

Theses and Dissertations

---

2012

## A model to increase employability of traumatic brain injury patients at the West Los Angeles Veteran Affairs Administration

Colleen M. Babineau

Follow this and additional works at: <https://digitalcommons.pepperdine.edu/etd>

---

### Recommended Citation

Babineau, Colleen M., "A model to increase employability of traumatic brain injury patients at the West Los Angeles Veteran Affairs Administration" (2012). *Theses and Dissertations*. 242.  
<https://digitalcommons.pepperdine.edu/etd/242>

This Dissertation is brought to you for free and open access by Pepperdine Digital Commons. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of Pepperdine Digital Commons. For more information, please contact [bailey.berry@pepperdine.edu](mailto:bailey.berry@pepperdine.edu).

Pepperdine University  
Graduate School of Education and Psychology

A MODEL TO INCREASE EMPLOYABILITY OF TRAUMATIC BRAIN  
INJURY PATIENTS AT THE WEST LOS ANGELES VETERAN AFFAIRS  
ADMINISTRATION

A dissertation submitted in partial satisfaction  
of the requirements for the degree of  
Doctor of Education in Organizational Leadership

by

Colleen M. Babineau

April, 2012

June Schmieder-Ramirez, Ph.D. – Dissertation Chairperson

This dissertation, written by

Colleen M. Babineau

under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

Doctoral Committee:

June Schmieder-Ramirez, Ph.D., Chairperson

Robert Barner, Ph.D.

Roi Ann Wallis, M.D.

© Copyright by Colleen M. Babineau (2012)

All Rights Reserved

# TABLE OF CONTENTS

	Page
LIST OF TABLES .....	vi
LIST OF FIGURES .....	vii
DEDICATION .....	viii
ACKNOWLEDGEMENTS .....	x
VITA .....	xi
ABSTRACT .....	xiv
Chapter 1: The Problem .....	1
Background .....	1
Problem Statement .....	4
Purpose of the Study .....	5
Importance of the Study .....	6
Research Questions .....	7
Scope of the Study .....	8
Limitations of the Study .....	9
Assumptions About the Study .....	10
Definitions of Terms .....	11
Chapter Summary .....	14
Chapter 2: Literature Review .....	16
Employment Challenges for Veterans With TBI .....	16
Increased Prevalence of Brain Injury .....	19
Categorizations of Traumatic Brain Injury .....	20
Standard Treatment of Traumatic Brain Injury .....	21
Progression of Traumatic Brain Injury Symptoms .....	22
Most Common TBI Symptoms .....	23
Mood Lability as a TBI Symptom .....	25
Overview of Three Treatments for Psychological Effects of TBI:	
Medication, Psychotherapy, and Psychoeducation .....	28
Therapy Modes of Interest in the Present Study .....	32
Cognitive Behavior Therapy .....	33
Psychoeducation .....	38
Government Agency Assistance in Career Orientation and Rehabilitation .....	44
Chapter Summary .....	53

	Page
Chapter 3: Methodology .....	56
Research Design .....	56
Restatement of Research Questions.....	56
Description of Variables .....	57
Data Source.....	61
Population and Sample .....	61
Protocol.....	63
Data Analysis.....	63
Precautions for Use of Human Subjects .....	65
Chapter Summary .....	66
Chapter 4: Results.....	67
Research Questions.....	67
Demographics of Subject Group .....	68
Findings for Research Question 1.....	71
Findings for Research Question 2.....	72
Findings for Research Question 3.....	72
Findings for Research Question 4.....	75
Findings for Research Question 5.....	77
Findings for Research Question 6.....	78
Chapter 5: Discussion .....	81
Limitations .....	81
Conclusions.....	82
Implications .....	87
Recommendations for Practical Application .....	91
Recommendations for Future Research.....	93
Chapter Summary .....	93
REFERENCES .....	96
APPENDIX: Electronic Data Entry Form.....	110

## LIST OF TABLES

	Page
Table 1. Comparison of Currently Recommended Treatments for Mood Lability Associated With TBI .....	32
Table 2. Relationships Among Research Questions and Methods .....	64
Table 3. Ages of Subjects .....	69
Table 4. Race/Ethnicity of Subjects.....	69
Table 5. Gender Distribution of Subjects .....	70
Table 6. Relationship Status of Subjects .....	70
Table 7. Blast or Non-blast Status of Subjects .....	70
Table 8. Employment Rate of Subjects .....	72
Table 9. Impact of Blast and Non-blast TBI as Evidenced by Change in GAF Score .....	74
Table 10. Impact of Blast and Non-blast TBI as Evidenced by Employment Status .....	75
Table 11. Presence of Emotional Outbursts in Subjects.....	76
Table 12. Incidence of Depression in Subjects.....	76
Table 13. Incidence of Depression in Subjects Related to Blast or Non-blast Status .....	77
Table 14. Incidence of PTSD in Subjects.....	77
Table 15. Incidence of Depression Medication Prescription for Subjects.....	78

## LIST OF FIGURES

	Page
Figure 1. GAF scores for all subjects .....	71
Figure 2. Level of GAF scores for blast and non-blast groups.....	73



## DEDICATION

This dissertation is dedicated to 3 very important people:

First and foremost, I would like to dedicate this dissertation in memoriam to my mother, Margaret Anne Mc Donough Larkin, who was affectionately known and loved by all as “Margie.” My mother was brilliant, articulate, and beautiful. After high school, during WWII, Margie was awarded a full scholarship to attend college. However, due to the day and age she lived, or perhaps due to her family’s financial problems, she was unable to accept this most prestigious honor. My mother was the eldest of four children and her younger brother would be going off to university. She would need to work to help with the family’s finances. Thankfully, I live in a time when both men’s and women’s education are valued, so that I am able to enjoy and complete my doctoral program at Pepperdine University. My daughter too can follow her heart and secure a well deserved higher education.

Secondly, I would like to dedicate this dissertation to my daughter, Grace Ejan Babineau who is presently pursuing her college education and her dreams. Grace is gifted, talented, beautiful, and above all a gentle and wise soul.

Lastly, I would like to dedicate this dissertation in memoriam to my father, Charles Robert, Larkin. He was a WWII veteran from the Asiatic Pacific Campaign, who received an honorable discharge from the army infantry highest rank of Tech Sergeant after being the recipient of several commendations. My father received a Good Conduct Medal, Asiatic Pacific Campaign Medal, Bronze Star, and WWII Victory Medal.

Legend has it that my father risked his life to save an Australian allied soldier from drowning and subsequently received the bronze star.

In addition, this dissertation is a commemoration to all veterans past, present, and future. I was raised to respect and appreciate all veterans. My father instilled that into all of his four children. I thank you for your service!

"To care for him who shall have borne the battle and for his widow and his orphan"

—Abraham Lincoln

## ACKNOWLEDGEMENTS

I wish to acknowledge and thank the numerous colleagues who have assisted and encouraged me while I pursued this lofty goal. I would like to officially acknowledge Christie Dailo, Program Administrator, Pepperdine EDOL Staff. Christie never wavered with her expertise, her kindness and her gentle words of encouragement as I traversed through this maize kindly referred to as a doctoral program. I would also like to acknowledge John Baker, Communications Facilitator EDOL, Pepperdine Staff for his civility, manners and always ready to solve any problem I could possibly present.

I want to thank my dissertation committee for their knowledge, patience and their unconditional support for this project. I would like to especially thank my chairperson June Schmieder- Ramirez, PhD for her warmth, brilliance and insight. I want to thank Robert Barner PhD for his cooperation, astute intellect and kind disposition. In addition, I would also like to thank Dr. Roi Ann Wallis, MD for her dedication, profound knowledge as a physician who freely shared her expertise, intellect and research skills. Dr. Wallis was committed to this project from our very first meeting and I could not have succeeded without her. I would like to uniquely acknowledge Kimberly Panizzon, JD, for her perseverance, ardor and devotion to research and Veterans alike. She is a gifted researcher that I had the good fortune to come to know as colleague and friend. I am eternally grateful.

Lastly, I would like to acknowledge all of our wounded warriors, especially those Veterans diagnosed with Traumatic Brain Injury, in hope that they will benefit from this research and future studies.

## VITA

Colleen M. Babineau

**PROFILE**

Professionally qualified in mental health, substance abuse and crisis intervention, community organizing, advocacy, program management and development, grant writing skills, research and data analysis. Currently working as a HUD-VASH social worker, VA, GLA, Oxnard, Ca.. Past experience as a bio-psycho-social assessor, dual diagnosis specialist, psychotherapist and mental health clinician. All clients (including dually diagnosed) are provided assessment, crisis management, intensive case management, group and individual therapy directed by consumers, families, physicians, and stakeholders within the mental health community.

**EDUCATION**

Research Coordinator for Dr. Roi Ann Wallis MD, VA W.LA, Committee Member, Doctoral Program Study of Veterans with Traumatic Brain Injury	Veterans Administration Los Angeles, CA
---	---

University of Southern California School of Social Work Masters in Social Work USC Presidential Fellow Leadership Institute of Southern California	Los Angeles, CA
--	-----------------

Antioch University Bachelor of Arts, Liberal Studies	Los Angeles, CA
---	-----------------

University of California	Los Angeles, CA
--------------------------	-----------------

Columbia College	Chicago, IL
------------------	-------------

**SOCIAL WORK EMPLOYMENT**

HUD VASH & ER Social Worker GS-12 Community Care West Los Angeles, Veterans Administration Hospital	February 2011 to Present
--	-----------------------------

Clinical Emergency Room On Call Social Worker West Los Angeles, Veterans Administration	November 2010 to February 2011
--	-----------------------------------

HUD VASH Social Worker GS-11 Community Care West Los Angeles, Veterans Administration	September 2010 to February 2011
--	------------------------------------

Psychotherapist, Psycho-Social Assessor, Screening, Triage, Assessment & Referral, Crisis Intervention	April 2009 to September 2010
---	---------------------------------

Dual Diagnosis Specialist, County of Ventura Psychiatric Social Worker, Clinician, Therapist, Crisis Triage	October 2006 to April 2009
WLA VA, Clinical Emergency Room, On Call Social Worker	2010 to 2011
HUD VASH Social Worker GS-11 Community Care, Veterans Administration	September 2010 to February 2011
Psychotherapist, Psycho-Social Assessor, County of Ventura Screening, Triage, Assessment & Referral	April 2009 to September 2010
Dual Diagnosis Specialist, County of Ventura Psychiatric Social Worker, Clinician, Therapist, Crisis Triage	October 2006 to April 2009
Psychiatric Social Worker Clinician, Therapist, Field Supervisor for Older Adults Didi Hirsch Community Mental Health Center Culver City, CA	2003 to 2006
Administrative Social Worker, Field Supervisor For USC 2 <sup>nd</sup> year graduate students (5) Placed in Neighboring LAUSD K-12 Schools	1997 to 1999
Field Supervisor 2 <sup>nd</sup> year MSW graduate students Training completed at USC/School of Work University of Southern California	1997 to 1999
Program Specialist, USC Civic & Community Relations Kid Watch and After School Enrichment Specialist Safety events and after school programs LAUSD – Grades K-12	1996 to 1999
Grants Awarded: Kid Watch Program, USC and After School Enrichment Program, USC Los Angeles, CA	1997 to 1999
Child Counselor/Intern Behavioral Health Consultants Marina del Rey, CA	1996 to 1997
Crisis Counselor/Intern Sojourn Battered Women's Shelter	Santa Monica, CA 1994 to 1995
<b>COMMUNITY PROJECTS</b>	
Elected official for Councilman Mark Ridley Thomas's Empowerment Congress	1997 to 1999
Appointed to Southwest Division Community Police Advisory Board	1997 to 1999

Liaison to the Mayor's Office, Richard Riordan and LAPD, Chief Bernard Parks Representing University of Southern California	1996 to 2000
Project Director USC Medical and Dental Health Fair USC Medical Campus	1998
Community Organizer/Advocate Hispanic Outreach University Park	1997 to 1999

## ABSTRACT

This study assessed the impact of traumatic brain injury (TBI) upon specific behavioral and psychosocial factors related to employability. This descriptive study was a retrospective chart review of the records of TBI patients, returning military service members, between 2003 and 2010. Some long term residual effects for TBI patients with blast or non-blast head injuries include cognitive deficits, memory problems, chronic pain, post-traumatic stress disorder, all of which impact recovery and function. The 4 research questions relate to (a) global assessment of functioning, (b) employment challenges, (c) the impact of blast versus non blast TBI upon global assessment of functioning and employment challenges, (d) type of treatment provided, and (e) what interventions seem promising for helping those patients maintain self-sufficiency. Only 186 TBI patient charts met criteria for inclusion. The mean GAF was 55.2, which is typical for major depressive disorder. The majority was perceived by clinicians as having moderate difficulty in social, occupational, or school functioning. Approximately half of the subjects were unemployed. The lowest GAF scores belong to subjects with blast injury. The highest GAF scores belong to both blast and non-blast subjects. Only 6% of the blast group showed GAF score stability (48%), and approximately the same number of patients were seen to have worsened symptoms as had alleviated symptoms at a later date. A greater percentage of subjects with non-blast TBI were unemployed than those with blast TBI. As an indication of emotional lability, 34% of subjects exhibited emotional outbursts. Over three-fourths of the subject group reported symptoms leading to the diagnosis of depression, and a similar proportion was diagnosed with PTSD. Of those with depression, most (74%) were prescribed depression medication, but had no

indication of utilizing available services such as individual or group counseling. TBI patients were much less employable than the general population, with employment difficulties that are likely to persist without intensive and long-term treatment. The study indicates paucity of treatments recommended in the literature for this population, namely CBT, psychoeducation, and intensive occupational rehabilitation. Patient-centered individualized care, incorporating these modalities, is recommended as a model because TBI results in heterogeneous symptoms.



## Chapter 1: The Problem

### Background

A significant proportion of military personnel deployed in support of Operation Enduring Freedom and Operation Iraqi Freedom have been exposed to war-zone events. Many of these events are associated with blast or non-blast traumatic brain injury (TBI). In addition, there have been a large number of service men and women returning from combat who have had repeated exposures to blasts. The increase in the number of combat-related TBIs is due in part to advances in modern military armor and battlefield medical techniques that have resulted in more soldiers surviving these injuries than in previous conflicts. Data on the number of service members who have been exposed to blasts are emerging. The President's Commission on Care for America's Returning Wounded Warriors (2007) reported that of the 35,000 otherwise healthy service members returning from OIF/OEF, approximately 10-20% (3,500-7,000) met the criteria for mTBI during a detailed screening; and a recent survey suggested that as many as 160,000-320,000 service members will return with a mTBI.

There has been significant controversy regarding healthcare policy for those service members and military veterans who returned from combat deployments with TBI. Currently, there is little information available regarding the long-term effects of TBI. Research is clear, however, that TBI hinders veterans' return to the workforce. A study by Tsaousides, Ashman, and Seter (2008) found that only 21% of veterans with TBI experienced similar levels of employment pre- and post-injury. Shames, Treger, Ring, and Giaquinto (2007) conducted an overview of the current rehabilitation literature

regarding return to work following TBI, including civilian subjects. They noted that return to work rates in the 12% to 70% range.

Some of the long term residual effects for military service members who have suffered traumatic brain injury from blast or non-blast exposure include cognitive deficits, memory problems, chronic pain, post-traumatic stress disorder (PTSD), all of which impact the recovery and function of these veterans. In terms of these residual effects of trauma, it is not well delineated as to the impact of blast versus non-blast exposure. Traumatic brain injury (TBI) frequently produces neurobehavioral syndromes that can have a devastating effect on functional independence (Cicerone et al., 2000). The two most common mood disorders occurring after traumatic brain injury are depression and mood lability (Douglas & Spellacy, 2000). Mood disorders associated with traumatic brain injury present serious problems such as (a) exacerbating cognitive deficits that may have resulted from the traumatic injury, (b) reducing the ability to function independently and effectively (Douglas & Spellacy, 2000; Jorge & Starkstein, 2005), and (c) interfering with rehabilitative therapies (Hommet, Mondon, de Toffol, & Constans, 2007).

The level of cognitive impairment of traumatic brain injury patients will vary from subject to subject, and is expected to correlate with mood lability. Mood lability can be debilitating. Agitation, acts of aggression, and impulsivity are characteristic of mood lability. Mood lability could lead to greater frequency of and/or escalation in substance abuse, domestic violence, and/or altercations with authority. Another detriment associated with mood lability is that some patients struggle to sustain employment and to avoid incarceration due to tendencies toward acting out.

