

RESILIENCE AND HEALTH OUTCOMES IN PATIENTS WITH TRAUMATIC INJURY

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Due to the increasing healthcare costs and reduced length of hospital stay it is becoming increasingly important to identify individuals who are 'at risk' of experiencing long-term health issues. The purpose of the study was to: (1) determine if resilience, self efficacy and depression changed from inpatient to 3-month follow up; (2) examine the relationship between resilience, self efficacy, depression, and quality of life (social roles/activity limitations) at inpatient and 3-month follow up; and (3) identify if resilience at inpatient is related to change scores in self-efficacy and depression at 3-month follow up. Results from the paired sample *t*-test indicated that participants did not experience a significant change from inpatient to 3-month follow up in resilience or self-efficacy, but a significant decrease in depression was observed. Findings also indicated significant correlations between resilience, self-efficacy, and depression during inpatient stay and resilience, self-efficacy, depression, and quality of life at 3-month follow up. However, there was no relationship found between resilience and change scores in self-efficacy and depression. Future resilience research should continue to identify the variables that are most strongly related to resilience so effective interventions can be developed that improve rehabilitation outcomes, decrease secondary and chronic conditions as well as aid in the successful reintegration of individuals into their lives after a traumatic injury.

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RESILIENCE AND HEALTH OUTCOMES IN PATIENTS WITH TRAUMATIC INJURY

Introduction

Traumatic injuries are a serious public health issue due to the high incidence, complexity of the disability, and subsequent healthcare costs. Traumatic injuries include traumatic brain injuries (TBI), spinal cord injuries (SCI), and multi traumas. Annually, an estimated 1.4 million Americans sustain a TBI (Faul, Wald, & Coronado, 2010) and 12,000 Americans acquire a SCI. In the United States there are currently 5.3 million people living with a TBI (Rutland-Brown, Langlois, Thomas, & Yongli Lily Xi, 2006) and 255,000 people living with a SCI (Spinal Cord Injury Information Network, 2008).

Traumatic injuries can be caused by a number of different factors with the most prevalent being a fall (35.2%), followed by a motor vehicle accident (17.3%), and an assault (10%) (Faul et al., 2010). Traumatic injuries are extremely complex disabilities and can result in numerous associated, secondary and chronic conditions. Associated conditions are health issues that are directly caused by the injury, such as, muscle spasticity, seizures, and aphasia. Secondary conditions are health concerns that are not a direct result of the primary disability but rather are acquired at a later time due to lifestyle changes associated with the disability (e.g., pressure sores, pain, depression) (Rimmer & Rowland, 2008). For example, depression is a common secondary condition seen in individuals with SCI and is related to longer hospital stays, pressure sores, urinary tract infections, spending more time in bed, and increased overall medical expenses (Richards, Kewman, & Pierce, 2000). Chronic conditions are related to poor overall health caused by associated and secondary conditions, and can include heart disease, diabetes, and arthritis. Each of these conditions, (i.e., associated, secondary and chronic) have an impact

on one's health and, without the correct care or intervention, can play a significant role in a negative health spiral, placing a greater burden on the healthcare system.

Consequently, clinicians are challenged to find modes of rehabilitation that can improve health outcomes (e.g., quality of life, depression, healthcare utilization) during the rehabilitation process by enabling individuals to manage associated conditions and avoid secondary and chronic conditions. However, optimizing the rehabilitation process is becoming especially challenging due to the decrease in the inpatient hospitalization period. For example, the typical length of stay following an SCI in 1973 was 115 days compared to 2005 where it was 36 days (National Spinal Cord Injury Statistical Center (NSCISC), 2009). This pattern is also true for patients with a TBI. In 1990 the typical length of stay in a rehabilitation hospital was 48 days, by 1995 it was reduced to 29 days, and has remained constant over the last decade (Ashley, O'Shanick, & Kreber, 2009). The decreased length of inpatient rehabilitation after a traumatic injury has been attributed to high medical costs, which have increased significantly over the last several decades (Ashley et al., 2009). For example, in 2000, direct and indirect (e.g., loss of productivity) medical costs in the United States for TBI totaled an estimated \$60 billion (Finkelstein, Corso, & Miller, 2006), with the average per-person lifetime cost of care for TBI reaching as high as \$1.8 million (National Institute of Health, 2008). Furthermore, in the United States SCIs cost an estimated \$9.3 billion (National Spinal Cord Injury Statistical Center (NSCISC), 2009) with the average per-person lifetime costs totaling around \$3.1 million (National Institute of Health, 2008). The increased costs seen in healthcare can be attributed to the secondary and chronic conditions experienced, which are largely avoidable if identified and managed early (Cardenas, Hoffman, Kirshblum, & McKinley, 2004).

Therefore, due to the increasing healthcare costs it becomes significantly more important to identify individuals undergoing inpatient rehabilitation who are at risk of experiencing long-term health issues (e.g., increased secondary and chronic conditions experienced) so steps can be taken to intervene. Despite this fact, there is currently not an effective method of identifying these at risk patients. However, one variable that has attracted interest is resilience, which refers to an individual's ability to adapt in the face of tragedy, trauma, adversity, or ongoing stress (Campbell-Sills, Cohan, & Stein, 2006; Connor & Davidson, 2003; Newman, 2005). A growing body of literature indicates that resilience is closely related to psychosocial characteristics (e.g., affect, perceived social support, personal control, spirituality) both acutely (White, Driver, & Warren, 2010) and chronically (Quale & Schanke, 2010) after a traumatic injury. However, research has not examined the relationship between resilience and key rehabilitation health outcomes (e.g., self-efficacy, depression, quality of life) for individuals with a traumatic injury at different stages of the rehabilitation process.

Therefore, the purposes of this study were to (a) determine if resilience, self-efficacy and depression changed from inpatient to three month follow up, (b) examine the relationship between resilience, self-efficacy, depression, and quality of life at inpatient and three month follow up, and (c) examine if resilience during inpatient rehabilitation was related to change scores in health outcomes (e.g., self-efficacy, depression,) for individuals with traumatic injuries. If resilience during inpatient stay is identified as being related to change scores in self-efficacy and depression at three month follow up then individuals who report having low resilience at inpatient stay could be considered at risk for poor long term health (i.e., low resilience, self-efficacy, and quality of life, high depression which would have significant clinical implications.

Theoretical Framework of Resilience

Resilience is a relatively new variable in psychology; therefore, limited theoretical approaches have been developed. However, theory is important for guiding research and providing a conceptually coherent framework upon which to develop and test hypotheses (Wilson, 2004). The current study is grounded in Richardson's model (see Figure 1) as it describes different resilience pathways that individuals can follow after a traumatic event and suggests that certain health outcomes are associated with the different pathways.

