

PREDICTING PATTERN CHARACTERISTICS THAT LEAD TO WORK RETURN
FOLLOWING FUNCTIONAL RESTORATION TREATMENT IN A CHRONIC
DISABLING OCCUPATIONAL MUSCULOSKELETAL
DISORDER POPULATION

by

RACHEL L. PURDUM

Presented to the Faculty of the Graduate School of
The University of Texas at Arlington in Partial Fulfillment
of the Requirements
for the Degree of

MASTER OF SCIENCE IN PSYCHOLOGY

THE UNIVERSITY OF TEXAS AT ARLINGTON

MAY 2015

Copyright © by Rachel Purdum 2015

All Rights Reserved

Acknowledgements

I would like to thank my mentor and committee chair Dr. Robert Gatchel for all his help and guidance over thesis past few years. I would also like to thank both of my committee members: Dr. Cindy Trowbridge and Dr. Angela Dougall for always being there and ready to help no matter the challenge or the problem.

I am very appreciative of all my friends and family for all their support.

April 24, 2015

Abstract

PREDICTING PATTERN CHARACTERISTICS THAT LEAD TO WORK RETURN
FOLLOWING FUNCTIONAL RESTORATION TREATMENT IN A CHRONIC
DISABLING OCCUPATIONAL MUSCULOSKELETAL
DISORDER POPULATION

Rachel Purdum

The University of Texas at Arlington, 2015

Supervising Professor: Robert J. Gatchel

Chronic pain is a major problem worldwide. Millions of dollars are spent on treatment of chronic pain each year. Some people require a tertiary approach to pain recovery and seek treatment at an interdisciplinary functional restoration rehabilitation program (FRP). The aim of the present study is to identify specific characteristics of a group that would complete an FRP and not return-to-work. Patients who participated in the FRP can be classified into three groups: return to work ($n = 2,470$), quality of life ($n = 346$) and non-completers ($n = 782$). Return-to-work individuals are defined as those individuals who have a goal to return to work. "Quality of life patients" are those who complete the FRP but do not return-to-work. These individuals do not expect to re-enter the work force and pick to either retire, be a stay at home housewife or husband, are disabled, or have another reason. Non-completers are those patients who do not complete the FRP. All patients participated in a medically supervised FRP, consisting of quantitatively-directed exercise progression and multi-modal disability management. Participants were administered psychosocial measures upon admission and chose to be return-to-work, quality of life or non-completers as they undergo treatment in the FRP.

Table of Contents

Acknowledgements	iii
Abstract	iv
List of Tables	ix
Chapter 1 Introduction.....	1
1.1 Chronic Pain	1
1.2 Treatment of Chronic Pain.....	2
1.3 Functional Restoration Treatment	3
1.4 Quality of Life Patients.....	4
1.5 Purpose of the Current Study	7
Chapter 2 Methods.....	9
2.1 Participants	9
2.2 Materials and Measures	11
2.2.1 Psychosocial Intake Evaluation.....	11
2.2.1.1 Perceived Pain Intensity.....	11
2.2.1.2 Patient Disability Questionnaire (PDQ)	11
2.2.1.4 Oswestry Disability Index (ODI)	12
2.2.1.5 Beck Depression Inventory (BDI).....	12
2.2.1.6 Psychosocial Clinical Interview	13
2.2.1.7 Medical Outcome Study 36-item Short-form Health Survey (SF-36).....	13
2.2.1.8 Tampa Scale for Kinesiophobia (TSK).....	14
2.2.1.9 Insomnia Severity Index (ISI)	14
2.2.1.10 Central Sensitization Index (CSI)	14
2.2.2 Structured One-year Follow-up Interview.....	15

2.3 Procedure	15
2.4 Analytic Plan	17
Chapter 3 Results	19
3.1 Assessment of Psychosocial Differences between Return to Work Group, Quality of Life Group, and Non-completers.....	19
3.1.1 Pain Intensity	21
3.1.2 Perceived Disability	21
3.1.2.1 PDQ.....	21
3.1.2.2 ODI	21
3.1.3 Depressive Symptoms.....	22
3.1.4 Quality of Life.....	22
3.1.4.1 SF-36 Mental Health Summary (MHS)	22
3.1.4.2 SF-36 Physical Health Summary (PHS)	23
3.1.7 Fear-Avoidance	23
3.1.6 Insomnia	23
3.1.7 Central Sanitization	24
3.2 Assessment of Psychosocial Differences between Young Quality of Life Individuals and Older Quality of Life Individuals	24
3.2.1 Pain Intensity	24
3.2.2 Perceived Disability	25
3.2.2.1 PDQ.....	25
3.2.2.2 ODI	25
3.2.3 Depressive Symptoms.....	25
3.2.4 Quality of Life.....	25
3.2.4.1 SF-36 Mental Health Summary (MHS)	25

3.2.4.2 SF-36 Physical Health Summary (PHS)	26
3.2.7 Fear-Avoidance	26
3.2.6 Insomnia	26
3.2.7 Central Sanitization	26
3.3 Assessment of Psychosocial Differences between Young Return to Work Group and Younger Quality of Life Group	27
3.3.1 Pain Intensity	27
3.3.2 Perceived Disability	27
3.3.2.1 PDQ.....	27
3.3.2.2 ODI	29
3.3.3 Depressive Symptoms.....	29
3.3.4 Quality of Life.....	29
3.3.4.1 SF-36 Mental Health Summary (MHS)	29
3.3.4.2 SF-36 Physical Health Summary (PHS)	30
3.3.7 Fear-Avoidance	30
3.3.6 Insomnia	30
3.3.7 Central Sanitization	30
Chapter 4 Discussion.....	32
4.1 Evaluation of Psychosocial Difference between the Return to Work Group and the Quality of Life Group	32
4.2 Evaluation of Psychosocial Difference Between the Non-completer Group and the Quality of Life Group	33
4.3 Evaluation Age Among the Quality of Life Group	33
4.4 Evaluation Psychosocial Distress Measures among the Young Quality of Life Group and the Young Return to Work Group	34

4.5 Conclusion	35
4.6 Limitations and Furture Research.....	35
References.....	37
Biographical Information	44

List of Tables

Table 1. Demographic Information.....	10
Table 2. Psychosocial Distress Measures at Admission	20
Table 3. Psychosocial at Admission for Younger Return-to-Work and QL Group	28

Chapter 1

Introduction

1.1 Chronic Musculoskeletal Pain

Chronic pain has been increasingly studied over the past decade (Gatchel, Peng, Peters, Fuchs, & Turk, 2007). More than \$200 billion per year has been spent in association with individuals who have chronic pain (McGeary, Mayer and Gatchel, 2006). Eighty-five billion dollars is spent on accurately diagnosing pain each year (Loeser, 2006). For direct and indirect cost of chronic pain, the total cost may be as high as \$294.5 billion annually (National Academic of Science and Institute of Medicine, 2001).

A specific type of chronic pain is chronic musculoskeletal pain. Chronic musculoskeletal pain can come from musculoskeletal injuries such as strain, sprains, fractures, dislocation and other orthopedic injuries that cause a patient to remain disabled for four months or more (McGeary, Mayer, & Gatchel., 2006). Up to 85% of these individuals who have chronic disabling occupational musculoskeletal disorders (CDOMD) will be unable to work and seek professional help for their pain (McGeary, Mayer, and Gatchel, 2006). Chronic musculoskeletal pain injuries are commonly sustained at work. According to the Department of Labor, 34 cases of musculoskeletal disorders per 10,000 full-time workers were reported in 2010. There has been a 4% increase in cases reported since 2009. Of all workplace injuries and illness, musculoskeletal disorders account for 29% of the injuries requiring time off from work in 2010, and soreness and pain accounts for 11% of total cases (Bureau of Labor Statistics, U.S. Department of Labor, 2011). The estimated cost associated with lost work days and compensation of occupational musculoskeletal disorders range from \$13 billion to \$20 billion per year (Gatchel & Mayer, 2000).

