessment tool so that it is easier for the staff to administer, clients to complete, and clinicians to evaluate would enhance health professionals' ability to address the needs of this difficult-to-treat population.

It is recommended that the study of perceived self-efficacy in client with CLBP be continued on a much larger scale. Because of the myriad of confounding personal and physical factors, a large sample size is required to get meaningful statistical data. Although the small convenience sample population had similarities with the CLBP populations in other studies, it was not representative of all clients with CLBP. It is recommended that future research with an increased sample size include provisions to obtain admission and discharge data from non-English speaking clients who are receiving therapy.

An important aspect of multidisciplinary rehabilitation treatment of CLBP is the role of non-specific elements. These include placebo effects and other effects that are not peculiar to any particular treatment but have an important influence on perceived self-efficacy. A prescription to the clinic, group discussions with other CLBP clients,

concentrated attention by care givers, modeling, positive feedback, and incentive programs may result in functional improvements and increase perceived self-efficacy.

Interesting research would result from the isolation of specific components of the clinic's approach from the nonspecific effects of treatment. Randomized clinical trials using control groups could be designed to test interventions thought to increase perceived self-efficacy for a particular task or behavior.

It would be important to conduct follow-up research on this study population, especially since Manning and Wright (1983) found that perceived self-efficacy predicts behavior after treatment better than it predicts behavior during treatment. A myriad of research projects has emphasized the importance of self-care as a means to improve a client's compliance with treatment plans and confidence in the ability to influence their conditions, yet few studies have considered these changes over time or after therapy has been completed. A logical extension to this study would be to compare a client's perceived self-efficacy upon admission and again at discharge with back-to-work outcomes.

More nursing research using Bandura's concept of self-efficacy is needed. The perceived self-efficacy construct is relevant to both acute care and community health nursing. Knowing a client's perception of an ability to perform an

health promoting activity can help the nurse tailor interventions to best meet the client's needs.

Interventions could be designed for a specific task that are less intuitive and are based on the client's perceived self-efficacy for that task. Considering the impact of this "benign" condition, much more research on CLBP using the theoretical concept of perceived self-efficacy is needed.

REFERENCES

References

- Aberg, J. (1984). Evaluation of an advanced back rehabilitation program. Spine, 9, 317-318.
- Alonzo, A. A. (1984). An illness behaviour paradigm: A conceptual exploration of a situational-adaptation perspective. Social Science Medicine, 19, 499-510.
- Atkinson, J. H. (1983). Current perspectives in the management of chronic pain. Drug Therapy, 813, 17-22.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 119-215.
- Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.
- Bernier, M., & Avar, J. (1986). Self-efficacy, outcome and attrition in a weight-reduction program. Cognitive Therapy and Research, 10, 319-338.
- Berwick, D. M., Budman, S., & Feldstein, M. (1989). No clinical effect of back schools in an HMO: A randomized prospective trial. Spine, 14, 338-344.
- Bonica, J. J. (1974). Management of pain (2nd ed.). Philadelphia: Lea and Febiger.

- Cairns, D., Mooney, V., & Crane, P. (1984). Spinal pain rehabilitation: Inpatient and outpatient treatment results and development of predictors for outcome. Spine, 9(1), 91-95.
- Condiotte, M. M., & Lichtenstein, E. (1981). Self-efficacy and relapse in smoking cessation programs. Journal of Consulting Psychology, 49, 648-658.
- Dehlin, O., Berg, S., Andersson, G. B., & Grimby, G. (1981). Effect of physical training and ergonomic counselling on the psychological perception of work and on the subjective assessment of low-back insufficiency. Scandinavian Journal of Rehabilitative Medicine, 13, 1-9.
- Deyo, R. A. (1983). Conservative therapy for low back pain: Distinguishing useful from useless therapy. Journal of the American Medical Association, 280, 1057-1062.
- Deyo, R. A., & Diehl, A. K. (1983). Measuring physical and psychosocial function in patients with low-back pain. Spine, 8, 635-642.
- Dolce, J. J., Crocker, M. F., Moletteire, C., & Doleys, D. M. (1986). Exercise quotas, anticipatory concerns and self-efficacy expectancies in chronic pain: A preliminary report. Pain, 24, 365-372.

