

TELEPHONIC RN CASE MANAGEMENT, FUNCTIONAL HEALTH,
AND WORK DAYS AMONG INJURED WORKERS
WITH MUSCULOSKELETAL INJURIES

A DISSERTATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
IN THE GRADUATE SCHOOL OF THE
TEXAS WOMAN'S UNIVERSITY

COLLEGE OF NURSING

BY

SULEMA E. MORALES PALMAREZ, BSN, MHA/MBA

DENTON, TEXAS

DECEMBER 2015

TEXAS WOMAN'S UNIVERSITY
DENTON, TEXAS

November 13, 2015

To the Dean of the Graduate School:

I am submitting herewith a dissertation written by Sulema E. Morales Palmarez entitled "Telephonic RN Case Management, Functional Health, and Work Days Among Injured Workers with Musculoskeletal Injuries." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Nursing Science.

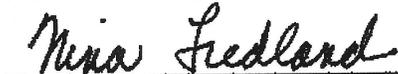


Ann Malecha, PhD, Major Professor

We have read this dissertation and recommend its acceptance:



Sandra K. Cesario



Nina Fredland



Ainslie Nibert, Associate Dean-Houston

Accepted:



Dean of the Graduate School

Copyright © Sulema E. Morales Palmarez, 2016 all rights reserved.

DEDICATION

To my two Albert's,

My husband, Albert John and my son Albert Anthony Palmarez

ACKNOWLEDGEMENTS

I am grateful to the generosity of so many people who believed in this work and who helped me to complete it. Among them, I would first like to thank God without Whom I would not have had the ability to begin or to finish this project.

Thank you to my prayer warriors among them my most unfailing advocate, my beloved late mom, Lala Morales. Also my friends, Tosca Arbelaez, RN, Cathy Marshall, Brenda Hodges and her young son, Nathan and so many others who have prayed over me.

I would like to acknowledge my committee chair, Dr. Ann Malecha, for her generous gift of sharing her experience in occupational nursing as well as her deep wealth of knowledge in nursing research, her provision of guidance and for her immense patience. I am also indebted to my committee members Dr. Sandra Cesario and Dr. Nina Fredland for giving of their time, sharing their knowledge with me, and also for their priceless assistance, critique, and support.

I would also like to thank the legions of friends, family, and professional colleagues who cheered me on, among them Rose Wilburn, RN, Jane Gray, RN, Leslie Dydalewicz, RN, and my boss, Ruth Hampton Grover, RN.

To my husband, Albert, you will never know how much your love and unfailing belief in me and my work has motivated me and lifted me up when I was exhausted.

Thank you, Albert, for your faith in me and for your endless prayers, and emotional and financial support which can never be enumerated accurately. To my son, Albert, thank you for never complaining when I was not present and for always extending your encouragement. Thank you for always expressing your belief in my abilities. I love you both.

I also wish to acknowledge the generosity of the Physical Therapy sites for their willingness to open their doors to me and for their support of Nursing Science. I am grateful to the staff of all of the Physical Therapy sites who were so helpful, kind, and supportive. Finally, I want to thank the injured workers who willingly participated in this work and who shared of their time and experiences.

ABSTRACT

SULEMA E. MORALES PALMAREZ BSN, MHA/MBA

TELEPHONIC RN CASE MANAGEMENT, FUNCTIONAL HEALTH, AND WORK
DAYS AMONG INJURED WORKERS WITH MUSCULOSKELETAL INJURIES

DECEMBER 2015

This study explored the effect of an RN case management intervention on injured workers with musculoskeletal injuries. A two group randomized posttest controlled design was used. The hypothesis stated that injured workers, ages 20 to 65 years old, with work-related musculoskeletal injuries who were randomized to receive a six-week telephonic RN case management intervention would report higher functional health as measured by the SF-36 Health Survey and would have fewer lost days from work compared to injured workers randomized to the control group who receive treatment as usual.

A sample of 23 injured workers who were participating in physical therapy was recruited over an eight-month period. The SF-36 Health Survey assessed the injured workers' health perceptions at the end of a six-week enrollment in the study.

The results of the ANOVA for the SF-36 Health Survey subscales indicated that there were no significant differences between the intervention group and the control group.

TABLE OF CONTENTS

| | Page |
|--|------|
| COPYRIGHT | iii |
| DEDICATION | iv |
| ACKNOWLEDGEMENTS | v |
| ABSTRACT | vii |
| Chapter | |
| I. INTRODUCTION | 1 |
| Problem of the Study | 2 |
| Theoretical Framework | 5 |
| Assumptions | 7 |
| Hypothesis | 8 |
| Definitions of Terms | 8 |
| Limitations | 10 |
| Summary | 10 |
| II. REVIEW OF THE LITERATURE | 11 |
| Search Strategies | 11 |
| Telephonic Nurse Case Management | 12 |
| Worker's Compensation Telephonic Nurse Case Management | 21 |
| Summary | 22 |
| III. PROCEDURE FROM COLLECTION AND TREATMENT OF DATA | 24 |
| Setting | 24 |
| Population and Sample | 24 |
| Protection of Human Participants | 26 |
| Instruments | 27 |
| Data Collection | 28 |

| | |
|---|-----------|
| Intervention | 29 |
| Treatment of Data | 31 |
| IV. ANALYSIS OF DATA | 33 |
| Description of the Participants..... | 33 |
| Findings of the Study | 37 |
| Reliability of the SF-36 | 40 |
| Summary of RN Case Management Intervention | 41 |
| Summary of the Findings | 42 |
| V. SUMMARY OF THE STUDY | 44 |
| Discussion of the Findings..... | 44 |
| Physical Functioning, Role Physical, and General Health Perceptions | 44 |
| Bodily Pain | 48 |
| Energy/Fatigue | 48 |
| Emotional Well-Being..... | 49 |
| Emotional Role Functioning and Social Functioning | 50 |
| Reliability of the SF-36 Scale with Injured Workers..... | 51 |
| Implications for Nursing | 51 |
| Recommendations for Further Study | 56 |
| REFERENCES | 54 |
| APPENDICES | |
| A. RN Telephonic Case Management Intervention Form | 63 |
| B. SF-36 Health Survey English Version | 65 |
| C. SF-36 Health Survey Spanish Version..... | 70 |
| D. Recruitment Flyer in English | 77 |
| E. Recruitment Flyer in Spanish | 79 |
| F. IRB Approval..... | 81 |
| G. Intervention Consent Form English | 81 |
| H. Intervention Consent Form Spanish..... | 84 |
| I. Control Consent Form English | 87 |
| J. Control Consent Form Spanish | 90 |
| K. Demographics Form..... | 93 |

LIST OF TABLES

| Table | Page |
|---|------|
| 1. Demographic Characteristics | 36 |
| 2. Functional Health (SF-36) in the Study Group | 39 |
| 3. SF-36 Health Survey Reliability in Study Group..... | 41 |
| 4. Summary of Telephone Calls of RN Case Management Intervention..... | 42 |

LIST OF FIGURES

| Figure | Page |
|---|------|
| 1. Roy's Adaptation Model | 7 |
| 2. Flowchart of Participants..... | 34 |
| 3. Comparison of Mean Scores of Injured Workers With and Without RN Case Management Intervention | 45 |
| 4. Comparison of Intervention Group Mean Scores with Intervention Groups from Other Studies | 46 |

CHAPTER I

INTRODUCTION

The role of the worker's compensation nurse case manager is not well defined although employers such as American Airlines (Ceniceros, 2014), Caterpillar (Pompe, 2014), and insurance carriers rely on this professional service for injured employees. The worker's compensation nurse case manager works with injured workers, insurance personnel, medical providers, and employer representatives in order to assist injured workers with coordination of health care services, to optimize functional capacity, and to expedite their return to work (Mullahy, 2014). While this definition is specific to the worker's compensation nurse case manager, the general definition of a case manager includes the assessment, planning, facilitation, care coordination, evaluation, and advocacy for services to meet a client's comprehensive health needs through communication and resources to promote quality cost effective outcomes (Case Management Society of America, 2010). Case managers are represented by many health care disciplines including nursing, medicine, social work, and physical therapy. Due to the diversity in definitions and roles of case managers (Smith, A., 2011), research is lacking regarding specific client outcomes such as injured worker outcomes.

Each state has its own laws relating to work injuries and according to the Texas Department of Insurance, Division of Worker's Compensation (2010), the role of the case manager aids in the goal to encourage injured employees to return to work in a timely and

safe manner. Case managers are problem solvers and they seek to empower the patient and the family via education and coordination of health care (Smith, C., 2011).

There were several issues that prompted this study including the lack of experimental research studies related to nurse case management and injured workers, lost days from work, and functional health. There have been few studies, mostly descriptive, conducted in the US showing that case management with injured workers can be beneficial. For example, a cohort study with 42 injured dancers and physical therapy case managers found that case management reduced the number of new injuries and number of lost days from work (Bronner, Ojofeitimi, & Rose, 2003). Another descriptive study evaluated a nurse case management program and found that some of the injured workers were satisfied with the coordination of their care while others were not (Brines, J., Salazar, M.K., Graham, K.Y., Pergola, T., & Cannon, C., 1999). A third prospective analysis of injured hotel workers working with nurse case managers found an increase in satisfaction with their employer's treatment of their claim and increased the likelihood that they would not miss time from work due to the injury (Butler, Johnson, & Gray, 2007). Not only are there few quantitative studies on outcomes of care delivered by a worker's compensation nurse case manager, there is a lack of research related to use of standardized case management intervention.

Problem of the Study

The purpose of this study was to explore the effect of a telephonic registered nurse (RN) case management intervention on injured workers with musculoskeletal

injuries. Musculoskeletal injuries can be classified as acute, chronic recurring, or chronic overuse (Knight, 2008) and this study recruited participants with all classifications of musculoskeletal injuries.

According to the US Bureau of Labor Statistics (2012a), in 2011 there were 3.0 million work injuries and illnesses and there were 117 cases per 10,000 full-time workers requiring days away from work in private industry. The number of reported injuries in 2011 constituted a halt in the decline of injuries which had been going on since 2002 and in addition there was no change in the number of days away from work US Bureau of Labor Statistics (2012b). Melhorn, Wilkinson, and O'Malley (2010) state that the cost of musculoskeletal disorders is over \$50 billion per year and that the total cost of work related injuries is over \$1 trillion. The occurrence of work place musculoskeletal injury is common and, according to Pransky, Benjamin, Hill-Fotoubi, Himmelstein, Fletcher, Katz, and Johnson (2000), musculoskeletal injuries "account for over 85% of all worker's compensation claims" (p. 401). Thirty three percent of all injuries and illnesses reported in 2011 who had lost work days were due to musculoskeletal injuries that consisted of sprains, strains, tears, soreness, and pain (Bureau of Labor Statistics, 2012a).

In the US, an injured employee may be covered by worker's compensation (WC) insurance for which the rules vary by state. In Texas, WC covers all compensable medically necessary and appropriate care, including hospitalization, surgical treatment, rehabilitation, durable medical equipment, medications, physician visits, salary, and in some cases, it may also cover home modifications (Texas Workers Compensation Act,

2013). Reducing the number of lost days from work and returning the employee back to work after an injury benefits the employee, the employer, and the insurance. The longer the period of time that an injured worker is away from work, the less likely that return to work will occur (Scheer, Radack, & O'Brien, 1995).

The history of case management in the US began in the 1860s, the term “case management” appeared in the 1960s (Kersbergen, 1996) and the specialty of nursing case management was introduced in 1985 deriving from primary nursing (Cohen & Cesta, 2001). The utilization of nurse case managers in worker’s compensation by insurers is based on their value in understanding the principles of cost containment and maintenance of quality care (Cohen & Cesta, 2001). Due to the implementation of the Patient Protection and Accountability Care Act of 2011 (PPACA), case management continues to be of great importance today (Smith, C., 2011). The financial value of telephonic case management has been documented by Little, Saul, Testa and Gaziano (2002) as it had an effect on birth weights and created savings of \$501.31 per average for both inpatient and outpatient costs per patient. Southard and colleagues (2003) estimated a return on investment of 213% through use of a case management system geared toward cardiac rehabilitation. Hutti and Usui (2004) found that nurse telephone case management generated a cost savings based on a mean cost for pregnant woman who received telephonic case management which was \$1,818 compared to \$4,587 for pregnant women who were not members of a health plan which provided telephonic case management. The value of telephonic case management to health has been demonstrated through its

effect on medical outcomes (Ahmed & Rak, 2010; Howe et al. 2005; Ishani et al. 2011; Gustafson et al. 2012; Shearer, Cisar, & Greensberg, 2007). However, case management continues to struggle with role confusion (Gray & White, 2012) and with a lack of benchmarks and standardization of services (Park & Huber, 2009). It is therefore critical to quantifiably evaluate the care provided by nurse case managers as well as their client outcomes.

Theoretical Framework

Roy's Adaptation Model (RAM) guided this study in terms of framing the process of human behavior adapting to stimuli from a work injury as well as the nurse case manager's role in assisting the human with the adaptation process. RAM is based on humanism which holds that a human has individual and subjective dimensions which constitute the human experience and which are central to knowing and valuing and is also based on verity which holds that humans have a common purpose (Roy, 2009). The RAM holds that the concepts of adaptation, the person, the environment, health, and nursing care are all interrelated. A look at the RAM diagrammatic model (Figure 1) indicates that the person is an adaptive system who receives stimuli from the environment and through the use of any or all of four adaptive modes achieves adaptation that is manifested in behavior. In the RAM, the nurse utilizes six steps to promote health: 1) assesses the person's current level of adaptation (behavior), 2) identifies any factors (stimuli) which may be impacting or hindering the person's adaptation or behavior, 3) develops a nursing diagnosis, 4) develops goals, 5) provides nursing interventions which

will assist the person to adapt to the stimuli, and 6) conducts an evaluation of the level of adaptation as a result of the nursing intervention (Phillips, 2002; Roy, 2009).