1.2 Treatment of Chronic Musculoskeletal Pain

The first approach to treatment of musculoskeletal injury is during the primary phase or acute phase of the injury. There are many approaches that can include structured rehabilitation, supervised by a physical therapist (PT) or occupational therapist (OT). These healthcare professionals may employ the use of different modalities such as heat, ice, ultrasound, electrical stimulation, laser, manual muscle manipulation, stretching, and exercise. Sometimes medication, such as anti-inflammatory drugs (NSAIDs), muscle relaxers, or opioids, may be prescribed to help promote healing and decrease pain. Secondary care of a musculoskeletal injury in the post-acute phase and the goals include: prevention of physical deconditioning, medication habituation, adverse psychosocial reactions, mobilization and strengthening of the injured area, and restoration of function. Treatments for secondary care can include continued physical therapy, psychosocial interventions, surgery and multidisciplinary care.

Some patients do not respond well to primary or secondary rehabilitation, and tertiary rehabilitation may be needed in about 10% of patients (Mayer & Polatin, 2000). There are two types of tertiary rehabilitation which include palliative pain management and multidisciplinary rehabilitation. The goal of palliative pain management is not to rehabilitate the patient to a functional state but to focus on pain reduction by the use of medication, usually narcotics. Multidisciplinary rehabilitation, however, addresses the physical, psychosocial, and socioeconomic barriers to recovery. When a body part is immobilized or not used frequently, physical deconditioning issues may occur and can become progressively worse due to the amount of time of disuse (Mayer & Polatin, 2000). With tertiary rehabilitation programs, it is essential that the programs consist of

physical functioning treatment, psychosocial assessment/treatment, and disability management (Mayer & Polatin, 2000).

1.3 Functional Restoration Treatment

The Productive Rehabilitation Institute of Dallas for Ergonomics (PRIDE) is an interdisciplinary functional restoration rehabilitation program (FRP) that specializes in the treatment of individuals who suffer from chronic musculoskeletal pain disorders. This FRP combines many disciplines including: physicians, nurses, psychiatrists/psychologists, physical therapists, occupational therapists, medical case managers, counselors, and biofeedback specialists, to help patients regain their functional abilities after work-related injuries (Gatchel, McGeary, McGeary, & Lippe, 2014; Gatchel & Okifuji, 2006; Kermond, Gatchel, & Mayer, 1991). FRP uses physical and psychosocial measures to assess and quantify pain and disability among patients. Patients undergo a physical rehabilitation component with specific exercises, training, education, and work simulations to enhance their functional abilities. Psychosocial interventions consist of behavioral pain management training, involving muscle relation, guided imagery and EMG/biofeedback, cognitive behavioral skill training, individual and group counseling emphasizing a crisis-intervention, and family counseling (Gatchel et al., 2014; Gatchel & Okifuji, 2006; Mayer & Gatchel, 1988).

The interdisciplinary FRP has been shown to be highly effective. In 2004, since opening in 1983, the PRIDE clinic has successfully returned almost half of all their patients to work, with more than half of these patients returning to their original employer (Hartzell, Mayer, Asih, Neblett, & Gatchel, 2014; Kolata, 2004). PRIDE has a work return rate of 93% for the years of 2004-2008 and work retention rates of 84% (Hartzell et al., 2014; Productive Rehabilitation Institute of Dallas Ergonomics, 2009).

1.4 Quality of Life Patients

Patients that enroll in the FRP are classified into groups upon discharge from the program. Individuals, who complete the program, can be classified into two groups: return to work and “quality of life”. Return-to-work patients are patients who have gone through the entire program and have a job plan. They make up the majority of the PRIDE FRP population and are either able to go back to their previous job or find new work. Patients who are classified as “quality of life” (QL) are individuals who have completed the FRP but do not go back to work. Some reasons these individuals may choose not to go back to work could be because they decide to retire, are housewives or husbands, or are on disability. The QL patients’ goal is to reduce their pain and restore physical function. Patients who drop out, or do not complete the program, are classified as non-completers.

Past research has found that disabling pain can lead to early retirement across the world. In England and Wales, it was found that a majority of people did not return to work and sought earlier retirement due to illness and injury on the job (Pattani, Constantinovici, & Williams, 2001). Of these individuals in England and Wales, 72% were female and attributed early retirement reasons to musculoskeletal injury (49%) or psychiatric (20%), and cardiovascular conditions (Pattani, Constantinovici, & Williams, 2001).

Schofield, Shrestha, Percival, Callander, Kelly and Passey (2010) published a paper explaining how money and back pain can lead to an early retirement from the work force. Within the European work force, back pain has been a concern for early retirement. This study looked at individuals who had back pain and those who did not have back pain. It was found that those who did not have back pain were able to continue on in the work force and gain wealth before retirement. However, it was found that those who did have back pain and no wealth often sought out early retirement, and these individuals

struggled with financial security in the future once employment benefits and money dwindled (Schofield et al., 2010).

Neugarten (1974) was one of the first studies that looked at how age could impact society and the work force in the United States. One of the author's points was that there seemed to be a shift in what was considered elderly or the old-old and what she considered young-old. She predicted that as individuals' age they were more functional and not as ill as they used to be but their priorities such as working had changed. Many individuals were living longer and were becoming more family oriented, wanting to spend time with their children, grandchildren and parents. With this new found drive for leisure, the impact that it was taking on society had changed. She states when an individual may retire and when they draw social security has changed. People used to wait until the age of 65 to retire and draw social security but now individuals are drawing social security at an earlier age, 55 year old, and this is having an impact on the economy (Neugarten, 1974).

Smola and Sutton (2002) looked at work values among different generations in the new millennium. These authors used questionnaires to gather data on different aged individuals' opinions and attitudes towards work values. Some important information they found was that younger-aged groups (27-40) and older-aged groups (41-65) both had a strong desire to be promoted quickly within their job. The authors found that baby boomers (1946-1964) felt more strongly that work should be one of the most important parts of a person's life. The younger generation (under the age of 65) was found to report that they would quit their jobs if they inherited a lot of money and were less loyal to their companies and more self-oriented. These authors have shown that values in the work force have changed and the younger generations are more self-oriented, less loyal

to their companies and value their leisure time more compared to older generations (65 years old and over) (Smola & Sutton, 2002).

Subsequently, Twenge (2002) looked at generational differences in work attitude. He found that once again younger generations did not want to work hard and did not want great responsibility at work. The younger generations, according to the author, were more family/leisure oriented and were less likely to make work a more important part of their lives. Besides finding there was a decline in a work ethic among younger generations, he found that work hours have been extended due to technology, thus the work day is now longer. However, younger generations are more satisfied with their jobs compared to older generations but they view it as just a way to make a living and loyalty is no longer there (Twenge, 2002).

Parry and Urwin (2011) did a review in the differences in work value among different generations in Western economies such as the United States, the United Kingdom and Australia. These authors broke the generation into four groups: Veterans (1925-1942), Baby Boomer (1943-1960), Generation X (1961-1981) and Generation Y (1882-). They looked at a review of the literature to determine if there were any differences among these four age groups. An interesting finding was that Generation X and Y both scored higher on self-enhancement values on questionnaire compared to the other groups. Generation Y valued autonomy and work-life balance and economic return more highly than the other groups. Veterans, Baby Boomers, and Generation X were found to want to progress in terms of income, responsibility, and influence within their job compared to Generation Y. Generation X is accustomed to instant gratification and look for jobs and live where they can be rewarded quickly for the good work instead of waiting in line for their promotion. It was also found that there was a strong desire to be promoted more quickly, but yet felt that work was not the most important factor in one's life among the

Generation X group. In addition, generation X was found to be more centered around themselves and less loyal to their employers. Generation Y was shown to take technology for granted and liked to keep their career options open. Psychologically, it was found that Generation Y had increased self-esteem, narcissism, anxiety, depression, and a lower need for control and self-approval compared to the other groups. The key message of this article is that there has been a change in values in the work force among the different age or generation groups (Parry & Urwin, 2011).