- Fairbanks, J. C. T., Couper, J., Davies, J. B., & O'Brien, J. P. (1980). The Oswestry low back pain disability questionnaire. Physiotherapy, 66, 271-273.
- Fields, H. (1987). Pain. New York: McGraw-Hill Information Services Company.
- Fisk, J. R., DiMonte, P., & Courington, S. M. (1983). Back schools past, present, and future. Clinical Orthopaedics and Related Research, 179, 18-23.
- Fredrickson, B. E., Trief, P. M., Van Beveren, P., Yuan, H. A., & Baum, G. (1988). Rehabilitation of the patient with chronic back pain: A search for outcome predictors. Spine, 13, 351-353.
- Frymoyer, J. W. (1988). Back pain and sciatica. The New England Journal of Medicine, 318, 291-300.
- Frymoyer, J. W., Rosen, J. C., Clements, J., & Pope, M. H. (1985). Psychologic factors in low-back-pain disability. Clinical Orthopaedics and Related Research, 195, 179-184.
- Gottlieb, H. J., Koller, R., & Alperson, B. L. (1982). Low back pain comprehensive rehabilitation programs: A follow-up study. Archives in Physical Medicine Rehabilitation, 63, 458-461.

- Grazier, K. L., Holbrook, T. L., Kelsey, J. L., & Stauffer, R. N. (1984). The frequency of occurrence, impact, and cost of musculoskeletal conditions in the United States. Washington DC: American Academy of Orthopaedic Surgeons.
- Hall, H., & Icton, J. A. (1983). Back school: An overview with specific reference to the Canadian back education units. Clinical Orthopaedics and Related Research, 179, 10-17.
- Hallal, J. C. (1992). The relationship of health beliefs, health locus of control, and self concepts to the practice of breast self-examination in adult women. Nursing Research, 31, 137-142.
- Hayne, C. R. (1984). Back schools and total back care programmes-a review. Physiotherapy, 70(1), 14-17.
- Heinrich, R. L., Cohen, M. J., Naliboff, B. D., Collins, G. A., & Bonebakker, A. D. (1985). Comparing physical and behavior therapy for chronic low back pain on physical abilities, psychological distress, and patients' perceptions. Journal of Behavioral Medicine, 8, 61-78.
- Huck, S. W., Cormier, W. H., & Bounds, W. G. (1974). Reading statistics and research. New York: Harper Collins.

- Hurri, H. (1989). The Swedish back school in chronic low back pain. Scandinavian Journal of Rehabilitation Medicine, 21, 33-40.
- Jamison, R. N., Matt, D. A., & Parris, W. C. V. (1988). Treatment outcome in low back pain patients: Do compensation benefits make a difference? Orthopaedic Review, 17, 1210-1215.
- Jarvikoski, A., Harkapaa, K., & Mellin, G. (1986). Symptoms of psychological distress and treatment effects with low-back pain patients. Pain, 25, 345-355.
- Kelsey, J., & White, A. A. (1980). Epidemiology and impact of low back pain. Spine, 6, 133-142.
- Klein, M. H., Greist, J. H., Gurman, A. S., Neimeyer, R. A., Lesser, D. P., Bushnell, N. J., & Smith, R. E. (1985). A comparative outcome study of group psychotherapy vs. exercise treatments for depression. International Journal of Mental Health, 13(3-4), 148-177.
- Kleinke, C. L., & Spangler, A. S. (1988). Predicting treatment outcome of chronic back pain patients in a multidisciplinary pain clinic: Methodological issues and treatment implications. Pain, 33, 41-48.

- Langhorst, G. J., Van De Stadt, R. J., Vogelaar, T. W.,
Van der Korst, J. K., & Revo, A. J. H. (1983). The
effect of the Swedish back school in chronic idiopathic
low back pain. Scandinavian Journal of Rehabilitation
Medicine, 15, 141-145.
- Lichter, R. L., Hewson, J. K., Radke, S. J., & Blum, M.
(1984). Treatment of chronic low-back pain: A
community-based comprehensive return-to-work physical
rehabilitation program. Clinical Orthopaedics, 190,
115-123.
- Linchitz, R. M. (1987). Life without pain. Reading, MA:
Addison-Wesley Publishing.
- Lindquist, S., Lundberg, B., Wikmark, R., Bergstad, B.,
Loof, G., & Ottermark, A. (1984). Information and
regime on low back pain. Scandinavian Journal of
Rehabilitation Medicine, 16, 113-116.
- Linton, S. J., & Kamwendo, K. (1987). Low back schools: A
critical review. Physical Therapy, 67, 1375-1383.
- Lobiondo-Wood, G., & Haber, J. (1990). Nursing research:
Methods, critical appraisal and utilization (2nd ed.).
St. Louis: C.V. Mosby.
- Lorig, K., Lubeck, D., Kraines, R. G., Seleznick, M., &
Holman, H. R. (1985). Outcomes of self-help education
for patients with arthritis. Arthritis Rheumatology,
28, 680-685.