Richardson's model begins with an explanation of "biopsychospiritual homeostasis" which is considered a state of adaptation (e.g., mind, body and spirit) that can be either positive or negative. This "homeostasis" during daily life is constantly challenged by internal (e.g., thoughts and feelings) and external life prompts (e.g., new bits of information, new experiences, recurring thoughts), stressors, adversity, opportunities and other forms of change, such as a traumatic injury (Richardson, 2002). According to the model, resilience is the balance between an individual's life challenges and their own innate qualities (e.g., protective factors or developmental assets) that help them to buffer stress and allow balance (e.g., homeostasis). A traumatic event often marks the beginning of an imbalance in the individual's biopsychospiritual homeostasis. For example, a woman experienced an SCI and now needed help with her activities of daily living has undergone a disruption to her homeostasis. According to Richardson, how an individual reacts to a traumatic event is determined by their resilience and results in an individual following one of four pathways during recovery including (a) resilient reintegration (e.g., acknowledge limitations after a traumatic injury, and develop new interests and activities, high self-efficacy and quality of life), (b) reintegration back to homeostasis (e.g., life activities return

to homeostasis), (c) reintegration with loss (e.g., a woman who can no longer drive) and (d) dysfunctional reintegration (e.g., depression, low quality of life, low self-efficacy). Ideally once an individual begins rehabilitation they would follow the resilient reintegration or reintegration back to homeostasis pathway leading to a chance of positive recovery and more positive health outcomes. If an individual reintegrates dysfunctionally or with loss (e.g., lack of healthy support system, poor self-efficacy, greater depression) then the individual will likely continue in the state of disruption (e.g., experience secondary conditions, fail to return to work).

Resilience – State or Trait?

There is debate within the resilience literature about whether resilience is a state or trait like quality. For example, does resilience change over time with proper intervention or is it stable across time – and this question has not been definitively answered. Richardson (Richardson, 2002) refers to resilience as a “choice” suggesting that resilience is a more state-like involving behaviors, thoughts and actions, which can be learned over time. This viewpoint, which is supported by the American Psychological Association (APA Help Center from the American Psychological Association, 2006), suggests that an individual's level of resilience could change overtime if the proper interventions are put in place. Richardson (Richardson, 2002) suggests interventions should play to an individual's personal growth and strength to uncover their protective layers, their denial, and anger toward the situation in order to discover an individual's innate resilience.

Resilience has also often been viewed as a personality trait, which is rather stable and does not change much over a period of time (Newman, 2005). The suggestion that resilience is trait-like is usually based on the Big Five personality factor point of view, which suggests that people who are resilient display specific personality traits (e.g., conscientiousness, extroversion,

agreeableness) (McCrae & Costa, 1997). For example, research has indicated that more resilient people (e.g., able to successfully rehabilitate from trauma) are emotionally stable, open, conscientious, and extroverted (Davey, Eaker, & Walters, 2003; Riolli, Savicki, & Cepani, 2002). This notion is supported by several research studies which posit that resilience is „trait like, with findings reporting that an individual s resilience remained stable overtime (Newman, 2005; White et al., 2010). Regardless of the difference in the trait versus state point of view, research has consistently demonstrated that individuals with greater resilience are able to overcome hardships more successfully.

Resilience Research

The concept of resilience was examined in the 1980s and was first termed “hardiness” by Kobasa et al. (Kobasa, Maddi, & Kahn, 1982) and consisted of three dimensions: (a) being committed to finding meaningful purpose in life, (b) the belief that one can influence one s surrounding and the outcome of events, and (c) the belief that one can learn and grow from both positive and negative life experiences. Initially, research published on the topic of resilience commonly focused on school-aged children (Luthar, 2006), until the “positive psychology” movement and events such as 9/11 turned attention onto individuals who had been exposed to a traumatic event. Originally, resilience among individuals who had experienced a traumatic event was only thought to occur in pathological or exceptionally healthy individuals (Bonanno, 2005). However, research has found that most individuals who are exposed to traumatic events follow relatively stable patterns or pathways of “healthy functioning coupled with the enduring capacity for positive emotion and generative experiences” (Bonanno, 2005). One of Bonanno s key points is that even though resilient individuals may experience an initial spike in distress or difficulty maintaining their psychological equilibrium, (e.g., biopsychospiritual homeostasis), they manage

to keep functioning effectively at or near normal levels. Furthermore, Mancini and Bonanno state that the majority of people “maintain relatively stable, healthy levels of psychological and physical functioning.” (Mancini & Bonanno, 2006). This suggestion has been supported by several studies completed by Bonanno and colleagues who have typically found that 35-55% of people affected by loss or trauma (e.g., violent or life threatening occurrences, death of close friend or relative) follow the resilience pathway (Bonanno, 2004; Bonanno, 2005). As a result of the growing interest in the construct of resilience, researchers began to examine the concept among individuals who have experienced a traumatic injury.

For example, Quale and Schanke examined pathways of psychological adjustment (i.e., resilience, recovery, distress) of 80 participants (*Mean* = 39.1, *SD* = 15.6) following a physical injury (e.g., severe multi trauma or SCI). The individual's psychosocial pathway was determined by measuring satisfaction with social support, injury severity, PTSD, anxiety, depression, positive affect and negative affect, optimism and pessimism. Questionnaires and semi-structured psychological interviews were administered (a) 1-3 weeks after admittance to the rehabilitation hospital (Median day since injury = 38.5 days), and (b) within a week before discharge (median days since injury = 121 days). Based on the individual's psychological distress and state positive affect, participants were classified into one of three pathways: resilience (defined as having low distress and high state positive affect at both admittance and discharge), recovery (measured by improvements on at least one of the symptom scales), or distress (defined as high distress, high state negative affect, or low state positive affect at both admit and discharge). Results indicated that the resilience pathway (54%) was most prevalent, followed by recovery (25%) and finally distress (21%). The differences between the pathways were the result of optimism, affect, social support and pain. It is important to note that none of the participant's changed pathway from

Time 1 to Time 2, suggesting that resilience is perhaps “trait like” and can be associated with psychosocial adjustment after a traumatic event. However, these results do not indicate how resilience is related to long-term health outcomes that are critical to the rehabilitation process (e.g., such as self-efficacy to manage the disability, quality of life, or healthcare utilization) and the study did not intervene to increase resilience in any way.

In another study, White, Driver and Warren examined changes in resilience and indicators of adjustment (i.e., satisfaction with life, depressive symptomatology, spirituality, functional independence) in 42 individuals with a SCI during inpatient rehabilitation. A repeated measures design was used with questionnaires completed at 3 different points during rehabilitation (i.e., admit, 3 weeks, and discharge). Results demonstrated no significant change in resilience but significant changes for each indicator of adjustment. Significant correlations were also found between resilience, satisfaction with life, spirituality and depressive symptoms. Results again indicate the trait like nature of resilience and relationship to rehabilitation outcomes. However, results did not identify a relationship between resilience and long-term health outcomes.

deRoon-Cassini et al. (deRoon-Cassini, Rusch, Mancini, & Bonanno, 2010) also investigated the relationship between resilience and health outcomes (i.e., self-efficacy, PTSD, and depression) following traumatic injuries (e.g., motor vehicle crash, fall, assault) in 330 participants during rehabilitation (M age = 40.4, SD = 15.8). Participants completed in-person interviews while hospitalized followed by telephone interviews at 1, 3 and 6 months post discharge. Each follow-up interview included questionnaire assessments of depression, self-efficacy and posttraumatic stress disorder (PTSD). After initial assessment, participants were classified into four groups or pathways: chronic distress, delayed distress, recovered, and

resilient. Again, these pathways were parallel to those described in the theoretical framework by Richardson. First, individuals in the chronic distress group demonstrated PTSD and depressive symptoms that increased from hospitalization to measurement at six months. Second, participants in the delayed distress group reported an increase in PTSD and depressive symptoms, with a dramatic increase between measurements at three months and six months. Third, the recovered group peaked in PTSD and depression at 3 months and then returned to baseline at the six-month follow-up. Finally, the resilient group remained stable from hospitalization through six months, with no apparent increase or decrease in PTSD and depressive symptomatology. These findings suggest that those individuals who are found to be resilient at the start of rehabilitation will continue down a resilient path and demonstrate an overall better recovery with fewer long-term psychosocial issues.