Some of the long term residual effects for military service members who have suffered traumatic brain injury include cognitive deficits, memory problems, chronic pain, post-traumatic stress disorder (PTSD), all of which impact the recovery and function of these veterans. In the present study, global assessment of functioning (GAF) is used as a measure of recovery and function. The Diagnostic and Statistical Manual of Mental Disorders (DSM), which describes criteria for various mental disorders, includes criteria to help clinicians establish a measure of a person's skill level in conducting tasks needed for day-to-day independent living (American Psychiatric Association, 2000). GAF levels are commonly used by the Veterans Benefits Administration of the United States Department of Veterans Affairs in determining the appropriate level of disability compensation to be paid to veterans who suffer from service-connected psychiatric disorders, in connection with other measures (Lintecum & Lintecum, 1998). This variable gives a reasonable approximation of the degree of recovery and function that is needed to function successfully in the workforce, thus it is an important variable in the present study concerning employability of veterans who have suffered traumatic brain injury. The GAF score presents an overall level of functioning that may be (a) a result of a number of cognitive and emotional deficits, or (b) a result of interactions between these deficits. The GAF describes the behavioral aspect, as opposed to the underlying deficit and specific symptoms.

In the present study, therapeutic modalities that are discussed are medication, psychotherapy (particularly cognitive behavioral therapy), and psychoeducation, which relates closely to the topic of adult learning. According to Knowles (1998), the adult learner has learning needs closely related to changing social roles, is problem-centered,

and is interested in immediate application of knowledge, all of which relate to the concept of psychoeducation. The study revolves around the need for a patient-centered model of care that incorporates multiple treatment types as coordinated by a treatment team.

### **Problem Statement**

The behavioral and psychosocial affects of physical injuries in relationship to traumatic brain injury (TBI) commonly include lowered general functioning and higher mood lability, both of which can cause problems in the workplace. A primary focus of this retrospective chart review will be to assess the differences between TBI in terms of chronic residual effects and overall function related to employability. More information on how TBI affects employment of veterans is needed to help clinicians effectively advise patients in ways that ameliorate their employment challenges. According to the direct cumulative disadvantage hypothesis, “service members exposed to combat are more likely to be disabled and unemployed than are service members who were not exposed to combat” (MacLean, 2010, p. 565) because of the effects that early unemployment may have on later employment opportunities. This affect highlights the need to address employment issues for veterans as early as possible.

In terms of these residual effects of trauma, it is not well delineated as to the impact of blast versus non-blast exposure. Thus, an important difference in treatment needs may be overlooked because of this largely unknown aspect.

Physical effects of injuries can often be overcome by (a) finding suitable positions that make use of a veteran’s capabilities and do not demand significant proficiency in areas of debilitation, and (b) adaptive technology devices. Behavioral and psychosocial

affects, in contrast, can be far more debilitating for employment. Veterans with traumatic brain injury (TBI) may suffer from lowered general functioning, which could be presented as a lowered score on the global assessment of functioning (GAF) scale, as well as higher mood lability. Most jobs demand (a) some degree of social skill in order to work cooperatively with other employees, (b) ability to tolerate a reasonable amount of stress, and (c) adaptation to change. Mood lability especially can reduce one's ability to work cooperatively, tolerate stress, and tolerate the uncertainties inherent in a change process. Thus, TBI can lead to significant challenges in the workplace. Several authors, most notably the U.S. Government Accountability Office (GAO), have extensively researched these challenges (Ainspan, 2008; MacLean, 2010; O'Keefe, Birger, & Burke, 2010; Ottomanelli et al., 2009; U.S. Government Accountability Office, 2007, 2009; Walker, 2010). These are described extensively in the literature review.

With the economic downturn in the United States, commencing in 2008, Veterans' ability to secure employment has been further threatened, as injuries may exacerbate the difficulty Veterans have in competing in the job market with the unemployed of the private sector. President Obama's edict to end Veteran homelessness in 5 years highlights the prevalence and importance of this problem.

### **Purpose of the Study**

This descriptive study will describe the behavioral and psychosocial dysfunction in relationship to traumatic brain injury (TBI). Reflected in the first research question, the study aims to understand behavioral dysfunction as measured by global assessment of functioning (GAF) score and unemployment/underemployment rates. Reflected in the second research question, the study also aims to determine psychosocial dysfunction,

specifically mood lability, because this characteristic directly relates to behavioral issues that may impact employment. In terms of these residual effects of trauma, this study may help clarify any differences between the impact of blast versus non-blast exposure. In addition, this study aims to determine the ways in which TBI is currently most commonly treated, as a point of reference for discussion of what treatment methods may be most effective for TBI patients.

### **Importance of the Study**

A large proportion of military personnel deployed in support of Operation Enduring Freedom and Operation Iraqi Freedom have been exposed to war-zone events. There are also military personnel from previous combat operations who still suffer the effects of physical combat. Many of these events are associated with traumatic brain injury (TBI). In addition, there have been a large number of service men and women returning from combat who have had repeated exposures to blasts. In the more recent theaters of war, such as Iraq and Afghanistan there has been increased use of IEDs (intermittent explosive devices), leading to increasing incidence of TBI. There has been significant controversy regarding healthcare policy for those service members and military veterans who returned from combat deployments with TBI. Currently, there is little information available regarding the long-term effects TBI, thus this study helps fill a gap in the literature. Ottomanelli et al. (2009), who studied vocational rehabilitation of veterans with the closely related diagnosis of spinal cord injury, stated that “the importance of work to quality of life and overall well-being cannot be overemphasized. Successful work participation will be expected to produce important psychosocial, economic, and health benefits for the person” (p. 927).

In terms of these residual effects of trauma, this study may help clarify any differences between the impact of blast versus non-blast exposure, thus leading to more specific and appropriate treatment types. Very little is known about the sequelae of exposure to multiple blasts when no overt injuries are sustained (Taber, Warden, & Hurley, 2006).

The present study may increase the understanding of the challenges of traumatic brain injury (TBI) patients (who are most often returning military service members) who suffer from employment issues due to behavior dysfunction and psychosocial dysfunction. Specifically, this study may increase clinicians' and policy makers' understanding of (a) how TBI affects global assessment of functioning (GAF) so that specific treatment can be designed accordingly; (b) how presence of mood lability corresponds to employment problems; (c) how blast and non-blast TBI might differ in terms of GAF and employability; and (d) an understanding of what treatment modalities are currently most used, which understanding can prompt further discussion of what therapies should be most prevalent based on research of which therapies best serve this population and which are adapted to their particular needs.

### **Research Questions**

The overall research topic is unemployment and underemployment for TBI patients who are veterans. The particular research questions investigated in this study are as follows:

1. What is the average Global Assessment of Functioning Score for patients with traumatic brain injury ages 18 to 65 in the years 2003 to 2010 in the Los Angeles Veterans Hospital?

2. What is the unemployment/underemployment rate for the years 2003 to 2010 in patients with traumatic brain injury?
3. What is the impact of blast versus non blast injury in patients with traumatic brain injury, as evidenced by difference in Global Assessment of Functioning Score and unemployment/underemployment rate?
4. What is the incidence of mood lability as recorded on charts for patients with traumatic brain injury for the years 2003 through 2010 at the Los Angeles Veterans Administration hospital?
5. Based upon charts for patients with traumatic brain injury for the years 2003 to 2010, what treatments are most commonly used to treat behavioral and psychosocial dysfunction in patients with traumatic brain injury?
6. Based upon the findings for the above research questions, what might be a model to help TBI patients maintain a self-sufficient lifestyle or raise their employment possibilities?

### **Scope of the Study**

The researcher has narrowed the focus of the study in order to gain more in-depth understanding of a particular area of concern. This study focuses on patients with traumatic brain injury (TBI) and the associated behavioral and psychosocial factors related to unemployment and underemployment. Although TBI can cause physical challenges that affect return to civilian employment (McNamee, Walker, Cifu, & Wehman, 2009), those are not addressed in the present study. Other issues that may affect veterans' employability are not discussed directly, although there is some overlap. For example, there are psychosocial challenges aside from TBI: (a) post-traumatic stress



disorder (PTSD) in some military service members may be a psychological result of active combat experiences, and (b) the nature of the military lifestyle can present a challenge to rehabilitation in the civilian workplace. Similarly, physical injuries can present employment challenges apart from behavioral and psychosocial issues, such as memory or task-performance deficits, but the effects of these injuries are not a topic of concern for this study. The inclusion of investigation into the prevalence of certain treatment types is meant to be descriptive; the study does not investigate or compare the effectiveness of these therapies.

### **Limitations of the Study**

The limitations of the study include the following concerns:

1. Archival records, specifically medical charts, will be used as the source of data in this study. The researcher is limited to the information available in the charts, thus the completeness, objectivity, and accuracy is dependent upon the prior recording procedures of medical staff at the Los Angeles Veteran's Hospital from which the records are made available.
2. The study is descriptive. The study does not include investigation of the reasons for the findings or cause and effect relationships.
3. Because the sample will be drawn from a population of TBI patients seeking services from a veteran's hospital, the majority of patients are likely to be male. Thus, interpretation should be extended to female traumatic brain injury (TBI) patients cautiously and tentatively.

4. Because the sample will be drawn from records at one veteran's hospital, the therapeutic methods found to be prevalent there may differ from therapeutic methods utilized elsewhere for TBI patients.
5. Aggressive action as an aspect or operational definition for behavioral impact of TBI is somewhat flawed in that PTSD, also common in combat veterans, might also be associated with aggressive action. Further, it is unknown whether military service members might have chosen a military career because of a predisposition toward aggressiveness. Even with these caveats, the presence of aggressive action can cause a detrimental effect on employment and is valuable to study in relation to an overall effort to ameliorate the employment challenges faced by TBI patients.

#### **Assumptions About the Study**

For the purposes of this study, the researcher assumes the following:

1. It is assumed that the medical staff at the Los Angeles Veteran's Administration (VA) hospital completed the patient treatment assessments contained in the reviewed charts completely, objectively, and accurately.
2. It is assumed that the level of mood lability affects employment directly, and that mood lability also affects other aspects of functioning that affect employment indirectly.
3. It is assumed that lowered global assessment of functioning (GAF) scores in traumatic brain injury (TBI) patients corresponds with limited employment options or indicates deficits that cause difficulties in the workplace.

4. It is assumed that the treatment methods for TBI patients, as recorded in patient charts, reflect the established protocol of the VA hospital.

### **Definitions of Terms**

The following terms are defined for this study as follows:

- *Blast injury*: In general, the effects of a blast may be classified into four categories, which are primary, secondary, tertiary, and quaternary. The primary blast injury results from the abrupt change in atmospheric pressure (barotraumas) caused by the blast and results in trauma to tissue and organ systems including the lungs, bowels, and middle ear. The secondary blast injury results from the individual being struck by objects put in motion by the blast. Tertiary blast injury results from an individual being put into motion forcefully by the blast and colliding with a solid object (Taber et al., 2006). Finally, the quaternary blast injury includes the additional medical injuries that are caused by explosions, including burns, toxic inhalation of gases, inhalation of dust, and exposure to radiation (Roth, 2007).
- *Cognitive-behavioral therapy (CBT)*: The Encyclopedia of Mental Disorders defines this intervention mode as follows:

Cognitive therapy is a psychosocial (both psychological and social) therapy that assumes that faulty thought patterns (called cognitive patterns) cause maladaptive behavior and emotional responses. The treatment focuses on changing thoughts in order to solve psychological and personality problems. Behavior therapy is also a goal-oriented, therapeutic approach, and it treats emotional and behavioral disorders as

maladaptive learned responses that can be replaced by healthier ones with appropriate training. Cognitive-behavioral therapy (CBT) integrates features of behavior modification into the traditional cognitive restructuring approach. Cognitive-behavioral therapy attempts to change clients' unhealthy behavior through cognitive restructuring (examining assumptions behind the thought patterns) and through the use of behavior therapy techniques. (Cognitive-behavioral therapy, 2007, para. 1-2)

- *Global assessment of functioning (GAF)*: The Diagnostic and Statistical Manual of Mental Disorders (DSM), which describes criteria for various mental disorders, includes criteria to help clinicians establish a measure of a person's skill level in conducting tasks needed for day-to-day independent living. Many mental health professionals use the DSM to determine and describe a patient's diagnosis after an evaluation (American Psychiatric Association, 2000). The GAF score presents an overall level of functioning that may be (a) a result of a number of cognitive and emotional deficits, or (b) a result of interactions between these deficits. The GAF describes the behavioral aspect, as opposed to the underlying deficit and specific symptoms.
- *Mood lability*: Mood lability has been defined as rapid emotional changes such as fluctuation between opposite moods and is frequently associated with periods of irritability (Benazzi, 2006). Mood lability after traumatic brain injury (TBI) is associated with impulsivity, anger, and aggression (McIntosh, 1997). TBI patients often feel they may not be in control of their emotions (Beetar, 1996).

- *Post-traumatic stress disorder (PTSD)*: This disorder effects up to a third of people who have experienced a traumatic event. The National Institute for Clinical Excellence (2005) describes the symptoms as follows:

One of the most common symptoms for [post-traumatic stress disorder] PTSD is having repeated and intrusive distressing memories of the event. There may also be a feeling of reliving (or ‘re-experiencing’) the event through flashbacks or nightmares, which can be very distressing and disorientating. There can also be physical reactions, such as shaking and sweating. Because the memory can be very intense and upsetting, some PTSD sufferers may avoid people or situations that remind them of the trauma . . . . Other people will think about the event constantly, which stops them coming to terms with it. (p. 8)

- *Psychoeducation*: This term refers to education of patients so that they can implement self-help strategies. It is a type of treatment that is not costly and does not require considerable time and staff resources for treatment centers to provide. It could be used in conjunction with other treatment types but may also afford a treatment to those who by choice or by medical contraindication are unable to benefit from drug therapy for mood lability. Psychoeducation can be used as a tool to provide concrete strategies that are immediate and efficient, allowing the subject to diffuse a potentially stressful situation by employing a coping mechanism learned through psychoeducation.
- *Traumatic brain injury (TBI)*: This is the technical term for what would commonly be called a concussion. Traumatic brain injury is defined as damage to

the brain resulting from an external mechanical force, such as rapid acceleration or deceleration, impact, blast waves, or penetration by a projectile (Maas, Stocchetti, & Bullock, 2008). TBI is the result of a severe or moderate force to the head, during which physical portions of the brain were damaged and functioning impaired (U.S. Department of Veteran's Affairs, 2011). While TBI is not an official diagnosis in the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM), the VA captures diagnoses for TBI by using the 800 series (intracranial injuries due to skull fractures), 850 series (intracranial injuries due to specified to non-fracture causes), or 850 series (concussion). Each of these three diagnoses are further classified as severe, moderate, or mild.

### **Chapter Summary**

The overall research topic is employment and underemployment for traumatic brain injury (TBI) patients. This study aims to assess the impact of blast versus non blast TBI upon specific behavioral and psychosocial factors related to employability. Specifically, the study asks: (a) What is the behavioral dysfunction in patients with traumatic brain injury from blast versus non-blast exposure, as measured by global assessment of functioning (GAF) score and unemployment/ underemployment rates? and (b) What is the psychosocial dysfunction in patients with traumatic brain injury from blast versus non-blast exposure, specifically mood lability? This study may be of utility to returning military service members who have suffered injuries. Adult learning is an important topic that relates to employability of TBI patients, as workers in today's knowledge-based industries, well paid positions often require constant assimilation of

new information. An important limitation is that the study uses archival records—patient charts—as the sole data source.

## **Chapter 2: Literature Review**

Traumatic brain injury is a major cause of death and disability worldwide, especially in children, young adults, and military personnel. Causes include falls, vehicle accidents, and violence. This study concerns mainly TBI in adults and relates to the rehabilitation process. To begin the literature review, a section giving a general overview on veterans' challenges in employment gives a background for the importance of the present study. Next, a section on increased incidence of TBI highlights the relevance of this disorder as a contributor the veterans' challenges in employment. Next, a history of the development of understanding of brain injury and its treatment sets the stage for understanding how the current study contributes to ongoing research on rehabilitation. Next, a section describing standard traumatic brain injury treatment explains the overall treatment model, in which rehabilitation plays an important later role. It is important to understand that there are multiple symptoms of traumatic brain injury (TBI) patients and particular struggles they face, and these are described briefly, although a focus of this study is the symptom of mood lability, which is discussed in depth.