1.5 Purpose of the Current Study

The purpose of this present study is to determine if there are special characteristics of QL patients that can be identified. This study aims to determine whether there are differences between the QL patient, the return-to-work group, and the non-completers in levels of psychosocial distress at admission. This is important and may give some insight into why some patients who complete the FRP, choose to become QL patients and not return to work. If specific characteristics can be identified, a better program might be developed to prompt the individuals to return-to-work, and become more productive members of society.

In previous research done with the FRP population it was found that quality of life patients did worse than return-to-work individuals on psychosocial distress measures (Asih, Neblett, Mayer, Brede, & Gatchel, 2014). In this current study it was hypothesized, that compared to return-to-work participants with job plans, QL patients would: report higher levels of psychosocial distress on self-report measures (based upon our preliminary findings for the insomnia cohort) at admission into the FRP. The second hypothesis stated that compared to non-completers, QL patients will report lower levels of psychosocial distress on self-report measure at admission into the FRP compared to non-completers. The third hypothesis was that, within the QL group (in regard to age)

younger individuals will have higher psychosocial distress on self-report measures at admission compared to older individuals (65 years and older). The final fourth hypothesis is dependent upon hypothesis three and predicted that young “quality of life” participants would have higher psychosocial distress scores compared to younger return-to-work participants.

Chapter 2

Methods

2.1 Participants

All 3,598 patients in the current study were enrolled consecutively in a tertiary FRP for chronic musculoskeletal disorders. Patients were admitted to, and completed or attempted treatment, at the Productive Rehabilitation Institute of Dallas for Ergonomics (PRIDE) between 2001 and 2012. Those patients were categorized into either a return-to-work group, a “quality of life” (QL) group, or a non-completer group upon as they participated in treatment at the FRP. All return-to-work individuals ($n = 2,470$) finished the FRP and had job plans, whereas, the QL group ($n = 346$) did not have job plans and could be sub-categorized into either those who retired, were housewives or husbands, had disability income, or other. The non-completers did not finish the FRP ($n = 782$). The only criterion for participation in this study was enrollment of the PRIDE FRP. All participants were either English or Spanish speaking. See Table 1 for demographic.

Patients who consented to treatment at PRIDE were added to the study. Therefore, 100% of the patients agreed to participate ($N = 3,595$). Upon entering the program, patients signed a Health Insurance Portability and Accountability Act (HIPPA) authorization form, this served as their informed consent. Patients were not compensated for their time spent completing questionnaires

Table 1. Demographic Information (n = 3595)

Variable	Non-Completers n = 782	Return-to-Work n = 2470	Quality of Life n = 346	p- value
Age, mean (SD)	45.07 (10.29)	45.65 (9.64)	52.86 (9.72)	.00
Gender, male, n (%)	467 (59.7%)	1411 (57.2%)	161 (46.5%)	.00
Ethnicity, n (%)				
Caucasian	342 (55.7%)	993 (49.4%)	171 (57.6%)	.00
African American	155 (25.2%)	475 (23.6%)	70 (23.6%)	
Hispanic	108 (17.6%)	495 (24.6%)	47 (15.8%)	
Other	9 (1.5%)	47 (2.3%)	9 (3%)	
Length of Disability in Months, mean (SD)	31.67 (47.08)	21.86 (31.49)	52.08 (61.74)	.00
Marital Status, n (%)				
Single	103 (15.8%)	311 (14.8%)	38 (12.2%)	.00
Married	322 (49.5%)	1120 (53.4%)	167 (53.7%)	
Separated	47 (7.2%)	150 (7.2%)	15 (4.8%)	
Divorced	140 (21.5%)	422 (20.1%)	69 (22.2%)	
Widowed	16 (2.5%)	42 (2%)	19 (6.1%)	
Cohabiting	23 (3.5%)	52 (2.5%)	3 (1%)	
Receiving SSDI or SSI, n (%)	75 (10.8%)	56 (2.5%)	66 (22.8%)	.00

and testing because they were accepted into the functional rehabilitation program and these measures would have been taken regardless. All data were gathered from the PRIDE database in Dallas. Because the data collected were part of the patient's standard medical record, this study was granted an exemption from the review by the Institutional Review Board (IRB) at the University of Texas at Arlington. Through the use of HIPPA guidelines and de-identification measures, all patients' information was safely secured and anonymous.

2.2 Materials and Measures

2.2.1 Psychosocial Intake Evaluation

When patients had been accepted into the FRP, they then underwent an initial Mental Health Evaluation (MHE). This evaluation consisted of a packet of self-report questionnaires which included psychosocial measures assessing pain, perceived disability, health-related quality of life, depressive symptoms, insomnia, and fear-avoidance. These measures were gathered upon admission to the program and then again at discharge from the program.

2.2.1.1 Perceived Pain Intensity

This Visual Analog Scale (VAS) measures pain intensity on a 10mm scale. The anchors used on this scale are "no pain" to "worst possible pain." Pain intensity is determined by measuring the distance from the "no pain" endpoint to the patient's marking on the line. The VAS is a useful tool in measuring subjective pain and is easily understood (Jensen, Karoly, & Braver, 1986).

2.2.1.2 Patient Disability Questionnaire (PDQ)

The Pain Disability Questionnaire (PDQ) was developed at PRIDE for use in patients with musculoskeletal disorder and was designed as a functional measure of disability (Anagnostis, Gatchel, & Mayer, 2004; Gatchel, Mayer, & Theodore, 2006). The

PDQ has a functional status component, a psychosocial component, and a total component score. Patients are instructed to put an "X" along the line to show how much their pain affects them. Each item of the PDQ is scored from 0-10, for a total cumulative possible score of 150. Higher scores on the scale indicate greater levels of pain and disability. This instrument was designed for many chronic disabling painful musculoskeletal disorders including upper extremity, lower extremity, as well as spinal disorders (Anagnostis et. al., 2004; Gatchel et. al., 2006). The Pain Disability Questionnaire has been found reliable and valid (Wilson, 2007).

2.2.1.4 Oswestry Disability Index (ODI)

The ODI is one of the oldest, psychometrically sound measures that has been used to evaluate disability (Fairbank & Pynsent, 2000). Unfortunately, the ODI does have some limitations such as the inability to distinguish low-scoring patients, and is focused mostly on low back pain (Gatchel et al, 2006). There are 10 sections of the ODI that ask about functional limitations due to pain. Each section contains a series of six possible responses describing functional difficulty from no difficulty to high difficulty. Patients are asked to mark one box that describes their ability to function. The scores are then added up and the total score is doubled and expressed as a percentage. The maximum possible raw score is 50, which means a patient can have a maximum percent of 100% indicating that they are bed-bound. The established ranges of the ODI are: minimal disability (0-20%), moderate disability (20-40%), severe disability (40-60%), crippled (60-80%) and bed-bound or exaggerating (80-100%) (Fairbank, Couper, Davies, & O'Brien, 1980).

2.2.1.5 Beck Depression Inventory (BDI)

The BDI is a tool that was created to measure depressive symptoms (Beck, Ward, Mendelson, Mock & Erbaugh, 1961). It is frequently used as a screener in pain

centers, but is thought to overestimate depressive symptoms because of the similarity between somatic symptoms of depression and physical symptoms of chronic pain (Wesley, Gatchel, Garofalo, & Polatin, 1999). The measure consists of 21 items scored on a 0-3 point scale. Zero indicates there are no depressive symptoms present and three indicates that the symptom is severe on the scale. Total scores of the BDI range from 0-63. The ranges of the BDI are as followed: no depression symptoms (0-9), mild to moderate depression symptoms (10-18), moderate to severe depression symptoms (19-20), and severe depression (30-63). The BDI has high internal consistency and moderate stability (Beck, Steer, & Garbin, 1988). The BDI has been found to have concurrent, construct and discriminate validity (Beck, Steer, & Garbin, 1988).