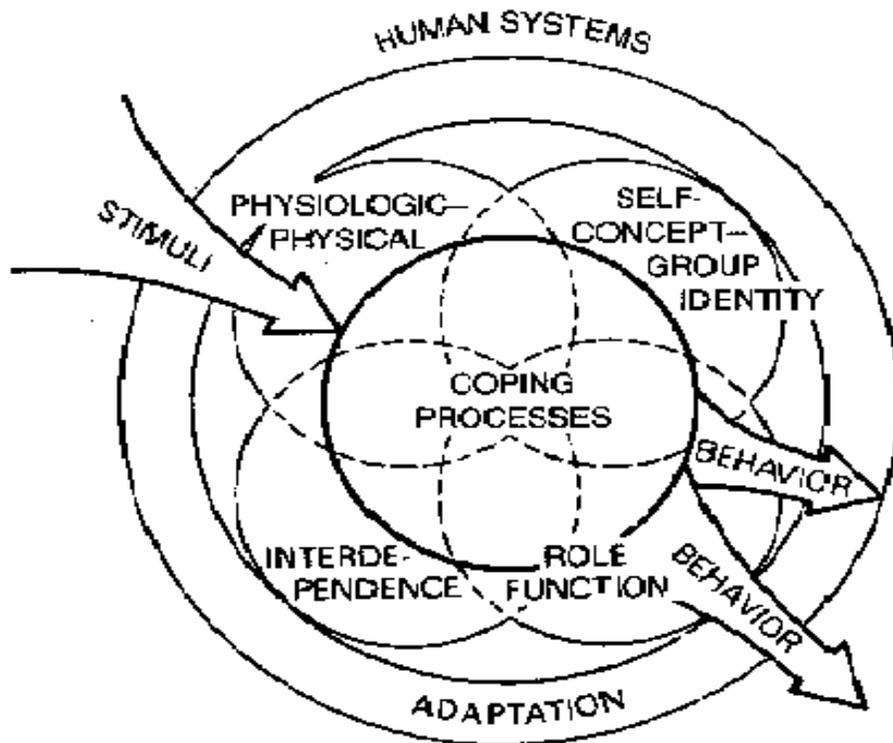


Figure 1. Roy's Adaptation Model. Adapted from Roy, C. (2009). *The Roy adaptation model (3rd ed)*. Upper Saddle River, New Jersey: Pearson Education, Inc. p. 45.

In this study, the stimuli was a work injury which affected health through a musculoskeletal injury and the injured worker exhibited behavior in the process of adaptation to the stimuli. Losing days from work constituted a behavior in reaction to the stimuli and the telephonic RN case manager performed a nursing assessment to determine

whether the injured worker was losing days from work. The telephonic RN case management intervention in this study provided education and enabled the injured worker to set goals. The telephonic RN case management intervention was provided in an effort to assist the patient with his adaptation (behavior of decreased lost days from work) to the external stimuli (musculoskeletal injury) by providing knowledge about the physiology of the musculoskeletal injury diagnosis as well as information about pain control, physical activity, stress management, and vocational goals with an overarching goal to improve the injured worker's health and function and to decrease lost days from work.

Assumptions

Assumptions of the Roy Adaptation Model (2009) that pertain to this study are:

1. Adaptation is behavior brought about by the utilization of adaptive modes by injured workers causing them to become conscious of and to choose to integrate with their environment.
2. Telephonic RN case management intervention in the injured worker's preferred language (English/Spanish) promotes health and assists injured workers to expand their abilities to respond to the stimuli and to adapt to their environment.
3. The injured worker is an individual who has the ability to adapt to change and to affect change in the environment.

Hypothesis

Injured workers, ages 20 to 65 years old, with work-related musculoskeletal injuries, who are randomized to receive a six-week telephonic RN case management intervention will report higher functional health as measured by the SF-36 Health Survey and will have fewer lost days from work compared to injured workers randomized to the control group who receive usual care.

Definition of Terms

1. *Telephonic RN case management intervention* (Appendix A) was defined conceptually according to the standards of the American Association of Occupational Health Nurses (2012) as the process of coordinating comprehensive health care services, following illness or injury, to achieve optimum quality care delivered in a cost effective manner. The process integrates assessment, planning, implementation, and evaluation components. For this study, the telephonic RN case management intervention was defined as a nursing intervention that consisted of a ten minute telephone call twice per week for six weeks and followed a standardized format of topics that included assessment of pain levels, physical activity, stress and anxiety, education about the diagnosis, and discussion about vocational goals and options for return to work. At each telephone call, all topics were reviewed and discussed with the injured worker in order to assist with clarification, understanding, and goal setting related to successful adaptation to the work injury.

2. *Functional health* was conceptually defined as the person's well-being including his or her patterns with his or her environments that result in maintaining wholeness and integrity (Roy, 2009). For this study, functional health was operationally defined by Ware (1999) and the SF-36 Health Survey. This survey consists of physical and mental health components. (Appendix B and C).
3. *Work-related musculoskeletal injuries* were conceptually defined as injuries to “the musculoskeletal system that is comprised of the skeleton, which provides mechanical support and determines shape; the muscles, which power movement; and connective tissues such as tendon and ligament, which hold the other components together. The cartilage surfaces of joints and the intervertebral discs of the spine allow for movement and flexibility” (National Institute of Health, 2014). For this study, work-related musculoskeletal injuries were defined as those injuries diagnosed and referred for treatment at physical therapy centers.
4. *Work days* related to a work-related injury were conceptually defined using the United States Department of Labor Occupation Safety and Health Administration (2001) definition Section 1904.7(b)(3) that states “work-related injuries and illnesses involving one or more days away from work must be recorded on the OSHA Log.” Section 1904.7(b)(3)(iii) goes on to state that “if a physician or other licensed health care professional recommends the employee can return to work, but the employee stays at home, the case does not have to be recorded as a

day away.” For this study, lost work days related to work-related injury were defined as work status of “off work”, “light duty” or “full duty” as reported by the participant.

Limitations

This study took place at four physical therapy facilities in Houston, Texas, and it is not known whether the participants were representative of the general population. Work days or work status was a self-report from the injured worker and the accuracy of the report was not verified. This study took place in an urban setting and it is not known whether the results of this study are generalizable to other geographical areas. The small sample size is a limitation.

Summary

This study examined the effect of a telephonic RN case management intervention on injured workers with musculoskeletal injuries. The theoretical underpinning for this study was the Roy’s Adaptation Model. This was a feasibility study with a small sample size. A telephonic RN case management intervention was administered and the effect on functional health and work days of injured workers was tested.

CHAPTER II

REVIEW OF THE LITERATURE

This review of the literature focused on quantitative research studies related to telephonic nurse case management in general as well as telephonic nurse case management specifically with injured workers.

Search Strategies

The search strategy for this review included the use of various databases including: Cumulative Index to Nursing and Allied Health Literature (CINAHL) Plus, EBSCOhost Databases, Medline, Pubmed, and Journal@Ovid. Keywords searched included: nurse case management; nurse and case management; case management and registered nurse; case management and low back pain; case management and return to work; case management and return to work and research; case management and injured workers; nurse case management and injured workers; case management and research and workers; case management and research and occupational injury; nurse case management and research; nurse case management and musculoskeletal disorders; nurse case management and work related injuries and nurse case management interventions.

The majority of the studies were from 2005 to the present and were restricted to studies written in English. A consideration when reviewing the literature was that the type and amount of telephonic case management services and case management support that an injured worker receives varies by country and, in the US also varies by state.

Worker's compensation laws differ between countries; therefore, only studies based in the U.S. were used. Another consideration is that not all case managers are nurses; case managers have a variety of professional backgrounds with the most common being social workers and nurses (White, & Hall, 2006) and an effort was made to include only research studies which involved nurses.

Telephonic Nurse Case Management

Ahmed and Rak (2010) conducted a retrospective cohort study in which they analyzed the relationship between telephonic case management (CM) and hospital readmission with patients who received telephonic CM services ($n=8,972$) and those who did not receive telephonic case management ($n=1,286$). Patients with digestive, musculoskeletal, circulatory, and respiratory medical diagnoses were included. The protocol for the telephonic CM intervention included a phone call to the patient within three business days from the discharge date with a second phone call if the CM was unable to reach the patient in which case a letter would be sent to the patient. The CM would attempt to reach the patient by phone a third time within the 15 business days after discharge and the file would close at 15 days if no contact was made. Once the patient was reached, the CM would provide education about his or her discharge instructions, his or her medications, and his or her disease. The CM provided assessment of the patient's level of functioning, transportation needs, home care needs, and financial needs. The article did not describe number or length of telephone calls nor did it specify the care received by patients who did not receive the CM intervention. The authors found that

patients who received telephonic CM had: 1) a 2% readmission rate within 7 days compared to an 11% readmission rate for patients who did not receive telephonic CM services ($p<.0001$); 2) a 7.0% readmission rate within 15 days compared to a 20% readmission rate for patients who did not receive telephonic CM services ($p<.0001$); and 3) a 13% readmission rate within 30 days compared to a 36% readmission rate for patients who did not receive telephonic CM services ($p<.0001$). The researchers concluded that early participation in telephonic CM decreased the rate of readmission.

Ishani and colleagues (2011) conducted a randomized controlled trial to study whether nurse CM would improve rates of control for hypertension, hyperglycemia, and hyperlipidemia for veterans with diabetes. The researchers recruited 556 patients with the intervention group ($n=278$) receiving a 12-month nurse CM intervention and the control group ($n=278$) receiving usual care that included management of diabetes under the care of their primary care provider. The participants met with the CM for an initial visit and then were contacted by phone every two weeks with decreased frequency of contact as the patient achieved goals. The CM intervention included review of blood pressure and lipid medications following protocols that were established for the study and used by the CM to make adjustments to the medications. The CM reviewed the patient's experience in self-monitoring of blood glucose and blood pressure. Over the 12-month period, the range of number of telephone calls was 10 to 21 calls. Results showed at the end of the 12 months, that 21.9% of the patients in the intervention group had all 3 outcome measures under control compared to 10.1% of the control group ($p<0.01$). The

authors found that there was no significant difference between groups with regard to lowering of HbA1c ($p=0.047$) or in lipid concentration ($p=0.017$) on patients who had elevated HbA1c or lipid concentrations when they entered the study. However, the intervention group had a modest decrease in HbA1c ($p=0.12$) and in lipids ($p=0.005$) as well as a significant decrease in systolic blood pressure for patients who had an elevated systolic when they entered the study ($p<0.001$). The authors also found that patients in the intervention group were more likely to achieve their set goals due to better use of their medications. The researchers found that nurse CM can increase the number of patients who successfully reach their goals of control of HbA1c, hypertension and hyperlipidemia.

Gustafson and colleagues (2012) conducted a 12-month two-group randomized controlled trial to study the effects of CM along with a web-based e-health program compared to the effects of the e-health web-based program without CM. The study population was pediatric asthma patients. The study measured asthma control (symptom free days), adherence to asthma medications, self-efficacy, social support, and information competence. Participants were dyads composed of children ages 4 to 12 years old that had a diagnosis of asthma and the adults who had a parental role. The telephonic nurse CMs were part of the intervention along with educators, pharmacists, and nurse practitioners who were asthma specialists. The nurse CM made phone calls to the intervention group ($n=132$) on a monthly basis to assess adherence to medication, challenges of a psychosocial nature, and to provide education and support. The control

group ($n=127$) received the web-based e-health program called the Comprehensive Health Enhancement Support System (CHESS) program which included a 45 minute training session without a monthly CM phone call. All participants, including those in the control group, participated in an hour long intake meeting which provided asthma assessment and assessment of the parent's well-being, education, and a "hand off" to the provider as opposed to a referral. The intervention group received the CHESS program with a 45-minute training session along with a monthly phone call from the CM. The article did not provide details as to the length or duration of the phone calls or of the total number of phone calls completed per participant. Study participants were recruited from five managed care organizations (MCO's) and were provided internet service, land phone lines and laptops. Participants in four of the MCO's received training in their homes and participants in the fifth MCO received training at a community center. None of the participants were given minimum goals as to use of CHESS. At one week after entry into the study all participants received a phone call from the project manager. Mailed surveys were sent to all participants at 3, 6, 9 and 12 months along with educational material. The authors found that children in the intervention group had improvement in symptom free days (odds ratio 1.38, $p=.01$) compared to the control group (odds ratio 1.20, $p=.29$) however, there was no significant difference between groups (odds ratio 0.18, $p=1.00$). They found that asthma control was better for the intervention group (-0.42 on a 7 point Likert scale with lower scales indicating better control, $p=.001$) than for the control group (-0.11, $p=.22$) with a significant between groups difference ($p=.01$). The researchers did

not find a significant within groups or between-groups difference for medication adherence. The intervention group had a 2.06% ($p=.55$) increase and the control group had a .58% ($p=.87$) in medication adherence and the between groups difference was 1.48% ($p=.76$). With regard to self-efficacy, information competence, and social support, they found that self-efficacy (alpha .080, $p=.14$) and information competence (alpha .079, $p=.09$) were non-significant in their effect. Social support had a significant effect (alpha 0.200, $p=.01$). The researchers concluded that for their low income and minority population it may be more effective to receive asthma information by phone or email from “trusted and caring” nurse CMs rather than reading information on the eHealth site.

Howe and colleagues (2005) conducted a three group randomized controlled trial to study the effect of education and telephone case management on children with Type I diabetes. The children ranged in age from 8.1 to 15.6 years old. The authors compared three nursing interventions. The control group ($n=28$) received standard care (SC) at the Diabetes Center for Children, the education group ($n=21$) received standard care and a one-time educational session (ED), and the education plus telephonic case management group (ED + TCM) ($n=26$) received both standard care and the educational session as well as weekly telephone calls for three months until they returned to the clinic for follow up and then bimonthly for three months. The participants in the SD group received 30 minute visits with a nurse practitioner and an endocrinologist at suggested time intervals of every three months but for which scheduling was at the discretion of the parent. The visit consisted of evaluation of HbA1c, review of blood glucose records, identification of

problems, determination of goals, and provision of education. Participants in the ED group were seen quarterly in the clinic in the same manner as the SC group. Participants, including children over 8 years old, also received a one-time education session. During the education session participants received education about blood sugar testing, record keeping, administration of insulin, use of sliding scales, exercise, carbohydrate counting, and sick-day management. Participants in the ED + TCM received the care that participants in the SC and in the ED group received with the addition of telephonic CM. The ED + TCM group received a weekly phone call for three months until the date of their first clinic visit. Once the participant kept the first clinic visit the phone calls would occur once every two months. The duration of the study was six months. Phone call appointments were made with the agreement of the participants at their convenience and for children who were younger than 13 years old, the calls included a designated parent. The phone calls were made by the study coordinator using a protocol and discussions included issues regarding hypoglycemia, hyperglycemia, and a review of blood sugar records. In addition, the participants received education regarding problem-solving, diet, and meal planning, as well as insulin dose changes and parental skills as needed. The phone calls lasted from 5 to 15 minutes. The article did not provide information regarding the total number of phone calls per participant. The authors did not find significant differences among groups in mean HbA1c at three or six months $F(4,71) = 0.12, p=.97$. They also did not find significant differences among groups in knowledge scores. The baseline score for the SC group was 83.6 +/- 10.0 and at six months it was

83.7 +/- 10.2. For the ED group the baseline score was 81.6 +/- 12.5 and at six months it was 84.9 +/- 12.1 with the ED + TCM group had a baseline score of 83.8 +/- 11.3 and at six months it was 88.1 +/-10.1. The difference in adherence scores between groups were statistically significant $F(2, 69)=68.8, p=.0006$ as were the scores for team work $F(2,69)=7.1, p=.0003$. At the six months mark, the ED + TCM group improved in adherence and in teamwork by 24%. The authors concluded that telephonic CM had an effect on the adherence scores and may have caused a change in behaviors so that they became habit.