### **Employment Challenges for Veterans With TBI**

MacLean (2010) insists that most studies have found that combat veterans are more likely than non-combat veterans to have difficulty finding work, to have lost a job, and to be unemployed. This is unsurprising, given the greater likelihood that combat veterans will have sustained injuries. Specific to the injury type of interest in this study, Walker (2010) found that among traumatic brain injury (TBI) patients, "recent male veterans and male nonveterans ages 18 to 54 years had similar unemployment rates in 2009, and earnings of full-time male veterans and nonveterans were likewise similar" (p.



3). In one study of civilians with TBI, 56% of previously productive persons in the present sample were unemployed 1 to 3 years post-injury which is similar to that found in other studies reviewed by these authors (Gollaher et al., 1998). Shames et al. (2007) noted that return-to-work rates in the 12% to 70% range for civilian TBI patients. Tsaousides et al. (2008) found that only 21% of veterans with TBI experienced similar levels of employment pre- and post-injury.

These findings suggest that veterans experience wars as traumatic events that may lead to unemployment and lower earnings. MacLean (2010) states, “Consistent with this view, the current analyses show that combat negatively shapes veterans’ health and their ability to work” (p. 581). If the negative effects on veterans’ lives persist and increase over time, the longitudinal effect of combat could contribute to cumulative disadvantage directly. Merton developed the theory of cumulative advantage to describe positive effects; scholars subsequently extended this concept to describe negative effects or cumulative disadvantage (Merton, as cited in MacLean, 2010). According to this theory, people tend to continue on the path on which they start. During the past 4 decades, scholars have argued that some people have greater initial advantages that accumulate. Related research describes events or experiences that have negative effects as contributing to cumulative disadvantage through the same process. People suffer in their later work lives, for example, if they lose their jobs earlier in the life course. On this basis, researchers argue that early unemployment has a scarring effect and contributes to greater inequality over time. Combat exposure increased rates of disability and unemployment among veterans, consistent with the view that combat exposure is a

scarring experience. Veterans who saw combat started their work lives at a relative disadvantage, which they were unable to overcome.

Regardless of the discrepancies in findings of whether returning soldiers were or were not more likely to be unemployed, the evidence is clear that “soldiers exposed to combat were more likely than non-combat veterans to be disabled and unemployed in their mid-20s and to remain so throughout their work life” (MacLean, 2010, pp. 578, 580). Hence, for combat veterans who suffer from traumatic brain injury (TBI), many will suffer in their socioeconomic attainment. Further, combat effects were found to be potentially negative regardless of pre-service status in that “less privileged veterans were as negatively influenced by combat as were more privileged veterans” (p. 580).

Bootes and Chapparo (2010) conducted work performance research including psychometric cognitive measures and cognitive component information processing measures, which are strong predictors of success in multitasking work environments. They found that subjects with a mild to moderate traumatic brain injury (TBI) returning to a job requiring multitasking may have difficulty. Results of their study indicated that substantial information processing deficits were perceived by employers. With a similar outcome, Shames et al. (2007) conducted an overview of the current rehabilitation literature regarding return to work following TBI. They reviewed (a) predictive factors for successful return to work and (b) current concepts in rehabilitative strategies for successful return to work. They concluded that even mild TBI may cause lasting problems in tasks calling for sustained attention.

A study by Tsousides et al. (2008) highlights the importance of post-injury employment on quality of life and depression. Although veterans with TBI face

significant challenges in obtaining employment, it clearly is essential to make substantial efforts toward this goal. Shames et al. (2007) state that although accurate prediction of whether a particular TBI patient will successfully return to work is not feasible, still a significant proportion of TBI patients, including those who are severely injured, are able to return to productive employment if sufficient and appropriate effort is invested. In one study, the authors questioned whether the greater presence of clinical psychiatric symptoms in unemployed TBI patients was caused by or exacerbated by the condition of unemployment. Their study indicated that work has a therapeutic effect on the TBI symptoms. This effect was observed in practice, which allowed a significant reduction in psychotropic drug therapy. Whichever the position, it is believed that employment is important, both as a goal in itself and for its rehabilitative effect (Franulic, Carbonell, Pinto, & Sepulveda, 2004).

### **Increased Prevalence of Brain Injury**

Traumatic brain injury is a major cause of death and disability in military personnel. The increase in the number of combat-related TBIs is due in part to advances in modern military armor and battlefield medical techniques that have resulted in more soldiers surviving these injuries than in previous conflicts. Data on the number of service members who have been exposed to blasts are emerging. The President's Commission on Care for America's Returning Wounded Warriors (2007) reported that of the 35,000 otherwise healthy service members returning from Operation Enduring Freedom and Operation Iraqi Freedom, approximately 10% to 20% (3,500-7,000) met the criteria for mild TBI (mTBI) during a detailed screening; and a recent survey suggested that as many as 160,000 to 320,000 service members will return with a mTBI. These statistics include

service members with documented injuries following blast exposure. Many soldiers with mTBI are not diagnosed, because the exposure to the blast went unreported and, thus, the symptoms went untreated in the early stages of recovery. Many service members and veterans have been exposed to the effects of multiple blasts and present with psychological disorders (e.g., post-traumatic stress disorder [PTSD]) that add to the complexity of these cases.

The most recent demographic data for American casualties in Operation Enduring Freedom and Operation Iraqi Freedom indicate that more than 75% of the wounded service members are male, between 18 and 30 years-old, active duty, and in the enlisted ranks (Department of Defense, Statistical Information Analysis Division, 2008). A majority of the wounded service members have spent greater than 4 years in the service and are accustomed to the structure and culture of military life. Following the injury, these individuals will either remain in the military or will be medically discharged and return to civilian life. Many of these wounded service men and women will be encouraged to seek employment or return to school, but with traumatic brain injury, these options are less viable. In addition, their experiences in combat, exposure to blast(s), and the nature of the military lifestyle, as well as potential coexisting psychological issues impact their ability to return to a productive civilian life.

### **Categorizations of Traumatic Brain Injury**

TBI caused by a blast may be classified into four categories, which are primary, secondary, tertiary, and quaternary, as described in the definitions section. The primary blast injury results from the abrupt change in atmospheric pressure (barotraumas), the secondary blast injury results from the individual being struck by objects put in motion

by the blast, the tertiary blast injury results from an individual being put into motion forcefully by the blast and colliding with a solid object (Taber et al., 2006), and the quaternary blast injury includes the additional medical injuries that are caused by explosions, including burns, toxic inhalation of gases, inhalation of dust, and exposure to radiation (Roth, 2007). The secondary and tertiary injuries involve pathophysiological changes similar to civilian mechanical injuries (e.g., motor vehicle accidents, falls, etc.), including contusions and diffuse axonal injury. The concomitant exposure to the primary blast (barotraumas) is less understood. Moreover, very little is known about the after-effects of exposure to multiple blasts when no overt injuries are sustained (Taber et al., 2006).

### **Standard Treatment of Traumatic Brain Injury**

People with moderate to severe injuries are likely to receive treatment in an intensive care unit followed by a neurosurgical ward. Neuroimaging is a standard diagnostic tool that can guide treatment type. Treatment depends on the recovery stage of the patient. In the acute stage the primary aim of the medical personnel is to stabilize the patient and focus on preventing further injury because little can be done to reverse the initial damage caused by trauma. Rehabilitation is the main treatment for the subacute and chronic stages of recovery. A multidisciplinary approach helps patients overcome disabilities caused by TBI. Neurologists are the main physicians involved, but depending on the symptoms, doctors of other medical specialties may be helpful. Physical deficits caused by TBI may be treated by physiotherapy, speech and language therapy, or occupational therapy. Neuropsychiatric symptoms such as emotional distress and clinical

depression may involve mental health professionals (National Institute of Neurological Disorders and Stroke, 2002).

Shames et al. (2007) state that there appears to be a complex interaction between pre-morbid characteristics, injury factors, post injury impairments, personal and environmental factors in TBI patients, which influences return to work outcomes in ways that make prediction difficult. Several medical, psychosocial and rehabilitative therapies are currently being implemented in rehabilitation settings, which improve the chances of returning to work. According to Shames et al., intensive rehabilitative efforts typically emphasize the early phase and address mainly the accompanying functional deficits in the realm of basic activities of daily living and mobility. An otherwise successful medical rehabilitation may end unsuccessfully because of the failure to return to work, with profound consequences to the individual and family, both economic and psychosocial.

#### Progression of Traumatic Brain Injury Symptoms

The course of TBI can be divided into three phases: acute, subacute, and chronic. In the acute phase, care of traumatic brain injury patients focuses upon stabilizing physiological functions and salvaging brain tissue. Depending on the severity of the case, this level of care can continue for weeks until a medically stable state is reached. In the subacute phase, care centers start rehabilitative therapies, as well as prevention of complications. This phase can last several months. Thereafter, in the chronic phase of TBI, rehabilitation usually continues with an emphasis on re-integration into the community and independent living. Disabilities from TBI may last a lifetime, and interventions may be appropriate even many years after the injury (Morris, 2010; "Patient Information," 2009).

TBI frequently produces neurobehavioral syndromes that can have a devastating effect on functional independence (Cicerone et al., 2000). These neurobehavioral syndromes fall into two general categories: cognitive dysfunction and mood disorders. Of these, mood disorders can be particularly problematic because they can worsen cognitive recovery and the day-to-day functioning of TBI patients.

The course of TBI can be divided into three phases: acute, subacute, and chronic. In the acute phase, care of traumatic brain injury patients focuses upon stabilizing physiological functions and salvaging brain tissue. Depending on the severity of the case, this level of care can continue for weeks until a medically stable state is reached. In the subacute phase, care centers start rehabilitative therapies, as well as prevention of complications. This phase can last several months. Thereafter, in the chronic phase of TBI, rehabilitation usually continues with an emphasis on re-integration into the community and independent living. Disabilities from TBI may last a lifetime, and interventions may be appropriate even many years after the injury (“Patient Information,” 2009).

TBI frequently produces neurobehavioral syndromes that can have a devastating effect on functional independence (Cicerone et al., 2000). These neurobehavioral syndromes fall into two general categories: cognitive dysfunction and mood disorders. Of these, mood disorders can be particularly problematic because they can worsen cognitive recovery and the day-to-day functioning of TBI patients.

### **Most Common TBI Symptoms**

Arlinghaus, Shoaib, and Price (2005) note that TBI appears to predispose patients to psychiatric disorders including obsessive compulsive disorder, alcohol or substance

abuse or dependence, dysthymia, clinical depression, bipolar disorder, phobias, panic disorder, and schizophrenia. The two most common mood disorders occurring after TBI are depression and mood lability (Douglas & Spellacy, 2000; Jorge & Starkstein, 2005). According to both these sets of authors, mood disorders associated with TBI presents serious problems such as (a) exacerbating cognitive deficits that may have resulted from the traumatic injury; (b) reducing the ability to function independently and effectively, according to Douglas and Spellacy, as well as Jorge and Starkstein; and (c) interfering with rehabilitative therapies (Hommet et al., 2007). Depression can have disastrous effects if untreated. Fortunately, there are a variety of effective treatments for post-TBI depression that have been shown to improve functional outcome after TBI (Alderfer, Arciniegas, & Silver, 2005; Smith, Cornelius, Warnock, Bell, & Young, 2007). Unfortunately, there is currently no proven effective treatment for mood lability in TBI patients.

Arlinghaus et al. (2005) noted the greater prevalence of substance abuse for TBI patients. Although substance abuse may be the result of self-medication, it may exacerbate depression and mood lability symptoms. In order to have an effective intervention in treating any kind of mental health diagnosis, clinicians must be aware of the issue of substance abuse and its impact on treatment.

It is important to understand that there are multiple psychological and physical symptoms of traumatic brain injury (TBI) patients, related psychological disorders, and particular struggles they face as a result. Two of the major psychological disorders are described briefly in the following sections. First the symptom of mood lability is discussed in depth, as it is a common symptom of TBI patients. Second, post-traumatic



stress disorder is discussed as related to mood lability and TBI. This discussion sets the groundwork to understand the treatment process and treatment needs for TBI patients.

### **Mood Lability as a TBI Symptom**

**Definition of mood lability.** Mood lability, defined simply, is an oscillation between opposite poles of mood, frequently associated with periods of irritability (Benazzi, 2006).<sup>1</sup> Patients sometimes refer to this as “the ups and downs” they experience on a day-to-day basis. Patients with TBI who demonstrate mood lability experience and express emotions that change rapidly (Shoumitro, Lyons, Koutzoukis, Ali, & McCarthy, 1999). They often feel that they may not be in control of their emotions (Beetar, Guilmette, & Sparadeo, 1996). Mood lability is seen in the majority of TBI cases. Although the incidence of mood lability with TBI is not known, it is estimated that the majority of patients with TBI experience rapid emotional changes, according to Beetar et al.

**Prevalence of mood disorder in TBI patients.** According to one Veteran Administration researcher, 80% of TBI veteran patients have mood lability (K. Panizzone, personal communication, January 28, 2011). Arlinghaus et al. (2005) note that TBI appears to predispose patients to psychiatric disorders including obsessive compulsive disorder, alcohol or substance abuse or dependence, dysthymia, clinical depression, bipolar disorder, phobias, panic disorder, and schizophrenia. The two most common mood disorders occurring after TBI are depression and mood lability (Douglas & Spellacy, 2000; Jorge & Starkstein, 2005). According to both these sets of authors,

---

<sup>1</sup> Mood lability should not be confused with another disorder common to TBI patients, that is *involuntary emotional expression disorder* characterized by pathological crying and laughter (Perucca & Johannessen, 2003).

mood disorders associated with TBI present serious problems such as (a) exacerbating cognitive deficits that may have resulted from the traumatic injury; (b) reducing the ability to function independently and effectively, according to Douglas and Spellacy, as well as Jorge and Starkstein; and (c) interfering with rehabilitative therapies (Hommet et al., 2007). Depression can have disastrous effects if untreated. Fortunately, there are a variety of effective treatments for post-TBI depression that have been shown to improve functional outcome after TBI (Alderfer et al., 2005; Smith et al., 2007). Unfortunately, there is currently no proven effective treatment for mood lability in TBI patients.

Arlinghaus et al. (2005) noted the greater prevalence of substance abuse for TBI patients. Although substance abuse may be the result of self-medication, it may exacerbate depression and mood lability symptoms. In order to have an effective intervention in treating any kind of mental health diagnosis, clinicians must be aware of the issue of substance abuse and its impact on treatment.

**Characteristics of mood lability.** Mood lability after TBI is associated with impulsivity, anger, and agitation (McIntosh, 1997). Mood lability may be present at any of the phases of recovery mentioned earlier, according to Beetar et al. (1996). Ongoing research by Reis (2009) delineates specific areas in the brain that when impacted by percussive trauma can produce a variety of symptoms. Thus, levels of mood lability will vary from patient to patient.

Researchers who have taken images of the brain as it processes information related to personal identity have noticed that several areas are particularly active...these frontal and midline areas communicate with the regions of the brain

that process memory and emotion. . . . A patient will have various levels of trauma based on the specific area and or location of the injury. (p. A1)

**PTSD exacerbates mood lability.** Post-traumatic stress disorder is one of the major psychological results of traumatic brain injury (TBI), and discussion of this disorder aids in understanding how the current study relates to ongoing research on rehabilitation. Southwick et al. (1995) noted in returning veterans are diagnosed with post traumatic stress disorder (PTSD), hyper arousal symptoms varied due to degree of exposure. In addition there was an overall increase in PTSD symptoms spanning the 2 years. Therefore, the study suggests that it may take a period of time for consequences of traumatic exposure to unfold and be identified and or diagnosed. In a co-morbid diagnosis of PTSD and TBI, this syndrome can be a common challenge that returning veterans face, which can exacerbate symptoms of mood lability. Resnick and Rosenheck (2008) stated that the rate of competitive employment at discharge from veteran's service-connected disability treatment was 30% for individuals with PTSD and 36% for individuals without PTSD. After controlling for all other independent variables, veterans with PTSD were 19% less likely to be employed at discharge.

**Consequences of mood lability.** Mood lability can be debilitating for a variety of reasons. As a result of the agitation, impulsivity, and anger that are characteristic of mood lability, acts of aggression are commonly associated with mood lability. Mood lability thus often leads to greater frequency of and/or escalation in substance abuse, domestic violence, and/or altercations with authority. Another detriment associated with mood lability is that some patients have difficulty sustaining employment and avoiding incarceration due to tendencies toward acting out.