- Lorig, K., Chastain, R., Ung, U., Shoor, S., & Holman, H. (1989). Development and evaluation of a scale to measure perceived self-efficacy in people with arthritis. Arthritis and Rheumatism, 32, 37-44.
- Lorig, K., Seleznick, M., Lubeck, D., Ung, E., Chastain, R. L. & Holman, H. R. (1989). The beneficial outcomes of the arthritis self management course are not adequately explained by behavior change. Arthritis Rheumatology, 32, 91-95.
- Lubkin, I. M. (1986). Chronic Illness: impact and interventions. Boston: Jones and Bartlett.
- Manning, M. M., & Wright, T. L. (1983). Self-efficacy expectancies, outcome expectancies, and the persistence of pain control in childbirth. Journal of Personality and Social Psychology, 45, 421-431.
- Mayer, T. G., Gatchel, R. J., Kishino, N., Keeley, J., Capra, P., Mayer, H., Barnett, J., & Mooney, V. (1985). Objective assessment of spine function following industrial injury: A prospective study with comparison group and one-year follow-up. Spine, 10, 482-493.
- Mayer, T. G., Gatchel, R. J., Kishino, N., Keeley, J., Capra, P., Mayer, H., & Mooney, V. (1986). A prospective short-term study of chronic low back pain patients utilizing novel objective functional measurements. Pain, 25, 53-68.

- McCaffery, M., & Beebe, A. (1989). Pain: Clinical manual for nursing practice. St. Louis: C. V. Mosby.
- McCaffery, M. (1979). Nursing management of the patient with pain (2nd ed.). Philadelphia: J. P. Lippincott.
- McElligott, J., Miscovich, S. J., & Fielding, L. P. (1989). Low back injury in industry: The value of a recovery program. Connecticut Medicine, 53, 711-715.
- Melzak, R. (1983). Pain measurement and assessment. New York: Raven Press.
- Melzak, R., Katz, J., & Jeans, M. (1985). The role of compensation and non-compensation pain patients: Analysis using a new method to score the McGill Pain Questionnaire. Pain, 23, 101-112.
- Merriam-Webster. (1986). Third new international dictionary of the English language (unabridged). Springfield, MA: Author.
- Moffett, J. A. K., Chase, S. M., Portek, I., & Ennis, J. R. (1986). A controlled, prospective study to evaluate the effectiveness of a back school in the relief of chronic low back pain. Spine, 11, 120-122.
- Nachemson, A. L. (1985). Advances in low-back pain. Clinical Orthopaedics and Related Research, 200, 266-278.

- Nachemson, A. L. (1989, June). Current knowledge in low back pain with perspectives for the year 2000. Paper presented at the meeting of the World Health Organization Scientific Group on Rheumatic Diseases, Geneva, Switzerland.
- Newman, R. I., Seres, J. L., Yospe, L. P., & Garlington, B. (1978). Multidisciplinary treatment of chronic pain: Long-term follow-up of low-back pain patients. Pain, 4, 283-292.
- Norusis, M. J. (1991). Guide to data analysis for SPSS/PC+ (2nd ed.). Chicago: SPSS, Inc.
- Pender, N. J., Walker, S. N., Sechrist, K. R., & Frank-Stromborg, M. (1990). Predicting health-promoting lifestyles in the workplace. Nursing Research, 39, 326-332.
- Sanders, S. H. (1986). Component analysis of a behavioral treatment program for chronic low-back pain. Behavior Therapy, 14, 697-705.
- Sauer, J., & Thurman, D. H. (1981). Back pain rehabilitation program. The Journal of the Kentucky Medical Association, 79, 212-214.
- Schunk, D. H. (1984). Self-efficacy perspective on achievement behavior. Educational Psychologist, 19, 48-58.