Riegel and colleagues (2006) examined the effect of bilingual and bicultural telephonic nurse case management of Hispanics of Mexican origin with a diagnosis of heart failure through a two group randomized controlled trial. The intervention group ($n=69$) received a phone call in an average of five days after discharge from the hospital and then on a frequency directed by a software program and based on the nurse CM's judgment. Patients received an average of 13.5 phone calls and families received an average of 8.4 phone calls over six months. The CM also made 4.6 phone calls to consult with other professionals. The CM intervention was most intense during the first month after discharge from the hospital. The CM intervention was guided by the software program which prompted the CM to assess factors predictive of hospitalization and to provide education to improve self-care skills. The software also assisted the CM to set priorities for the next phone call with the emphasis being on monitoring, education, and guidance. The CM intervention was also structured with a focus on cultural

appropriateness based on cultural values of “personalized caring, trust, inclusion of the family, and concrete solutions and problem solving in response to problems of self-care” (Riegel et al, (2006), p. 213). The control group ($n=65$) received usual care which consisted of education about heart failure which occurred at discharge from the hospital. The study sample was ages 61 to 83 years old and 55% were entirely unacculturated. Results indicated that there was no statistical difference between the two groups with regard to heart failure hospitalization ($p=.85$). The scores for quality of life were measured by the Patient Health Questionnaire 9 item survey (PHQ) for which scores range from 0 to 27 and a higher score indicates higher depression. The researchers found that the intervention group had a baseline score of 8.8 ± 5.8 (CI 7.2-10.4) and at six months it was 1.5 ± 2.0 (CI 0.92-2.1) and the usual care group had a baseline score of 8.6 ± 5.4 (CI 6.8-10.4) and at six months the score was $2.0 \pm$ (CI 1.3-2.6). They concluded that telephonic CM helps initially to decrease the use of acute care resources but not at a statistically significant rate. The researchers also concluded that bilingual and bicultural telephonic CM is not enough to improve the outcomes of Hispanic patients with heart failure.

Shearer, Cisar, and Greensberg (2007) conducted a randomized two group control trial to study the effects of a telephonic case management empowerment intervention on patients with heart failure who were 21 year old or older with a mean age of 76 years. The intervention group ($n=45$) received a telephonic empowerment intervention which was delivered by one of three nurse clinicians using a standardized script and who had

expertise in heart failure, at 2, 4, 6, 8, and 12 weeks after discharge from the hospital. The intervention group was reminded on discharge from the hospital that they would receive six phone calls from the nurses. The nurses making the phone calls were trained specifically in delivery of the intervention prior to beginning the study. The nurse CM intervention consisted of a standardized script which was developed to provide the patient with information and skills in goal-setting and self-management which would impact the functional health of the patient and which were specific for the patient. All study participants, including the control group ($n=45$), received education in the hospital as per the standard of care for all heart failure patients. Standard education included written as well as verbal instruction along with an educational video. The control group also received a phone call at 12 weeks after discharge as a reminder to complete a questionnaire and to return it in the stamped envelope. There was no significant difference between groups in terms of purposeful awareness as measured by the Power of Knowing Participation in Change Tool VII (PKPCT). The intervention group had a baseline PKPCT mean score of 255.43 and a post intervention mean score of 260.30 and the control group had a baseline PKPCT mean score of 256.95 and a post intervention mean score of 267.39. The authors found no significant difference between the groups in functional health as measured by the SF-36 and reported that the mean score was averaged at 30.3 pretest and 32.9 posttest for both groups. They found a significant difference between groups for the SF-36 mental health component with a mean score that averaged 45.9 pretest and 50.0 posttest for both groups ($p=.036$). Self-management was

measured with the Self-Management of Heart Failure (SMHF) scale. The researchers found significant differences between groups in SMHF scores ($p=0.14$) The mean score for the intervention group pretest was 16.4 and posttest the mean score was 19.6 and for the control group the mean score pretest was 17.0 and posttest it was 18.0. The researchers concluded that the telephonic intervention assisted the patients in self-management of heart failure.

Worker's Compensation Telephonic Nurse Case Management

Butler, Johnson, and Gray (2007) conducted a prospective cohort study ($n=216$) to determine whether early nurse case management telephonic contact had an effect on injured workers' satisfaction with the nurse case management service, their healthcare provider, and their employer and they also measured pain intensity, functional limitations, and health-related quality of life. The researchers compared the effect of contacts by supervisors with those by the CM. Their sample included workers with worker's compensation claims based on low back pain. The CM intervention was based on the employer's protocol of phone calls to the injured worker, the healthcare provider, and the work unit early in the injury. The emphasis of the CM phone call was on return to work. The article did not include details of the content of the CM intervention nor did it provide information regarding the number of phone calls made to each employee or the length or frequency of the phone calls. The article examined the timing of the first call to the injured worker from the CM and from the supervisor. The authors found that CM contacts made during the first week improved worker satisfaction with case management

services ($p=0.238$) and kept workers on the job ($p=.022$) while contact from the supervisor had more effect when they occurred within 24 hours of the injury ($p=.096$). The perception of the injured worker toward their employer was positively affected by CM contact within 24 hours based on a mean of 2 ($p=.092$) out of a possible high of 4 on the satisfaction scale with lower values indicating greater satisfaction. The injured worker's perception of his or her healthcare provider was not affected by the timing of CM contact with a mean of 2.16 at 24 hours and at greater than one week. There were no statistically significant effects of timing of CM contact to low back pain intensity ($p=.394$) or on functional health based on the SF-12 scores for emotional health ($p=.521$) and for physical health ($p=.431$). The authors concluded that contact by nurse case managers within the first week of injury had a significant effect on the worker's ability return to work and/or to maintain a continued work status.

Summary

A review of the literature found that telephonic CM interventions make a difference in rates of hospital readmission (Ahmed and Rak, 2010), can affect treatment plan adherence, change health behaviors in patients with Type I diabetes (Howe et al. 2005). Additionally, telephonic CM can improve HbA1c, hypertension and hyperlipidemia (Ishani et al. 2011) and have a significant effect on the ability of injured worker's to return to work or to maintain a continued work status (Butler et al. 2007). The literature review also revealed that, in a low income and minority population, telephonic CM intervention may be more effective than written information on an

eHealth internet site for patients (Gustafson et al. 2012). The literature review also found that bilingual and bicultural telephonic CM is not enough to improve the outcomes of Hispanic patients with heart failure (Riegel et al. 2006), while Shearer et al. (2007) found that a telephonic CM intervention assisted patients in self-management of heart failure. Telephonic nurse case management is a useful tool for providing nursing care to patients with different medical conditions and with many different treatment plans.

More studies are needed as the literature on quantitative studies in nurse case management in general health is relatively sparse. There are even fewer reports of studies regarding the effect of nurse case management interventions for injured workers. The limited amount of published literature regarding the effect of nurse case management interventions on return to work and quality of life post-injury supports the need for ongoing nursing research.

CHAPTER III

PROCEDURE FOR THE COLLECTION AND TREATMENT OF DATA

The study design was a two group randomized posttest controlled trial. A randomized controlled trial is useful in its ability to draw out results and conclusions regarding the impact of an intervention (Polit & Beck, 2008). The intervention group received the telephonic RN case management intervention for six weeks while the control group received treatment as usual. Both groups received the SF-36 Health Survey at the end of six weeks.

Setting

The settings for this study were four privately owned outpatient physical therapy clinics located in the Houston, Texas metropolitan area. One of the clinics had four locations, one of the clinics had two locations, and two of the clinics had one location each for a total of eight sites. Participants were recruited via flyers in English and Spanish that were distributed by the physical therapists and physical therapy assistants at each setting (Appendix D and E). Recruitment, consent, and initial intake occurred at the physical therapy sites. The intervention and all follow-up surveys were conducted via telephone.

Population and Sample

The sample included persons who met the following inclusion criteria: 1) persons with work-related injuries, 2) ages 20 to 65 years old, 3) diagnosis of musculoskeletal

injury, 4) not receiving any current case management services, 5) no legal representation for the work injury, and 6) English and/or Spanish speaking. The rationale for the age criteria, 20 to 65 years, was to capture the age group most at risk according to the U.S. Bureau of Labor Statistics (2012a). The diagnosis of musculoskeletal injury was selected based on a U.S. Bureau of Labor Statistics report that musculoskeletal cases made up 33% of injuries and illnesses in 2011.

Power analysis and determination of effect size was conducted after reviewing one meta-analysis report and one literature review on case management. Kim and Soeken (2005) presented a meta-analysis of 12 randomized studies on hospital-based case management interventions and reported effect sizes ranging from -0.063 to 0.393 for length of stay and 0.289 to 1.331 for readmission. Oeseburg, Wynia, Middel, and Reijneveld (2009) reported on a literature review of eight controlled trials regarding the effects of case management on frail or impaired older people with effect sizes ranging from -0.06 to 0.15. Based on these studies, a small to moderate effect size of 0.25 was proposed; with power set at 0.80 and alpha of 0.05, a sample size of 251 for each group would need to be recruited (Polit & Beck, 2008). Due to the nature of this dissertation study being a feasibility study, a sample size of 25 participants per group or 10% of the optimal sample was proposed. A total of 22 participants, 11 per group, were recruited into the study.

Protection of Human Participants

The nurse researcher obtained written permission from the physical therapy business owners (or their representatives) to recruit participants at the physical therapy sites and approval from the Institutional Review Board (IRB) of Texas Woman's University, Houston, Texas. Consent forms (Appendix G, H, I and J) and recruitment materials were created for each group and included English and Spanish language versions of all materials. The nurse researcher is fluent in both English and Spanish and created both English and Spanish language consent forms. The Spanish consent form was back-translated by a bilingual native Spanish speaker. Each potential participant received a review of the consent form prior to entry into the study. The risks to the participant included: 1) possible risk of discomfort with the questions asked, 2) potential loss of confidentiality, and 3) potential inconvenience of time. The following steps were taken to minimize these risks. The participant could at any time refuse to answer any questions and the interviewer continually monitored the participants for cues of discomfort. The interviewer was prepared to stop if the participant was distressed and was prepared to encourage the participant to contact his or her personal health care provider, if needed. The participant was at liberty to discontinue participation in the study at any time without penalty. Secondly, in order to minimize risk for potential loss of confidentiality, all data files were retained in a locked file cabinet in the PI's office located in her private home. Only the PI had access to the file cabinet. Only ID numbers were entered into the database. The third risk, the potential for inconvenience of time,

was addressed through the timing and scheduling of all phone calls that were scheduled according to the time and convenience of the participant.

Instruments

The PI designed the demographic form that collected data on gender, age, race, ethnicity, preferred language, occupation and physical demand level, musculoskeletal problem, prior musculoskeletal problems, surgical history, medications, allergies, physical therapy site, number and frequency of physical therapy visits, and work status at intake and at end of six weeks (Appendix K). Work days were based on the participant's statement of work status at entry into and exit from the study. The Short Form 36 Health Survey (SF-36) was used to measure functional health (Ware, 1999). The SF-36 was constructed to represent eight major health concepts identified by the Medical Outcomes Study (Ware, Snow, Kosinski, & Gandek, 2000). The eight scales include physical functional health as well as mental health (Ware et al. 2000). Physical functional health consists of physical function, role physical, general health, bodily pain and energy/fatigue (Ware et al. 2000). Mental health includes emotional well-being, role emotional, and social function (Ware et al. 2000). The SF-36 is suitable for computerized administration, and administration in person and by phone. The SF-36 is scored from 0 to 100 with a higher score indicating higher function. The SF-36 has a Cronbach's alpha that exceeds 0.80 and is considered suitable for generic use and is not specific to any particular age, disease or treatment (Ware et al. 2000). The SF-36 has been found to be reliable in the health assessment of occupational workers (Koh, Chang, Kang, Cha, &

Park, 1997) and for the health assessment of adults of working age (Jenkinson, Coulter, & Wright, 1993). The SF-36 was found reliable for various disease entities by Garratt, Ruta, Abdalla, Buckingham, and Russell (1993) as well as for the health assessment of older Mexican Americans (Peek, Ray, Patel, Stoebner-May, & Ottenbacher, 2004) and in older adults living at home (Walters, Munro, & Brazier, 2001). The SF-36 was found to be sensitive to changing health in general populations (Hemingway, Stafford, Stansfeld, Shipley, & Marmot, 1997).

Data Collection

Participant recruitment occurred at the outpatient physical therapy sites. English language and Spanish language flyers were available at each site. The physical therapists and physical therapy assistants identified patients who were covered by worker's compensation insurance and provided them either with a flyer or with the information from the flyer. The PI made regular frequent visits and telephone calls to each of the physical therapy sites in order to recruit eligible participants. When a potential participant was identified, the PI scheduled an appointment to meet the person at the physical therapy site. Once scheduled, the PI met with each participant in person, explained the study, and determined eligibility for the study. If the participant was eligible and agreed to participate, he or she was randomized and assigned to either the intervention group or to the control group and was also assigned a study code number.

Randomization was conducted by means of sealed envelopes which contained one piece of paper and each piece of paper had the word "control" or "intervention" as well as

a code number written on it. An equal number of envelopes for each group were prepared. If an eligible participant expressed interest in the study, an envelope was drawn and the participant was placed into the corresponding group and was assigned the code number. If the potential participant declined to enroll in the study, the envelope was replaced into the randomization group to be drawn again. Once a participant was assigned to a group, details of participation in the study were explained to the participant in accordance to the group where randomized and informed consent was obtained and demographic data was collected. The PI obtained agreement from the participant as to the most convenient date and time for telephone contact. At the end of six weeks following entry into the study, participants from both groups were administered the SF-36 Health Survey.