As with depression and substance abuse, mood lability can often be detrimental to recovery of cognitive skills after TBI, because mood lability can (a) interfere with rehabilitative therapies, (b) impede cognitive performance, and (c) decrease the effectiveness of day-to-day functioning (Holbrook & Hoyt, 2004), such as in social and employment settings. Clearly, effective treatments are needed in order to provide TBI patients with a way to overcome the negative consequences of mood lability.

### **Overview of Three Treatments for Psychological Effects of TBI: Medication, Psychotherapy, and Psychoeducation**

The clinical care for traumatic brain injury (TBI) must be individually tailored for the type of injury and neurobehavioral syndrome produced. The forces produced by head trauma are complex, and involve variation depending on the location and severity of the injury (Malec et al., 2007). Thus, treatments must be tailored to each patient's specific symptoms. Fortunately, on average the Veteran's Administration provides health care with better quality than that available through civilian providers (Asch et al., 2004). The following sections delineate four treatments that have been common treatment modalities in the helping professions, although among these, psychoeducation has not been in frequent use specifically for veterans with TBI. These treatments can be provided simultaneously or separately and thus should not be seen as competing modalities. Shames et al. (2007) conducted an overview of the current rehabilitation literature regarding return to work following TBI. They reviewed (a) predictive factors for successful return to work and (b) current concepts in rehabilitative strategies for successful return to work. Injury severity and lack of self-awareness appear to be the most significant indicators of failure to return to work. Thus they concluded that a

comprehensive approach, medical and psychosocial, eventually entailing adequate vocational rehabilitation with supported employment, can improve outcomes. It is this multi-faceted treatment approach, focusing on the most common and cost-effective therapies, that this study focuses on.

**Medication.** The most common treatments for behavior problems (such as those associated with mood lability) in TBI patients are medication and psychotherapy, or a combination of these treatments. Medication is often inexpensive and not time-consuming, thus it is easy to adhere to the treatment plan. Waldron-Perrine, Hanks, and Perrine (2008) recently reviewed a number of medications used in treating deficits in arousal, cognition, function, and other problems associated with TBI. They concluded that although pharmaceuticals are commonplace in rehabilitation treatment, clear clinical guidelines for the use of pharmacotherapy in TBI are lacking. This is because of the few conclusive findings regarding the effectiveness of any particular agent. At the same time, some of the medications that have been used for mood lability can worsen cognitive function (Hommet et al., 2007; Waldron-Perrine et al., 2008). New pharmaceuticals are currently being explored, but currently, psychotherapy and psychoeducation may be the most acceptable treatments in some cases. Still, Povlishock (2009) discussed various multi-modal approaches and the need for combinational therapy to address and improve clinical outcomes for this debilitating disease. Thus, even when pharmacological interventions are tolerated by a patient, the addition of behavioral therapy or other therapeutic modes is recommended.

**Psychotherapy.** Psychotherapy offers an effective alternative avenue for treatment (as opposed to medication), yet psychotherapy has the following drawbacks: (a)

it requires intensive resources from mental health practitioners and thus and may not be available at an optimal schedule; (b) it may require significant expenditure of time and resources on the part of patients who must allow for travel and mental health expenses; and (c) some patients avoid psychotherapy because of a perceived stigma. To make psychotherapy more available to a greater number of patients at affordable rates, some practitioners offer group psychotherapy. Contrary to their hypothesis, researchers Shaffer, Shapiro, Sank, and Coghlan (1981) found group therapy with CBT to be as effective as individual therapy in treating anxiety and depression in 10 weekly sessions involving progressive relaxation, cognitive restructuring, and assertion training.

**Psychoeducation.** As noted in the definitions section, psychoeducation is the education of patients about psychological issues so that they can implement self-help strategies. It is a type of treatment that is not costly and does not require considerable time and staff resources for treatment centers to provide. It can be used in conjunction with other treatment types but may also afford a treatment to those who by choice or by medical contraindication are unable to benefit from drug therapy for mood lability and other symptoms. Psychoeducation can be used as a tool to provide concrete strategies that are immediate and efficient, allowing the subject to diffuse a potentially stressful situation by employing a coping mechanism learned through psychoeducation. This modality can also be used to introduce the cognitive behavior therapy (CBT) and other techniques to the TBI patients to maximize the effectiveness of these treatments. In contrast with medication and traditional psychotherapy, psychoeducation can be employed as an adjunctive or stand-alone intervention, which can address the individualized cognitive impairment of individual subjects. A variety of psychoeducation

techniques have been found effective with mood disorders. Thase (2002) asserts that psychoeducational sessions can be favorably compared to standard CBT sessions: “Beyond the specific interventions, issues such as ‘dosing’ of psychosocial interventions, based both on cost considerations as well as burden to the patient, must be considered” (p. 330). Thus, to address the issue of mood lability in light of the drawbacks of psychotherapy, Wallis, Licht, Babineau, and Dergalust (in press) have suggested that patients with mood lability resulting from TBI might respond positively to psychoeducation techniques that have been found effective with mood disorders. In addition, like psychotherapy, psychoeducation avoids the physical side effect of medication. On the other hand, the effectiveness depends on an individual’s (a) motivation to follow through with the treatment plan and (b) capacity and willingness for insight and introspection. In addition, if a client becomes agitated or anxious as a result of the therapeutic content that is worked on in isolation, he or she might lack the immediate assistance of a clinician. However, some mental health services provide emergency phone counseling, which might effectively fill such a need in many instances. See Table 1 for a summary of the recommended treatments. These suggestions about the appropriateness of behavioral therapies and psychoeducation lead to the topic of the next sections, the descriptions of behavior therapy and psychoeducation. In the following sections, each of the treatment modalities discussed in this overview will be examined in greater depth.

Table 1

*Comparison of Currently Recommended Treatments for Mood Lability Associated With TBI*

Treatment Mode	Description	Benefits	Negative Aspects
Medication	Pharmaceuticals	<ul style="list-style-type: none"> <li>• Effective</li> <li>• Inexpensive</li> <li>• Not time-consuming or difficult</li> </ul>	<ul style="list-style-type: none"> <li>• Some medications used for mood lability can worsen cognitive function</li> </ul>
Psychotherapy	Usually from a cognitive behavioral perspective, therapeutic interventions involve a series of intensive one-on-one or group sessions with a licensed psychotherapist in addition to homework	<ul style="list-style-type: none"> <li>• Effective</li> <li>• Avoids physical side effects of medications</li> </ul>	<ul style="list-style-type: none"> <li>• Requires intensive resources from mental health providers</li> <li>• May not be available at an optimal schedule</li> <li>• May require significant expenditure of time and resources from patients</li> <li>• Carries perceived stigma for some</li> </ul>
Psychoeducation	From a cognitive behavioral perspective, therapeutic interventions would involve one-on-one or group education sessions with a mental health professional in addition to homework	<ul style="list-style-type: none"> <li>• Research indicates probability of effectiveness for TBI mood lability</li> <li>• Avoids physical side effects of medications</li> <li>• Does not require intensive resources from mental health providers</li> </ul>	<ul style="list-style-type: none"> <li>• Effectiveness depends on individual motivation to follow through</li> <li>• Requires a capacity and willingness for insight and introspection</li> <li>• Benefits from availability of emergency phone clinician support and willingness to use it</li> </ul>

### **Therapy Modes of Interest in the Present Study**

To put cognitive therapy in perspective, it is currently one of the most well known and most practiced approaches to therapy. Its philosophical basis differs from other



major therapy approaches, such as psychoanalytic and psychodynamic therapies that seek to uncover unconscious conflicts, behavior therapy that focuses solely on behavior modification without involving any exploration of thought processes, as well as humanistic and existential therapy that aim to help clients come to terms with the challenges of everyday living through exploration of their personal beliefs and value system (Strisik & Strisik, 2009).

Cognitive therapy is often called *cognitive behavior therapy* because it aims to help people in the ways they think (the cognitive) and in the ways they act (the behavior). This form of psychotherapy is based on the concept that the way we think affects how we feel emotionally. Cognitive therapy focuses on present thinking, behavior, and communication rather than on past experiences. It is oriented toward problem solving. Cognitive therapy has been applied to a broad range of problems including depression, anxiety, panic, fears, eating disorders, substance abuse, and personality problems (“Definition of Cognitive Therapy,” 2004).

Cognitive and behavior therapies can be distinguished from other psychotherapies by an emphasis on short-term therapy sessions that bring practical results in the present rather than focusing on past occurrences that affected development of symptoms (British Association for Behavioural and Cognitive Psychotherapies, 2005). The therapies discussed in the following sections draw from this tradition.

### **Cognitive Behavior Therapy**

**Definition of CBT.** CBT draws from the behavior therapy tradition in that it uses short-term therapy sessions that bring practical results in the present. In the first stage, therapists help clients to identify the problematic beliefs and examine their logical merit.

The next step is to learn to challenge the automatic thoughts, based on these beliefs, which occur as a response to life situations. Armed with the new understanding, patients then practice new skills that can be put into use in real-world situations (British Association for Behavioural and Cognitive Psychotherapies, 2005). According to Friedman and Thase (2008), these therapies “emphasize directive interventions aimed at reducing symptomatic distress, enhancing interpersonal skills, and improving social and vocational functioning” (p. 644). These authors note that the cognitive component of cognitive behavior therapy is aimed at “identifying and modifying distorted thoughts and *pathological schemas*” (p. 644), meaning mental maps or belief systems. According to Farmer and Chapman (2008), CBT is psychoeducational in nature and attempts to instruct patients by providing skills for managing their various symptoms. Patients may employ strategies to record their thoughts so they can examine them and learn to respond proactively and effectively rather than reacting based on flawed logic. By deciphering their assumptions and developing new strategies for coping, one may create significant and more lasting changes in attitudes and behaviors. CBT differs from other therapy modalities due to the emphasis on structure. The therapist designs the session in such a fashion that (a) progress is made; (b) there is a sense of utility, efficiency, and responsibility incumbent upon the patients; and (c) the patients grasp the principles they find useful and summarily take more ownership of the content of the sessions. Ultimately the patients feel empowered and continue to work autonomously.

Beck a pioneer in the field of cognitive therapy, provided powerful components used in CBT. According to Beck (1976) and Beck, Steer, and Brown (2006), patients have the key to understanding and solving their psychological disturbances within the

scope of their own awareness; they can correct the misconceptions producing their emotional disturbance as they are guided toward greater awareness of their thought processes. Patients can learn strategies to respond with a conscious decision to alter a potential negative act and thus produce a more desirable and attractive consequence, rather than reacting based on habitual responses. Melton (n.d.) describes Beck's approach as based on the idea that people with emotional difficulties tend to (a) commit characteristic logical errors that slant objective reality to the path of self-deprecation, (b) fail to distinguish between fantasy and reality, and (c) make incorrect inferences on the basis of inadequate or incorrect information. Thus treatment of their emotional distress consists of placing a heavy emphasis on schema (core beliefs or so-called mental maps). A key factor of the therapeutic process involves helping the patient restructure distorted belief systems (schema), which have a pivotal impact on changing dysfunctional behaviors. Cognitive behavior therapists place a heavy emphasis on examining cognitions and using cognitive rehearsal techniques to identify and change negative thoughts. If clients can learn to combat self-doubts in a therapy session, he or she may be able to apply their newly acquired cognitive and behavioral skills in real-life settings. Thus by changing thinking, behavior, and emotional responses, therapists assist clients in overcoming challenges and difficulties.

### **CBT as the therapy of choice for mood disorders, PTSD, and PCS.**

Psychotherapy treatment of mood disorders often involves a form of cognitive behavioral therapy. A systematic review (summary of related studies) on depression showed that the groups of people receiving CBT had the largest reduction in their symptoms, compared to interpersonal therapy, psychodynamic therapy, and supportive therapy (Churchill et al.,

2001). Similarly, a meta-analysis of studies on mood disorders in general found that people receiving CBT had the largest reduction in their symptoms, compared to supportive counseling and that CBT is comparable to treatment with tricyclic antidepressant medication. It also has an advantage over antidepressant medication in that relapse after medication cessation is high, while CBT effects are more sustained even after ceasing CBT therapy for mood disorders (Friedman & Thase, 2008). In addition, side effects of medication are not present with CBT. The National Collaborating Centre for Mental Health (2005) and the National Institute for Clinical Excellence (2005) both recommend CBT (specifically trauma-focused CBT) as the treatment of choice for a number of mental health difficulties, including post-traumatic stress disorder, based on a review of controlled-outcome studies. According to one study, there is evidence that CBT can be an effective intervention in addressing post concussion syndrome (PCS), a type of TBI. The study showed a reduction in symptoms of PCS after CBT. “The cognitive behavioral model also explains why early education about the nature and incidence of expected symptoms and cognitive restructuring appear to constitute effective inoculation against protracted PCS” (Mittenburg, Tremont, Zeilinski, Ficjera, & Rayls, 1996, p. 143).

**Post concussion syndrome.** CBT is well-suited for self-help and psychoeducation because (a) there is a sense of responsibility incumbent upon the patients; (b) the patients grasp the principles they find useful and summarily take more ownership of the content of the sessions; and (c) ultimately the patients feel empowered and continue to work autonomously (Farmer & Chapman, 2008).

CBT is frequently and effectively used in therapeutic modes aside from one-on-one psychotherapy, such as (a) group settings, (b) assisted self-help using a computer program or non-therapist personnel, and (c) self-help using printed materials (British Association for Behavioural and Cognitive Psychotherapies, 2005). Thase (2002) notes the following:

The strength of the CBT interventions . . . is that they are already widely available, training is relatively easy, and they have a long tradition of evolution into more practical modalities [such as] group interventions, shortened (significantly fewer than 20 sessions) courses, and even self-help and computer-aided versions. (p. 330)

A study by Anson (2006) concluded that a coping skills group employing a CBT intervention program may have provided some benefit in providing effective coping strategies. The study addressed emotional and adjustment issues. Following the group the majority of patients stated they had an improved understanding of emotional issues and gained skills to better implement coping mechanisms to manage these issues.

Gellatly et al. (2007) completed a meta-regression analysis regarding self-help interventions in managing depressive symptoms in which 34 studies were identified with 39 comparisons. Greater effectiveness was associated with contact with a therapist (i.e., guided self-help rather than unaided psychoeducation) and the use of CBT techniques. The authors report that “self-management [CBT] may be a way of delivering effective treatment to large numbers with unmet needs and barriers to care” (Litz, Engel, Bryant, & Papa, 2007, p. 1676). They report that if CBT “can be efficiently deployed and conveniently delivered, it can be more accessible and widely disseminated, especially to

individuals who experience various barriers to care” (p. 1676). The authors report that despite the effectiveness of CBT on reducing PTSD symptomology, it “is not widely available nor routinely employed” perhaps because it “requires significant professional training and expertise to administer, as well as patient time and resources” (p. 1676).

**CBT for mood lability.** At present there is not cognitive behavioral therapy (CBT) treatment developed specifically for mood lability associated with TBI; however, there is enough overlap in symptoms between mood lability and other mood disorders to justify use of CBT techniques that have been shown to be successful with other mood disorders. Thase (2002), for example, notes that two studies presented encouraging pilot results on CBT developed for bipolar disorder in the maintenance phase. In one of these studies, a large randomized controlled trial, a specific manual for CBT psychoeducation was used. The conclusion was that psychoeducation was found to largely protect against manic relapse and hospitalization and may reduce overall mood lability. In addition, Bisson and Andrew (2007) found evidence that CBT is effective at reducing PTSD symptomology. Ownsworth and McKenna (2004) who conducted a literature review of 85 studies on TBI and vocational rehabilitation, emphasized the importance of metacognitive, emotional, and social environment factors for improving employment outcome. Each of these is well-suited to improvement by CBT therapy.

### **Psychoeducation**

Since the mid 1980s when this mode of intervention was first introduced, psychoeducation has evolved into an independent therapeutic program with a focus on a fixed approach. This intervention mode consists of presenting key information by a skilled communicator and typically falls within the framework of a cognitive-behavioral

approach. Through their increased understanding of their disorder and understanding of ways to re-direct their thoughts and actions, patients (and their relatives if included in the psychoeducation) should be empowered to understand the illness and cope with it in a successful manner. This basic-level competency can coincide with other treatment programs such as individual behavioral therapy, self-assertiveness training, problem-solving training, and communication training. Psychoeducation practitioners strive to combine the factor of empowerment of the patient with scientifically founded treatment expertise (Bäumel, Froböse, Kraemer, Rentrop, & Pitschel-Walz, 2006). Rao and Lyketsos (2000) support this multi-faceted and practical approach, stating, “The management of this disorder should be practical and holistic. Education and support of TBI patients and family members should be associated with supportive and behavioral psychotherapy, occupational and vocational intervention, and social skills training” (para. 33). Bond and Campbell (2008) listed family psychoeducation as one of six evidence based practices for individuals with severe mental illness, in improving their quality of life, including meaningful work.