2.2.1.6 Psychosocial Clinical Interview

The clinical interview is conducted by a qualified clinician (psychologist) who integrates all self-report measures with their personal patient assessment. The patient is assessed for symptoms of depression, anxiety, stress and psychiatric disorders (as diagnosed by the DSM-IV (American Psychiatric Association, 1994)). The patient's home and family life and presence of social support are also assessed by the clinician. The clinician determines patient motivation for recovery, including financial disincentives for return-to-work, secondary gain, and malingering symptoms (Gatchel, 1991).

2.2.1.7 Medical Outcome Study 36-item Short-form Health Survey (SF-36)

The SF-36 evaluates health-related quality of life that represents multidimensional health concepts (Mchorney, Ware, & Raczek, 1993). This measure includes eight subscales which are: physical functioning, role limitations, social functioning, mental health, general health perception, bodily pain and vitality. These subscales are condensed into two summary scales the mental component scale and the physical component scale. The SF-36 has shown high reliability and content, criterion,

and construct validity (Mchorney et al., 1993). The measure has also shown good relation to socioeconomic outcomes (Gatchel, Mayer, Dersh, Robinson, & Polatin, 1999), even though it has been found that it is less useful for showing individual responsiveness (Gatchel, Polatin, Mayer, Robinson, & Dersh, 1998). With this scale, a higher score reflects better self-reported health.

2.2.1.8 Tampa Scale for Kinesiophobia (TSK)

The TSK explained a cognitive behavioral model for fear avoidance. It was first introduced in an unpublished manuscript in 1991 (Miller, Kori, & Todd, 1991) and was later published in Dutch by Vlaeyen, Kole-Snijders, Boeren & van Eek (1995). The TSK consists of 13 item scale and has two subscales which are activity avoidance and somatic focus. The scale ranges from 1 (strongly disagree) to 4 (strongly agree). Activity avoidance is defined as a belief that activity may result in pain and possible reinjury, and somatic focus is identified as belief that pain is caused by an underlying medical problem (Roelof, Peters, Vlaeyen, & Crombez, 2004).

2.2.1.9 Insomnia Severity Index (ISI)

The ISI is a valid self-report measure of insomnia symptoms (Asih et al., 2014). The ISI assesses the severity of both nighttime and daytime components of insomnia, using a 5-point scale, where 0 is “not at all” and 5 is “extremely”. The ranges of the ISI are as follows: no clinically significant insomnia (0-7), subthreshold insomnia (8-14), moderate clinical insomnia (15-21), and severe clinical insomnia (22-28) (Asih et al., 2014).

2.2.1.10 Central Sensitization Index (CSI)

The CSI was created to measure somatic and emotional symptoms that have been found to be associated with central sensitization (CS) and central sensitivity syndrome (CSS) (Mayer, Neblett, Cohen, Howard, Choi, Williams, Perez, & Gatchel,

2012). Central sensitization is characterized by painful sensations to a normally non-painful stimulus (allodynia), excessive sensitivity to a normally painful stimulus (hyperalgesia) that extends beyond the area of peripheral nerve supply, and usually by prolonged pain after the stimulus has been removed. Central sensitivity syndrome is a nonorganic disorder that is presumed to share CS etiology. There are two parts to the CSI. Part A has 25 questions in regards to current health symptoms. Each item is measured on a 5-point Likert scale. A cumulative score can range from 0 to 100 with a higher score indicating more symptoms. Part B of the CSI, is additional information on previously diagnosed CSS and related conditions (Mayer, Neblett, Cohen, Howard, Choi, Williams, Perez, & Gatchel, 2012).

2.2.2 Structured One-year Follow-up Interview

One-year after discharge, socioeconomically-relevant outcomes are assessed in a structured interview. The outcomes include: work return, work retention excessive healthcare utilization, and the number of new injuries and new surgeries acquired within one year after discharge. Work retention assessed whether the patient was still working at the time of the one-year follow up, and healthcare utilization is measured by the number of visits made to providers in excess of standard follow-up visits after discharge. The interview is independently verified through employers, workers' compensation system and insurance carriers, thus making the outcomes objective and able to measure responsiveness to the FRP (Mayer & Polatin, 2000).

2.3 Procedure

The FRP is a quantitatively-directed, medically supervised program that adopts a sports medicine approach and is based on the biopsychosocial model. The biopsychosocial model views dysfunction and occupational illness as a complex interaction of biological, psychological and social variables (Turk, 1996; Gatchel et al.,

2007). The FRP's primary goal is to restore function and reduce perceived pain in a CDOMD population. Eliminating pain is not the main focus of this program; however, a decrease in pain is often a by-product of the FRP. There are some complications that act as barriers to recovery in a chronic pain population; this treatment addresses the psychological, physical, financial, legal, work-related or occupational complications. Treatment is guided by a physician, who serves as the medical director, with nurses serving as an extension of the physician. Patients participate in physical therapy, occupational therapy, group stretching/yoga, and a multi-modal disability management program where patients undergo individual and group counseling using a cognitive-behavioral therapy (CBT) approach, stress management, biofeedback, educational sessions on the nature of pain, stress disability and recovery, and vocational integration which is handled by a case manager. It is an interdisciplinary approach rather than multidisciplinary because all clinicians are housed in the same building and have direct communication with one another (Deschner & Polatin, 2009).

The FRP consists of three major phases. The first phase focuses on barriers to recovery and disability education, which is led by a psychology staff member. The psychology staff will begin to treat problematic psychosocial issues through counseling and/or pharmacotherapy. Stretching/yoga and range-of-motion (ROM) increases goals that are emphasized by both the physical therapy (PT) and occupational therapy (OT) staff. During this phase, baseline physical function assessments, an initial occupational assessment, and an interview take place. Then frequent assessments of physical and psychosocial functioning are conducted throughout the course of treatment to help maintain objectives and to provide patients with feedback with their treatment progression.

The second phase of the FRP is considered the intensive rehabilitation phase. This phase focuses on the enhancement of physical strength, endurance and aerobic capacity by using an individualized-graded exercise plan. During this second phase, PT and OT are key components, with the psychology staff assisting with barriers to recovery and medication reliance. The PT staff specifically treats injured body areas and the OT staff coordinates the whole body movement in order to hone job skills and activities involved in daily living. Functional Capacity Evaluations (FCEs) are performed routinely in order to objectively measure improvement.

The final phase of the FRP is the follow-up. The patient is gradually weaned off the FRP during this phase. Focus is put on returning to work and patients continue to do an exercise regimen at home. A recurrence of symptom magnification, non-compliance, and regression can often take place during this phase due to the patient's anxiety in regards to the future, making the counseling and case manager team very crucial during this final phase (Mayer & Gatchel, 1988; Deschner & Polatin, 2000; Mayer & Polatin, 2000).

2.4 Analytic Plan

Mixed model Analyses of Variance (ANOVAs) were used to compare the return-to-work, non-completers and quality of life participants. Post-hoc tests for continuous variables were computed using Bonferroni correction for multiple comparisons and independent Chi-Square tests (χ^2) were used for categorical variables. Effect size for all continuous variables are partial eta-squared (η^2) for continuous variables and Cohen's *W* (Cohen, 1992) for categorical variables. Due to the large number of two-level factorial designs, the Holm Step-down procedure was used to determine the need for adjustment of *p*-values (Holm, Mark, & Addison, 2005). A power analysis was conducted on the data to determine appropriate sample size. According to a G*Power analysis (Faul, Erdfelder,

Lang, & Bachner, 2007; Faul, Erfelder, Buchner, & Lang, 2009) with a moderate effect size of .25, a power of .80, and an alpha of .05, a sample size of 305 was required. Due to recruitment, the actual sample size was 3,598 participants. There were 346 (9.5%) participants in the quality of life group, 2,470 (68.7%) participants in the return-to-work group, and 782 (21.8%) participants in the non-completer group. Because group classification is assigned as participants participate in the FRP, this could not be manipulated. All participants choose the category they were in as they go through the FRP.

Chapter 3

Results

There were four main hypothesis examined in this study. Each hypothesis examined characteristics of the quality of life group compared to others who participated in the FRP.