Participants in the control group received usual care without the telephonic RN case management intervention. Usual care consisted of treatment which was provided by a worker's compensation provider who remained unknown to the PI. The treatment plan for participants in the intervention group and in the control group included outpatient physical therapy.

Intervention

The RN case management intervention was delivered by the researcher (PI) to participants in the intervention group for 10 minutes twice weekly for six weeks via telephone. The RN case management intervention was developed utilizing several sources: a) the PI has clinical expertise as a case manager for 21 years; b) the PI

collaborated with a faculty advisor who has experience in occupational health nursing; and c) information from the literature (Basavanthappa, 2003; Holloway, 2004; Issel, 1997; Smeltzer, Bare, Hinkle, & Cheever, 2010).

The RN case management intervention encompassed five topics related to work injuries: pain, physical activity, stress and anxiety, education about the diagnosis, and vocational issues. Each of these topics were addressed and discussed with the participants during each of the 10 minute phone calls. The PI assessed pain levels (Basavanthappa, 2003; Holloway, 2004; Smeltzer et al. 2010) using a pain scale where 0 indicates absence of pain and 10 indicates the most severe pain (Bryce et al. 2007). Within the topic of pain, the PI gathered information from the participant about recommendations for pain relief given by the providers, medication prescriptions, effectiveness of the medications, and about other methods of pain relief used by the participant. The PI provided guidance on safe medication use based on the website nlm.nih.gov/medlineplus. The PI provided the participant with basic information about the use of alternative methods for reduction of pain levels, such as relaxation, yoga, distraction, physical activity, and weight reduction (Smeltzer et al. 2010).

For the topic of physical activity (Basavanthappa, 2003; Smeltzer et al. 2010), the PI reviewed and discussed the participant's attendance to physical therapy appointments and encouraged consistent attendance. The PI discussed with the participant the relevance of physical therapy and physical activity to recovery of physical function and

emotional well-being. The PI reviewed the participant's home exercise program (HEP) and provided encouragement to continue with the HEP.

For the topic of stress and anxiety (Basavanthappa, 2003; Smeltzer et al. 2010), the PI provided an opportunity for the participant to express thoughts and feelings regarding the injury experience, including medical treatment and rehabilitation plans. The participant was given the opportunity to express any psychological stressors related to the injury. For the education about the diagnosis topic (Basavanthappa, 2003; Smeltzer et al. 2010), the PI assessed the participant's knowledge and understanding of the injury related diagnosis and provided clarification and enhancement of the participant's knowledge related to diagnosis, treatment, and rehabilitation. The PI assessed and discussed the participant's expectations of the treatment and rehabilitation plan. The final topic on vocational issues included a discussion of the participant's goals for return to work and available work options (Mullahy, 2014; Vanichkachorn, Roy, Lopez, & Sturdevant, 2014). This topic also included an opportunity for the participant to express feelings about return to work.

Treatment of Data

The data was coded and analyzed using SPSS Version 18.0. Descriptive statistics were utilized for the demographic data and for data regarding work status. Demographic differences between the intervention and control group were investigated using independent *t* test and Chi-square (X^2) tests of independence. To determine if there were differences in functional health between the intervention and control group, data were

analyzed using analyses of variance (ANOVA). The level of significance for this study was set at $\alpha = 0.05$.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to explore the effect of a telephonic registered nurse (RN) case management intervention on injured workers with musculoskeletal injuries. A demographic form was used to capture the characteristics of study participants at the time of entry into the study. The SF-36 Health Survey was administered to study participants in both the control group and in the intervention group to obtain the injured worker's perceptions of health and function. Descriptive statistics were used to summarize data. Data were also analyzed by (ANOVA), a multivariate approach one-way repeated measures analysis of variance. Cronbach's alpha was calculated for each of the eight subscales in order to estimate the reliability of the SF-36 Health Survey.

Description of the Participants

A randomized sample of workers who had been injured on the job and who met study criteria was obtained over an 8 month period. Figure 2 illustrates the recruitment process for this study. A total of 31 injured workers consented to participate in the study. Of the 31 injured workers, 3 did not meet study criteria and 5 declined participation citing a lack of time. Twenty-three injured workers were enrolled in the study and 20 were available for administration of the SF-36 at the six weeks' time period for an 87% retention rate. One of the three injured workers who were not available was lost to

contact due to relocation to another state with an unknown address and change of phone number. A second injured worker completed over half of the intervention and then became lost to follow up. The third injured worker became ineligible during the study due to attorney representation.

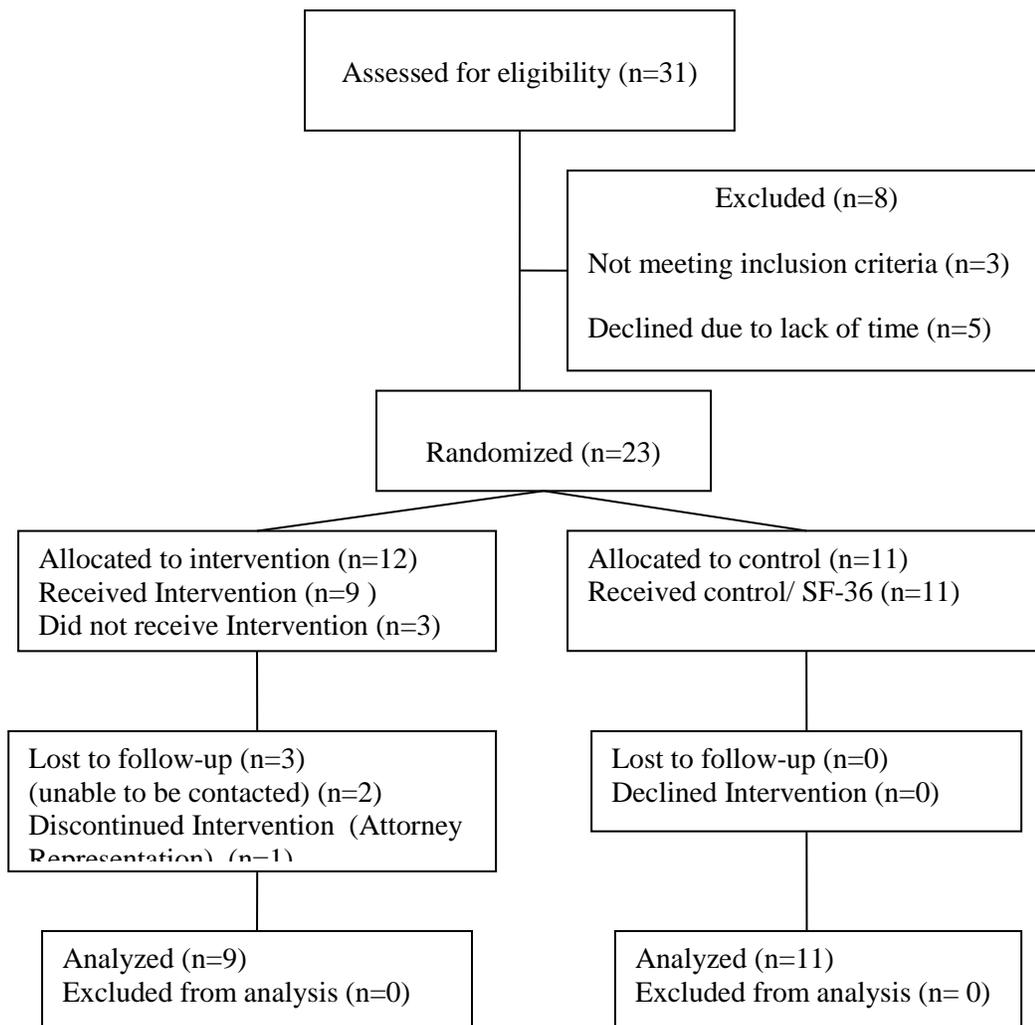


Figure 2. Flowchart of participants

Participants in the intervention group consisted of 4 men and 5 women and the control group consisted of 6 men and 5 women. Table 1 summarizes the demographic characteristics of the study group. There were no differences between the two groups in terms of demographic variables. The mean age for the intervention group was 48.4 years and the mean age for the control group was 47.6 years. The intervention group consisted of 3 injured workers who were Black and non-Hispanic, 3 injured workers who were White and Hispanic, and 3 injured workers who were White and Non-Hispanic. The control group consisted of 3 injured workers who were Black and non-Hispanic, and 8 injured workers who were White and Hispanic. The intervention group consisted of 7 injured workers whose primary language was English and 2 injured workers whose primary language was Spanish. The control group consisted of 6 injured workers whose primary language was English and 5 injured workers whose primary language was Spanish.

In terms of occupation, the groups were similar with 3 injured construction workers in the intervention group and 3 in the control group. There were also 3 injured office workers in the intervention group and 3 in the control group. For the remaining occupations, the intervention group included a janitor and education employees and the control group included janitors, protective services, and education. The physical demand level for the intervention group consisted of 4 injured workers in sedentary work and 5 in heavy work. The control group had 3 in the sedentary physical demand level, 3 in the medium physical demand level, 3 in the heavy physical demand level, and 2 in the very

heavy physical demand level. Of the 9 injured workers in the intervention group, 5 had surgery and 4 did not. In the control group there were 7 injured workers who had surgery and 4 who received non-surgical care.

The work status at entry to the study indicated that there were 5 injured workers in the intervention group and 5 injured workers in the control group who were off work. There were 4 injured workers in the intervention group who were on light duty and 3 injured workers in the control group were on light duty. There were no injured workers in the intervention group who were at full duty and 3 in the control group had returned to full duty. Work status at six weeks found that 2 of the injured workers in the intervention group and 2 in the control group were off work. There was 1 injured worker in the intervention group and 3 in the control group who were on light duty. There were 6 injured workers in the intervention group and 6 injured workers in the control group at full duty.

Table 1

Demographic Characteristics

| Variable | Intervention | Control | Total | Statistics |
|-------------|--------------|-------------|-------|-------------|
| Gender | | | | |
| Male | 4 | 6 | 10 | $X^2=0.202$ |
| Female | 5 | 5 | 10 | $p=0.653$ |
| Age (years) | | | | $t=0.167$ |
| Mean (SD) | 48.4 (12.8) | 47.6 (11.3) | | $p=0.869$ |
| Range | 23-63 | | | |

(continued)

| | | | | |
|--|---|---|----|-------------|
| Race and Ethnicity | | | | |
| Black and non-Hispanic | 3 | 3 | 6 | $X^2=5.124$ |
| White and Hispanic | 3 | 8 | 11 | $p=0.077$ |
| White and non-Hispanic | 3 | 0 | 3 | |
| Language | | | | |
| English | 7 | 6 | 13 | $X^2=1.174$ |
| Spanish | 2 | 5 | 7 | $p=0.279$ |
| Occupation | | | | |
| Construction | 3 | 3 | 6 | $X^2=2.49$ |
| Office | 3 | 3 | 6 | $p=0.646$ |
| Janitor | 1 | 2 | 3 | |
| Education | 2 | 1 | 3 | |
| Protective services (fire or police) | 0 | 2 | 2 | |
| Physical demand level | | | | |
| Sedentary | 4 | 3 | 7 | $X^2=5.498$ |
| Medium | 0 | 3 | 3 | $p=0.139$ |
| Heavy | 5 | 3 | 8 | |
| Very heavy | 0 | 1 | 2 | |
| Surgery | | | | |
| Yes | 5 | 7 | 12 | $X^2=0.135$ |
| No | 4 | 4 | 8 | $p=0.714$ |
| Work status at entry into study | | | | |
| Off work | 5 | 5 | 10 | $X^2=2.973$ |
| Light duty | 4 | 3 | 7 | $p=0.226$ |
| Full duty | 0 | 3 | 3 | |
| Work status at 6 weeks | | | | |
| Off work | 2 | 2 | 4 | $X^2=0.808$ |
| Light duty | 1 | 3 | 4 | $p=0.668$ |
| Full duty | 6 | 6 | 12 | |

Note: (N=20)

Findings of the Study

The SF-36 Health Survey (Ware, 1999) was administered to study participants in both the control group and in the intervention group to obtain the injured worker's

perceptions of health and function. The injured workers in the intervention group completed the SF-36 Health Survey at the end of a six week RN case management intervention. The SF-36 Health Survey was administered to each injured worker individually by phone. The control group received the SF-36 Health Survey in the same manner after being enrolled in the study for six weeks.

The SF-36 Health Survey is scored so that a higher score indicates a higher perception of function and health. The responses on the SF-36 Health Surveys were re-coded on a scale of 0 to 100 in accordance with the scoring rules based on RAND Health Surveys (www.rand.org). Data were entered and analyzed via SPSS 18.00.

Mean scores were calculated for each of the six subscale of the SF-36 in order to test the null hypothesis that injured workers, ages 20 to 65 years old, with work-related musculoskeletal injuries who are randomized to receive a six-week telephonic RN case management intervention will report higher functional health as measured by the SF-36 Health Survey and will have fewer lost days from work compared to injured workers randomized to the control group who do not receive the case management intervention, but who receive usual care as prescribed by their healthcare provider.

Results of the ANOVA for the SF-36 Health Survey subscales indicate that there were no significant differences between the intervention group and the control group (Table 2). While there were no significant differences between the groups, some trends were observed. When comparing the two groups, the mean physical functioning in the intervention group was 70.56 and the control group had a mean score of 50.9. The mean

pain score for the intervention group was 55.00 and the control group had a mean score of 46.36. For the general health subscale, the intervention group reported a mean score of 60.56 compared with the control group mean score of 56.82.

The findings suggest a trend toward a perception of improved physical function by participants in the intervention group. The demographic data suggest a trend of return to work from being off work to returning to full duty work status with an increase of 100% in the intervention group. The control group reported a 50% change in work status from off work to full duty status.