Psychoeducation, one of the treatment modes focused on in this study, means the patients are taught information and skills that may enable them to resolve symptoms through their own application, rather than in the course of a sustained relationship with a therapist. The information is imparted and practice sessions completed in a brief number of sessions, as opposed to seeing a psychotherapist over a course of weeks or months. In contrast with medication and traditional psychotherapy, psychoeducation can be employed as an adjunctive or stand-alone intervention, and can address the individualized cognitive impairment of individual subjects. (The level of cognitive impairment of TBI

patients will vary from subject to subject due to differences in severity of injury.) The addition of psychoeducation as an intervention can provide great utility as a supplemental or alternative treatment, to provide coping strategies that are self employed, as needed, by TBI subjects. Psychoeducation can also be used as a participatory model in which learning is self-guided. In this respect, it fits in well with the following discussion of adult learning.

**Adult learning styles as a factor in psychoeducation effectiveness.** Three key factors in determining the effectiveness of the psychoeducation program include the patients' acceptance and attitudes about (a) the relevance of psychoeducation methods to their own needs, (b) the method of training, and (c) the trainer. Each of these components will be discussed in this section. According to Knowles (1998), the following five characteristics describe the adult learner: (a) has an independent self-concept and can direct his or her own learning, (b) has accumulated a reservoir of life experiences that is a rich source for learning, (c) has learning needs closely related to changing social roles, (d) is problem-centered and is interested in immediate application of knowledge, and (e) is motivated to learn by internal factors rather than external social factors. These characteristics will also be discussed in the sections below.

There are several characteristics of the learners that can impact their learning, such as the following, discussed by Knowles, Holton, and Swanson (1998):

- The learners' past experiences: Adults come into the educational activity with a great amount of varied experiences. Greater emphasis in adult education is placed on individualization of teaching and learning strategies to take into account those



past experiences. Instructors can use variance in age and personalities to add depth to the learning environment to increase effectiveness.

- **Readiness to learn:** Knowles et al. (1998) states that adults become ready to learn those things they need to know and be able to do in order to cope effectively with their real-life situations. In other words, adults are motivated to learn to the extent that they perceive that learning will help them perform tasks or deal with problems that they confront in their life situations. Trainers can create the conditions that help learners become aware of their learning needs; it is not necessary to wait for their readiness to develop naturally. For example, the trainer could ask subjects to complete a homework assignment to journal about what real-life situations have brought up extreme anxiety in the past and what unfortunate circumstances might have resulted from the less-effective coping strategies.
- **Motivation:** While adults are responsive to external motivators (better jobs, promotions, etc.), the most potent motivators are internal pressures, such as the desire for increased job satisfaction, self-esteem, quality of life, and so forth, according to Knowles et al. The trainer can enhance subjects' desire to learn the CBT techniques by prompting a discussion of how the techniques can be applied to real-life situations. As a contrast to the previously described discussion of ineffective coping strategies, the trainer could then have subjects identify difficult situations in the past that they may have had success in managing, without asking specific questions that could trigger a traumatic memory, keeping in mind that many members of this veteran population have PTSD. The subjects could be

given a homework assignment to identify stressful situations from the past, then imagine themselves using the CBT and DBT techniques they have learned, calming down, and responding effectively. The trainer might motivate learners by providing success stories, real-life accounts of effective use of the strategies to be learned and the resulting benefits.

- Specific learning objectives and learning contracts can be formulated between the adult learner, the trainer, other mentors and mental health providers, and peers.
- According to Knowles (1996), learning contracts serve this function:

Learning contracts provide a vehicle for making the planning of learning experiences a mutual undertaking between a learner and his helper, mentor, teacher, and often peers. By participating in the process of diagnosing his needs, formulating his objectives, identifying resources, choosing strategies, and evaluating his accomplishments, the learner develops a sense of ownership of (and commitment to) the plan. (p. 212)

**Patient perceptions of relevance of psychoeducation methods.** Most adults have the tendency to retain the information more if they consider the learning material useful. When they recognize the teaching as relevant to their needs, then they choose what knowledge to retain. In order for facilitators to make an intellectual case for the value of the learning in improving the patients' work performance and quality of life, the patients need to be informed of available research that supports the effectiveness of the psychoeducation techniques (as described later in this chapter).

One way to enhance a sense of a psychoeducation technique's relevance is to allow patients to choose, from among several techniques, which they believe would be

best suited to them. Knowles et al. (1998) state that adults have a self-concept of being responsible for their own decisions, for their own lives. Once they have arrived at this self-concept, they develop a deep psychological need to be seen by others and treated by others as being capable of self-direction. Thus, for ideal adult learning conditions, facilitators need to include learners in the decision-making. For effective adult learning conditions, Knowles et al. notes the need to include learners in the decision-making. Thus patients will be given some choice about which interventions they want to participate in, in order to increase the personal investment and motivation of the patients. At the same time, there will also be a specific set of interventions given to all patients. Because these patients have a vested interest in what does and does not work for them, their feedback will be of paramount importance to the validity of providing a psychoeducational intervention.

In summary, psychoeducation is therapeutic information imparted by expert practitioners. Patients are taught information and skills that may enable them to resolve symptoms through their own application, rather than in the course of a sustained relationship with a therapist. The information is imparted and practice sessions completed in a brief number of sessions. The inclusion of psychoeducational interventions can help make the most efficient use of hospital resources, especially staff time. In addition, the psychoeducation can be enhanced by patients making use of printed or online resources, which affords a benefit to those patients without easy transportation access to on-site treatments. These patients with traumatic brain injury need effective alternative therapies. Psychoeducation provides a way to overcome

logistics that have been a significant hindrance in providing the necessary and warranted level of care for many patients.

### **Government Agency Assistance in Career Orientation and Rehabilitation**

Approximately 700,000 veterans are unemployed in any given month, and roughly 200,000 service members leave active duty and transition to civilian life each year, according to the Department of Labor (U.S. Government Accountability Office, 2009, p. 1). This is an unemployment rate similar to that of the general population. Several government agencies offer programs for rehabilitation, including vocational rehabilitation. In addition, ongoing research and reform efforts have attempted to improve such programs. In this section, first the government programs are described briefly, then several studies that directly relevant to the present study are described in detail.

**Government programs and initiatives to assist veteran vocational rehabilitation.** Several government agencies are responsible for assisting veterans in finding and preparing for civilian employment, such as ETA and VETS, and the Department of Veterans Affairs, operated by states with federal funding. All veterans with TBI are eligible for state vocational rehabilitation and a portion of veterans who have eligible military service-connected disabilities can be served by the Veterans Benefits Administration's (VBA) Vocational Rehabilitation and Employment (VR&E) department. These government programs offer such services as assessment, counseling, job readiness evaluation, and placement. Some programs are responsible to give priority to disabled veterans and those with other barriers to employment. According to HRfocus (2010), "the Labor Department has made available a new online 'toolkit' to guide

employers through the process for hiring military veterans, including those who are disabled as a result of their service” (p. 11).

In Executive Order No. 13518, CFR 1 (2009) President Obama called on private employers as well as the federal offices to recognize and utilize veteran’s skills and experience to fill their staffing needs. He stated, “Veterans have served and sacrificed in defense of our nation. When they complete their service, we must do everything in our power to assist them in re-entering civilian life and finding employment” (p. 1). An interagency Council on Veterans Employment was called on by this order to ensure that measures such as job counseling and training are implemented to meet this goal. Although any programs were previously in place to meet employment needs of veterans, the ongoing and increased need for such services was emphasized by this act. This was primarily because, as reported by the U.S. Government Accountability Office (2009), questions have been raised about whether available performance reports accurately reflects services and outcomes for veterans. In addition, “the current performance measures do not include a method to weight the successful outcomes of veterans who are harder to serve, such as those with barriers to employment” (p. 3). Further, as is common for large bureaucracies, the at times the use of precise and complex definitions for eligibility categories “creates gaps in services for veteran clients, complicates the implementation of priority of service . . . and complicates data entry between programs” (U.S. Government Accountability Office, 2009, p. 23). This organization also noted the need for a one-stop system for services. Two common types of services are described as follows:

- The Vocational Rehabilitation and Employment service has a five tracks to fit the varying needs of veterans: (a) reemployment (for those separating from active duty and returning to work for a previous employer), (b) rapid access to employment (for those seeking immediate employment and possessing skills for a viable occupation), (c) self-employment (for those with limited access to traditional employment due to a disabling condition or other life circumstances), (d) long term services through government programs (for those needing training or education or transitional work experience), (e) independent living (for those unable to immediately work and needing rehabilitation services such as assistive technology or training to achieve independence in daily living skills (U.S. Government Accountability Office, 2009).
- Compensated work therapy (transitional work experience): Employers contract with compensated work therapy programs to fill job openings or to perform identified tasks. The veteran workers are hired by the government agency offering the program, and although vocational staff may provide job coaching or other types of support, the veteran workers are often supervised directly by the employer. The employee's wages are paid by the government agency, and participating companies pay a small surcharge to support program operations. Some transitional work therapy positions are located in community businesses, but the majority of contracts for transitional work therapy are within government agencies. Positions may include janitors, print shop workers, construction workers, and groundskeepers. The Veterans Health Administration (VHA) compensated work therapy program provides diverse vocational approaches, with

163 individual programs in VHA facilities nationwide that follow multiple models of vocational rehabilitation. Although there is much structural and philosophical variability among compensated work therapy programs, until recently the predominant vocational activity in compensated work therapy has been the transitional work experience (Resnick & Rosenheck, 2008).

- **Supported employment:** According to Resnick and Rosenheck (2008), supported employment “is a new vocational service component offered for veterans with severe mental illness has become a growing part of compensated work therapy at all sites nationwide” (p. 428). This model differs from the above-described compensated work therapy (transitional work experience) model in that supported employment involves independent placement without payment by the government agency offering the program. This model has evidence-based effectiveness. As a result, vocational rehabilitation services, especially supported employment, for people with serious mental illness are increasingly considered to be central features of a recovery-oriented service system.
- **Incentives and advantages for private-sector employers:** Some non-government workplaces have found it profitable to hire veterans due to (a) financial incentives, (b) specific skill sets, and (c) other characteristics related to military training. Financial incentives include abundant free resources and tax credits of up to \$4,800 per hire (Williams, 2010). Some companies have found that (a) training in personnel management, (b) habits of personal discipline, and (c) comfort with hierarchical structure also have been advantages of hiring military veterans (Williams, 2010).

This section now turns to a discussion of several studies of vocational rehabilitation of veterans, some of which involve compensated work therapy or supported employment.

**A study of vocational rehabilitation of veterans with spinal cord injury.** One study with direct and meaningful implications for this present study's topic is described here in detail because it offers valuable insight regarding the research questions of the present study. At the outset of this description, it is important to note that the article did not describe a completed study, but the methods and progress of the study, as it had not yet been completed as of the publication of the article. This study of 301 veterans with spinal cord injury compared a program of evidence-based supported employment with conventional vocational rehabilitation (Ottomanelli et al., 2009). Similar to the present study, Ottomanelli et al.'s sample largely consists of male veterans. Baseline data indicated that up to 72% of the sample of employment-seeking veterans with spinal cord injury had never been employed after their injury, despite the fact that nearly half (41%) had received some type of prior vocational rehabilitation. This figure is consistent with the low rates of employment found in community samples of persons with spinal cord injury (50%-51%). It is important to note, however, that among persons with spinal cord injury, 13% to 69% are unemployed and the unemployment rate is more than 10 times greater than the general unemployment rate.

A study recently reviewed randomized controlled trials of supported employment. Supported employment is a term for programs that use an integrated approach to help people obtain and maintain community-based competitive employment in their chosen occupation. Bond et al. concluded that evidence-based supported employment is one of the most effective interventions available for persons with serious mental illness (Bond et



al., as cited in Ottomanelli et al., 2009). In 2004, the Veteran's Health Administration implemented a large-scale initiative to provide supported employment to veterans with serious mental illness under the auspices of the mental health compensated work therapy programs. Yet, the supported employment model has not been widely used or clinically tested among persons with physical disabilities, such as spinal cord injury, although they relate and may overlap with mild or serious mental illness.

In Ottomanelli et al.'s (2009) study of veterans with spinal cord injury condition, for the treatment condition, a vocational counselor was responsible for integrating and coordinating vocational rehabilitation services. The treatment was based on the following evidence-based supported employment principles:

1. Integrated treatment. Vocational rehabilitation is considered an integral component of interdisciplinary spinal cord injury care rather than a separate service.
2. Rapid engagement. Emphasis is on immediate assistance with job finding rather than lengthy prevocational assessment or training.
3. Competitive employment. The goal is paid jobs in regular work settings; that is, jobs that anyone can obtain regardless of disability status.
4. Belief that success is possible regardless of severity or type of disability. People with severe disabilities can directly obtain and succeed in competitive jobs.
5. Ongoing support. Follow-along supports continue for a time that fits the individual rather than terminating at a set point after a job is started.
6. Veteran preferences. Job finding and job supports are based on clients' preferences and choices rather than on providers' judgments.

7. Community-based services. Services are primarily provided in the community, rather than in mental health treatment or rehabilitation settings.
8. Personalized benefits counseling. Veterans with disabilities considering employment need up-to-date information from qualified disability benefits counselors. (pp. 920-912)

In contrast, the standard care model was that typically, veterans with spinal cord injury who are interested in employment would be referred outside the Veteran's Administration spinal cord injury centers to providers who are not members of the spinal cord injury healthcare team and who may not have knowledge of or experience with the unique issues relevant to this population and this particular diagnosis. For example, all veterans, regardless of disability benefits status, can be referred to state vocational rehabilitation services or Vocational Rehabilitation and Employment services. The services they receive through these providers are conventional vocational rehabilitation services that typically use a case management approach. Ottomanelli et al. (2009) note that "these vocational rehabilitation services vary widely in nature and intensity from state to state and may include referrals to training programs, job placement services, and rehabilitation technology assistance" (p. 921).

Because caseworkers in state agencies typically carry a caseload that far surpasses the caseload requirement associated with supported employment as defined in the Ottomanelli study, the study's subjects in the standard-care condition carried the burden of accessing and coordinating vocational rehabilitation services themselves. Yet, conditions in the treatment group were not always ideal either. For example, the researchers' experience was that employment and vocational rehabilitation were not

clinical priorities at the spinal cord injury centers because other more acute medical and rehabilitation needs took precedence. This lack of attention meant that both patients and providers were not used to identifying or addressing vocational issues in the treatment setting. To recruit patients who were willing to seek employment, the researchers used a cross-disciplinary educational process to elevate employment as an important area of clinical focus. This education prompted a culture change occurred such that providers began to introduce and explore the topic of employment and vocational goals in the outpatient clinic and inpatient unit, and veterans who were willing to consider undertaking this significant life change were then referred to the project. Hence, the researchers concluded that recruitment essentially relies on clinical providers' willingness to broaden their definition of rehabilitation to include vocational issues. Although the study had not been completed and therefore did not note conclusions comparing the treatment and control groups, it was an important observation that clinical priorities at the veteran medical treatment centers began to change as a result of participation in the study, in that vocational rehabilitation came to be considered a more important part of the overall treatment process.

**A study of veterans with PTSD in a compensated work therapy program.**

Few studies have examined employment outcomes in individuals with a primary diagnosis of posttraumatic stress disorder (PTSD). A study by Resnick and Rosenheck (2008) examined the employment status of veterans with PTSD who participated in a compensated work therapy program. They examined the relationship between PTSD and employment among 5,862 veterans in a national Department of Veterans Affairs vocational rehabilitation program. The authors found that veterans with PTSD were 19%

less likely to be employed at discharge from the program, after controlling for potentially confounding variables. This finding was in line with several previous studies that examined the relationship between PTSD and employment outside of vocational services and found that (a) those with combat-related PTSD were significantly less likely to be employed than those without PTSD; (b) PTSD diagnosis was associated with a lower hourly wage among those in the competitive workforce; and (c) increased severity of PTSD was associated with a decreased likelihood of fulltime employment. In this study, the rate of competitive employment for individuals with PTSD was lower than for those without, the overall rate of employment at discharge from the program was low for both groups, at 30% and 36% respectively, which is a modest difference.