Overall, despite the belief that most people follow this resilient, stable pattern there is little research examining whether resilience is related to long-term health outcomes for individuals after a traumatic injury. Consequently, it is important to identify if resilience is related to a patient's long-term health so that at risk individuals can be identified as early in the rehabilitation process as possible. Previous research has identified several variables that are considered key rehabilitation outcomes related to the individual's health including self-efficacy to manage the disability, depression, and quality of life.

Despite the difference in the trait versus state perspective, research has consistently demonstrated that more resilient individuals were able to overcome adversity more successfully. However, little research has been completed examining the relationship between resilience and key health outcomes (e.g., self-efficacy, depression and quality of life) after a traumatic injury.

Self-efficacy

Self-efficacy is frequently used across scientific disciplines (e.g., health and social sciences) and is defined as an individual's beliefs about his/her likelihood to engage in a certain behavior (Bandura, 1986). Self-efficacy is a key variable in rehabilitation as it provides a means for understanding an individual's willingness to engage in a behavior (e.g., medication compliance, look for a job, dress oneself) when adjusting to a disability (O'Sullivan & Strauser, 2009). Individuals who are adjusting to a new disability are vulnerable to many of the factors that influence efficacy, including an inability to get a job, dress independently, get around by oneself, and set unrealistic expectations (e.g., function like pre-injury) as well as uncontrollable factors (e.g., insurance issues, loss of caregiver, relapse in rehabilitation) (O'Sullivan & Strauser, 2009). Furthermore, self-efficacy to manage the disability is critical if individuals are to manage associated conditions and prevent secondary and chronic conditions (Rimmer & Rowland, 2008). For example, individuals with high self-efficacy to manage their disability are more than likely to complete the steps to manage their condition. Consequently, self-efficacy to manage a disability is considered a key health outcome during rehabilitation. Several studies have demonstrated the role that self-efficacy to manage a disability plays on rehabilitation outcomes (e.g., return to work, community functioning).

Tsaousides and colleagues (Tsaousides et al., 2009) examined the relationship between employment-related and general self-efficacy on quality of life (i.e., ability to return to work) for individuals with a TBI. Participants included 427 individuals with a TBI under the age of 65. Results found that employment-related and general self-efficacy were strongly related to quality of life. For example, individuals who reported increased self-efficacy in their ability to meet the demands of employment and life reported higher perceptions of quality of life. In addition, self-

efficacy was found to be a better predictor of quality of life than employment status. Results emphasize the central role that self-efficacy plays on the rehabilitation process and one's quality of life post-rehabilitation. The study also demonstrates that self-efficacy is a critical component to an individual's ability to recover and return to biopsychospiritual homeostasis after an injury.

The central role of self-efficacy in the rehabilitation process has also been highlighted by Cicerone and Azulay who looked at self-efficacy and life satisfaction after a TBI. Participants included 97 adults (e.g., 18 and over) who were living in their community with or without assistance for at least 6 months after sustaining a TBI. The primary finding was that self-efficacy had a strong and consistent association with an individual's life satisfaction and was the greatest predictor of quality of life after a TBI. It was also found that self-efficacy beliefs mediated the relationship between community functioning (e.g., return to work, and community participation) and general life satisfaction (e.g., quality of life). For example, individuals with higher self-efficacy were more likely to have high general life satisfaction, which in turn increased the individual's community participation. This finding is critical as community participation is a key rehabilitation outcome that is often used to evaluate if an individual has recovered successfully (Griffen, Hanks, & Meachen, 2010). The findings by Cicerone et al. reinforce the notion that self-efficacy is central to an individual's positive rehabilitation and a critical health outcome post injury.

Depression

Depression is one of the most common and disabling psychiatric disorders (Araon & Chatav, 2003) and is a secondary condition for individuals with any type of traumatic injury (Stalnacke, 2007). Research has shown that depression is a key health outcome post injury which affects a number of other areas, such as one's ability to integrate into the community, overall life

satisfaction, and social support post injury (Stalnacke, 2007). However, oftentimes depression at the time of injury is not necessarily indicative of depression at 3, 6, or 12 months post injury, as „individuals may experience an initial, brief spike in distress or may struggle for a short period to maintain equilibrium” (pg. 135), but most individuals are likely to adjust (G. Bonanno, 2005). White et al, also demonstrated that those individuals who receive depression intervention (i.e., cognitive-behavioral therapy, medication) post traumatic injury experience significantly lower depressive symptomatology. Thus, depression is different to resilience, which is believed to be more trait-like and not change over time.

Hibbard and colleagues (Hibbard et al., 2004) examined the relationship between depression and key components of the rehabilitation process (e.g., quality of life, social roles and responsibilities) in 188 individuals with a TBI living in the community. Participants were placed into 4 groups based on observed depression patterns at initial and repeat assessment, which included (a) no-depression, (b) resolved-depression, (c) late-onset-depression, and (d) chronic-depression. Results indicated that individuals in the no-depression group reported fewer depressive symptoms and improved social roles and responsibilities (e.g., grocery shopping, family events). In contrast, those in the chronic-depression group reported significant depressive symptomatology and limited social roles and responsibilities. Individuals in the resolved-depression group had improved rehabilitation outcomes at the one-year follow up, while those in the late-onset-depression group had poor rehabilitation outcomes at follow up. These findings demonstrate the important role that depression can play in the rehabilitation process, and why it is considered a key health outcome post injury (Stalnacke, 2007).

Quality of Life

Another critical health outcome post injury is quality of life (i.e., life satisfaction). Quality of life (QOL) has several broad definitions, but in physical health and medicine it refers to a person or group's perceived physical and mental health over time (Centers for Disease Control and Prevention, 2010). Within a rehabilitation environment, QOL is typically conceptualized by how much an individual's illness/disability interferes with their ability to return to their everyday roles and become active members of the community (Doig & Fleming, 2001). Participation in community activities provides meaning to everyday life as social activities can enhance structure and satisfaction (e.g., quality of life) to daily living (Ostir, Smith, & Ottenbacher, 2005) although many things after a disability (e.g., physical, cognitive, psychosocial functioning, etc.) can limit participation in social activities (Doig & Fleming, 2001). For example, Doig and her colleagues (Doig & Fleming, 2001) examined this relationship in patterns of community integration 2-5 years after a TBI in 208 individuals. Participants were divided into three groups including working, balanced, and poorly integrated group. Results showed that 38% of individuals fit into the working group and had returned to a high level of community integration and a productive life style (e.g., return to work, volunteer, return to school). The balanced group consisted of 22% of the individuals who had achieved a balanced lifestyle (e.g., part-time work, school). The remaining 40% were considered as the poorly integrated group (e.g., decreased rate of return to work, volunteer, school) with overall low levels of integration across all areas. QOL is an important health outcome and it is critical for health professionals to help individuals return to productive activity (e.g., full time or part time employment, volunteering, recreational activities).

Overall, resilience is considered an important variable in helping to understand why some individuals are able to deal with a traumatic event more successfully than others (White, Driver, & Warren, 2010). A growing body of literature suggests that individuals follow resilient (e.g., positive) pathways to recovery or dysfunctional (e.g., negative) pathways and that health outcomes are associated with these pathways. While several studies have examined the relationship between psychosocial variables and resilience, none have explored the long-term relationship between resilience and key rehabilitation health outcomes (e.g., self-efficacy, depression, QOL) post injury.