Table 2

Functional Health (SF-36) in Study Group

| Subscale | Intervention Mean (SD) | Control Mean (SD) | Total Mean (SD) | Statistic |
|----------------------|---------------------------|----------------------|--------------------|---------------------------------|
| Physical Functioning | 70.56 (17.93) | 50.91 (34.99) | 59.75 (29.67) | $F(1,18) = 2.32$ $p = 0.145$ |
| Role-Physical | 36.11(48.59) | 36.36 (42.37) | 36.25 (44.04) | $F(1,18) = .000$ $p = 0.990$ |
| Role-Emotional | 40.74 (49.38) | 51.52 (45.62) | 46.67 (46.39) | $F(1,18)=0.257$ $p=0.619$ |
| Energy/fatigue | 47.22 (25.38) | 46.82 (21.25) | 47.00 (22.56) | $F(1,18) = .002$ $p= 0.969$ |
| Emotional well-being | 56.00 (30.27) | 62.55 (23.88) | 59.60 (26.40) | $F(1,18)=0.293$ $p=0.595$ |
| Social functioning | 48.61 (32.74) | 64.77 (30.01) | 57.50 (31.52) | $F(1,18)=1.324$ $p=0.265$ |

| | | | | |
|----------------|---------------|---------------|---------------|------------------------------|
| Pain | 55.00 (23.22) | 46.36 (30.13) | 50.25 (26.91) | $F(1,18)=0.496$ $p=0.490$ |
| General health | 60.56 (23.24) | 56.82 (25.02) | 58.50 (23.68) | $F(1,18)=0.118$ $p=0.736$ |

Note: ($N=20$)

Reliability of the SF-36

The SF-36 Health Survey (Ware, 1999) is a well-known, reliable, valid, and stable instrument that measures functional health (Elliott, Renier, & Palcher, 2003, Obidoa, Reisine & Cheniack, 2010). The Spanish version of the SF-36 Health Survey has also demonstrated psychometric qualities in previous studies (Vilagut, Ferrer, Rajmil, Rebollo, et al. 2005).

For this study, reliability was calculated (Cronbach's alpha) for each of the eight subscales in order to estimate the reliability of the SF-36 Health Survey. Table 3 summarizes the results of the analysis. There were four subscales with Cronbach's alpha of 0.90 or higher. Physical functioning had a 0.93, role function and emotional well-being both had a 0.92, and role emotional had a 0.90. Three subscales had a Cronbach's alpha of 0.80 or above and those were pain with a 0.88, energy/fatigue with a 0.85, and social functioning with a 0.80. Cronbach's alpha for general health was 0.75. The result of the analysis was that the SF-36 Health Survey was reliable for the sample in this study.

Table 3

SF-36 Health Survey Reliability in Study Group

| Subscale | Cronbach's Alpha |
|----------------------|------------------|
| Physical functioning | 0.93 |
| Role-physical | 0.92 |
| Role-emotional | 0.90 |
| Energy/fatigue | 0.85 |
| Emotional well-being | 0.92 |
| Social functioning | 0.80 |
| Pain | 0.88 |
| General health | 0.75 |

Note: (N=20)

Summary of RN Case Management Intervention

For this study, 9 of the 12 intervention group participants completed the 6 week RN case management intervention. Table 4 summarizes a description of the number and mean time for the phone calls made to administer the intervention. Eight of the 9 intervention group participants completed 12 calls and one participant completed 9 calls. Phone calls ranged in time from 1 to 15 minutes with a mode of 13 minutes and a median of 8.5 minutes. Once the participant was contacted all five topics of the intervention

were completed at each call and there were no issues encountered in administering the intervention.

Table 4

Summary of Nurse Case Management Intervention

| Participant | Number of Calls in 6 weeks | Call Time (mean minutes) |
|-------------|-------------------------------|-----------------------------|
| 1 | 12 | 4.3 |
| 2 | 12 | 4.2 |
| 3 | 12 | 4.4 |
| 4 | 12 | 8.1 |
| 5 | 12 | 9.0 |
| 6 | 12 | 9.2 |
| 7 | 12 | 7.0 |
| 8 | 12 | 3.5 |
| 9 | 10 | 6.7 |

Summary of the Findings

Twenty injured workers participated in this two group randomized feasibility study to determine whether an RN case management six week intervention had an effect on their functional health. The SF-36 Health Survey was used to measure injured worker perception of functional health.

Data from the SF-36 Health Survey was analyzed using a multivariate approach to ANOVA for repeated measures. The results indicated no significant differences between intervention and control groups on any of the eight SF-36 Health Survey subscales. The SF-36 Health Survey demonstrated high reliability scores for this group of injured

workers. The RN case management intervention was delivered without any issues and took an average of 6.16 minutes per week to deliver.

CHAPTER V
SUMMARY OF THE STUDY

Discussion of the Findings

Physical Functioning, Role Physical, and General Health Perceptions

For this study, the intervention group reported a physical functioning mean score of 70.56 and the control group reported a physical functioning subscale mean score of 50.91. Figure 3 offers a comparison of the SF-36 Health Survey study group scores with norms for the United States. Although, with a $p = 0.145$ there was not a significant difference, it is possible with a larger sample size that differences could be detected.

The intervention group for this study had a mean score of 36.11 and the control group had a mean score of 36.36 in the role physical subscale. The $p = 0.990$ and there was no significant difference between the two groups for the role physical subscale.

In the subscale for general health the intervention group in this study had a mean score of 60.56 and the control group had a mean score of 56.82. With a $p = 0.736$ there was no significant difference between the intervention group and the control group.

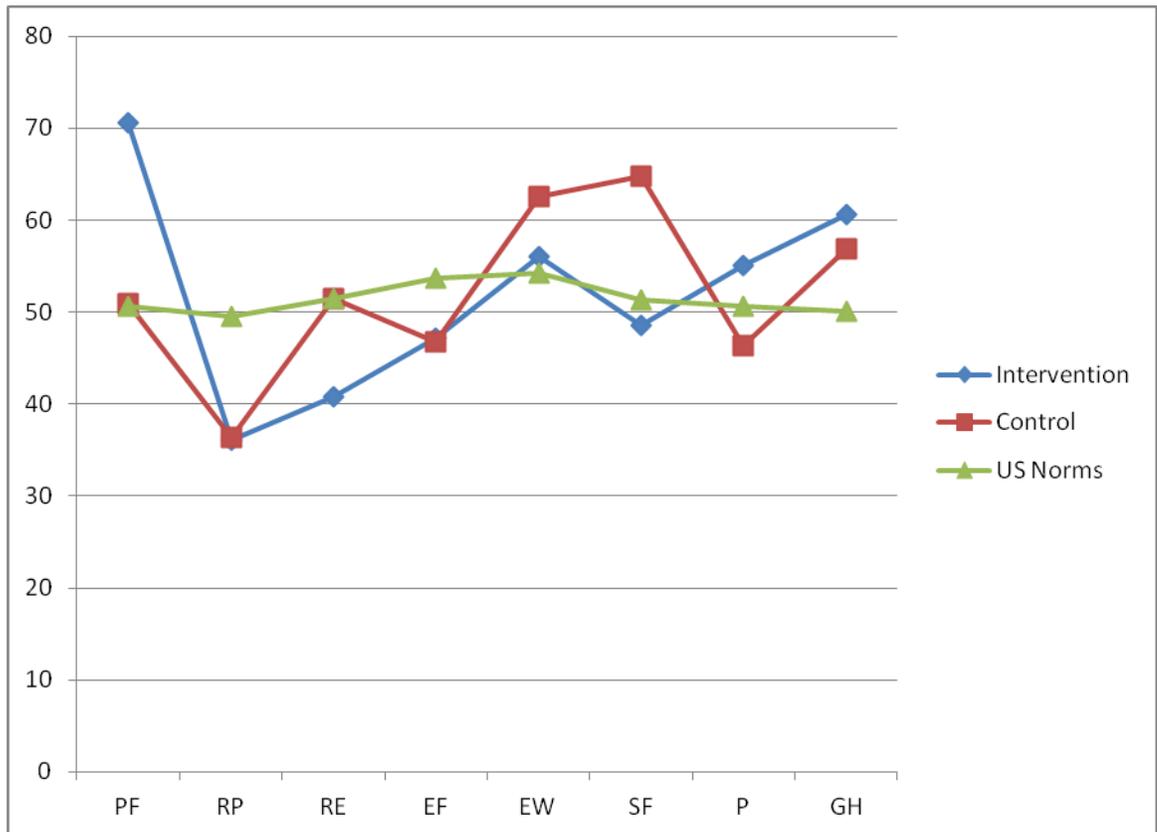


Figure 3. Comparison of mean scores of injured workers with and without RN case management intervention

In a study of functional limitation of injured workers (Gillen, Jewell, Faucett, & Yelin, 2004) the authors administered the SF-36 Health Survey at four time intervals and at the interval most comparable to this study, the one month interval after injury, the mean score for the physical functioning subscale was 68.1 . Hee, Whitecloud, Myers, Roesch, and Ricciardi (2002) studied neck pain in injured workers and reported a physical functioning subscale mean score of 52.1. Figure 4 illustrates a comparison

between this study and studies by Chow & Wong (2010), Gillen et al. (2004), and Hee et al. (2002).

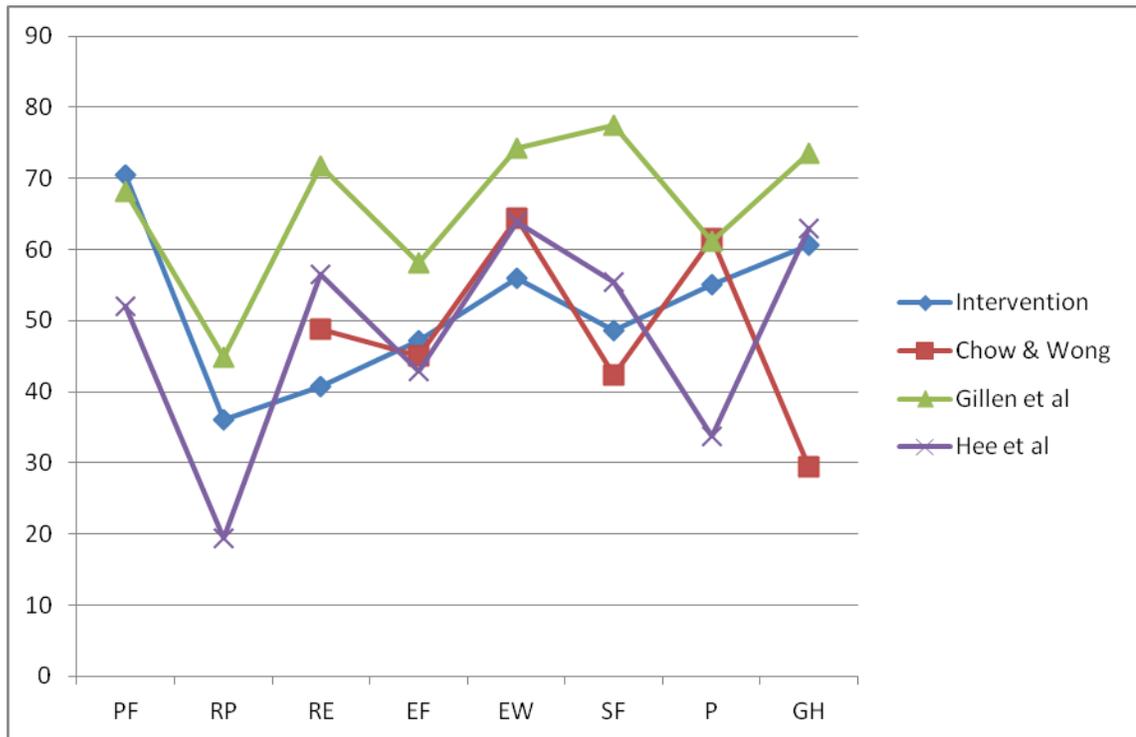


Figure 4. Comparison of intervention group mean scores with intervention groups from other studies

For the role physical subscale Gillen et al. (2004) found a mean score of 44.9 at one month post injury. Hee et al. (2002) reported a mean score of 19.5. In a study of patients undergoing peritoneal dialysis, Chow and Wong (2010) found that after a six week nurse telephonic follow up the general health subscale mean score was 29.4. Injured workers in the study by Gillen et al. (2004) had a mean score of 73.5 in the

general health subscale. The general health subscale mean score reported by Hee et al. (2002) was 63.0.

Compared to US norms that report a physical functioning subscale score of 50.68, the intervention group in this study scored higher than the US norms and the control group was similar to the US norms. The injured workers in the studies by Gillen et al. (2004) and Hee et al. (2002) scored lower in the physical functioning subscale than the intervention group for this study.

When compared to US norms of 49.47 for the role physical subscale both the intervention group and the control group in this study scored lower than US norms. A comparison of the mean scores of this study for the role physical subscale with a study by Gillen et al. (2004) and a study by Hee et al. (2002) the intervention group of this study had a lower mean score than was found by Gillen et al. (2004) but had a higher mean score than found by Hee et al. (2002) in the role physical subscale.

A comparison of the general health subscale means scores for the intervention group and for the control group of this study with US norms of 50.10 indicates that the injured workers in this study scored higher than the norm. A comparison of the scores for injured workers found in other studies (Gillen et al. 2004; Hee et al. 2002; Chow & Wong, 2010) finds that the study by Chow and Wong (2010) scored lower than US norms and also lower than the mean scores for this study.

Bodily Pain

Mean scores for the pain subscale were 55.00 for the intervention group and 46.30 for the control group. There was no significant difference between the two groups ($p=0.490$). For the pain subscale the US norm is 50.66. The mean scores for both the intervention group and the control group are similar to the norm.

After a six-week nurse telephone follow up of peritoneal dialysis patients Chow & Wong (2010) reported a pain subscale mean score of 61.5. Gillen et al. (2004) reported a pain subscale mean score of 61.1 at one month after injury. For the pain subscale, Hee et al. (2002) reported a mean score of 33.8.

The mean score for the intervention group for this study for the bodily pain subscale was higher than the US norm of 50.66 while the control group was lower. When compared with a study by Chow and Wong (2010) and a study by Gillen et al. (2004) the intervention group for this study had a lower mean score in the bodily pain subscale. However the intervention group for this study had a higher mean score than a study by Hee et al. (2002).

Energy/Fatigue

For the subscale, energy/fatigue both groups scored similarly with the intervention group scoring 47.22 and the control group scoring 46.82. There was no significant difference between the two groups ($p=0.969$).

Chow and Wong (2010) reported an energy/fatigue subscale mean score of 45.1 after a six week nurse telephonic follow up with peritoneal dialysis patients. Gillen et al.

(2004) reported an energy/fatigue subscale mean score of 58.2 at one month after injury.

Hee et al. (2002) reported an energy/fatigue subscale mean score of 42.9.

When compared with other studies (Chow & Wong, 2010; Gillen et al. 2004; Hee et al. 2002) the mean score for the intervention group in this study for the subscale energy/fatigue was similar to the mean score found by Chow and Wong (2010) and Hee et al. (2002) and lower than the mean score found by Gillen et al. (2004).