3.1 Assessment of Psychosocial Differences between Return-to-Work Group, Quality of Life Group, and Non-completers

The first hypothesis stated that at admission, the return-to-work group would have lower psychosocial measures compared to the QL group. The first hypothesis was supported. The second hypothesis stated that at admission, the non-completer group would have higher psychosocial distress measures compared to the QL group. However, the second hypothesis was not supported. A one-way mixed model between-subjects Analysis of Variance (ANOVA) was performed on the data to test these hypotheses. The means and standard deviation for all psychosocial variables are shown in Table 2.

Table 2. Psychosocial Distress Measures at Admission (n = 3599)

Variable	Non-Completers n = 782	Return-to-Work n = 2470	Quality of Life n = 346	<i>p</i> -value
Age , mean (SD)	45.07 (10.29)	45.65 (9.64)	52.86 (9.72)	.00
Gender , male, n (%)	467 (59.7%)	1411 (57.2%)	161 (46.5%)	.00
Ethnicity , n (%)				
Caucasian	342 (55.7%)	993 (49.4%)	171 (57.6%)	.00
African American	155 (25.2%)	475 (23.6%)	70 (23.6%)	
Hispanic	108 (17.6%)	495 (24.6%)	47 (15.8%)	
Other	9 (1.5%)	47 (2.3%)	9 (3%)	
Length of Disability in Months , mean (SD)	31.67 (47.08)	21.86 (31.49)	52.08 (61.74)	.00
Marital Status , n (%)				
Single	103 (15.8%)	311 (14.8%)	38 (12.2%)	.00
Married	322 (49.5%)	1120 (53.4%)	167 (53.7%)	
Separated	47 (7.2%)	150 (7.2%)	15 (4.8%)	
Divorced	140 (21.5%)	422 (20.1%)	69 (22.2%)	
Widowed	16 (2.5%)	42 (2%)	19 (6.1%)	
Cohabiting	23 (3.5%)	52 (2.5%)	3 (1%)	
Receiving SSDI or SSI , n (%)	75 (10.8%)	56 (2.5%)	66 (22.8%)	.00

3.1.1 Pain Intensity

The first hypothesis proposed that return-to-work individuals would have lower pain on the VAS compared to quality of life individuals and the second hypothesis stated that the QL group would have lower pain on the VAS compared to the non-completers. There was a significant main effect of group $F(2, 3117) = 60.15, p < .00$, partial $\eta^2 = .04$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The return-to-work group had lower pain scores ($M = 6.78, SE = .04$) compared to the quality of life group ($M = 7.58, SE = .10$), $p < .00$. There was no significance found between the QL group and the non-completers on the VAS.

3.1.2 Perceived Disability

It was hypothesized that return-to-work individuals would have less perceived disability compared to those in the QL group and that the QL group would have less perceived disability compared to the non-completers.

3.1.2.1 PDQ

There was a significant main effect for group $F(2, 2691) = 67.91, p < .00$, partial $\eta^2 = .05$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The return-to-work group had significantly lower perceived disability scores on the PDQ ($M = 96.05, SE = .58$) compared to the quality of life group ($M = 107.69, SE = 1.42$), $p < .00$. However, there were no significant findings between the QL group and the non-completers on the PDQ.

3.1.2.2 ODI

A significant main effect for group $F(2, 2908) = 67.82, p < .00$, partial $\eta^2 = .05$, was found. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The return-to-work group had lower perceived disability scores on

the ODI ($M = 41.83$, $SE = .37$) compared to the QL group ($M = 50.26$, $SE = .96$), $p < .00$.

There were no significant finding between the QL group and non-completers on the ODI.

3.1.3 Depressive Symptoms

The hypotheses stated that return-to-work individuals would have significantly lower depressive symptoms at admission compared to the QL group and that the QL group would have significantly lower depressive symptoms compared to the non-completers. A significant main effect for group $F(2, 3111) = 34.98$, $p < .00$, partial $\eta^2 = .02$ was found. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The return-to-work group had lower depressive symptom scores on the BDI ($M = 18.13$, $SE = .24$) compared to the quality of life group ($M = 22.22$, $SE = .61$), $p < .00$. There was no significant different between the QL group and the non-completers.

3.1.4 Quality of Life

The first hypothesis proposed that return-to-work individuals would have a significantly improved quality of life, due to participation in the FRP, over those who were in the QL group at admission and the second hypothesis proposed that the QL group would have a significantly improved quality of life compared to non-completers.

3.1.4.1 SF-36 Mental Health Summary (MHS)

There was a significant main effect for group $F(2, 2467) = 6.17$, $p = .00$, partial $\eta^2 = .00$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The return-to-work group had higher scores on the MHS ($M = 39.03$, $SE = .25$) which indicated better mental quality of life compared to the QL group ($M = 37.33$, $SE = .67$), $p = .05$. No significant findings were found for the MHS scores between the QL group and the non-completer.

3.1.4.2 SF-36 Physical Health Summary (PHS)

For the PHS, there was a significant main effect for group $F(2, 2465) = 14.28, p < .00$, partial $\eta^2 = .01$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The return-to-work group had higher scores on the PHS ($M = 29.98, SE = .15$) which indicated better mental quality of life compared to the quality of life group ($M = 28.56, SE = .40$), $p = .00$. There were no significant findings found between the QL group and the non-completers for the PHS.

3.1.7 Fear-Avoidance

It was hypothesized that return-to-work participants would have lower kinesiophobia scores compared to the QL participants at admission and that the QL group would have lower kinesiophobia scores compared to the non-completer group. There was a significant main effect for group $F(2, 795) = 9.08, p < .00$, partial $\eta^2 = .02$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The return-to-work group had lower scores on the TSK ($M = 32.89, SE = .38$) compared to the quality of life group ($M = 35.35, SE = .79$), $p = .02$. However, no significant findings were found between the QL group and the non-completer group on the TSK.

3.1.6 Insomnia

It was expected that the return-to-work group would have lower symptom scores on the insomnia scale compared to the QL group at admission. There was a significant main effect for group $F(2, 527) = 11.22, p < .00$, partial $\eta^2 = .04$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The return-to-work group had lower symptom scores for insomnia ($M = 16.97, SE = .34$) compared to the QL group ($M = 18.95, SE = .72$), $p = .04$. Between the QL group and the non-completer group, there were non-significant findings found on the ISI.

3.1.7 Central Sensitization

It was hypothesized that the return-to-work group would have lower scores on the CSI compared to the QL group and that QL group would have lower scores compared to non-completers. There was a significant main effect for group $F(2, 700) = 25.81, p < .00$, partial $\eta^2 = .07$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The return-to-work group had lower scores on the CSI ($M = 41.32, SE = .73$) compared to the quality of life group ($M = 51.52, SE = 1.57$), $p < .00$. No significant was found on the CSI between the QL group and the non-completer group.

3.2 Assessment of Psychosocial Differences between Young Quality of Life Individuals and Older Quality of Life Individuals

The third hypothesis stated that at admission, the younger (below the age of 65) would have higher psychosocial distress measures compared to older (65 year and older) individuals within the QL group. A one-way mixed model Analysis of Variance (ANOVA) was performed on the data to test this hypothesis. The third hypothesis was partially supported.

3.2.1 Pain Intensity

The third hypothesis proposed that younger quality of life individuals would have higher pain on the VAS compared to older quality of life individuals. There was a significant main effect for group $F(1, 290) = 6281.31, p < .00$, partial $\eta^2 = .96$. There was significance found that younger individuals ($M = 7.63, SD = 1.64$) had reported higher pain than older quality of life individuals ($M = 6.92, SD = 2.02$).

3.2.2 Perceived Disability

It was hypothesized that young quality of life participants would have more perceived disability compared to older the quality of life participants.

3.2.2.1 PDQ

There was a significant main effect for group $F(1, 274) = 6405.09, p < .00$, partial $\eta^2 = .96$. It was found that younger individuals ($M = 108.84, SD = 22.55$) reported significantly higher pain than older quality of life individuals ($M = 94.28, SD = 33.55$).