**A study of suitability and attractiveness of various government services.** As noted previously, veterans may seek assistance in five tracks: (a) reemployment, (b) rapid access to employment, (c) self-employment, (d) long term services through government programs, and (e) independent living. The U.S. Government Accountability Office (2009) reported that more than half of veterans pursuing vocational assistance chose to pursue employment through the long-term services track, which includes education and training, while about one-fifth chose more immediate employment through the reemployment or rapid access to employment tracks, about one-fifth entered the independent living track, and very few (1%) veterans chose self-employment. The greater number entering long term services may be due to the fact that the Vocational Rehabilitation and Employment Service has an incentive structure for veterans to enroll in education and training programs, but offers no financial incentive for those seeking immediate employment. For example, “the program offers a monthly subsistence

allowance only to those veterans who are enrolled in education or training, but not to those who receive employment services only” (p. 11). This study mentioned a concern that some may not choose the track that is most appropriate for them because they seek and need the financial benefits available only through some tracks.

A civilian study confirming the importance of job placement for vocational rehabilitation. In one investigation of vocational rehabilitation services for persons with TBI found that college, counseling, and job placement were all significant positive predictors of employment, but job placement was the most important positive predictor (Gamble & Moore, 2003).

### **Chapter Summary**

Veterans with traumatic brain injury (TBI) face substantial challenges when returning to civilian employment. Studies consistently show that TBI patients, whether veteran or civilian, range between 12% to 70% return to employment, which indicates, conversely, a 30% to 88% unemployment rate. The incidence of TBI has increased over time. Fortunately, the history of treatments for traumatic brain injury symptoms has showed progress in effectiveness of treatment. Gains made in related areas of medicine and psychotherapy have benefitted this area of treatment. Increased medical technology and improvements in psychological treatment techniques have benefitted the recovery of TBI patients. TBI symptoms include disabilities that may last years or a lifetime and can have a devastating effect on functional independence.

Many returning veterans are diagnosed with post-traumatic stress disorder (PTSD). Cognitive dysfunction and mood disorders are the most common psychological disorders associated with TBI and PTSD. Within the mood disorder category, depression

and mood lability are the most common. Mood lability is a symptom that affects the majority of TBI cases and is associated with impulsivity, anger, and agitation. Mood lability can be detrimental to patients because it is associated with problems such as the following: aggression, escalation in substance abuse, domestic violence, altercations with authority, difficulty sustaining employment, and higher rate of incarceration due to tendencies toward acting out.

Current treatment for mood lability typically includes medication, except in cases in which it is contraindicated or the side effects not tolerated by the patient. Psychotherapy is another common treatment. Cognitive behavior therapy structures treatment as short-term therapy sessions that bring practical results (i.e., changes in thinking, behavior, and emotional responses). CBT is a natural choice for TBI because it has become the therapy of choice for mood disorders, PTSD, and PCS, all of which are frequent TBI symptoms. In addition, these modes are well-suited for use in psychoeducation because they allow patients to take more ownership of the content of the sessions with the goal that ultimately the patients feel empowered and continue to work autonomously. Psychoeducation has not been a common treatment for TBI patients, but because it has been found effective with mood disorders, it holds promise as a possibly efficient, affordable, and effective intervention mode. Psychoeducation emphasizes empowerment of the patient. This chapter included a section on adult learning because the psychoeducation model relies on the patients' capacity and motivation for learning. One important characteristic of adult learners is that they have learning needs closely related to changing social roles, is problem-centered, and is interested in immediate application of knowledge (Knowles, 1998), all of which relate to the concept of

psychoeducation. They will retain more information if they consider the learning material useful, they can relate it to prior experiences, and the learning is problem-centered.

Many government agencies have invested heavily in employment rehabilitation programs for veterans. Two modes of transitional work experience modes of rehabilitation are in consistent use, including compensated work therapy (placement with government payment of the veteran's wages) and supported employment (without government payment of wages). Ottomanelli et al. (2009) found that vocational rehabilitation was more effective for patients with spinal cord injury when it was part of an overall structured plan of care, rather than being referred to general vocational rehabilitation where the caseworkers had heavy caseloads and lacked understanding of the specific symptoms of these injuries. Resnick and Rosenheck (2008) found that although veterans with PTSD were only 19% less likely to be employed at discharge from a compensated work therapy program, which represents a modest difference between those without PTSD. Although the programs and the bureaucratic administration of them has presented challenges in affording the most suitable and attractive services for veterans, substantial benefits are available.

### **Chapter 3: Methodology**

This chapter describes in detail the research design. The research questions are explained. The next section clarifies the variables of interest in this study and their operational definitions. Characteristics are described for the sample group, as well as the characteristics that excluded patients from the study. Data analysis is described, as well as storage and destruction of data.

#### **Research Design**

This study was a retrospective chart review assessing the employment challenges of patients with traumatic brain injury (TBI). This study uses quantitative data and made frequency counts of categorical, ordinal, and interval variables.

#### **Restatement of Research Questions**

The research questions are reiterated here:

1. What is the average Global Assessment of Functioning Score for patients with traumatic brain injury ages 18 to 65 in the years 2003 to 2010 in the Los Angeles Veterans Hospital?
2. What is the unemployment/underemployment rate for the years 2003 to 2010 in patients with traumatic brain injury?
3. What is the impact of blast versus non blast injury in patients with traumatic brain injury, as evidenced by difference in Global Assessment of Functioning Score and unemployment/underemployment rate?
4. What is the incidence of mood lability as recorded on charts for patients with traumatic brain injury for the years 2003 through 2010 at the Los Angeles Veterans Administration hospital?



5. Based upon charts for patients with traumatic brain injury for the years 2003 to 2010, what treatments are most commonly used to treat behavioral and psychosocial dysfunction in patients with traumatic brain injury?
6. Based upon the findings for the above research questions, what might be a model to help TBI patients maintain a self-sufficient lifestyle or raise their employment possibilities?

### **Description of Variables**

In defining and writing about the main variables in this study, the researcher was careful to make distinctions between variables and the attributes or categories that make up the variables. A variable is a set of characteristics that may vary among individuals, among groups, or over time. This section sets out operational definitions for the variables to be included in this study.

**Global assessment of functioning.** To assess the psychosocial impact upon traumatic brain injured patients exposed to blast versus non-blast injury, this study used the global assessment of functioning (GAF) score assigned by the clinician who assessed the patient and recorded the score in the patient chart. This is an interval variable, having a scale from 1 to 100, with the larger number indicating greater level of functioning. This measure includes the clinician's evaluation of the following patient characteristics: functioning in a wide range of activities; interest and involvement in a wide range of activities; social effectiveness; general satisfaction with life; occupational or school functioning; presence of meaningful relationships; presence of mood disorders, anxiety disorders, sleep disorders, logic and judgment impairment, delusion or hallucination, violent behavior; maintenance of hygiene; communication ability (American Psychiatric

Association, 2000). The GAF score presents an overall level of functioning that may be (a) a result of a number of cognitive and emotional deficits, or (b) a result of interactions between these deficits. The GAF describes the behavioral aspect, as opposed to the underlying deficit and specific symptoms.

The score is often given as a range, as outlined below.

- The range 91-100 indicates superior functioning in a wide range of activities, life's problems never seem to get out of hand, is sought out by others because of his or her many positive qualities. No symptoms.
- The range 81-90 indicates absent or minimal symptoms (e.g., mild anxiety before an exam), good functioning in all areas, interested and involved in a wide range of activities, socially effective, generally satisfied with life, no more than everyday problems or concerns (e.g., an occasional argument with family members).
- The range 71-80 indicates that if symptoms are present, they are transient and expectable reactions to psychosocial stressors (e.g., difficulty concentrating after family argument); no more than slight impairment in social, occupational, or school functioning (e.g., temporarily falling behind in schoolwork).
- The range 61-70 indicates some mild symptoms (e.g., depressed mood and mild insomnia) *or* some difficulty in social, occupational, or school functioning (e.g., occasional truancy, or theft within the household), but generally functioning pretty well, has some meaningful interpersonal relationships.
- The range 51-60 indicates moderate symptoms (e.g., flat affect and circumstantial speech, occasional panic attacks) *or* moderate difficulty in social, occupational, or school functioning (e.g., few friends, conflicts with peers or co-workers).

- The range 41-50 indicates serious symptoms (e.g., suicidal ideation, severe obsessional rituals, frequent shoplifting) *or* any serious impairment in social, occupational, or school functioning (e.g., no friends, unable to keep a job).
- The range 31-40 indicates some impairment in reality testing or communication (e.g., speech is at times illogical, obscure, or irrelevant) *or* major impairment in several areas, such as work or school, family relations, judgment, thinking, or mood (e.g., depressed man avoids friends, neglects family, and is unable to work; child frequently beats up younger children, is defiant at home, and is failing at school).
- The range 21-30 indicates that behavior is considerably influenced by delusions or hallucinations *or* serious impairment, in communication or judgment (e.g., sometimes incoherent, acts grossly inappropriately, suicidal preoccupation) *or* inability to function in almost all areas (e.g., stays in bed all day, no job, home, or friends)
- The range 11-20 indicates some danger of hurting self or others (e.g., suicide attempts without clear expectation of death; frequently violent; manic excitement) *or* occasionally fails to maintain minimal personal hygiene (e.g., smears feces) *or* gross impairment in communication (e.g., largely incoherent or mute).
- The range 1-10 indicates persistent danger of severely hurting self or others (e.g., recurrent violence) *or* persistent inability to maintain minimal personal hygiene *or* serious suicidal act with clear expectation of death.

In one study, data from the Veterans Health Administration were used to evaluate the strengths and weaknesses of the global assessment of functioning (GAF) scale. The

analysis supported the discriminant validity of the GAF-derived measures at more than 130 VHA medical centers, and was consistent across facilities (Greenberg & Rosenheck, 2005). In another study, the GAF scale was used in measuring adaptive functioning of psychologically traumatized veterans. It was found to be a valid and reliable measurement with a high inter-rater reliability. Further, this study showed that the GAF score is primarily related to a reduction in functioning due to psychiatric symptoms rather than environmental circumstances, which indicates that it is well suited to use in the present study, as it gives theoretical support for comparing GAF scores with PTSD and mood lability (Jovanović, GaSic, Ivković, Milovanović, & Damjanović, 2008).

**Unemployment and underemployment.** This variable was recorded as an ordinal variable: difficulties at work, underemployment, and unemployment, with the higher number indicating greater severity of employment challenge.

**Mood lability.** Mood lability was indicated by (a) the presence of this term in the charts, (b) a description of the patient being quick to anger or quickly become anxious, or (c) mention of emotional outbursts. This was used as a categorical variable. As noted in the definitions section, mood lability has been defined as rapid emotional changes such as fluctuation between opposite moods and is frequently associated with periods of irritability (Benazzi, 2006). Mood lability after traumatic brain injury (TBI) is associated with impulsivity, anger, and aggression (McIntosh, 1997). TBI patients often feel that they may not be in control of their emotions (Beetar et al., 1996).

**Therapy type.** Therapy type was recorded as a categorical variable. Many types of therapies may be found in the charts. Of particular interest to the researcher are three

therapy types that are expected to be most prevalent for TBI patients: medication, CBT and/or other psychotherapy, and psychoeducation.

**Summary.** A study by Miller, Wolf, Martin, Kaloupek, and Keane (2008) showed that the association between combat exposure and GAF scores was statistically related to PTSD severity. Combat exposure more directly related to re-experiencing symptoms, while avoidance and numbing symptoms more directly related to GAF. Only 17% of variance in GAF was accounted for by PTSD, indicating that other factors, such as therapy and rehabilitation treatment type may account for a portion of the variance as well, among other variables. This study gives support to the use of the variables chosen for the present study, because it (a) shows GAF scores to relate to PTSD and (b) shows that PTSD does not account for all of the variance in GAF scores, leaving room for consideration of other factors that may account for the remainder of the variance, such as employment status as well as therapy and rehabilitation treatment type.

### **Data Source**

Patient records were accessed from a hospital associated with the Veteran's Administration, located in Los Angeles, California. These records are contained in a computerized data file.

### **Population and Sample**

The study population consisted of those who meet the following criteria:

- Patients 18 years and older who have a documented exposure to traumatic brain injury
- Confident history of mild to moderate TBI greater than 6 months before data collection for the present study (severity of TBI was determined upon the Mayo

Classification, which is loss of consciousness after head trauma, as documented by medical record, or history taken from a third party)

- Received treatment at the Los Angeles Veteran's Administration hospital between (and inclusive of) the years 2003 through 2010
- Were between the ages of 18 and 70 years old at the time of the patient's first visit to the Los Angeles Veteran's Administration hospital

Patients excluded from the study were those who served in eras earlier than the Vietnam era because older veterans are less likely to be engaged in the competitive workforce. The sample was thus restricted by both service era and age to allow examination of the relationship between service era and employment.

Patient records were accessed from a hospital associated with the Veteran's Administration, therefore the majority of patients were veterans. Patients are likely to be male because of (a) the likelihood of most patients being veterans<sup>2</sup> and (b) the greater incidence of TBI in males. Incidence of traumatic brain injury (TBI) is higher for males than females (Elovic, Baerga, & Cuccurullo, 2004). Exclusionary criteria would include those whose records are not complete enough to determine the patient's status on the variables under study.

---

<sup>2</sup> The armed forces currently and in the past have excluded women from most combat jobs where they would be more vulnerable to head injury, according to the Congressional Research Service (1996).

## **Protocol**

The following list of procedures is in the order that each process was initiated.

1. The researcher has obtained permission from the Los Angeles Veteran's Administration (VA) to conduct this study, including IRB permission and access to the patient records.
2. Patient charts were pre-screened to determine which patients are eligible to be included in the study according to their TBI status and year-range of service. This review and subsequent record reviews were conducted on-site at the VA hospital, as agreed to by the Los Angeles Veteran's Administration, in order to maintain security of the records and ensure that the records are continually available to other clinicians and researchers who may need access to the records.
3. The researcher then reviewed each file that meets the study criteria, recording each patient's status on specific variables. The researcher entered the data directly into a computer spreadsheet as each file is reviewed, to minimize the possibility of errors in data transfer. See Appendix: Electronic Data Entry Form.

## **Data Analysis**

Data were presented as frequency counts and presented in graphic format. Table 2 describes the analysis method for each research question. The GAF score initially performed rendered a median score of 55.0 GAF scores can be secured on an annual basis. Although, not all GAF scores are typically monitored annually. The subsequent multiple GAF score had a median score of 55.02 the *n* was 32. The original GAF score was elicited closest to the patients' brain injury. There is not a significant difference post original score. The multiple GAF score was an improvement of only .02%.

Table 2

*Relationships Among Research Questions and Methods*

Research Question	Operational Definition	Analysis Method
1. What is the average Global Assessment of Functioning Score for patients with traumatic brain injury ages 18 to 65 in the years 2003 to 2010 in the Los Angeles Veterans Hospital?	GAF score recorded by evaluating clinician (1-100)	Create average percentage
2. What is the unemployment/underemployment rate for the years 2003 to 2010 in patients with traumatic brain injury?	Unemployment/underemployment or employment difficulties mentioned as part of GAF or elsewhere on chart	Comparison of simple descriptive statistics (frequency counts)
3. What is the impact of blast versus non blast injury in patients with traumatic brain injury, as evidenced by difference in Global Assessment of Functioning Score and unemployment /underemployment rate?		Comparison of simple descriptive statistics (frequency counts)
4. What is the incidence of mood lability as recorded on charts for patients with traumatic brain injury for the years 2003 through 2010 at the Los Angeles Veterans Administration hospital?	Mention of or diagnosis of mood lability in patient chart	Simple descriptive statistics (frequency counts) for types of therapy mentioned
5. Based upon charts for patients with traumatic brain injury for the years 2003 to 2010, what treatments are most commonly used to treat behavioral and psychosocial dysfunction in patients with traumatic brain injury?	Mention of therapeutic method in patient chart	Simple descriptive statistics (frequency counts) for types of therapy mentioned
6. Based upon the findings for the above research questions, what might be a model to help TBI patients maintain a self-sufficient lifestyle or raise their employment possibilities?	Not applicable	Collection and quantitative analysis of entire set of findings



## **Precautions for Use of Human Subjects**

According to the Pepperdine University Institutional Review Board's (n.d.) Application for Approval of Research Project, "individuals with mental or cognitive disabilities" are considered a vulnerable population (§ 8.4). Because patients in this study may have cognitive deficits due to their traumatic brain injury, they fit this description as a vulnerable population. However, because the data source includes only archival data and no contact with patients by the researcher, the study qualifies as exempt from IRB requirements for use of human subjects in research. Still, in accordance with requirements, confidentiality was maintained, including requirements for storage and destruction of data.