Emotional Well-Being

The intervention group for this study scored 56.00 and the control group scored 62.55 in the emotional well-being subscale. Although the control group had a higher mean score there was no significant difference between the two groups ($p=0.595$).

Chow and Wong (2010) reported an emotional well-being (MH) subscale score of 64.4 after a six-week nurse telephonic follow up with peritoneal dialysis patients. Gillen et al. (2004) reported an emotional well-being (MH) subscale score of 74.3 at one month after injury. For the emotional well-being (MH) subscale Hee et al. (2002) reported a score of 63.8.

In a comparison with the US norm of 54.2, the intervention group for this study had a similar mean score for the emotional well-being (MH) subscale. The intervention group for this study had a lower mean score for the emotional well-being (MH) subscale than studies by Chow and Wong (2010), Gillen et al. (2004), and Hee et al. (2002).

Emotional Role Functioning and Social Functioning

Scores for the role emotional subscale were 40.74 for the intervention group and 51.52 for the control group. There was no significant difference between the two groups with $p=0.619$. For the subscale social functioning, the intervention group scored 48.61 and the control group scored 64.77. There was no significant difference between the two groups with $p=0.265$.

At one month after injury Gillen et al. (2004) reported an emotional role function subscale mean score of 71.8. Chow and Wong (2010) found the emotional role function subscale mean score to be 48.8 after a six-week nurse telephonic follow up with peritoneal dialysis patients. Hee et al. (2002) reported a mean score of 56.5 for the emotional role function subscale.

At one month after injury Gillen et al. (2004) reported a social functioning subscale score of 77.4. Chow and Wong (2010) reported a score of 42.4 for the social functioning subscale. For the social functioning subscale Hee et al. (2002) reported a score of 55.5.

The control group for this study was similar to the US norm of 51.44 for the emotional role function subscale and the intervention group had a mean score lower than the norm. The US norm for social functioning is 51.37 and the control group for this study had a higher mean score than the intervention group that had a lower mean score than the norm. Compared to studies by Chow and Wong (2010) and Hee et al. (2002),

the intervention group for this study had a similar mean score for the emotional role function subscale and had a lower mean score than a study by Gillen et al. (2004).

Reliability of the SF-36 with Injured Workers

For this study, seven of the eight subscales of the SF-36 Health Survey demonstrated reliability with estimates which exceeded 0.80. However, the general health subscale had a reliability coefficient of 0.75.

The following conclusions were discerned based on the results of this study of the functional health of injured workers.

1. Although there was no significant difference between the intervention group and the control group, the intervention group had similar mean scores on the SF-36 to US norms and to other comparable studies.
2. The format for the RN case management intervention was manageable in a relatively small amount of time with an average delivery time of 6.16 minutes per week per participant in the intervention group.
3. The SF-36 Health Survey was reliable for this sample of injured workers.

Implications for Nursing

The following implications for nursing practice were derived from this study.

1. Injured workers in the intervention group for this study reported mean scores in the physical function and in the general health subscales that were higher than US norms suggesting that with a larger sample the RN case management intervention might show a statistical difference.

2. Injured workers in the intervention group for this study had a mean score in the pain level and emotional well-being subscales lower than US norms while simultaneously reporting a mean score higher than US norms in the physical function and general health subscales. While it is unclear as to the cause for this phenomenon, it may be that injured workers are expected to function with a higher pain level and while feeling ill as compared to US norms.

Recommendations for Further Study

Based on this study recommendations for further study are as follows:

1. This was a feasibility study and it is recommended that this study be replicated with a larger sample.
2. Expansion of this study is recommended to include other work-related injuries that utilize case management such as brain injury, spinal cord injury, burns, psychological injury, traumatic injury, and inhalation injury.
3. Collaboration with other nurse case managers is recommended with a goal toward further inquiry and testing of the NCM i2015.
4. This study should be replicated to include the involvement of the injured worker's healthcare providers and the employer since RN case management interventions involve multiple dimensions.
5. Further research should be conducted with the addition of demographic information regarding education as well as attitudes toward injury and health.

6. Repeated measures testing with the SF-36 would be helpful to detect changes, if any, in the intervention group.

REFERENCES

- Ahmed, O.I., & Rak, D. J. (2010). Hospital readmission among participants in a transitional case management program. *The American Journal of Managed Care*, 16(10), 778-783.
- AAOHN (2012). *American Association of Occupational Health Nurses Practice Standards*. [Practice standards]. Retrieved from <http://www.aaohn.org/practice/standards.html>
- Basavanthappa, B.T. (2003). Common problems of the adult patient. In Medical-surgical nursing. (pp. 76-78). New Dehli, India: Jaypee Brothers Medical Publishers.
- Brines, J., Salazar, M.K., Graham, K.Y., Pergola, T., & Cannon, C. (1999). Injured worker's perceptions of case management services: A descriptive study, *AAOHN Journal*, 47(8), 355-364.
- Bronner, S., Ojofeitimi, S., & Rose, D. (2003). Injuries in a modern dance company: Effect of comprehensive management on injury incidence and time loss. *The American Journal of Sports Medicine*, 31(3), 365-373.
- Bryce, T.N., Budh, C.N., Cardenas, D.D., Dijkers, M., Felix, E.R., Finnerup, N.B., Kennedy, P., Lundeberg, T., Richards, J.S., Rinatala, D.H., Siddall, P., & Widerstrom-Noga, E. (2007). From the 2006 NIDRR SCI measures meeting pain after spinal cord injury: An evidence-based review for clinical practice and research

- report of the National Institute on Disability and Rehabilitation Research spinal cord injury measures meeting. *The Journal of Spinal Cord Medicine*, 30(5), 421-440.
- Bureau of Labor Statistics U.S. Department of Labor. (2012a). *Nonfatal occupational injuries and illnesses requiring days away from work*. [New release]. Retrieved from http://www.bls.gov/news.release/archives/osh2_11082012.pdf
- Bureau of Labor Statistics U.S. Department of Labor. (2012b). Workplace injuries and illnesses. [New release]. Retrieved from http://www.bls.gov/news.release/archives/osh_10252012.pdf
- Butler, R.J., Johnson, W.G., & Gray, B.P., (2007). Timing makes a difference: Early nurse case management intervention and low back pain. *Professional Case Management*, 12(6), 316-327.
- Case Management Society of America, (2010). *CMSA Standards of Practice for Case Management. The Definition of Case Management*. [Practice standards]. Retrieved from <http://www.cmsa.org/portals/0/pdf/memberonly/StandardsOfPractice.pdf>
- Ceniceros, R. (2014). American Airlines expands workers comp nurse case manager use. *Business Insurance*. [Research brief]. Retrieved from <http://www.businessinsurance.com/article/20121223/NEWS08/312239992>
- Chow, S.K.Y., & Wong, F.K.Y. (2010). Health-related quality of life in patients undergoing peritoneal dialysis: Effects of a nurse-led case management programme. *Journal of Advanced Nursing*, 66(8), 1780-1792.

- Cohen, E.L., & Cesta, T.G. (2001). Evolution of nursing case management in a changing health care system. In *Nursing case management* (p. 7). St. Louis, MO: Mosby, Inc.
- Elliott, T.E., Renier, C.M., & Palcher, J.A. (2003). Chronic pain, depression, and quality of life: Correlations and predictive value of the SF-36. *Pain Medicine*, 4(4), 331-339.
- Garratt, A.M., Ruta, D.A., Abdalla, M.I., Buckingham, J.K., & Russell, I.T. (1993). The SF-36 health survey questionnaire: An outcome measure suitable for routine use within the NHS? *British Medical Journal*, 306, 1440-1444. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1677883/pdf/bmj00022-0022.pdf>
- Gillen, M., Jewell, S A., Faucett, J.A., and Yelin, E. (2004). Functional limitations and well-being in injured municipal workers: A longitudinal study. *Journal of Occupational Rehabilitation*, 14(2), 89-105.
- Gray, F.C. & White, A. (2012). Concept analysis: Case management and role confusion. *Nursing Forum*, 47(1), 3-8.
- Gustafson, D., Wise, M., Bhattacharya, A., Pulvermacher, A., Shanovich, K., Phillips, B., Lehman, E., Chinchilli, V., Hawkins, R., & Kim, J.S. (2012). The effects of combining web-based ehealth with telephonic nurse case management for pediatric asthma control: A randomized controlled trial. *Journal of Medical Internet Research*, 14(4), e101.doi:10.2196/jmir.1964
- Hee, H.T., Whitecloud, T.S. III., Myers, L., Roesch, W., and Ricciardi, J.E. (2002). Do worker's compensation patients with neck pain have lower SF-36 scores? *European Spine Journal*, 11, 375-381.

- Hemingway, H., Stafford, M., Stansfeld, S., Shipley, M., and Marmot, M. (1997). Is the SF-36 a valid measure of change in population health? Results from the Whitehall II study. *British Medical Journal*, 315-1273.
- Holloway, N.M. (2004). Neurologic disorders laminectomy. In *Medical surgical care planning* (4th ed.). (pp. 211-212). Ambler, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins.
- Howe, C.J., Jawad, A.F., Tuttle, A. K., Moser, J.T., Preis, C., Buzby, M., Murphy, K. M. (2005). Education and telephone case management for children with type 1 diabetes: a randomized controlled trial. *Journal of Pediatric Nursing*, 20(2), 83-95.
- Hutti, M.H., & Usui, W.M. (2004). Nursing telephonic case management and pregnancy outcomes of mothers and infants. *Lippincott's Case Management*, 9(6), 287-299.
- Ishani, A., Greer, N., Taylor, B.C., Kubes, L., Cole, P., Atwood, M., Clothier, B., & Ercan-Fang, N. (2011). Effect of nurse case management compared with usual care on controlling cardiovascular risk factors in patients with diabetes: A randomized control trial. *Diabetes Care*, 34(8), 1689-1694.
- Issel, L.M. (1997). Measuring comprehensive case management interventions development of a tool. *Nursing Case Management*, 2(4), 132-138.
- Jenkinson, C., Coulter, A., & Wright, L. (1993). Short form 36 (SF 36) health survey questionnaire: Normative data for adults of working age. *British Medical Journal*, 306(29), 1437-1440.

- Kersbergen, A.L. (1996). Case management: A rich history of coordinating care to control costs. *Nursing Outlook*, 44(4), 169-172.
- Kim, Y., & Soeken, K.L. (2005). A meta-analysis of the effect of hospital-based case management on hospital length-of-stay and readmission. *Nursing Research*, 54(4), 255-264.
- Koh, S.B., Chang, S.J., Kang, M.G., Cha, B.S., & Park, J.K. (1997). Reliability and validity on measurement instrument for health status assessment in occupational workers. *Korean Journal of Preventive Medicine*, 30(2), 251-266.
- Knight, K.L. (2008). More precise classification of orthopaedic injury types and treatment will improve patient care. *Journal of Athletic Training*, 43(2), 117-118.
- Little, M., Saul, G.D, Testa, K., & Gaziano, C. (2002). Improving pregnancy outcome and reducing avoidable clinical resource utilization through telephonic perinatal care coordination. *Lippincott's Case Management*, 7(3), 103-112.
- Melhorn, J.M., Wilkinson, L.K., & O'Malley, M.D. (2010). Successful management of musculoskeletal disorders. *Human and Ecological Risk Assessment: An International Journal*, 7(7), 1801-1810.
- Mullahy, C.M. (2014). Healthcare reimbursement: Private or employer sector funding. In *The Case Manager's Handbook* (5th ed.). (p. 397). Burlington, MA: Jones and Bartlett Learning.

- NIH National Institutes of Health The NIH Almanac. (2014). National institute of arthritis and musculoskeletal and skin diseases. Division of musculoskeletal diseases. Retrieved from <http://www.nih.gov/about/almanac/organization/NIAMS.htm>.
- Obidoa, C. A., Reisine, S. L., & Cherniack, M. (2010). How does the SF-36 perform in healthy populations? A structured review of longitudinal studies. *Journal of Social, Behavioral, and Health Science*, 4(1), 30-48.
- Oeseburg, B., Wynia, K., Middel, B., & Reijneveld. (2009). Effects of case management for frail older people or those with chronic illness. *Nursing Research*, 58(3), 201-210.
- Park, E., & Huber, D. L. (2009). Case management workforce in the United States. *Journal of Nursing Scholarship*, 41(2), 175-183.
- Peek, M.K., Ray, L., Patel, K., Stoebner-May D., & Ottenbacher, K.J. (2004). Reliability and validity of the SF-36 among older Mexican Americans. *The Gerontologist*, 44(3), 418-425.
- Phillips, K.D. (2002). Sister Callista Roy Adaptation Model. In Tomey, A.M. & Alligood, M.R. *Nursing theorists and their work* (5th ed.). (pp. 269-298). St. Louis, MO: Mosby.
- Polit, D.E., & Beck, C.T. (2008). Using inferential statistics to test hypothesis. In *Nursing Research: Generating and Assessing Evidence for Nursing Practice*, (4th ed.) (pp 604-605). Philadelphia, PA: Lippincott Williams & Wilkins.

- Pompe, J. (2010). Caterpillar. *Partnership for workplace mental health*. Retrieved from <http://www.workplacementalhealth.org/Pages/EmployerInnovations/Employer.aspx?EmployerId=67>
- Pransky, G., Benjamin, K., Hill-Fotouhi, C., Himmelstein, J., Fletcher, K.E., Katz, J.N., & Johnson, W.G. (2000). Outcomes in work-related upper extremity and low back Injuries: Results of a retrospective study. *American Journal of Industrial Medicine*, 37, 400-409.
- Rand Health Medical Outcomes Study: 36-Item Short Form Survey Scoring Instructions. (2015). Retrieved from http://www.rand.org/health/surveys_tools/mos/mos_core_36item_scoring.html
- Reigel, B., Carlson, B., Glaser, D., & Romero, T. (2006). Randomized controlled trial of telephone case management in Hispanics of Mexican origin with heart failure. *Journal of Cardiac Failure*, 12(3), 211-219.
- Roy, C. (2009). *The Roy adaptation model* (3rd ed.). Upper Saddle River, New Jersey: Pearson Education, Inc.
- Scheer, S.J., Radack, K.L., & O'Brien, D.R. (1995). Randomized controlled trials in industrial low back pain relating to return to work, part 1, acute interventions. *Achives of Physical Medicine and Rehabilitation*, 76(10), 966-973.
- Shearer, N.B.C., Cisar, N., and Greensberg, E.A. (2007). A telephone-delivered empowerment intervention with patients diagnosed with heart failure. *Heart & Lung*, 36(3), 159-169.