3.2.2.2 ODI

There was a significant main effect for group $F(1, 273) = 2677.37, p < .00$, partial $\eta^2 = .91$. It was found that younger individuals ($M = 50.63, SD = 16.20$) reported significantly higher pain than older quality of life individuals ($M = 45.50, SD = 19.36$).

This does support the third hypothesis.

3.2.3 Depressive Symptoms

This hypothesis stated that younger QL individuals would have significantly higher depressive symptoms at admission compared to older quality of life individuals. There was a significant main effect for group $F(1, 290) = 1041.48, p < .00$, partial $\eta^2 = .78$. Younger QL individuals ($M = 22.40, SD = 11.84$) had significantly more depressive symptoms than older quality of life individuals ($M = 20.56, SD = 12.77$).

3.2.4 Quality of Life

The third hypothesis proposed that younger QL individuals would have a significantly higher quality of life, due to participation in FRP, over those who were in the older QL group at admission.

3.2.4.1 SF-36 Mental Health Summary (MHS)

There was a significant main effect for group $F(2, 214) = 2904.74, p < .00$, partial $\eta^2 = .93$. The younger QL group had higher scores on the MHS ($M = 37.60, SD = 10.23$).

which indicated better mental QL compared to the older quality of life group ($M = 33.86$, $SD = 14.24$).

3.2.4.2 SF-36 Physical Health Summary (PHS)

A significant main effect for group $F(1, 214) = 4808.24$, $p < .00$, partial $\eta^2 = .96$, was found. The younger group ($M = 28.54$, $SD = 6.04$) had lower scores on the PHS which indicated worse physical QL compared to the older group ($M = 29.00$, $SD = 5.88$). This hypothesis was supported.

3.2.7 Fear-Avoidance

The third hypothesis proposed that younger QL individuals would have higher kinesiophobia scores compared to the older QL participants at admission. There was a significant main effect for group $F(1, 108) = 1824.32$, $p < .00$, partial $\eta^2 = .94$. There were significant findings that younger individuals ($M = 35.44$, $SD = 8.66$) did worse on the TSK compared to older QL individuals ($M = 34.22$, $SD = 10.54$).

3.2.6 Insomnia

It was proposed that the younger QL group would have higher symptom scores on the insomnia scale compared to the older quality of life group at admission. There was a significant main effect $F(1, 75) = 522.46$, $p < .00$, partial $\eta^2 = .87$. Significance was found that the younger group ($M = 19.04$, $SD = 7.26$) had more insomnia symptoms than the older group ($M = 17.83$, $SD = 7.57$).

3.2.7 Central Sensitization

It was hypothesized that the younger group would have higher scores on the CSI compared to the older QL group. There was a significant main effect for group $F(1, 93) = 757.96$, $p < .00$, partial $\eta^2 = .89$. There were significant findings found that the younger group ($M = 51.96$, $SD = 18.30$) had worse scores on the CSI compared to the older quality of life group ($M = 44.67$, $SD = 20.60$).

3.3 Assessment of Psychosocial Differences between Young Return-to-Work Group and Younger Quality of Life Group

The fourth hypothesis stated that at admission, the younger return-to-work group would have lower psychosocial measures compared to the younger QL group. This hypothesis is dependent upon hypothesis three and confirms that younger QL individuals are still worse on psychosocial measure than younger return-to-work individuals. A one-way mixed model between-participant Analysis of Variance (ANOVA) was performed on the data to test this hypothesis. The fourth hypothesis is supported. The means and standard deviation for all psychosocial variables are shown in Table 3.

3.3.1 Pain Intensity

The fourth hypothesis proposed that younger return-to-work individuals would have lower pain on the VAS compared to younger QL individuals. There was a significant main effect of group $F(1, 2380) = 55.07, p < .00$, partial $\eta^2 = .02$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The younger return-to-work group had lower pain scores ($M = 6.77, SE = .04$) compared to the younger QL group ($M = 7.63, SE = .11$), $p < .00$.

3.3.2 Perceived Disability

It was hypothesized that younger return-to-work individuals would have less perceived disability compared to those in the younger quality of life group.

3.3.2.1 PDQ

There was a significant main effect for group $F(1, 2035) = 61.40, p < .00$, partial $\eta^2 = .03$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The younger return-to-work group had lower perceived disability scores on the PDQ ($M = 96.08, SE = .60$) compared to the younger quality of life group ($M = 108.84, SE = 1.52$), $p < .00$.

Table 3. Psychosocial at Admission for Younger Return-to-Work and QL Group
(n = 2, 234)

Variable	Younger Return-to-Work n = 1,960	Younger QL n = 274	p- value
Pain Visual Analog Scale, mean (SD)	6.77 (1.86)	7.63 (1.64)	.00
Beck Depression Inventory, mean (SD)	18.13 (10.53)	22.40 (11.84)	.00
Pain Disability Questionnaire, mean (SD)	96.08 (25.51)	108.84 (22.55)	.00
Oswestry Disability Index, mean (SD)	41.84 (16.62)	50.63 (16.20)	.00
SF-36, mean (SD)			
Mental Health Scale	39.04 (10.16)	37.60 (10.22)	.05
Physical Health Scale	30.00 (6.11)	28.54 (6.04)	.00
Insomnia Severity Index, mean (SD)	16.99 (6.72)	19.04 (7.26)	.02
Central Sensitization Inventory, mean (SD)	41.42 (15.35)	51.96 (18.30)	.00
Tampa Scale for Kinesophobia, mean (SD)	32.89 (8.76)	35.44 (8.66)	.01

3.3.2.2 ODI

There was a significant main effect for group $F(1, 2232) = 67.69, p < .00$, partial $\eta^2 = .03$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The younger return-to-work group had lower perceived disability scores on the ODI ($M = 41.84, SE = .37$) compared to the younger QL group ($M = 50.63, SE = 1.00$), $p < .00$.

3.3.3 Depressive Symptoms

This hypothesis stated that younger return-to-work individuals would have significantly lower depressive symptoms at admission compared to the younger QL individuals. There was a significant main effect for group $F(1, 2378) = 40.46, p < .00$, partial $\eta^2 = .02$. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The younger return-to-work group had lower depressive symptom scores on the BDI ($M = 18.13, SE = .23$) compared to the younger QL group ($M = 22.40, SE = .63$), $p < .00$.

3.3.4 Quality of Life

The fourth hypothesis proposed that younger return-to-work individuals would have a significantly improved QL, due to participation in the FRP, over those who were in the younger QL group at admission.

3.3.4.1 SF-36 Mental Health Summary (MHS)

A significant main effect for group $F(1, 1894) = 3.82, p = .05$, partial $\eta^2 = .00$, was found for the MHS. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The younger return-to-work group had higher scores on the MHS ($M = 39.04, SE = .25$) which indicated better mental quality of life compared to the younger QL group ($M = 37.60, SE = .69$), $p = .05$.

3.3.4.2 SF-36 Physical Health Summary (PHS)

There was a significant main effect for group $F(1, 1894) = 10.83, p = .00$, partial $\eta^2 = .00$ for the PHS. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The younger return-to-work group had higher scores on the PHS ($M = 30.00, SE = .15$) which indicated better physical quality of life compared to the younger QL group ($M = 28.54, SE = .42$), $p = .00$.

3.3.7 Fear-Avoidance

The fourth hypothesis proposed that younger return-to-work participants would have lower kinesiophobia scores compared to the younger QL participants at admission. There was a significant main effect for group $F(1, 627) = 7.65, p = .01$, partial $\eta^2 = .01$, found on for the TSK. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The younger return-to-work group had lower scores on the TSK ($M = 32.89, SE = .38$) compared to the QL group ($M = 35.44, SE = .84$), $p = .01$.

3.3.6 Insomnia

It was proposed that the younger return-to-work group would have lower symptom scores on the insomnia scale compared to the younger QL group at admission. There was a significant main effect for group $F(1, 447) = 5.74, p = .02$, partial $\eta^2 = .01$, found for the ISI. An adjusted Bonferroni post-hoc test was performed to further examine the main effect of group. The younger return-to-work group had lower symptom scores for insomnia ($M = 16.99, SE = .35$) compared to the younger QL group ($M = 19.04, SE = .78$), $p = .02$.