Purpose

Consequently, the purpose of the study was to (a) determine if resilience, self-efficacy and depression changed from inpatient to three month follow up, (b) examine the relationship between resilience, self efficacy, depression, and QOL at inpatient and three month follow up, and (c) identify if resilience at inpatient is related to change scores in self-efficacy and depression at three month follow up. Based upon previous research it is hypothesized that (a) resilience and self-efficacy will not change, self-efficacy will increase and depression will decrease from inpatient to three-month follow up, (b) resilience will have a significant relationship with self-efficacy, depression, and quality of life (social roles/activity limitations) at inpatient and three-month follow up, and (c) resilience will be related to change scores in depression and self-efficacy at three-month follow up.

METHODOLOGY

Participants

Approval to complete the study was received from the Institutional Review Board at Baylor Research Institute. Participants included 30 inpatients between the ages of 18-63 at Baylor Institute for Rehabilitation who had sustained a traumatic injury (i.e., spinal cord, brain injury, multi- trauma, amputee) and were within their first three weeks in the rehabilitation program. Each participant was undergoing inpatient rehabilitation that includes an interdisciplinary approach to treatment (i.e., physical, occupational, speech therapy, therapeutic recreation, social work, and neuropsychology) which focuses on meeting the participant's outcome goal(s) (e.g., return to work, school, or leisure activities).

A convenience sample was utilized with multiple inclusion and exclusion criteria. Inclusion criteria included (a) female or male, (b) aged 18 or older, (c) experienced a traumatic injury, (d) undergoing comprehensive inpatient rehabilitation, and (e) with no severe cognitive impairment. Exclusion criteria included (a) younger than 18, (b) non-traumatic injury (e.g., re-occurring injury, stroke), (c) severe cognitive impairment, and (d) pre-mental illness and or pre-morbid developmental disability. Patients with any diagnosed cognitive deficit (i.e., TBI) were routinely assessed by the treating neuropsychologist who made a determination of the patient's cognitive ability to participate in the study.

Procedure

Those patients who meet the inclusion/exclusion criteria were approached for consent within the first three weeks of inpatient rehabilitation in a private setting at Baylor Institute for Rehabilitation (BIR). Individuals were informed about the purpose of the study, requirements, and told all information collected would be confidential and non-identifiable. Those patients who

provided consent were scheduled for a 20-minute session (within 2 to 3 days of consent) to complete pre-test measures in a private room. Each participant completed the demographic Form A and B and a series of questionnaires assessing resilience, self-efficacy, and depression (see Figure 2). The demographic data included information on race/ethnicity, gender, age, marital status, years of education, income, occupation, family status, and more (see Appendix A – Form A). In addition, questions on Form B assessed pain, personal care needs, anxiety, sleep and overall general health (e.g., over the past 30 days how many days has pain made it hard for you to participate in your daily activities). The questions in Form B were also completed at follow up (Appendix A - Form B). Finally, data was collected by clinicians to describe the physical, cognitive, and psychosocial characteristics of participants, which included the Functional Independence Measure (Wright, 2000), and the Glasgow Coma Scale (Teasdale & Jennett, 1974). All demographic variables were collected to develop an understanding of the participants defining characteristics.

Individuals at BIR received a multidisciplinary approach to therapy that included physical, occupational, and aquatic therapy. Patients also received treatment for depression through group therapy, individual sessions, as well as antidepressant medications. However, individuals at BIR did not receive any type of resilience or self-efficacy intervention during inpatient rehabilitation.

After discharge from the inpatient program (M time = 5 weeks) participants were contacted at three months following the initial assessment. The rationale behind the three-month follow-up was due to an article by deRoos-Cassini et al. (2010), who looked at psychopathology and resilience at three-month and six-month follow-ups and was believed to be an appropriate time point to allow for reintegration into the community. The participant selected their preferred

method of follow-up during the consent process which included two options (a) electronically (via electronic survey) or (b) telephonically. Participants were contacted via their preferred method one week before their scheduled three month follow up to remind them of the upcoming assessment. At each follow-up period participants completed demographic Form B, and the same three questionnaires administered during the inpatient procedure (i.e., resilience, self-efficacy, depression). In addition, participants completed a questionnaire assessing social roles/limitations (quality of life) and four items about healthcare utilization. If participants chose to be contacted electronically for their follow up they were sent a link to a survey (using Qualtrics software). If participants chose to be contacted by telephone a script including the questionnaires was read to the participant by a research assistant. After data was collected it was entered into a PASW spreadsheet that was coded with the participant's identification number. The completed participant files were put in a file and coded with the participant's identification number and stored in a locked cabinet in a locked office at BIR.

Measures

A pilot study was conducted at BIR with 17 individuals who were undergoing comprehensive inpatient rehabilitation. The pilot study was conducted to increase the likelihood that the questionnaires and procedure were reliable. Participants were recruited using the same inclusion and exclusion criteria described for the full study. First, the stability (test-retest reliability) of the questionnaires was determined by administering the measures during the first three weeks of rehabilitation and then one week later. Second the internal consistencies of the measures were calculated. The results of these analyses are included in the description of each measure (see below).

The Connor-Davidson Resilience Scale (CD-RISC) short form was used to measure resilience (Campbell-Sills & Stein, 2007). The measure consists of 10 items using a 5-point Likert scale ranging from 0 (*not true at all*) to 4 (*true nearly all of the time*). The scale measures how the participant felt over the past month (e.g., “I like challenges”). The questionnaire produces an overall resilience score that ranges from 0-40, with higher scores representing greater resilience. Evidence demonstrates high reliability and validity of the CD-RISC for adults (Campbell-Sills & Stein, 2007; Connor & Davidson, 2003). The measure has also been used with adults who have experienced a SCI (B. White et al., 2010). Within the current study, an alpha coefficient of .85 was reported for the CD-RISC and the test-retest value was .81.

The Self-Efficacy for Managing Chronic Disease/Disability 6-Item Scale (K. R. Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001) was used to determine participants' self-efficacy in managing their chronic disability. The questionnaire consists of six questions that use a 10-point Likert scale that ranges from 1 (*not at all confident*) to 10 (*totally confident*). The scale examines patients' belief in their ability to manage their disability (e.g., “How confident are you that you can keep the emotional distress caused by your disability from interfering with the things you want to do”). Scores are the mean of the six items with lower scores indicating lower self-efficacy and higher scores indicating increased self-efficacy (K. Lorig et al., 1996). Evidence of the reliability and validity for this 6-item scale has been provided by Lorig and colleagues (K. R. Lorig et al., 2001). Within the current study, alpha coefficients of .87 were reported and the test-retest value was .85.

The Personal Health Questionnaire – 9 *Depression Scale* (PHQ-9) was used to assess the patient's depressive symptoms. The PHQ-9 is a nine-item self-report measure that is widely used in rehabilitation centers, with extensive evidence supporting its usefulness in identifying

and diagnosing major depressive disorder (Bombardier, Richards, Krause, Tulsy, & Tate, 2004; Kroenke, Spitzer, & Williams, 2001). The questionnaire consists of nine items that are statements about an individual's affective state (e.g., "Little interest or pleasure in doing things"), which are scored using a 4-point Likert scale with responses ranging from 0 (*not at all*) to 3 (scores range from 0-27 with scores of 0-4 indicating no depression, 5-9 mild depression, 10-14 moderate depression, 15-19 moderately severe depression, and 20-27 severe depression). Estimates of reliability and validity for a variety of clinical samples have been provided (Fann et al., 2005). Within this current study, the alpha coefficient reported was .84 and the test-retest value was .77.