- Smeltzer, S.C., Bare, B.G., Hinkle, J.L., & Cheever, K.H. (2010). Management of patients with musculoskeletal disorders. In *Brunner and Suddarth's textbook of medical surgical nursing: in one volume*. (pp. 2053-2055). Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins.
- Smith, A.C. (2011). Role ambiguity and role conflict in nurse case managers: An integrative review. *Professional Case Management*, 16(4), 182-196.
<http://dx.doi.org/10.1097/NCM.0b013e318218845b>
- Smith, C.K. (2011). Nurse case management specialty practice for a new and improved healthcare system. *Arizona Nurse*, August, September, October, 4.
- Southard, B.H., Southard, D. R., & Nuckolls, J. (2003). Clinical trial of an internet-based case management system for secondary prevention of heart disease. *Journal of Cardiopulmonary Rehabilitation*, 23, 341-348.
- Texas Department of Insurance Division of Worker's Compensation (2010). Chapter 137 Disability Management Subchapter A General Provisions 28 TAC §137.5 Case Manager Certification. Retrieved from
<http://www.tdi.texas.gov/wc/rules/adopted/documents/aocm1210.pdf>
- Texas Workers' Compensation Act 83rd Legislature. (2013). Texas Department of Insurance Division of Worker's Compensation. Retrieved from
<http://www.tdi.texas.gov/wc/act/documents/act83.pdf>
- U.S. Department of Labor, Occupational Safety & Health Administration. (2001). Recording and Reporting Occupational Injuries and Illness (Section [1904.7\(b\)\(3\)](#))

Retrieved from

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9638

U.S. National Library of Medicine, MedlinePlus Trusted Health Information for You.

(2015). Retrieved from <https://www.nlm.nih.gov/medlineplus/>

Vanichkachorn, G., Roy, B. A., Lopez, R., & Sturdevant, R. (2014). Evaluation and treatment of the acutely injured worker. *American Academy of Family Physicians*, 89(1), 17-24.

Vilaqut, G., Ferrer, M., Rajmil, L., Rebollo, P., Permanyer-Miralda, G., Quintana, J.M., Santed, R., Valderas, J.M., Ribera, A., Domingo-Salvany, A., & Alonso, J. (2005). The Spanish version of the Short Form 36 Health Survey: A decade of experience and new developments. *Gaceta Sanitaria*, 19(2), 135-150.

Walters, S. J., Munro, J.F., & Brazier, J.E. (2001). Using the SF-36 with older adults: A cross-sectional community-based survey. *Age and Aging*, 30, 337-343.

Ware, J.E. (1999). SF-36 Health Survey. In Maruish, Mark E. *The use of psychological testing for treatment planning and outcomes assessment* (2nd ed.). (pp. 1227-1246). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Ware, J., Snow, K. K., Kosinski, M., & Gandek, B. (2000). *SF-36 health survey manual and interpretation guide*. Lincoln, Rhode Island: QualityMetric.

APPENDIX A

RN Telephonic Case Management Intervention Form

NCM i2015 Intervention Form: Each intervention will consist of discussion in each of the five themes topics. The entire intervention will be 10 minutes in length. Place the date off NCM intervention in the date box. There will be a maximum total of 12 interventions, with a maximum of two interventions per week, within a six week time frame per participant. (Place a check mark in each box when topic is discussed.)

Name: _____

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year ____ Month ____ Date: | | | | | | | | | | | | |
| Start time/End time | / | / | / | / | / | / | / | / | / | / | / | / |
| Pain Level (scale x/10) Medication(s) Effect of medication(s) Provide guidance (alternate comfort measures) | | | | | | | | | | | | |
| Physical Activity Attendance to PT Home Exercise Program, Provide encouragement | | | | | | | | | | | | |
| Stress & Anxiety Thoughts and feelings, Sleep Strategies to achieve relaxation | | | | | | | | | | | | |
| Education about diagnosis Clarification and understanding, questions, expectations of treatment and rehabilitation plan | | | | | | | | | | | | |
| Vocational Patient goals for return to work, work options, feelings about return to work | | | | | | | | | | | | |

APPENDIX B

SF-36 Health Survey English Version

SF-36 Health Survey English Version

SF-36 Health Survey - English

1. In general, would you say your health is:

| | | | | |
|-------------|-------------|--------|--------|--------|
| Excellent 1 | Very good 2 | Good 3 | Fair 4 | Poor 5 |
|-------------|-------------|--------|--------|--------|

2. **Compared to 6 weeks ago**, how would you rate your health in general now?

| | | | | |
|-------------------|-----------------------|------------------|----------------------|------------------|
| Much better now 1 | Somewhat better now 2 | About the same 3 | Somewhat worse now 4 | Much worse now 5 |
|-------------------|-----------------------|------------------|----------------------|------------------|

The following items are about activities you might do during a typical day. Does your health **now** limit you in these activities? If so, how much?

| | Yes, limited a lot | Yes, limited a little | No, not limited at all |
|--|---------------------------|------------------------------|-------------------------------|
| 3. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports | 1 | 2 | 3 |
| 4. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or walking more than one hour | 1 | 2 | 3 |
| 5. Lifting or carrying groceries | 1 | 2 | 3 |
| 6. Climbing several flights of stairs | 1 | 2 | 3 |
| 7. Climbing one flight of stairs | 1 | 2 | 3 |
| 8. Bending, kneeling, or stooping | 1 | 2 | 3 |
| 9. Walking more than a mile | 1 | 2 | 3 |
| 10. Walking several blocks | 1 | 2 | 3 |
| 11. Walking one block | 1 | 2 | 3 |
| 12. Bathing or dressing yourself | 1 | 2 | 3 |

During the past 6 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

| | Yes | No |
|--|-----|----|
| 13. Cut down the amount of time you spent on work or other activities | 1 | 2 |
| 14. Accomplished less than you would like | 1 | 2 |
| 15. Were limited in the kind of work or other activities | 1 | 2 |
| 16. Had difficulty performing the work or other activities (for example, it took extra effort) | 1 | 2 |

During the past 6 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

| | Yes | No |
|---|-----|----|
| 17. Cut down the amount of time you spent on work or other activities | 1 | 2 |
| 18. Accomplished less than you would like | 1 | 2 |
| 19. Didn't do work or other activities as carefully as usual | 1 | 2 |

20. **During the past 6 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

| | | | | |
|--------------|------------|--------------|---------------|-------------|
| Not at all 1 | Slightly 2 | Moderately 3 | Quite a bit 4 | Extremely 5 |
|--------------|------------|--------------|---------------|-------------|

21. How much bodily pain have you had during the **past 6 weeks**?

| | | | | | |
|--------|-------------|--------|------------|----------|---------------|
| None 1 | Very mild 2 | Mild 3 | Moderate 4 | Severe 5 | Very Severe 6 |
|--------|-------------|--------|------------|----------|---------------|

22. **During the past 6 weeks**, how much did pain interfere with your normal work (including both work outside the home and housework)?

| | | | | |
|--------------|------------|--------------|---------------|-------------|
| Not at all 1 | Slightly 2 | Moderately 3 | Quite a bit 4 | Extremely 5 |
|--------------|------------|--------------|---------------|-------------|

These questions are about how you feel and how things have been with you **during the past 6 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

| | | | | | | |
|--|------------|---------|-------------------|---------|-------------|-------------|
| How much of the time <u>during the past</u> | All of the | Most of | A good bit of the | Some of | A little of | None of the |
|--|------------|---------|-------------------|---------|-------------|-------------|

| | | | | | | |
|---|------|----------|------|----------|----------|------|
| 6 weeks... | time | the time | time | the time | the time | time |
| 23. Did you feel full of pep? | 1 | 2 | 3 | 4 | 5 | 6 |
| 24. Have you been a very nervous person? | 1 | 2 | 3 | 4 | 5 | 6 |
| 25. Have you felt so down in the dumps that nothing could cheer you up? | 1 | 2 | 3 | 4 | 5 | 6 |
| 26. Have you felt calm and peaceful? | 1 | 2 | 3 | 4 | 5 | 6 |
| 27. Did you have a lot of energy? | 1 | 2 | 3 | 4 | 5 | 6 |
| 28. Have you felt downhearted and blue? | 1 | 2 | 3 | 4 | 5 | 6 |
| 29. Did you feel worn out? | 1 | 2 | 3 | 4 | 5 | 6 |
| 30. Have you been a happy person? | 1 | 2 | 3 | 4 | 5 | 6 |
| 31. Did you feel tired? | 1 | 2 | 3 | 4 | 5 | 6 |

32. **During the past 6 weeks**, how much time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

| | | | | |
|----------------------|-----------------------|-----------------------|---------------------------|-----------------------|
| All of the time 1 | Most of the time 2 | Some of the time 3 | A little of the time 4 | None of the time 5 |
|----------------------|-----------------------|-----------------------|---------------------------|-----------------------|

| | | | | | |
|--|-----------------|-------------|------------|--------------|------------------|
| How TRUE or FALSE is each of the following statements for you. | Definitely true | Mostly true | Don't know | Mostly false | Definitely false |
| 33. I seem to get sick a little easier than other people. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|--|---|---|---|---|---|
| 34. I am as healthy as anybody I know. | 1 | 2 | 3 | 4 | 5 |
| 35. I expect my health to get worse. | 1 | 2 | 3 | 4 | 5 |
| 36. My health is excellent. | 1 | 2 | 3 | 4 | 5 |

APPENDIX C

SF-36 Health Survey Spanish Version

Cuestionario de Salud SF-36 Health Survey Versión español

1. En general, usted diría que su **salud** es:

| | | | | |
|-------------|-------------|---------|-----------|--------|
| Excelente 1 | Muy buena 2 | Buena 3 | Regular 4 | Mala 5 |
|-------------|-------------|---------|-----------|--------|

2. ¿Cómo diría que es su **salud actual**, comparada con la de hace **sies semanas**?

| | | | | |
|------------------------|-----------------------|------------------------|----------------------|-----------------------|
| Mucho mejor ahora 1 | Algo mejor ahora 2 | Más o menos igual 3 | Algo peor ahora 4 | Mucho peor ahora 5 |
|------------------------|-----------------------|------------------------|----------------------|-----------------------|

Las siguientes preguntas se refieren a actividades o cosas que usted podría hacer en un día normal.

¿ Su salud actual le limita para hacer estas actividades? ¿Y si le limita, cuanto le limita?

| | Sí, me limita mucho | Sí, me limita un poco | No, no me limita nada |
|---|----------------------------|------------------------------|------------------------------|
| 3. Esfuerzos intensos, tales como correr, levantar objetos pesados, o participar en deportes agotadores | 1 | 2 | 3 |
| 4. Esfuerzos moderados, como mover una mesa, pasar la aspiradora, jugar a los bolos o caminar más de una hora | 1 | 2 | 3 |
| 5. Coger o llevar la bolsa de la compra | 1 | 2 | 3 |
| 6. Subir varios pisos por la escalera | 1 | 2 | 3 |
| 7. Subir un solo piso por la escalera | 1 | 2 | 3 |
| 8. Agacharse o arrodillarse | 1 | 2 | 3 |
| 9. Caminar una milla o más | 1 | 2 | 3 |
| 10. Caminar varias manzanas | 1 | 2 | 3 |
| 11. Caminar una sola manzana | 1 | 2 | 3 |
| 12. Bañarse o vestirse por sí mismo | 1 | 2 | 3 |

Las siguientes preguntas se refieren a problemas en su trabajo o en sus actividades cotidianas.

¿Durante las **últimas 6 semanas**, tuvo usted cualquiera de los siguientes problemas a causa de su salud física?

| | Sí | No |
|---|-----------|-----------|
| 13. Reducir el tiempo dedicado al trabajo o a sus actividades cotidianas | 1 | 2 |
| 14. Hizo menos de lo que hubiera querido hacer | 1 | 2 |
| 15. Tuvo que dejar de hacer algunas tareas en su trabajo o en sus actividades cotidianas | 1 | 2 |
| 16. Tuvo dificultad para hacer su trabajo o sus actividades cotidianas (por ejemplo, le costó más de lo normal) | 1 | 2 |

¿Durante las **últimas 6 semanas**, tuvo usted cualquiera de los siguientes problemas a causa de algún problema emocional (como estar triste, deprimido, o nervioso)?

| | Si | No |
|---|-----------|-----------|
| 17. Reducir el tiempo dedicado al trabajo o a sus actividades cotidianas, | 1 | 2 |
| 18. Hizo menos de lo que hubiera querido hacer | 1 | 2 |
| 19. No hizo su trabajo o sus actividades cotidianas tan cuidadosamente como de costumbre, | 1 | 2 |

20. ¿Durante las **últimas 6 semanas**, hasta qué punto su salud física o los problemas emocionales han dificultado sus actividades sociales habituales con la familia, los amigos, los vecinos u otras personas?

| | | | | |
|--------|-----------|-----------|------------|---------|
| Nada 1 | Un poco 2 | Regular 3 | Bastante 4 | Mucho 5 |
|--------|-----------|-----------|------------|---------|

21. ¿Tuvo dolor en alguna parte del cuerpo durante las **últimas 6 semanas**?

| | | | | | |
|------------------|-------------------|------------------|-------------------|----------------|--------------------|
| No, ninguno 1 | Sí, muy poco 2 | Sí, un poco 3 | Sí, moderado 4 | Sí, mucho 5 | Sí, muchísimo 6 |
|------------------|-------------------|------------------|-------------------|----------------|--------------------|

22. ¿Durante las **últimas 6 semanas**, has ta qué punto el dolor le ha dificultado su

trabajo habitual (incluido el trabajo fuera de casa y las tareas domésticas)?

| | | | | |
|--------|-----------|-----------|------------|---------|
| Nada 1 | Un poco 2 | Regular 3 | Bastante 4 | Mucho 5 |
|--------|-----------|-----------|------------|---------|

Las preguntas que siguen se refieren a cómo se ha sentido y cómo le han ido las cosas durante las **últimas 6 semanas**. En cada pregunta responda lo que se parezca más a cómo se ha sentido usted.