- Schwartz M., & Goldiamond, I. (1975). Social casework: A behavioral approach. New York: Columbia University Press.
- Sechrist, K. R., Noble-Walker, S., & Pender, N. J. (1987). Development and psychometric evaluation of the exercise benefits/barriers scale. Research in Nursing and Health, 10, 357-365.
- Selby, D. K. (1982). Conservative care of nonspecific low back pain. Orthopedic Clinics of North America, 13, 427-437.
- Simon, W. H., Gates, S. J., Crawford, A. G., & Robinson, D. (1990). Back school relieves patients' pain. Pennsylvania Medicine, 1, 40-44.
- Sikorski, J. M. (1985). A rationalized approach to physiotherapy for low-back pain. Spine, 10, 571-579.
- Sirles, A. T., Brown, K., & Hilyer, J. C. (1991). Effects of back school education and exercise in back injured municipal workers. Journal of American Academy of Occupational Health Nursing, 39, 7-12.
- Snook, S. H., & Webster, B. S. (1987). The cost of disability. Clinical Orthopaedics and Related Research, 221, 77-85.

- Sternbach, S. (1978). Fundamentals of psychological methods in chronic pain. In J. J. Bonica (Ed.), Advances in pain research and therapy (Vol. 5, pp. 777-780). New York: Raven Press.
- Tollison, C. D., Satterthwaite, J. R., & Kriegel, M. L. (1990). Interdisciplinary treatment of low back pain: A clinical outcome comparison of compensated versus noncompensated groups. Orthopaedic Review, 19, 701-706.
- United States Department of Commerce (1990). Statistical abstract of the United States 1990: The national data book. Washington, DC: U.S. Bureau of the Census.
- United States Department of Health and Human Services (1989). Draft objectives for the year 2000. Washington DC: U.S. Public Health Service.
- Vallfors, B. (1985). Acute, subacute and chronic low back pain: Clinical symptoms, absenteeism and working environment. Scandinavian Journal of Rehabilitation Medicine, 11, 2-97.
- Waddell, G. (1987). A new clinical model for the treatment of low-back pain. Spine, 12, 63-74.
- Weitzel, M. H. (1989). A test of the health promotion model with blue collar workers. Nursing Research, 38, 99-104.

- White, A. H. (1983). Back schools and other conservative approaches to low back pain. St Louis: C. V. Mosby Co.
- Zastro, C., & Kirst-Ashman, K. (1990). Understanding human behavior and the social environment (2nd ed.). Chicago: Nelson-Hall.

APPENDIX A

San Jose State University

Human Subjects Institutional Review Board Approval

A campus of The California State University

Office of the Academic Vice President • Associate Academic Vice President • Graduate Studies and Research
One Washington Square • San Jose, California 95192-0025 • 408/924-2480

To: Debra Kaczmar, Nursing

From: Serena W. Stanford *Serena W. Stanford*
AAVP, Graduate Studies and Research

Date: July 20, 1992

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"The Effects of Multidisciplinary Rehabilitation
Therapy on Perceived Self-Efficacy in Clients with
Chronic Low Back Pain"

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Dr. Serena Stanford immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that each subject needs to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have questions, please contact me at 408-924-2480.

CC: Sharon Hogan, Nursing

APPENDIX B
Corporate Authorization

California SpineCare
Orthopaedic Surgical and Medical Group
3880 South Bascom Avenue, Suite 106
San Jose, CA 95124

408/559-4100

Michael A. Sommer, M.D. and Associates

TO: _____

FROM: _____

DATE: 3-10-92

Name of Patient _____

Soc. Sec.# _____

Employer _____

Date of Injury _____ Anatomic Area _____

Your File # _____

DEBRA KALZMAR

DEBRA

Thanks for yours of 3/2 —

Agree to restriction to ENGLISH LANGUAGE per —

I like revisions —

As far as what facilities to use, this is an operational question which I'd like Harry to give input. I'll send copy of this and the 3/2 copies to him —

Look forward to study!

Michael

P.O. Box 5978
320 Incline Way, Building 2, Suite E
Incline Village, Nevada 89450
TEL 702-831-5896
FAX 702-831-5897

CHART[®]
Corporation

March 18, 1992

Mrs. Debra Kaczmar

Dear Debra:

I am writing in follow-up to your and Mike Sommer's correspondence since I know that you are out of town. If you will give me a fairly concise summary of the research project, I will forward same to all of the facilities and request their assistance.

Your summary should include at least the following:

- a) What is the purpose of the study?
- b) How much time it will take for the new patient to fill out the form?
- c) Is there any known operational/therapist time involved?
- d) What follow-up do you want from the facility after the form has been completed?