The Social/Role Activities Limitations Scale (Lorig et al., 2001) was used at the three month follow up to determine the participants overall QOL. The scale consists of 4 items using a 4-point Likert scale ranging from 0 (*not at all*) to 4 (*almost totally*) (Lorig et al., 1996). The scale is used to determine how health has affected social or recreational activities over the last month (e.g., "Has your health interfered with your hobbies or recreational activities"). Scores are totaled and higher scores indicating a greater limitation in daily activities. Within this current study, the alpha coefficient reported was .91.

Statistical Analyses

The data analyses consisted of three steps including (a) descriptive analyses, (b) paired samples t-tests to determine if there were differences in the participant's resilience, self-efficacy, and depression from inpatient to 3-month follow-up, and (c) correlation matrices between dependent variables. Descriptive analyses were completed using PASW (v18). First, descriptive statistics and homogeneity of variance tests were computed to assure normality, screen for outliers, and test the skewness and kurtosis of the distribution. Second, a paired sample t-test was

computed to determine if there were significant differences between each variable at inpatient and 3 month follow up. Finally, to examine the relationship between the dependent variables at inpatient and 3-month follow-up two correlation matrices were calculated and zero order correlations were reported. In order to determine the mean differences for each variable at inpatient compared to 3 month follow up, each was calculated by taking inpatient data subtracted by 3-month follow up data. On the basis of suggestions by Tabachnick and Fidell (2001), a minimum sample size of 20 was required to meet assumptions of homogeneity and adequate power. An alpha level of .05 was set for the tests of significance.

RESULTS

Preliminary data analyses involved screening for outliers or missing values. No data were removed or missing from the sample. Analysis of the distribution of the data revealed that values for skewness and kurtosis were not significantly different from zero ($p > 0.05$) with skewness values ranging between -0.51 to 0.63 ($M = 0.27$), and kurtosis between -0.37 to 0.68 ($M = 0.33$).

Demographic data was analyzed using PASW (v18) and the final sample included 41 participants (27 males and 14 females) with a mean age of 41.42 ($SD = 16.15$). Of the 41 total participants in the study, 34 individuals had been enrolled long enough to complete the three-month follow-up questionnaires. Of the 34 who could complete the three-month follow-up, 23 responded and completed the assessments for a response rate of 67%. Of the 23 follow-up respondents (15 males and 8 females), 12 were reached by telephone and 11 through e-mail. There were a number of different reasons for the remaining 11 participants not completing the three-month follow up including (a) five had telephone numbers that were disconnected, (b) three did not return voicemails, and (c) three e-mail addresses were incorrect and undeliverable.

In regards to race/ethnicity, 58.5% ($n = 24$) were Caucasian, 19.5% ($n = 8$) African American, 7.3% ($n = 4$) Asian/ Pacific Islander, and 14.7 ($n = 5$) were of other races. As for marital status 41.5% ($n = 17$) were single, 39.0% ($n = 16$) were married, 7.3% ($n = 4$) were divorced, and 12.2 ($n = 4$) were separated or widowed. A summary of the demographic information is included in Table 1.

Descriptive statistics for each of the dependent variables at inpatient and three-month follow up are available in Table 2 (i.e., resilience, self-efficacy, depression,). To test the first hypothesis, a paired sample t-test and effect size was conducted to determine if resilience, depression and self-efficacy changed from inpatient to three month follow up. Results indicated

that there was not a significant difference in scores for resilience $t(22) = -1.45, p = 0.161$; $ES = .22$ or self-efficacy $t(22) = -1.92, p = 0.067$; $ES = .47$, but that depression did decrease significantly $t(22) = 3.66, p = 0.001, ES = .54$. Depression rates for the current study decreased from mild depression to no depression.

For the second hypothesis, a correlation matrix was run to examine the correlation between variables at inpatient and three-month follow up (see Table 3). At inpatient there was a significant positive correlation between resilience and self-efficacy, $r = .75, p < .05$. Significant negative correlations were found between depression and resilience, $r = -.67, p < .05$ and self-efficacy, $r = -.54, p < .05$. At three month follow up there was a significant positive correlation between resilience and self-efficacy, $r = .79, p < .05$ and social roles limitations and depression, $r = .67, p < .05$. Significant negative correlations were found between depression and resilience, $r = -.80, p < .05$ and self-efficacy, $r = -.75, p < .05$ as well as social roles limitations and resilience, $r = -.72, p < .05$ and self-efficacy $r = -.71, p < .05$.

For the third hypothesis, a correlation matrix was also run to determine if resilience at inpatient was related to change scores in self-efficacy and depression at three-month follow up. Change scores were calculated by subtracting inpatient scores from three-month follow up scores on each measure. No significant relationships were found between inpatient scores on resilience and change scores on self-efficacy, $r = -.00, p > .05$ and depression $r = -.126, p > .05$ at three month follow up.

DISCUSSION

The purposes for this study were to determine if (a) resilience, self-efficacy, and depression changed from inpatient to three-month follow up, (b) if resilience, self-efficacy, depression, and QOL were related at inpatient and three-month follow up and (c) resilience at inpatient was related to change scores in self-efficacy and depression at three-month follow up.

Changes in Resilience, Self-Efficacy, and Depression

Results indicated that participants did not experience a significant change from inpatient to three-month follow up in resilience or self-efficacy, but a change was observed in depression. The finding that resilience remained stable across time is consistent with previous research (deRoos-Cassini et al., 2010; White et al., 2010) and position pieces (APA Help Center from the American Psychological Association, 2006) that suggest resilience is more of a ,trait-like quality that does not change based on an individual s situation. However, results do have implications for clinicians, as individuals who have high resilience at inpatient rehabilitation tend to experience high resilience over time. Research has demonstrated that these individuals also tend to have a better overall recovery with fewer long-term psychosocial issues (Quale & Schanke, 2010). In contrast, those individuals who have lower resilience at inpatient rehabilitation tend to experience the same lower resilience overtime. There needs to be extra support in place for individuals who experience low resilience as the group may have a more challenging recovery (e.g., return to work, depression, self-efficacy) and experience more psychosocial issues. These results were supported by hypothesis two and three in the present study and will be discussed in more detail (p.28).

Results also indicated that self-efficacy to manage ones disability did not increase from inpatient to three-month follow-up. However, this finding was not surprising, as BIR has no

behavior management involved in typical therapy, which could explain why no change in self-efficacy would be observed. Berkhuysen (Berkhuysen, et al, 2000) also suggests that in order to see a significant change in belief in ability a tailored self-efficacy intervention must be put into place during rehabilitation, and that simply understanding how to manage ones disability will not be enough to change self-efficacy. Thus, as no specific intervention for self-efficacy was implemented for patients in the current study, it is not surprising that self-efficacy did not change.

However, self-efficacy to manage a disability is critical if individuals are to manage associated conditions and prevent secondary and chronic conditions (Rimmer & Rowland, 2008). For example, individuals with high self-efficacy to manage their disability are more likely to complete steps to manage their condition (e.g., adhere to therapy programs, medication compliance). Therefore, self-efficacy to manage a disability is considered a key health outcome during rehabilitation and the clinical importance of increasing self-efficacy is recognized as a critical outcome for overall rehabilitation (e.g., return to work, return to community activities) (Tsaousides et al., 2009).