| ¿Durante las últimas 6 semanas cuánto tiempo se sintió... | Siempre | Casi siempre | Muchas veces | Algunas veces | Sólo alguna vez | Nunca |
|--|---------|--------------|--------------|---------------|-----------------|-------|
| 23. lleno de vitalidad? | 1 | 2 | 3 | 4 | 5 | 6 |
| 24. cuánto tiempo estuvo muy nervioso? | 1 | 2 | 3 | 4 | 5 | 6 |
| 25. cuánto tiempo se sintió tan bajo de moral que nada podía animarle? | 1 | 2 | 3 | 4 | 5 | 6 |
| 26. cuánto tiempo se sintió calmado y tranquilo? | 1 | 2 | 3 | 4 | 5 | 6 |
| 27. cuánto tiempo tuvo mucha energía? | 1 | 2 | 3 | 4 | 5 | 6 |
| 28. cuánto tiempo se sintió desanimado y triste? | 1 | 2 | 3 | 4 | 5 | 6 |
| 29. cuánto tiempo se sintió agotado? | 1 | 2 | 3 | 4 | 5 | 6 |
| 30. cuánto tiempo se sintió feliz? | 1 | 2 | 3 | 4 | 5 | 6 |
| 31. cuánto tiempo se sintió cansado? | 1 | 2 | 3 | 4 | 5 | 6 |

32. ¿Durante las **últimas 6 semanas**, ¿con qué frecuencia la salud física o los problemas emocionales le han dificultado sus actividades sociales (como visitar a los amigos o familiares)?

| | | | | |
|-----------|----------------|-----------------|-----------------|---------|
| Siempre 1 | Casi siempre 2 | Algunas veces 3 | Sólo alguna vez | Nunca 5 |
|-----------|----------------|-----------------|-----------------|---------|

| | | | | |
|--|--|--|---|--|
| | | | 4 | |
|--|--|--|---|--|

| Por favor, diga si le parece CIERTA o FALSA cada una de las siguientes frases. | Totalmente cierta | Bastante cierta | No lo sé | Bastante falsa | Totalmente falsa |
|--|--------------------------|------------------------|-----------------|-----------------------|-------------------------|
| 33. Creo que me pongo enfermo más fácilmente que otras personas. | 1 | 2 | 3 | 4 | 5 |
| 34. Estoy tan sano como cualquiera. | 1 | 2 | 3 | 4 | 5 |
| 35. Creo que mi salud va a empeorar. | 1 | 2 | 3 | 4 | 5 |
| 36. Mi salud es excelente. | 1 | 2 | 3 | 4 | 5 |

APPENDIX D

Recruitment Flyer English

TWU

A TWU education ignites potential, purpose and a pioneering spirit.



Nurse Research Study

Texas Woman's University nurse research study is underway and your participation is appreciated. We would love to include you in this important study. Please ask for phone contact information at the registration desk.

You may be eligible if you are:

- Persons with work-related injury
- 20 years of age or older



TWU Nursing Research

Sulema (Sue) Palmarez, BSN, RN-BC, CCM, MHA/MBA
Doctoral Student

Phone: (832) 451-5304

Fax: (713) 422-2379

E-mail: spalmare@twu.edu

APPENDIX E
Recruitment Flyer Spanish



Estudio Sobre Lesion De Trabajo

Una enfermera estudiante de Texas Woman's University esta conduciendo un estudio cientifico y aprecia su participacion. Nos encantaria que usted participe en este importante estudio.

Uste puede participar si usted tiene:

- Una lesion de trabajo
- 20 anos o mas de edad



Favor Llamar:

**Sulema (Sue) Palmarez, RN
Doctoral Student**

Phone: (832) 451-5304
OK mandar un texto
E-mail: spalmare@twu.edu
Hablo Espanol

APPENDIX F
IRB Approval

Institutional Review Board

Office of Research
6700 Fannin, Houston, TX 77030
713-794-2480
mjackson3@twu.edu
<http://www.twu.edu/irb.html>

DATE: October 23, 2014

TO: Ms. Sulema E. Palmarez
College of Nursing – Houston

FROM: Institutional Review Board - Houston

Re: Extension for Telephonic RN Case Management, Functional Health, and Lost Work Days among Injured Workers with Low Back Pain (Protocol #: 17125)

The request for an extension of your IRB approval for the above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. If subject recruitment is on-going, a copy of the approved consent form with the IRB approval stamp is enclosed. Please use the consent form with the most recent approval date stamp when obtaining consent from your participants. A copy of the signed consent forms must be submitted with the request to close the study file at the completion of the study.

This extension is valid one year from October 14, 2014. Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any unanticipated incidents. All forms are located on the IRB website. If you have any questions, please contact the TWU IRB.

Ann Malecha, PhD, College of Nursing - Houston
Dr. Brenda Binder, College of Nursing - Houston
Graduate School
cc.

APPENDIX G

Intervention Consent Form English

TEXAS WOMAN'S UNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

Title: Effectiveness of Telephonic RN Case Management on Functional Health and Lost Work Days Among Injured Workers

Investigator: Sulema (Sue) Palmarez,spalmare@twu.edu 832/451-5304
Advisor: Ann Malecha,amalecha@twu.edu 713/794-2725

Explanation and Purpose of the Research

You are being asked to participate in a research study for Ms. Palmarez' dissertation at Texas Woman's University. The purpose of this research is to determine the effect of RN case management intervention on injured workers. You have been asked to participate in this study because you have identified yourself as a person who injured yourself while at work

Description of Procedures

As a participant in this study you will be asked to spend a maximum total time commitment of 210 minutes. The initial enrollment process takes about 60 minutes and I will ask you demographic questions such as your age, race, injury date and type, and contact information. The telephone calls will take about 120 minutes. The phone calls will occur twice a week for a maximum of six weeks. Each phone call will last a maximum of ten minutes. In 6 weeks, I will telephone you and that call will take about 30 minutes. During that call I will ask you questions about your health and return to work status.

Potential Risks

Potential risks related to your participation in the study include experiencing some inconvenience due to the time involved in answering the questions or feeling uncomfortable answering some of the questions. If you become tired or upset you may take breaks as needed. You may also stop answering questions at any time and end the interview. If you feel you need to talk to a professional about your discomfort, you are encouraged to talk to your health care provider as soon as possible.

Initials
Page 1 of 2

Approved by the
Texas Woman's University
Institutional Review Board
Date: 1/22/15 RW

Another risk in this study is loss of confidentiality. Confidentiality will be protected to the extent that is allowed by law. All forms and information related to the study will be kept in a secure, locked office in the researcher's home office. Only the researcher will have access to this information. An ID number will be assigned to you and only this ID number will be used for computer data entry. The written notes and forms will be shredded within 5 years after the study is finished. The results of the study will be reported in scientific magazines or journals but your name or any other identifying information will not be included.

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

Participation and Benefits

Your involvement in this study is completely voluntary and you may withdraw from the study at any time. There will be no payment for participation in this study. If you would like to know the results of this study we will mail them to you.*

Questions Regarding the Study

You will be given a copy of this signed and dated consent form to keep. If you have any questions about the research study you should ask the researchers; their phone numbers are at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted, you may contact the Texas Woman's University Office of Research at 713-794-2480 or via e-mail at IRB@twu.edu.

Signature of Participant

Date

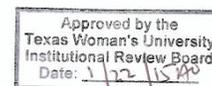
The above consent form was read, discussed, and signed in my presence. In my opinion, the person signing said consent form did so freely and with full knowledge of its contents.

Signature of Investigator

Date

*If you would like to know the results of this study tell us where you want them to be sent:

Email: _____ or Address:



APPENDIX H

Intervention Consent Form Spanish

TEXAS WOMAN'S UNIVERSITY
CONSENTIMIENTO PARA PARTICIPAR EN LA INVESTIGACIÓN

Title: La eficacia de una intervención telefónica de enfermera registrada manejadora de casos, salud funcional y días de trabajo perdidos entre trabajadores lesionados: un estudio clínico controlado aleatorizado

Investigador: Sulema (Sue) Palmarez,spalmare@twu.edu 832/451-5304
Aconsejador: Ann Malecha, amalecha@twu.edu 713/794-2725

Explicación y Propósito de la Investigación

Se le pide participar en un estudio de investigación para la tesis doctoral de la Sra. Palmarez en la Universidad, Texas Woman's University. El propósito de esta investigación es determinar el efecto de una intervención de la enfermera manejadora de casos en trabajadores lesionados. Le han pedido participar en este estudio porque usted ha identificado como una persona que se lesionó en el trabajo.

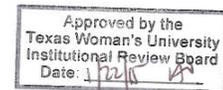
Descripción de Procedimientos

Como participante en este estudio, se le pedirá pasar un compromiso de tiempo total máximo de 210 minutos. El proceso de inscripción inicial tarda alrededor de 60 minutos y le preguntare cuestiones demográficas tales como su edad, raza, fecha de la lesión y tipo, e información de contacto. Las llamadas telefónicas se llevará alrededor de 120 minutos. Las llamadas se producirá dos veces por semana durante un máximo de seis semanas. Cada llamada telefónica durará un máximo de diez minutos. En 6 semanas, voy hacer una llamada telefonica y esa llamada tomará aproximadamente 30 minutos. Durante esa llamada voy hacerle preguntas sobre su salud y volver al Estado de trabajo.

Riesgo Potenciales

Los riesgos potenciales relacionados con su participación en el estudio incluyen experimentando algún inconveniente debido al tiempo en responder a las preguntas o sentirse incómodo contestar algunas de las preguntas. Si se siente cansado o molesto podrá tomar descansos según sea necesario. También puede dejar de responder a las preguntas en cualquier momento y poner fin a la entrevista. Si siente que necesita hablar con un profesional de su malestar, se anima a hablar con su proveedor de atención médica tan pronto como sea posible.

Iniciales
Pagina 1 de 2



APPENDIX I

Control Consent Form English

TEXAS WOMAN'S UNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

Title: Effectiveness of Telephonic RN Case Management on Functional Health and Lost Work Days Among Injured Workers

Investigator: Sulema (Sue) Palmarezspalmare@twu.edu 832/451-5304
Advisor: Ann Malechaamalecha@twu.edu 713/794-2725

Explanation and Purpose of the Research

You are being asked to participate in a research study for Ms. Palmarez's dissertation at Texas Woman's University. The purpose of this research is to determine the effect of an RN case management intervention on injured workers. You have been asked to participate in this study because you have identified yourself as a person who injured yourself while at work and have a musculoskeletal injury.

Description of Procedures

As a participant in this study you will be asked to spend a maximum total time commitment of 75 minutes. The initial enrollment process takes about 45 minutes and I will ask you demographic questions such as your age, race, injury date and type, and contact information. In 6 weeks, I will telephone you and that call will take about 30 minutes. During that call I will ask you questions about your health and return to work status.

Potential Risks

Potential risks related to your participation in the study include experiencing some inconvenience due to the time involved in answering the questions or feeling uncomfortable answering some of the questions. If you become tired or upset you may take breaks as needed. You may also stop answering questions at any time and end the interview. If you feel you need to talk to a professional about your discomfort, you are encouraged to talk to your health care provider as soon as possible.

Another risk in this study is loss of confidentiality. Confidentiality will be protected to the extent that is allowed by law. All forms and information related to the study will be kept in a secure, locked office in the researcher's home office. Only the researcher will have access to this information. An ID number will be assigned to you and only this ID number will be used for computer data entry. The written notes and forms will be shredded within 5 years after the study is finished. The results of the study will be reported in scientific magazines or journals but your name or any other identifying information will not be included.

Initials
Page 1 of 2

Approved by the
Texas Woman's University
Institutional Review Board
Date: 10-14-14 MSB

APPENDIX J

Control Consent Form Spanish

TEXAS WOMAN'S UNIVERSITY
CONSENTIMIENTO PARA PARTICIPAR EN LA INVESTIGACIÓN

Title: La eficacia de una intervención telefónica de enfermera registrada manejadora de casos, salud funcional y días de trabajo perdidos entre trabajadores lesionados

Investigador: Sulema (Sue) Palmarezspalmare@twu.edu 832/451-5304
Aconsejador: Ann Malecha amalecha@twu.edu 713/794-2725

Explicación y Propósito de la Investigación

Se le pide participar en un estudio de investigación para la tesis doctoral de la Sra. Palmarez en la Universidad, Texas Woman's University. El propósito de esta investigación es determinar el efecto de una intervención de la enfermera manejadora de casos en trabajadores lesionados. Le han pedido participar en este estudio porque usted ha identificado como una persona que se lesionó en el trabajo.

Descripción de Procedios

Como participante en este estudio, se le pedirá pasar un compromiso de tiempo total máximo de 75 minutos. El proceso de inscripción inicial tarda alrededor de 45 minutos y le preguntare cuestiones demográficas tales como su edad, raza, fecha de la lesión y tipo, e información de contacto. En 6 semanas, le llamare por teléfono y esa llamada tardará unos 30 minutos. Durante esa llamada voy hacerle preguntas sobre su salud y volver al estado de trabajo.

Riesgo Potenciales

Los riesgos potenciales relacionados con su participación en el estudio incluyen experimentando algún inconveniente debido al tiempo en responder a las preguntas o sentirse incómodo contestar algunas de las preguntas. Si se siente cansado o molesto podrá tomar descansos según sea necesario. También puede dejar de responder a las preguntas en cualquier momento y poner fin a la entrevista. Si siente que necesita hablar con un profesional de su malestar, se anima a hablar con su proveedor de atención médica tan pronto como sea posible.

Otro riesgo en este estudio es la pérdida de confidencialidad. Confidencialidad estarán protegido en la medida en que es permitido por la ley. Todos los formularios e información relacionados con el estudio se mantendrá en una Oficina de segura, bloqueada en la Oficina de casa del investigador. Sólo el investigador tendrá acceso a esta información. Se asignará un número de identificación para usted y sólo este número de identificación se utilizará para entrada de datos. Las notas escritas y las formas se destruyen dentro de 5 años después de terminado el estudio. Los resultados del estudio serán reportados en revistas científicas o en revistas, pero su nombre o cualquier otra información de identificación no serán incluido.

Iniciales
Pagina 1 de 2

Approved by the
Texas Woman's University
Institutional Review Board
Date: 10/14/14 MFB

APPENDIX K
Demographics Form

Demographics Form

| | |
|---|---|
| Participant's Code Number: | Date: |
| Gender: M_____ F_____ | Age: |
| Race: | |
| Ethnicity: | |
| Primary (preferred) Language: | |
| Occupation: | Physical Demand Level: |
| Current Musculoskeletal Problems: | |
| Prior Musculoskeletal Problems: | |
| Surgical History: | |
| Medications: | |
| Medication Allergies: | |
| Physical Therapy (PT) Site: | Number and Frequency of PT visits: |
| Intake Job Availability/Work Status: | End of 6 weeks Job Availability/Work Status: |