If you will send me a draft of the foregoing, I can get it out system wide to our General Managers.

A wild thought! Most of the general managers in the system will be in Tahoe in early June for a 3 day training. Perhaps we can make this one of the topics of discussion and/or use that time for follow-up questions. The tentative dates of the meeting are June 10-12.

If you will fax me your draft, we can get this out.

I hope that you enjoyed your time in Hawaii.

Best regards,

Harry M. Flagg
President

APPENDIX C
Client Consent Form

PRINCIPAL INVESTIGATOR: Debra Kaczmar

TITLE OF PROTOCOL: Changes in Perceived Self-efficacy and Functional Impairment in Clients with Chronic Low Back Pain.

I have been asked to participate in a research study that is investigating how chronic low-back pain affects people's lives. The results of this study should further the understanding of the consequences of chronic low-back pain and improve the quality of care at the clinic.

1. I will be asked to complete 3 health surveys. One will be completed at the time I am admitted for treatment at the clinic. The others will be completed during the middle of my treatment plan and again at the time of my discharge from the program. Each survey will take less than 15 minutes to complete.
2. no anticipated risks are expected and there will be no changes in my treatment as a result of participating in the study.
3. there will be no discernable benefits to me as a result of participating in the study but the results of the study may help the staff at the clinic to better understand clients such as myself in the future.
4. the results of the study may be published, but any information from this study that can be identified with me will remain confidential and will be disclosed only with my permission.

5. any questions about my participation in this study will be answered by **DEBRA KACZMAR (#)**. Complaints about the procedures may be presented to Ann Doordan, Ph.D. (#) For questions or complaints about research, subject's rights, or in the event of research-related injury, contact Serena Stanford, Ph.D. (Associate Academic Vice President for Graduate Studies and Research) at (#).
6. my consent is given voluntarily without being coerced; I may refuse to participate in this study or in any part of this study, and I may withdraw at any time, without prejudice to my relations with SJSU and the clinic.
7. no service of any kind, to which I am otherwise entitled, will be lost or jeopardized if I choose to not participate in the study.
8. I will receive no compensation for participation in the study.
9. I have recieved a copy of this consent form for my file.

I HAVE MADE A DECISION WHETHER OR NOT TO PARTICIPATE. MY SIGNATURE INDICATES THAT I HAVE READ THE INFORMATION PROVIDED ABOVE AND THAT I HAVE DECIDED TO PARTICIPATE.

Date

Subject's Signature

Debra Kaczmar, Investigator

APPENDIX D

Data Collection Instrument

Oswestry Low Back Pain Disability Questionnaire

Please answer every section. Mark only ONE box. We realize that two boxes may relate to you, but choose the ONE that best describes your problem.

PAIN INTENSITY:

- ☐ I can tolerate the pain I have without having to use pain medications.
- ☐ The pain is bad, but I manage without taking pain medications.
- ☐ Pain medications give complete relief from pain.
- ☐ Pain medications give moderate relief from pain.
- ☐ Pain medications give very little relief from pain.
- ☐ Pain medications have no effect on the pain and I do not use them.

PERSONAL CARE (Washing, Dressing, etc.):

- ☐ I can look after myself normally without causing extra pain.
- ☐ I can look after myself normally, but it causes extra pain.
- ☐ It is painful to look after myself and I am slow and careful.
- ☐ I need some help, but manage most of my personal care.
- ☐ I need help every day in most aspects of self care.
- ☐ I do not get dressed, wash with difficulty and stay in bed.

LIFTING:

- ☐ I can lift heavy weight without extra pain.
- ☐ I can lift heavy weights but it give extra pain.
- ☐ Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, e.g. on a table.
- ☐ Pain prevents me from lifting heavy weights but I can manage light-to-medium weights if they are conveniently positioned.
- ☐ I can lift only very light weights.
- ☐ I cannot lift or carry anything at all.

WALKING:

- ☐ Pain does not prevent me walking any distance.
- ☐ Pain prevents me walking more than 1 mile.
- ☐ Pain prevents me walking more than 1/2 mile.
- ☐ Pain prevents me walking more than 1/4 mile.
- ☐ I can only walk using a cane or crutches.
- ☐ I am in bed most of the time and have to crawl to the bathroom.

SITTING:

- ☐ I can sit in any chair as long as I like.
- ☐ I can only sit in my favorite chair as long as I like.
- ☐ Pain prevents me from sitting more than 1 hour.
- ☐ Pain prevents me from sitting more than 1/2 hour.
- ☐ Pain prevents me from sitting more than 10 minutes.