As hypothesized, depression did decrease significantly from inpatient rehabilitation to three-month follow up. This decrease in depression is supported by previous research involving individuals enrolled in inpatient rehabilitation (White et al., 2010) and has been attributed to the fact that patients receive a strategic intervention for depression that includes individual cognitive-behavioral therapy, group therapy sessions, and medication (Dimidjian et al., 2006; White et al., 2010). Furthermore, in a systematic review of the depression literature for individuals after a traumatic injury (Frann, Hart, Schomer, 2009) it was found that the two most effective types of intervention to reduce depression included low doses of anti-depressants as

well as cognitive-behavioral therapy. Participants in the current study received both types of interventions, which were effective in reducing depressive symptomology as scores reduced from 7.5 (i.e., mild) to 4.8 (i.e., minimal). Clinically, this decrease in depressive symptomology is important as previous research suggests that individuals who experienced lower depression have improved rehabilitation outcomes such as returning to work or participating in community activities (Hibbard et al., 2004).

Relationship between Resilience and Health Outcomes

Significant correlations were found between resilience, self-efficacy, and depression during inpatient stay and resilience, self-efficacy, depression, and QOL at three month follow up. The strength and direction of the correlations indicated that individuals who reported greater resilience reported higher self-efficacy, lower depression and higher QOL, while individuals who reported lower resilience reported lower self-efficacy, higher depression and QOL at both inpatient and three-month follow up. This finding is consistent with, Richardson (2002) theoretical framework as it suggests that individuals seem to follow certain pathways of resilience after a traumatic event and that certain psychosocial outcomes are associated with those pathways. The current study's results support the notion that there are different psychosocial outcomes as individuals who reported greater resilience at inpatient and three-month follow up, appear to fit the pathway termed resilient reintegration. For example, individuals reported higher resilience and self-efficacy and lower depression. In contrast, individuals who reported lower resilience at inpatient and three-month follow up appear to fit the pathway termed dysfunctional reintegration. For example, these individuals reported lower resilience and self-efficacy and higher depression.

A significant positive correlation was found between resilience and self-efficacy at

inpatient rehabilitation and three-month follow up. This indicated that individuals who reported greater resilience also reported higher self-efficacy, while lower reported resilience was associated with lower self-efficacy at inpatient and three-month follow up. This relationship has also been previously supported with groups of people who experienced traumatic injuries. For example, individuals who exhibited positive adjustment post injury (e.g., resilient qualities) were those who had high self-efficacy during hospitalization, while those who had low self-efficacy exhibited much lower positive adjustment (e.g., resilience) (deRoon-Cassini et al., 2010). Results from the current study emphasize the fact that resilience and self-efficacy have a strong relationship, and that steps should be taken during rehabilitation to increase self-efficacy and develop resilience through appropriately designed interventions. Future research is needed to develop and deliver this type of an intervention and then 1-2 years post injury investigate the relationship between these two variables to determine whether they are still closely related.

There was a significant negative correlation between resilience and depression at inpatient rehabilitation and three month follow up. This indicated that individuals who reported greater resilience also reported lower levels of depression while individuals who reported lower resilience had higher levels of depression. This relationship was consistent with findings for individuals who had experienced both an SCI and TBI(White, Driver, & Warren, 2008). For example, White et al. (2010) found that individuals who report greater resilience at admit, mid-point, and discharge from an inpatient rehabilitation program also experienced lower levels of depression at each time, and visa versa (White et al., 2008).

Finally, a significant negative correlation was found between resilience and QOL at three-month follow up. This indicated that individuals who reported greater resilience also reported high QOL, while individuals who reported lower resilience reported low QOL.

Although no previous research on the relationship between resilience and QOL was found, perhaps the resilience-QOL relationship highlights the fact that resilience is an indicator of how individuals reintegrate into their communities after a traumatic injury.

Change Relationship in Variables

Results indicated that resilience at inpatient rehabilitation was not related to change scores in the rehabilitation outcomes of self-efficacy and depression. Non-significant correlations between resilience and self-efficacy ($r = -.00, p > .05$) and depression ($r = -.12, p > .05$) were observed. However, this non-significant difference may have been due to the sample size ($n = 23$), and a larger sample may allow for a more sophisticated analyses (e.g., multiple regression) to determine if resilience at inpatient rehabilitation predicted health outcomes at 3 months post injury. As no previous research has been completed examining resilience in relationship to rehabilitation outcomes posttraumatic injury further research is needed.

Future Research - Intervention

As resilience was shown to be more ,trait like in the current study, it is still unknown whether resilience can be developed using a resilience intervention. However, there is a growing body of evidence to suggest that resilience can be developed over time if an intervention is in place. For example, an article by Steinhardt et al. (2008) looked at a four-week resilience intervention to enhance resilience within college students. Sixty-four college students were randomly assigned to two groups, the experimental group received the resilience intervention, which consisted of an education-based program that included four two-hour weekly sessions. The intervention consisted of information about transforming stress into resilience, taking responsibility for one's behavior, focusing on creating empowering interpretations from disempowering ones, and creating meaningful connections with friends and loved ones. Results

showed that students who received the psychoeducational intervention had significantly higher resilience scores than individuals who were on the wait list control group and did not receive the intervention (Steinhardt & Dolbier, 2008).

As individuals in the current study were not exposed to a specific resilience intervention it is not surprising that resilience failed to change significantly. Consequently, changes in resilience might be more likely to occur if a specific intervention is in place that would focus on the indicators of resilience which, based on previous research, were shown to be depression, spirituality, and social support (i.e., assurance of worth) (Driver & Warren, 2008; Driver & Warren, 2010; Warren & Driver, 2008). Thus, for individuals with a traumatic injury a resilience-based intervention could focus on developing skills that are critical to the construct of resilience (e.g., depression, social support, or spirituality) through therapy or education (e.g., individual or group based), so that individuals learn to use a greater range of skills to help them adapt to adversity. Interventions like this may increase the likelihood of an individual successfully reintegrating after a traumatic injury (e.g., higher QOL, self-efficacy, lower depression). Overall, it is essential that further research investigate whether or not a resilience intervention in a rehabilitation setting could in fact increase and improve resilience, and ultimately rehabilitation outcomes (Quale & Schanke, 2010; White et al., 2010). Especially as resilience did increase (31 points to 33 points) which neared significance, there are many opportunities for this type of future research on resilience as it is a growing construct of interest within the field of rehabilitation.

Self-efficacy is also a variable that did not change in this specific study. Again, there was no specific intervention for self-efficacy implemented for patients in the current study and there was only a three-month follow up; it is not surprising that self-efficacy did not change. Lorig and

colleagues conducted a year-long study on patients who received self-efficacy intervention at inpatient rehabilitation and their ability to manage a chronic disease in a “real-world” setting further emphasize the lack of a change in self-efficacy. Findings indicated that even with an intervention it might take a period of one year for an individual’s self-efficacy to change a significantly (Lorig et al., 2001). Research has shown a major downfall within the health care system is the lack of continuity of care (i.e., COC) following discharge from inpatient rehabilitation. Poor COC puts patients at risk of experiencing poor overall rehabilitation outcomes across their lifespan. Thus, poor COC increases the importance of having some sort of intervention that spans across inpatient to outpatient rehabilitation. For example, an online intervention where individuals are able to correspond with doctors and clinicians could be helpful in order to have continued care as well as continued education on how to manage their disability. In summary, future research is needed to determine if a self-efficacy intervention during inpatient rehabilitation and some sort of outpatient intervention could enhance patients’ self-efficacy across the rehabilitation process and long-term rehabilitation.