3.3.7 Central Sensitization

It was hypothesized that the younger return-to-work group would have lower scores on the CSI compared to the younger quality of life group. There was a significant main effect for group $F(1, 549) = 34.29, p < .00$, partial $\eta^2 = .06$. An adjusted Bonferroni

post-hoc test was performed to further examine the main effect of group. The younger return-to-work group had lower scores on the CSI ($M = 41.42$, $SE = .74$) compared to the younger QL group ($M = 51.96$, $SE = 1.64$), $p < .00$.

Chapter 4

Discussion

The overall goal of the present study was to examine and identify characteristics of individuals who participated in a FRP developed for chronic disabling musculoskeletal disordered population. Specifically, the study was aimed to identify characteristics of a group called Quality of Life (QL). To reiterate, the QL group are individuals who have chronic musculoskeletal pain and seek out the FRP to reduce their chronic musculoskeletal pain and improve their quality/function of life. These individuals unlike the other two groups (return-to-work and non-completers) complete the FRP but do not plan to return back into the work force and chose another option in life such as retirement. This study compared the QL group, the return-to-work (who have a goal to go back to work), and non-completers at admission in order to determine if there were psychosocial differences among the groups. This study also investigated age differences within the QL group to evaluate if age might be an important factor on psychosocial distress measures and might lead to answering the question why these individuals plan to not return-to-work.

4.1 Evaluation of Psychosocial Difference between the Return to Work Group and the Quality of Life Group

The first hypothesis examined the difference between individuals who completed the FRP. Both the return-to-work group and the quality of life group successfully completed the FRP; however, the QL group did not seek to return to the work force. The QL group picked a different alternative such as retirement, being a housewife or husband, disability or other (a different path that does not fit into the rest of the categories). It was hypothesized that the QL group would have worse psychosocial distress at admission compared to the individuals in the return-to-work group. There was

statistical significance found that across all psychosocial distress measures at admission, the QL group had higher psychosocial distress compared to the return-to-work group. This information supported the first hypothesis and can be useful in identifying those individuals who may complete the program but not seek work after discharge from the FRP.

4.2 Evaluation of Psychosocial Difference Between the Non-completer Group and the Quality of Life Group

The second hypothesis examined the differences between individuals who did not complete the FRP and the QL group. The non-completer group started the FRP with intentions of completion and returning to the work force, but for various reasons were unable to finish the program. This second hypothesis specifically examined psychosocial distress measure between the two groups. Due to clinician observation, it was thought that the QL group would have better psychosocial scores on the measures compared to the non-completer group. However, there was no statistical difference on psychosocial measures at admission between these two groups.

This information is still useful in identifying the QL group at admission. Even though there was no difference in psychosocial scores at admission between the non-completers and QL group, the QL group completed the FRP. Taking into account the worse scores on psychosocial distress measures, there is something about this QL group that compels them to complete the FRP instead of dropping out.

4.3 Evaluation of Age For the Quality of Life Group

Hypothesis three examined the variable age among the quality of life group in regards to psychosocial distress measures at admission. It was expected that younger individuals (under the age of 65) would have higher scores on psychosocial measure at admission compared to older individuals (65 years old and older) within the QL group

according to the previous literature (Smola & Sutton, 2002; Twenge, 2002; Parry & Urwin, 2010). According to recent literature (Asih, Hulla, Hartzell, Bradford, & Gatchel, 2014) in regards to chronic pain, elderly population is defined as being 65 and older.

The third hypothesis was partially supported. The younger QL group did worse on all psychosocial measures except on the SF-36 MHS. This might account for the fact that older individuals are in generally dealing with more life events and stressors.

The literature supports that younger individuals have a different view of the work force compared to older generations. It was been found that younger generations are more likely to seek instant gratification within their job (Parry & Urwin, 2010). If these younger generations are too psychosocially-distressed it may be too hard for them to adjust and overcome these distresses. This may be a cause of them to not want to return into the work force. The current literature also suggests that younger generations may struggle more with anxiety, depression and other psychological issues (Parry & Urwin, 2010). It was found that the younger QL group had higher psychosocial distress scores compared to the older QL group. This hypothesis adds to the support of the current scientific literature findings that younger generations have higher psychological distress.

4.4 Evaluation Psychosocial Distress Measures among the Young QL Group and the Young Return-to-Work Group

The fourth hypothesis was dependent upon the third hypothesis. This hypothesis predicted that the younger QL group was still worse on psychosocial distress measures compared to the younger return-to-work group. It was expected that the younger return-to-work group would have better scores on psychosocial distress measures because of the first hypothesis. As expected, the younger return-to-work had better psychosocial

scores compared to the younger QL group on all psychosocial distress measures at admission.

4.5 Limitations and Future Research

There were some limitations to this study. The number of participant in each group is determined by the participant as they go through the FRP. The FRP has a 93% work return rate (Productive Rehabilitation Institute of Dallas Ergonomics, 2009). This means that 93% of the sample population are in the return-to-work group. A way to adjust for this would be to match participants from each group by age, gender, and injury. Another way to correct for this limitation would be to do a prospective study instead of a retrospective study.

Future research needs to be done to further identify characteristics of the QL group. Looking at the psychosocial distress measures at discharge/or failure to complete the FRP could lead to some valuable information. Also, looking at clinical meaningfulness for each measure at admission to discharge/or failure to complete, could yield important information. Other variables that would be useful to look at would be income, wages, family support, number of children, and type of job before entering into the FRP. All these variables could lead to interesting findings about why a QL participant might chose to retire, stay at home and be a housewife/husband, or stay on disability.

4.6 Conclusion

Functional Restoration has been shown to be effective in treating a CDOMD population (Kolata, 2004; Productive Rehabilitation Institute of Dallas for Ergonomics, 2009). However, the types of individuals who decide to go through the FRP have not been comprehensively examined. During treatment from a FRP, individuals had been classified into 3 groups: return-to-work (those who completed the program and returned back into the work force), quality of life (those who complete the program but did not plan

to return back to work) and non-completers (those who did not complete the FRP). Of specific interest to this present study were those individuals who completed the FRP but did not plan to return to work. Results of this study have identified some special characteristics of the quality of life group. The individuals in the QL group do worse on psychosocial distress measures at admission compared to the return-to-work group and they tend to be younger. This information may be useful in identifying these individuals at the beginning of their treatment at the FRP and help the healthcare professionals, at the FRP, provide a more tailored and specific care to these individuals.

References

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders (4th edition)*. . Washington, D.C.
- Anagnostis, C., Gatchel, R. J., & Mayer, T. G. (2004). The pain disability questionnaire: A new psychometrically sound measure for chronic musculoskeletal disorders. *Spine*, 29(20), 2290-2302.
- Ashi, S., Neblett, R., Mayer, G., Brede, E., & Gatchel, R. J. (2014). Insomnia in a chronic musculoskeletal pain with disability population is independent of pain and depression. *The Spine Journal*, 14, 2000-2007.
- Beck, A. T., Steer, R. A., & Garbin, M. G. (1988). Psychometric properties of the beck depression inventory: Twenty-five years of evaluation. *Clinical Psychology Review*, 8, 77-100.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, 4(6), 561-571.
- Bureau of Labor Statistics, U.S. Department of Labor. (2011). *News release: Nonfatal occupational injuries and illnesses requiring days away from work*, .Retrieved April 2, 2012, from http://www.bls.gov/news.release/archives/osh2_11092011.pdf.
- Clark, M.E., Kori, S.H., and Brockel, J. (1996). Kinesiophobia and chronic pain: psychometric characteristics and factor analysis of the Tamps Scale. *American Pain Society Abstract* 15:77.

- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155-159.
- Deschner, M., & Polatin, P. B. (2000). Interdisciplinary programs: Chronic pain management. In T. G. Mayer, R. J. Gatchel & P. B. Polatin (Eds.), *Occupational musculoskeletal disorders* (pp. 629-637). Philadelphia, PA: Lippincott Williams & Wilkins.
- Fairbank, J. C., Couper, J., Davies, J. B., & O'Brien, J.P. (1980). The Oswestry low back pain disability questionnaire. *Physiotherapy*, 66(8), 271-273.
- Fairbank, J. C., & Pynsent, P. B. (2000). The Oswestry disability index. *Spine*, 25(22), 2940-2952.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149-1160.
- Faul, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175-191.
- Gatchel, R.J. (1991). Psychosocial assessment and disability management in the rehabilitation of painful spinal disorders. In T. Mayer, V. Mooney, & R. Gatchel (eds.) *Contemporary Conservative Care for Painful Spinal Disorders* (pp. 441-454). Philadelphia: Lea & Febiger.

Gatchel, R. J., Mayer, T. G., & Theodore, B. R. (2006). The pain disability questionnaire: Relationship to one-year functional and psychosocial rehabilitation outcomes.

Journal of Occupational Rehabilitation, 16, 75-94.

Gatchel, R. J., Peng, Y. B., Peters, M. L., Fuchs, P. N., & Turk, D. C. (2007). The biopsychosocial approach to chronic pain: Scientific advances and future directions.

Psychological Bulletin, 133(4), 581-624.

Gatchel, R. J., Polatin, P. B., Mayer, T. G., Robinson, R., & Dersh, J. (1998). Use of the SF-36 health status survey with a chronically disabled back pain population:

Strengths and limitations. *Journal of Occupational Rehabilitation, 8, 237-245.*

Gatchel, R. J., Mayer, T., Dersh, J., Robinson, R., & Polatin, P. (1999). The association of the SF-36 health status survey with 1-year socioeconomic outcomes in a

chronically disabled spinal disorder population. *Spine, 24(20), 2162-2170.*

Geisser, M.E., Haig, A.J., and Theisen, M.E. (2000). Activity avoidance and function in

persons with chronic back pain. *Journal of Occupational Rehabilitation, 10(3): 215 – 227.*

Goubert, L., Crombez, G., Van Damme, S., Vlaeyen, J.W.S., Bijttbier, P, and Roelofs, J.

(2004). Confirmatory factor analysis of the Tampa Scale for Kinesiophobia:

invariant two-factor model across low back pain patients and fibromyalgia patients.

Clinical Journal of Pain, 20: 103 – 110.

- Holm, S., Mark, S., & Adolfsson, T. (2005). A step-down test for effects in unreplicated factorial designs. *Communications in Statistics: Theory & Methods*, 34(2), 405-416.
doi:10.1081/STA-200047401
- Jensen, M. P., Karoly, P., & Braver, S. (1986). The measurement of clinical pain intensity: A comparison of six methods. *Pain*, 27(1), 117-126.
- Kolata, G. (2004, February 9, 2004). Healing a bad back is often an effort in painful futility. *The New York Times*,
- Mayer, T. G., & Gatchel, R. J. (1988). *Functional restoration for spinal disorders: The sports medicine approach*. Philadelphia, PA: Lea & Febiger.
- Mayer, T. G., Neblett, R., Cohen, H., Howard, K. J., Choi, Y. H., Williams, M. J. Perez, Y., & Gatchel, R. J. (2012). The development and psychometric validation of the central sensitization inventory. *Pain Practice*, 12(4): 276-285.
- Mayer, T. G., & Polatin, P. B. (2000). Tertiary nonoperative interdisciplinary programs: The functional restoration variant of the outpatient chronic pain management program. In T. G. Mayer, R. J. Gatchel & P. B. Polatin (Eds.), *Occupational musculoskeletal disorders* (pp. 639-649). Philadelphia, PA: Lippincott Williams & Wilkins.
- McHorney, C. A., Ware, J. E., J., & Raczek, A. E. (1993). The MOS 36-item short-form health survey (SF-36): II. psychometric and clinical tests of validity in measuring physical and mental health constructs. *Medical Care*, 31(3), 247-263.

- Miller, R.P., Kori, S.H., and Todd, D.D. (1991). The Tampa Scale. Unpublished report, Tampa Fl. (reported in Vlaeyen, et al, 1995)
- Million, R., Hall, W., Nilsen, K. H., Baker, R. D., & Jayson, M. I. (1982). Assessment of the progress of the back-pain patient 1981 volvo award in clinical science. *Spine*, 7(3), 204-212.
- National Academics of Sciences and Institute of Medicine. (2001). *Musculoskeletal disorders and the workplace: Low back pain and upper extremities*. Washington, D.C.: National Academic Press.
- Neugarten, B. L. (1974). Age groups in american society and the rise of the young-old. *American Academy of Political and Social Science*, 415(1), 187-198.
- Parry, E. & Urwin, P. (2010). Generational differences in work values: A review of theory and evidence. *International Journal of Management*, 13, 79-96.
- Pattani, S., Constantinovici, N., & Williams S. (2001). Who retires early from the NHS because of ill health and what does it cost? A national cross sectional study. *British Medical Journal*, 32(2), 208-209.
- Practicing Pain Management. (2014). *Pain Management in the Elderly: Etiology and Special Considerations*, Retrieved April 9, 2015, from <http://www.practicalpainmanagement.com/treatments/pain-management-elderly-etiology>.

Productive Rehabilitation Institute of Dallas for Ergonomics. *Recent functional restoration (FR) outcomes.*

Roelofs, J., Goubert, L., Peters, M.L., Vlaeyen, J.W.S., and Crombez, G. (2004). The Tampa Scale for Kinesiophobia: further examination of psychometric properties in patients with chronic low back pain and fibromyalgia. *European Journal of Pain, 8*: 495 – 502.

Ruff RL, Riechers RG. (2012). Effective Treatment of Traumatic Brain Injury: Learning From Experience. *JAMA, 308*(19):2032-2033.

Schofield, D. J., Shretha, R. N., Percival, R., Callander, E. J, Kelly, S. J., & Passey, M. E. (2011). Early retirement and the financial assets of individuals with back problems. *European Spine Journal, 20*, 731-736.

Smola, K.W. & Sutton, C. D. (2002). Generational differences: revisiting generational work values for the new millennium. *Journal of Organizational Behavior, 23*, 363-382.

Swinkels-Meewisse, I.E.J., Swinkels, R.A.H.M., Verbeek, A.L.M., Vlaeyen, J.W.S., and Oostendorp, R.A.B. (2003). Psychometric properties of the Tampa Scale for kinesiophobia and the fear-avoidance beliefs questionnaire in acute low back pain.

Turk, D. C. (1996). Biopsychosocial perspective on chronic pain. In R. J. Gatchel, & D. C. Turk (Eds.), *Psychological approaches to pain management: A practitioner's handbook* (pp. 3-32). New York: Guilford publications.

Twenge, J. M. (2002). A review of the empirical evidence on generational differences in work attitudes. *Journal of Business and Psychology, 24*, 201-210.

- Vlaeyen, J.W.S., Kole-Snijders, A.M.J., Boeren, R.G.B., and van Eek, H. (1995). Fear of movement/(re)injury in chronic low back pain and its relation to behavioral performance. *Pain*, 62: 363 – 372.
- Wesley, A. L., Gatchel, R. J., Garofalo, J. P., & Polatin, P. B. (1999). Toward more accurate use of the beck depression inventory with chronic back pain patients. *The Clinical Journal of Pain*, 15(2), 117-121.
- Woby, S.R., Roach, N.K., Urmston, M., and Watson, P.J. (2005). Psychometric properties of the TSK-11: a shortened version of the Tampa Scale for Kinesiophobia. *Pain*, 117: 137 – 144.

Biographical Information

Rachel Lynn Purdum is a second year graduate student at the University of Texas at Arlington. Current research is in regards to CDOMD population and chronic pain.

Rachel received her Bachelors of Arts in Athletic Training from the Oklahoma State University in 2005. She completed her Masters of Arts in Psychology with an emphasis in sports psychology from the University of Central Oklahoma in 2012. Rachel is a certified and licensed athletic trainer.