**Confidentiality.** Information about patients was handled as confidentially as possible. Data were presented in aggregate form so that no one patient could be identified by his or her characteristics. The researcher adhered to all privacy and confidentiality federal and state laws including the Federal Health Insurance Portability and Accountability Act (HIPAA).

**Storage and destruction of data.** Patients' research records were labeled with a code number. Patients were not be able to be identified by their research record. The list that matches each patient's name with his or her code number was kept in a locked file in the researcher's office at the Veteran's Administration hospital. The research records were kept in a password-protected computer file that only the researcher has access to. The data set was kept in a locked office throughout the duration of the study. Only the researcher had access to the data. The researcher complied with the requirement to take an online course concerning the protection of rights of human subjects. The researcher

submitted an application for exempt review to the Internal Review Board of Pepperdine University. The researcher did not begin data collection until given permission to conduct the study. The raw data will be kept in a secure location at the study site for 5 years from the end of the data collection period. After this time, the raw data files will be disposed of. Only the published study results will remain.

### **Chapter Summary**

This chapter describes the research model as a descriptive study. The chapter also clarified the variables of interest in this study as GAF, employment challenges, mood lability, and type of treatment. Characteristics for the population included in the chart review includes the following: veterans who have been diagnosed and/or treated at the VA hospital. Data sources for the study are medical records held at the VA hospital. Data processing and data analysis consisted of quantitative analysis Precautions that were taken relating to the use of human subjects include the following: (a) steps that were taken to protect confidentiality and (b) plans for storage and destruction of data.

## **Chapter 4: Results**

This chapter presents the results of the chart reviews of 220 traumatic brain injury (TBI) patients, according to the criteria described in detail in Chapter 3. Of these charts, 186 were considered complete enough to include in the data set. The data set was accessed from a computerized data file of a hospital associated with the Veteran's Administration, located in Los Angeles, California. The researcher is employed by the Veteran's Administration and thus had authorization to access the files and perform the study. As she compiled the dataset, she also had access to personnel who helped in the task of interpreting the data entered by the VA physicians and clinicians, so that valuable information would not be lost, overlooked, or misunderstood.

This chapter presents the data for the overall research topic, unemployment and underemployment for TBI patients, by using charts and graphs to depict the findings for those research questions that require presentation of complex data, with brief explanatory descriptions. The content of this chapter is organized by research question, after a description of the general demographic findings.

### **Research Questions**

The particular research questions investigated in this study are as follows:

1. What is the average Global Assessment of Functioning Score for patients with traumatic brain injury ages 18 to 65 in the years 2003 to 2010 in the Los Angeles Veterans Hospital?
2. What is the unemployment/underemployment rate for the years 2003 to 2010 in patients with traumatic brain injury?

3. What is the impact of blast versus non blast injury in patients with traumatic brain injury, as evidenced by difference in Global Assessment of Functioning Score and unemployment/underemployment rate?
4. What is the incidence of mood lability as recorded on charts for patients with traumatic brain injury for the years 2003 through 2010 at the Los Angeles Veterans Administration hospital?
5. Based upon charts for patients with traumatic brain injury for the years 2003 to 2010, what treatments are most commonly used to treat behavioral and psychosocial dysfunction in patients with traumatic brain injury?
6. Based upon the findings for the above research questions, what might be a model to help TBI patients maintain a self-sufficient lifestyle or raise their employment possibilities?

### **Demographics of Subject Group**

The mean age of subjects was 37.2, with a standard deviation of 13.5. There was a fairly even distribution of subjects in the 18 to 30 range as well as the 31 to 50 year old range, and fewer in the 51+ year old range (see Table 3). Table 4 shows racial/ethnic distribution of the subjects. Table 5 shows that the subject group has a much greater percentage of males than females. Table 6 shows that the subject group has roughly the same number of people currently in relationships with a significant other as those who are not. Table 7 shows that the subject group has a greater percentage of those with blast injury than without, although the numbers are fairly close. Where frequency counts do not equal 186 total respondents, this indicates that one or more charts did not contain that

information, but there was still enough essential information to qualify that chart for inclusion in the study.

Table 3

*Ages of Subjects*

Age Range	Frequency Count	Percentage
18-30 years old	83	45%
31-50 years old	69	37%
51+ years old	34	18%
Total	186	100%

Table 4

*Race/Ethnicity of Subjects*

Race/Ethnicity	Frequency Count	Percentage
Caucasian	73	39%
Hispanic	56	30%
African American	31	17%
Asian	12	6%
Other	13	7%
Total	185	99%

Table 5

*Gender Distribution of Subjects*

Gender	Frequency Count	Percentage
Male	178	96%
Female	8	4%
Total	186	100%

Table 6

*Relationship Status of Subjects*

Relationship Status	Frequency Count	Percentage
Single/divorced	98	52%
In a relationship	87	47%
Total	185	99%

Table 7

*Blast or Non-blast Status of Subjects*

Blast and Non-blast	Frequency Count	Percentage
Blast	108	58%
Non-blast	78	42%
Total	186	100%

### Findings for Research Question 1

Research Question 1 asked: What is the average Global Assessment of Functioning Score for patients with traumatic brain injury ages 18 to 65 in the years 2003 to 2010 in the Los Angeles Veterans Hospital? Of the 186 subjects, 22 (12%) had no recorded GAF and 164 (88%) had a recorded GAF. The mean GAF was 55.2; similarly the median and mode GAF were 55, with a standard deviation from the mean of 11.2. There were 32 occurrences of the mode score of 55. In Figure 1, the right-most bar depicts the total number of subjects, and the GAF scores are plotted on the  $x$  axis and the subject count on the  $y$  axis. These percentages were obtained by dividing the number of occurrences of a GAF score for blast or non-blast occurring as a percentage of the total number of GAF scores collected. They are percentages relative to the total number that had a GAF recorded, not relative to the group (blast or non-blast).

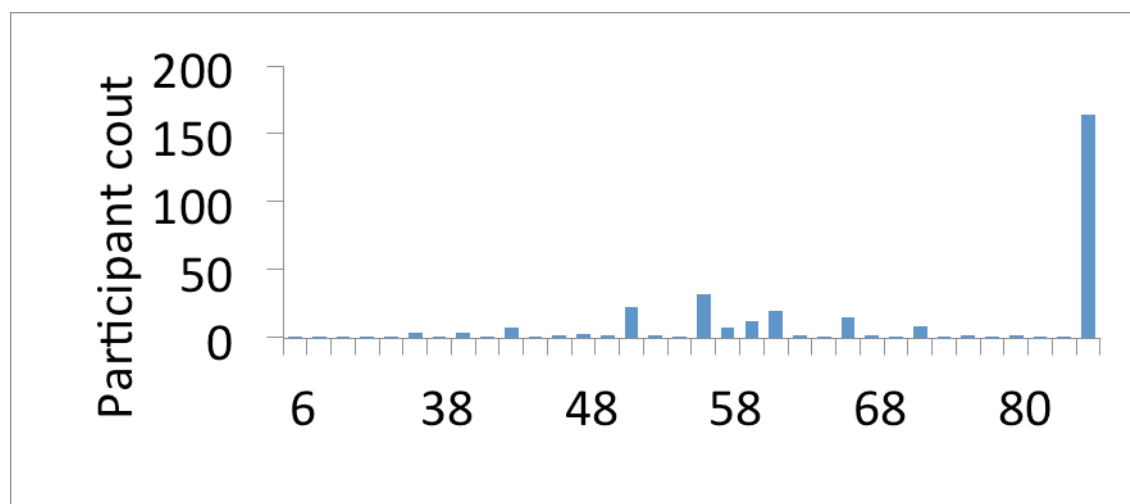


Figure 1. GAF scores for all subjects.

### Findings for Research Question 2

Research Question 2 asked: What is the unemployment/underemployment rate for the years 2003 to 2010 in patients with traumatic brain injury? Table 8 shows that approximately half of the subjects were unemployed. Assessment of age, race, or gender did not appear to have an impact on the rate of employment in post-TBI subjects. It should be noted that the number of subjects in these groups were much smaller, so comparisons are limited.

Table 8

#### *Employment Rate of Subjects*

Employment Status	Frequency Count	Percentage
Unemployed	96	52%
Employed	33	18%
Students	57	30%
Total	186	100%

### Findings for Research Question 3

Research Question 3 asked: What is the impact of blast versus non blast injury in patients with traumatic brain injury, as evidenced by difference in Global Assessment of Functioning Score and unemployment/underemployment rate? As with Figure 1, Figure 2 shows the GAF scores plotted on the *x* axis and the subject count on the *y* axis, but with GAF scores separated into non-blast and blast subject counts. The lowest GAF scores (indicating low level of general functioning) belong to subjects with blast injury. The highest GAF scores belong to both blast and non-blast subjects.



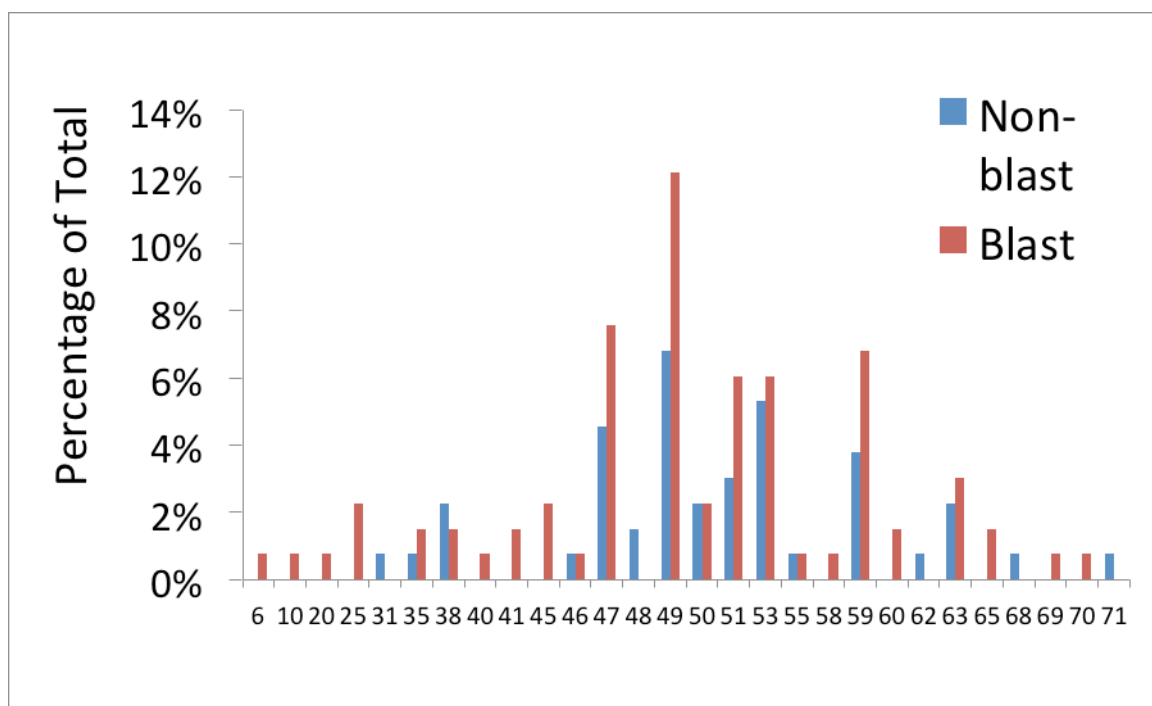


Figure 2. Level of GAF scores for blast and non-blast groups.

GAF Score changes were calculated for those subjects who had multiple GAF scores (performed annually) throughout the course of treatment at the VA hospital. The total number of these subjects was only 44 out of 186. Of these, 20 (45%) improved, 7 (16%) had no change in GAF score, and 17 (39%) worsened.

Table 9 separates these results relevant to blast or non-blast status. Interestingly, only 6% of the blast group showed GAF score stability, and most of the blast group's scores worsened (48%). Those whose GAF scores worsened were approximately equal to those who improved (48% and 45% respectively). Some charts did not record or indicate whether the TBI was blast or non-blast, thus the frequency counts are not equal to the total number of charts included in the subject pool.

Table 9

*Impact of Blast and Non-blast TBI as Evidenced by Change in GAF Score*

Blast Status	GAF Change Status	Frequency Count	Percent
Non-blast	Improved	5	45%
	No Change	5	45%
	Worsened	1	9%
Total non-blast		11	100%
Blast	Improved	15	45%
	No Change	2	6%
	Worsened	16	48%
Total blast		33	100%

There were a greater percentage of subjects with non-blast TBI who were unemployed than there were with blast TBI who were unemployed, as shown in Table 10. It should be noted that for calculations regarding employment that if a subject was an active student that they were considered employed. There were more subjects with blast TBI who were students than non-blast, which is likely related to the vast majority of blast subjects being younger and being Operation Enduring Freedom or Operation Iraqi Freedom (OEF/OIF) veterans. An important consideration for interpreting these results is that older Vietnam veterans are probably on SSI or a pension, so although not employed, neither are they destitute.

Table 10

*Impact of Blast and Non-blast TBI as Evidenced by Employment Status*

Blast Status	Employment Status	Frequency Count	Percent of Total
Non-blast	Unemployed	49	45%
	Student	22	20%
	Employed	37	34%
Total non-blast		108	100%
Blast	Unemployed	47	60%
	Student	11	14%
	Employed	20	26%
Total blast		78	100%

**Findings for Research Question 4**

Research Question 4 asked: What is the incidence of mood lability as recorded on charts for patients with traumatic brain injury for the years 2003 through 2010 at the Los Angeles Veterans Administration hospital? As indicative of mood lability, Table 11 shows that 34% of subjects exhibited emotional outbursts as a symptom recorded in chart reviews. Although not specifically asked with this research question, mood lability was a greater issue for blast versus non-blast subjects with an incidence of 41% compared to 25%, respectively. Some chart reviews did not indicate whether outbursts had been a symptom or not, thus the total of this frequency count is not equal to the total number in the chart reviews.

Table 11

*Presence of Emotional Outbursts in Subjects*

Lability Status	Frequency Count	Percentage
No outbursts	116	66%
Outbursts	60	34%
Total	176	100%

Because mood lability symptoms often coincide with depression, as discussed in the literature review, the incidence of depression is reported in Table 12. Over three-fourths of the subject group reported symptoms leading to the diagnosis of depression.

Table 12

*Incidence of Depression in Subjects*

Depression Status	Frequency Count	Percentage
No depression	42	23%
Depression	144	77%
Total	186	100%

Although not part of the research question specifically, the researcher calculated the difference of depression incidence based on blast or non-blast status. Table 13 shows that the results are roughly equal, although a greater percentage of subjects with blast injury reported depression (81%) compared to those with non-blast injury (72%). Again, some charts did not record or indicate whether the TBI was blast or non-blast, thus the frequency counts are not equal to the total number of charts included in the subject pool.

Table 13

*Incidence of Depression in Subjects Related to Blast or Non-blast Status*

Blast Status	Depression Status	Count	Percent of Total
Non-blast	No Depression	22	28%
	Depression	56	72%
Total non-blast		78	100%
Blast	No Depression	20	19%
	Depression	88	81%
Total blast		108	100%

Because mood lability symptoms often coincide with PTSD, as discussed in the literature review, the incidence of PTSD is reported in Table 14. Over three-fourths of the subject group reported symptoms leading to the diagnosis of PTSD. The incidence of depression reported for subjects with TBI has a similar percentage.

Table 14

*Incidence of PTSD in Subjects*

PTSD Status	Frequency Count	Percentage
No PTSD	35	22%
PTSD	121	78%

**Findings for Research Question 5**

Research Question 5 asked: Based upon charts for patients with traumatic brain injury for the years 2003 to 2010, what treatments are most commonly used to treat

behavioral and psychosocial dysfunction in patients with traumatic brain injury? Table 15 shows that of those with depression, most (74%) were prescribed depression medication. The chart review did not capture data regarding those subjects that may have declined medication and/or treatment for depression. In addition, although no other forms of therapy for depression were captured with this chart review, it should be noted that the Veterans Health Administration (VHA) is mandated to provide healthcare treatment for patients, particularly those with major depression or other mental health issues. Those patients with depression or other mental health issues are routinely offered group and individual counseling.