Limitations

One limitation of the current study is related to the small sample size. The current study is at the lower end for required number of participants ($n = 23$). Thus, increasing the sample size may increase the strength of the relationship between resilience and change scores in the rehabilitation outcomes of self-efficacy and depression at three month follow up. A large sample size would also allow for a more sophisticated statistical analysis (e.g., regression analyses) to be completed, to determine whether resilience predicted health outcomes at three month follow up.

A second limitation for this study was that all the data collected utilized a self-report format from participants. This is a weakness in that people may not respond truthfully, as they

may want to present themselves in an acceptable manner, or they simply do not remember. Another weakness with self-report data is that there is no way to be sure that what people say is actually what they do. Data collection for the three-month follow up was self-reported and was conducted over the phone or through a linked survey sent through e-mail. Those who chose to answer questions over the phone were read the questions and asked to respond, whereas those who chose to complete the survey through e-mail clicked on a link that took them to the questionnaire. The answers may have been answered differently through e-mail since it was a more private setting and the participants had a longer time to view and think before answering each question, as they were not responding to an individual person directly.

A third limitation was that the study included SCI, TBI and multi-traumas, so responses on resilience, self-efficacy, and depression could have been different for each group. However, the sample size was too small for each injury type to be able to examine difference based on type of injury. Finally, this study only had a three month follow up, it is important that future research collect data over a longer time period (i.e., 6 and 12 months) to examine changes in resilience as well as the relationship between resilience and health outcomes overtime.

Conclusions

In conclusion, results indicated that resilience remained stable from inpatient to three month follow up, suggesting that resilience is a „trait-like“ construct, especially as there were significant improvements in depressive symptomatology over time. However, previous research has indicated that resilience can be developed so that individuals who have low resilience can experience more successful rehabilitation and health outcomes such as self-efficacy, depression and QOL. Future resilience research should continue to identify the variables that are most strongly related to resilience so that effective interventions can be developed to provide service

providers with additional tools to improve rehabilitation outcomes, decrease secondary and chronic conditions as well as aid in the successful reintegration of individuals into their lives after a traumatic injury. Resilience should be considered an important part of rehabilitation and recovery from a traumatic injury (White et al., 2008), which was emphasized in the current study as those who reported high resilience coped better with their injury (i.e., relationship between resilience and self-efficacy). Also, participants who had lower depression while in inpatient rehabilitation as also showed lower depression at three-month follow up, those are all indicators of successful rehabilitation outcomes. Therefore, it is essential that researchers continue to examine the construct of resilience and its role in the rehabilitation process in order to develop resilience based interventions that are implemented early in the rehabilitation process.

Table 1

Descriptive Data of Sample Means, Standard Deviations, Ranges and Frequencies

	<i>M</i>	<i>SD</i>	Range	Frequencies
Age	41.42	16.15	59.00	
Days in Rehabilitation	32.09	16.75	57.00	
Injury type (1= TBI, 2= SCI, 3= Multi-trauma, 4= other)				1. 22 2. 16 3. 2 4. 1
Education (1= high school grad, 2= vocational school, 3= some college, 4= bachelor s degree, 5= masters degree, 6= professional degree)				1. 17 2. 4 3. 8 4. 7 5. 2 6. 1
Marital Status (1= divorced, 2= married, 3= Separated, 4= single, 5= widowed)				1. 3 2. 16 3. 2 4. 17 5. 1

Table 2

Dependent Variable Means, Standard Deviations, by Time

	Inpatient		3 month follow up		Changes were significant
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Resilience	31.48	5.84	32.82	6.46	
Self-efficacy	7.33	1.69	8.12	2.50	
Depression	7.53	5.06	4.82	5.30	**
Social Roles			6.94	5.53	

** = $p < .05$

Table 3

Second Hypothesis Correlation Matrix at Inpatient and Three Month Follow Up

	1	2	3	4
Inpatient				
1. Resilience	-	-	-	-
2. Self-efficacy	.752*	-	-	-
3. Depression	-.674*	-.547*	-	-
3-month follow up				
1. Resilience	-	-	-	-
2. Self-efficacy	.799*	-	-	-
3. Depression	-.728*	-.750*	-	-
4. Quality of Life	-.728*	-.718*	.674*	-

* $p < .05$.

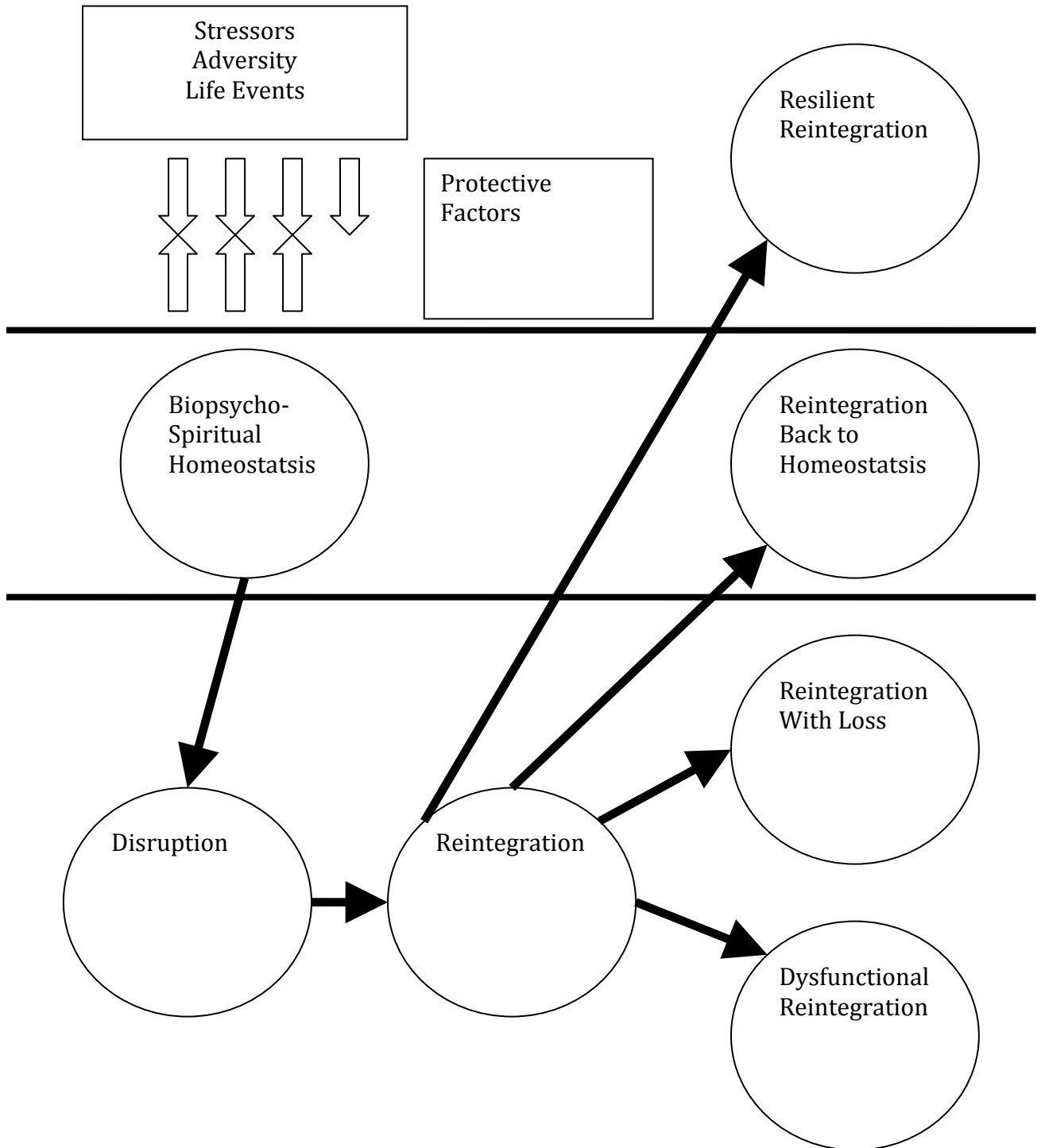


Figure 1. Richardson's model of resilience.