SITTING (continued):

- ☐ Pain prevents me from sitting at all.

STANDING:

- ☐ I can stand as long as I want without extra pain.
- ☐ I can stand as long as I want but it gives me extra pain.
- ☐ Pain prevents me from standing for more than 1 hour.
- ☐ Pain prevents me from standing for more than 30 minutes.
- ☐ Pain prevents me from standing for more than 10 minutes
- ☐ Pain prevents me from standing at all.

SLEEPING:

- ☐ Pain does not prevent me from sleeping well.
- ☐ I can sleep well only by using medications.
- ☐ Even when I take medication I have less than 6 hours sleep.
- ☐ Even when I take medication I have less than 4 hours sleep.
- ☐ Even when I take medication I have less than 2 hours sleep.
- ☐ Pain prevents me from sleeping at all.

SEX LIFE:

- ☐ My sex life is normal and causes no extra pain.
- ☐ My sex life is normal, but causes some extra pain.
- ☐ My sex life is nearly normal, but is very painful.
- ☐ My sex life is severely restricted by pain.
- ☐ My sex life is nearly absent because of pain.
- ☐ Pain prevents any sex life at all.

SOCIAL LIFE:

- ☐ My social life is normal and gives me no extra pain.
- ☐ My social life is normal but increases the degree of pain.
- ☐ Pain has no significant effect on my social life apart from limiting my more energetic interests, e.g. dancing, etc.
- ☐ Pain has restricted my social life and I do not go out as often.
- ☐ Pain has restricted my social life to my home.
- ☐ I have no social life because of pain.

TRAVELING:

- ☐ I can travel anywhere without extra pain.
- ☐ I can travel anywhere but it gives me extra pain.
- ☐ Pain is bad but I manage journeys over two hours.
- ☐ Pain restricts me to journeys of less than one hour.
- ☐ Pain restricts me to short necessary journeys under 30 minutes.
- ☐ Pain prevents me from traveling except to the doctor or clinic.

APPENDIX E
Data Collection Instrument
Self-Efficacy Scale

We would like to know how confident you are in performing certain daily activities. For each of the following questions, please place a mark under the number which describes how sure you are that you can perform the tasks **at this time**. Given the way you feel right now, please answer what you think you can do and not what would require extra effort.

AS OF NOW, HOW SURE ARE YOU THAT YOU CAN ...

[illegible]

AS OF NOW, HOW SURE ARE YOU THAT YOU CAN

[illegible]

AS OF NOW, HOW SURE ARE YOU THAT YOU CAN ...

[illegible]

APPENDIX F
Data Collection Instrument
Client Data Survey

Thank you for agreeing to participate in this study. Its purpose is to learn more about how people perceive their ability to control the effects of chronic low back pain.

You will be asked to complete this questionnaire again around the middle of your treatment course and then again during your last scheduled week at CHART. Once you have completed the questionnaire, place it in the stamped addressed envelope and mail it directly to me. ALL INFORMATION WILL BE KEPT CONFIDENTIAL.

If you have any questions or comments, please contact Debra Kaczmar

Date _____

Age _____

Male ☐

Female ☐

Married ☐

Single ☐

Number of Dependents _____

Highest level of education _____

Occupation _____

Are you working at this time? Yes ☐ No ☐

If working, how many hours a week are you working? _____ Seasonal only? ☐

If not working, how long have you been out of work? _____

Was your injury work related? _____

How long have you had low back pain? _____

Comments:

APPENDIX G
Cover Letter

Thank you for agreeing to participate in this study that will address how well people believe they can control the consequences of chronic low-back pain.

You will be asked to complete the same survey three times during your course of treatment. The surveys will take approximately 10 minutes to complete.

1. Please sign 2 copies of the permission form. One should be mailed with your completed survey and the other one is yours for your records.
2. After it is completed, place the survey and **one** copy of the permission form in the stamped addressed envelope. Give the sealed envelope to the clinic receptionist. The receptionist at the clinic will mail your survey directly to me. Since your name is not on the survey, your responses will remain confidential.
3. During the middle of your course of treatment and at the time of discharge you will be asked to complete the survey again. These should also be sent to me in the same manner.

Please do not hesitate to call me with concerns. I can be reached at (#).

Thank you for your help,

Debra Kaczmar