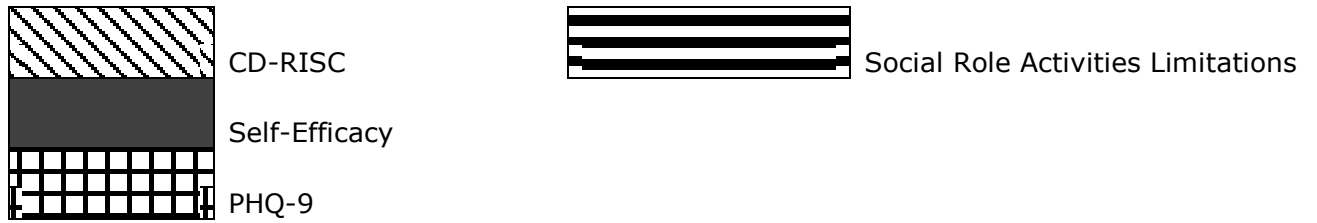
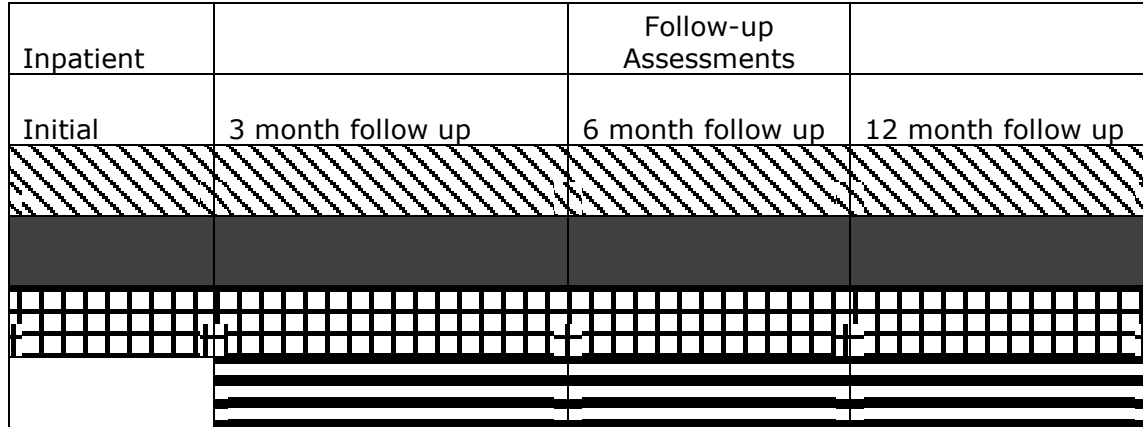


Figure 2. Timeline for data collection.

APPENDIX
SURVEYS

Dgo qi tcr j le'Hqto

Form A

Name: _____

Date of Birth: _____ Age: _____

Gender: _____

Height: _____ Weight: _____

Date of injury: ____/____/____

How did the injury occur:

Where do you reside (pre-injury)?
City, State:

What is your primary language?
 English
 Spanish
 Other _____

What is your current marital status?
 Divorced
 Living with another
 Married
 Separated
 Single
 Widowed
 Would rather not say

If you have children, how many children do you have?
_____ (include age)

How many children under the age of 16 year old live in your household?

- None
- 1
- 2
- 3
- 4 or more

How would you classify yourself?

- Arab
- Asian/Pacific Islander
- Black
- Caucasian/White
- Hispanic
- Indigenous or Aboriginal
- Latino
- Multiracial
- Would rather not say
- Other _____

What is the highest level of education you have completed?

- Grammar school
- High school or equivalent
- Vocational/technical school (2 year)
- Some college
- Bachelor s Degree
- Master s Degree
- Doctoral Degree
- Professional Degree (MD, JD, etc.)

Which of the following best describes the area you live in?

- Urban
- Suburban

- Rural

Which of the following best describes your role in industry (pre-injury)?

- Upper management
- Middle management
- Junior management
- Administration staff
- Support staff
- Student
- Trained professional
- Skilled laborer
- Consultant
- Temporary employee
- Researcher
- Self-employed
- Other: _____

What is your current household income in U.S. dollars (pre-injury)?

- Under \$10,000
- \$10,000-\$19,999
- \$20,000-\$29,000
- \$30,000-\$39,000
- \$40,000-\$49,000
- \$50,000-\$74,000
- \$75,000-\$99,000
- \$100,000-\$150,000
- Over \$150,000
- Would rather not say

Address:

Phone:

E-mail:

Pre-morbid Substance Abuse?

Substance Abuse at Time of Injury?

Length of Time Before Admittance to BIR?

Length of Stay at BIR?

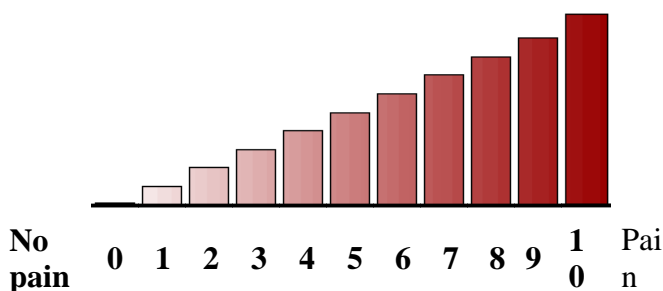
To be completed by BIR/UNT Clinician

FIM physical score:
FIM cognitive score:
FIM total:
FIM efficiency:

ASIA rating:
GCS:
PsychHx:
PsychHxType:
MedHxType:
PsychTherpyHours:
Mobility: Chair, walker, cane, independent
CD-RISC score:
SE-for Managing Chronic Disease score:
PHQ-9 score:
score:

Form B

Pain Numeric: Please circle the number below that describes your pain in the past 2 weeks.



During the past 30 days, for about how many days did pain make it hard for you to do your usual activities, such as self-care, work, or recreation?

- __ = Number of days
- None
- Don't know
- Refused

Because of any impairment or health problem, do you need the help of other persons with your personal care needs, such as eating, bathing, dressing, or getting around the house?

- Yes
- No
- Don't know
- Refused

Because of any impairment or health problem, do you need the help of other persons in handling your routine needs, such as everyday household chores, doing necessary business, shopping, or getting around for other purposes?

- Yes
- No
- Don't know

During the past 30 days, for about how many days have you felt worried, tense, or anxious?

- __ = Number of days
- None
- Don't know
- Refused

During the past 30 days, for about how many days have you felt you did not get enough rest or sleep?

- __ = Number of days
- None
- Don't know
- Refused

Would you say that in general your health is?

- Excellent
- Very good
- Good
- Fair
- Poor
- DK/NS
- Refused

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