Table 15

*Incidence of Depression Medication Prescription for Subjects*

Medication Status	Frequency Count	Percentage
No medications	37	26%
Medications	106	74%

**Findings for Research Question 6**

Research Question 6 asked: Based upon the findings for the above research questions, what might be a model to help TBI patients maintain a self-sufficient lifestyle or raise their employment possibilities? The chart review data provided information regarding the issues facing patients with TBI either from blast or non-blast exposures that would impact employability. The chart review data demonstrated that there were issues with mood lability, depression, memory loss (data not shown), decreased GAF scores, and other symptoms that are common post-TBI problems. Although the data set does not

point to any one issue being more important than another, any of these issues can impact the ability of an individual to obtain or keep a job.

### **Chapter Summary**

The mean age of subjects was 37.2, with a distribution of subjects from 18 to 51+. The racial/ethnic distribution of the subjects included primarily Caucasian and Hispanic, with African American and Asian subjects as well. The subject group was primarily male. The subject group has roughly the same number of people currently in relationships with a significant other as those who are not. The subject group has a greater percentage of those with blast injury than without, although the numbers are fairly evenly dispersed.

The mean, median, and mode for blast and non-blast TBI subjects were 55 for GAF scores. Approximately half of the subjects were unemployed. The lowest GAF scores belonged to subjects with blast injury. The highest GAF scores belonged to both blast and non-blast subjects. Only 6% of the blast group showed GAF score stability, and most of the group's scores worsened (48%). There was a greater percentage of subjects with non-blast TBI who were unemployed than there were with blast TBI who were unemployed. As an indication of emotional lability, 34% of subjects exhibited emotional outbursts as a symptom recorded within the medical charts. Related to emotional lability, over three-fourths of the subject group reported symptoms leading to the diagnosis of depression, and a similar proportion was diagnosed with PTSD. Of those with depression, most (74%) were prescribed anti-depressant medication. The chart reviews did not specifically address whether other forms of therapy for depression were provided in the subject groups, but group and individual therapy are offered for all patients that

exhibit issues with major depression. The chart review data did not contain recommendations for what might help TBI patients maintain a self-sufficient lifestyle or raise their employment possibilities, thus this topic is discussed in Chapter 5, along with interpretations and implications for findings related to each of the research questions.



## **Chapter 5: Discussion**

The overall research topic of this study was evaluation of unemployment and underemployment for traumatic brain injury (TBI) from blast versus non-blast exposure in veterans. In addition, this study aimed to assess the impact of TBI upon specific behavioral and psychosocial factors related to employability and to determine if there was a difference for blast versus non-blast induced TBI. To address these study questions, a retrospective chart review of the records of TBI patients was performed. The primary research questions related to (a) global assessment of functioning (GAF), (b) employment challenges, (c) the impact of blast versus non blast TBI upon GAF and employment challenges, (d) types of treatment provided, and (e) what interventions seemed promising for helping those patients maintain self-sufficiency.

In this chapter, the interpretations and implications of the findings are discussed. The interpretation of the findings also presents other plausible alternative explanations to my inferences. The next section discusses general conclusions based on my interpretations of the findings. Important implications are noted. Recommendations focus on policy and practice. Recommendations are made for the benefit of veterans and their care providers, whether in clinical, residential, or family settings. To guide future research efforts, recommendations for further study suggest useful extensions of research into the topic of this study.

### **Limitations**

One limitation of the study is that GAF scores were for the most part assessed only one point in time and are a subjective measure that was assessed by various clinicians including psychologists, medical doctors, and social workers. Any of these are

authorized to assign a GAF score, but they may be trained differently and prone to weight various components of the score differently. In addition, not all subjects were assigned a GAF score.

Another limitation is that although patients at the VA hospital are afforded opportunities for counseling if they present with mental health issues, the only recorded treatment for psychological symptoms was medication. Thus there was no opportunity for the present study to report on more than one treatment type or to compare outcomes based on therapy type.

Another important limitation is that the small sample did not allow for significant results with quantitative analysis, thus the study is merely descriptive. Although there were 220 charts reviewed and 186 charts included in the subject pool for this preliminary study, this is a relatively small sampling. In the planning of the study, the data set seemed large enough that more patient charts would meet inclusion criteria, but as the data set was collected, it became clear that charting was not consistent enough or complete enough that the desired quantitative analysis could be completed. It will be interesting to see if this rate over unemployment remains this high with a larger sampling. Unfortunately, the percentage is likely a fairly accurate finding for this group, but it should be further explored.

## **Conclusions**

The following conclusions were reached based on the data, having a direct conceptual link to the findings presented in Chapter 4.

**Conclusions for research question 1.** Research question 1 asked: What is the average Global Assessment of Functioning Score for patients with traumatic brain injury ages 18 to 65 in the years 2003 to 2010 in the Los Angeles Veterans Hospital?

The findings show that the mean, median, and mode for each group (blast versus non-blast) was 55 for GAF. This average score indicates that on a scale from 1 to 100 for the GAF that clinicians assessing the subject's overall level of functioning found the majority to have moderate symptoms or moderate difficulty in social, occupational, or school functioning. This is in keeping with many of the reported issues patients report following brain injury in terms of having difficulty interacting with others. The GAF scores have been utilized with the VA system for quite some time in terms of establishing the degree of disability a veteran may have sustained following various types of injury, particularly those with injuries related to combat duty. The GAF scores have been reliably used with this patient population, as noted in Chapter 3, Jovanović et al. (2008) where GAF scores were utilized in measuring adaptive functioning of psychologically traumatized veterans and found it to be a valid and reliable measurement with a high inter-rater reliability.

Kessler et al. (2003) define a serious mental disorder as any 12-month DSM-IV disorder, other than a substance use disorder, with a GAF score of less than 60. Narud, Mykletun, and Dahl (2005) investigated 91 patients presenting to psychiatric outpatient clinics. Multiple Axis I diagnoses were represented with depressive disorders, anxiety disorders, and alcohol dependence being the most common. The initial evaluation GAF mean was 55.4 before treatment. Comparison with these two cited studies indicates that on average the veterans in this study's subject group were functioning at a level similar to

that of self-referred patients seeking care outpatient clinics for depression, anxiety, and alcohol dependence, and would be classified as having a serious mental disorder.

**Conclusions for research question 2.** Research question 2 asked: What is the unemployment/underemployment rate for the years 2003 to 2010 in patients with traumatic brain injury? While the Department of Labor shows a veteran unemployment rate similar to that of the general population (U.S. Government Accountability Office, 2009, p. 1), veterans with TBI clearly fare worse than the general population. Approximately half of the subjects (52%) were unemployed, while 31% were students. Thus only 18% were fully employed. In comparison, in 2009 in Los Angeles County, the under-employment rate for men was 17% (Minority News, 2009), while a later report puts civilian unemployment at 12% and civilian underemployment at 23% (Economic Roundtable, 2011).<sup>3</sup> Thus, TBI patients were much less employable than the general population.

**Conclusions for research question 3.** Research question 3 asked: What is the impact of blast versus non blast injury in patients with traumatic brain injury, as evidenced by difference in Global Assessment of Functioning Score and unemployment/underemployment rate? The lowest GAF scores belong to subjects with blast injury. The highest GAF scores belong to both blast and non-blast subjects. Only 6% of the blast group showed GAF score stability, and most of the group's scores worsened (48%). There are a greater percentage of subjects with non-blast TBI who are

---

<sup>3</sup> Bureau of Labor Statistics data are not seasonally adjusted. The total civilian labor force includes marginally attached workers who are not included in the labor force count as well as employed and unemployed workers who are included in the labor force count. Data for the total civilian labor force, including marginally attached workers, is based on a 3-month moving average for the current month and the two prior months (Economic Roundtable, 2011).

unemployed than there are with blast TBI who are unemployed. It was interesting that the GAF score for blast injured subjects did not differ significantly from the non-blast injured subjects, since the majority of subjects with TBI from blast exposure also were diagnosed with post-traumatic stress disorder (PTSD) and one would expect these GAF scores to be worse in terms of impeding function.

Söderberg, Tungström, and Armelius (2005) showed that clinical raters can use the GAF in a sufficiently reliable way to enable use of the ratings at an aggregated level. When a number of ratings are averaged and compared with another set of ratings, “the precision will be high enough to enable relatively small differences to be detected, because precision depends on both the reliability of the scale and the number of patients in each group” (para. 33). These authors note that GAF ratings could be effectively used to compare aggregated before-and-after treatment data for a group of patients or to compare levels of GAF ratings for different diagnostic groups, as does the present study.

**Conclusions for research question 4.** Research question 4 asked: What is the incidence of mood lability as recorded on charts for patients with traumatic brain injury for the years 2003 through 2010 at the Los Angeles Veterans Administration hospital? As an indication of emotional lability, 34% of subjects exhibited emotional outbursts as a symptom recorded in chart reviews. Related to emotional lability, over three-fourths of the subject group reported symptoms leading to the diagnosis of depression, and a similar proportion was diagnosed with PTSD. This indicates substantial challenges in employability would be expected. As noted in Chapter 3, Jovanović et al. (2008) showed that the GAF score is primarily related to a reduction in functioning due to psychiatric symptoms rather than environmental circumstances, which indicates that it is well suited

to use in the present study, as it gives theoretical support for comparing GAF scores with PTSD and mood lability.

**Conclusions for research question 5.** Research question 5 asked: Based upon charts for patients with traumatic brain injury for the years 2003 to 2010, what treatments are most commonly used to treat behavioral and psychosocial dysfunction in patients with traumatic brain injury? Of those with depression, most (74%) were prescribed depression medication. The chart reviews revealed no other forms of therapy for depression in the subject group. However, the VA is mandated to provide mental health services for patients with major depressive issues or psychiatric problems. There has also been an effort to perform medication reconciliation with all healthcare providers within the VA to determine compliance so that patients who are prescribed medications, whether for depression or other medical illnesses, are actually getting the proper treatment with the appropriate medication for their healthcare problems. There are also mental health groups and individual counseling provided to patients with PTSD, substance abuse, and other issues. However, what is not clear from the data set is what percentage of patients avail themselves of these treatment options. Many patients, particularly younger veterans who may be still active in the reserves, may be hesitant to admit that they are having any type of emotional or psychological issues. In addition, there remains some stigma with mental health care, particularly with young male patients. Although there are a variety of services offered, there are likely insufficient resources to address the vast number of veterans with PTSD and emotional lability.

**Conclusions for research question 6.** Research question 6 asked: Based upon the findings for the above research questions, what might be a model to help TBI patients

maintain a self-sufficient lifestyle or raise their employment possibilities? The chart review provided data that confirmed that employability in post-TBI patients is extremely difficult, with more than half unemployed. The issues that impact employability include mood lability, poor anger control, depression, judgment issues, memory problems, cognitive issues, and other health issues such as seizures or post-TBI headaches can have a truly devastating effect upon a patient's ability to obtain and keep a job. Given the unemployment rates of the area and given that the unemployment percentages were almost three times higher for TBI patients, one can easily see that this is a daunting problem. The census reported 379,969 veterans in Los Angeles county between the years 2005-2009 (U.S. Census Bureau, 2010).

### **Implications**

The conclusions suggest the following implications with respect to the overall research topic of unemployment and underemployment for TBI patients who are veterans:

**Implications for research question 1.** Research question 1 asked: What is the average Global Assessment of Functioning Score for patients with traumatic brain injury ages 18 to 65 in the years 2003 to 2010 in the Los Angeles Veterans Hospital? As noted in the conclusion for research question 1, persons with a GAF of 55 would be classified as having a serious mental disorder. The implication for the topic of this study is that this population is likely to have difficulties in employment that would be expected of persons with a serious mental disorder, thus they would need vocational assistance as well as assistance with symptoms related to their diagnosis in order to function effectively in the workforce. One common need for these patients is that they need a great deal of

resources from a variety of services. GAF can be affected by substance abuse, anger issues, chronic pain, memory problems, as well as depression and mood lability. The issues are varied and the problem is growing as more service men and women return from combat with TBI. The census reported 379,969 veterans in Los Angeles County between the years 2005-2009 (U.S. Census Bureau, 2010). Of those veterans within Los Angeles County, we can expect this number to increase significantly in the coming years. More importantly, the number of TBI patients within this group is also likely to increase significantly. Given the increases in young OEF/OIF veterans returning with blast injuries, it will be critical to develop not only more acute interventions, but long-term treatments as well. No one really knows the long term effects of TBI, but there are some links to the later development of Parkinson's disease and Alzheimer's disease. In addition, the socioeconomic issues if returning veterans cannot obtain employment due to disabilities related to TBI will also be staggering. This will not be easy and is likely to take vast amounts of resources. For the service men and women who risked their lives in military service, it will be our responsibility to utilize whatever resources we have to improve their overall prognosis.

**Implications for research question 2.** Research question 2 asked: What is the unemployment/underemployment rate for the years 2003 to 2010 in patients with traumatic brain injury? The implication of having only 18% of the TBI patients in this sample fully employed shows that a particular emphasis needs to be placed on rehabilitation of this group. The unemployment of patients with TBI is over half (51%), which is more than three times the average for unemployment in the area. The residual



effects of TBI clearly have a significant impact on employability and are unlikely to change over time, unless the patient improves in function, which is difficult to predict.

**Implications for research question 3.** Research question 3 asked: What is the impact of blast versus non blast injury in patients with traumatic brain injury, as evidenced by difference in Global Assessment of Functioning Score and unemployment/underemployment rate? The GAF scores were not significantly different between blast and non-blast injury, nor was there a significant difference in employability of either group. As previously stated, this is a relatively small sampling and the GAF scores although used frequently, are a more general evaluation and not specifically designed for evaluation of TBI patients. It is more focused upon the psychiatric issues in relationship to function with less focus upon the physical issues that many TBI patients also must face. If a patient is also an amputee or has other medical issues, such as seizures, this can also impact employability, but are not specifically addressed within the GAF score. Still, the implication of having the majority of the sample at a GAF of 55 is that many will likely remain unemployed unless they receive long-term and intensive treatment and assistance.

**Implications for research question 4.** Research question 4 asked: What is the incidence of mood lability as recorded on charts for patients with traumatic brain injury for the years 2003 through 2010 at the Los Angeles Veterans Administration hospital? The implication of the finding that 34% of subjects, approximately one third, exhibited emotional outbursts as a symptom recorded in chart reviews is not surprising, as this is a common symptom with TBI. The problem with post-TBI mood lability is there is not treatment for mood swings induced by trauma currently approved. There are off-label

uses of various medications with some success, but no FDA approved treatments.

Without treatments for mood lability, patients will have difficulty keeping employed when the mood swings, which are sometimes violent are occurring frequently. Emotional stability will impact employment, personal interactions and overall function for the patient on a variety of levels. Mood lability can also interfere with rehabilitation efforts, making recovery even more difficult. This finding underscores the likelihood that the majority of TBI patients remain unemployed unless they receive long-term and intensive treatment and assistance.

**Implications for research question 5.** As noted in the literature review, Friedman and Thase (2008), in a meta-analysis of studies on mood disorders, found that CBT is comparable to treatment with tricyclic antidepressant medication and has the advantage over antidepressant medication in that (a) relapse after medication cessation is high, while CBT effects are more sustained even after ceasing CBT therapy for mood disorders and (b) CBT does not have unpleasant physical side effects. Given the benefits of CBT, it is regrettable that funding is not currently made available to offer this therapy in conjunction with or as an alternative to medication for the VA patients presenting with TBI. TBI patients may not be benefitted as much currently as they could be with the addition of treatment other than medication. Turning to the literature for relevant findings that relate to the results of the present study, it seems clear that the addition of CBT therapy and psychoeducation could offer substantial benefits to TBI patients. Given limited funding, CBT could be effective and realistic because it is a suitable therapy mode for a group therapy and homework format (Shaffer et al., 1981). Similarly, psychoeducation is a suitable therapy mode for a group therapy and homework format.

According to Farmer and Chapman (2008), ultimately the patients feel empowered and continue to work autonomously.

**Implications for research question 6.** Research question 6 asked: Based upon the findings for the above research questions, what might be a model to help TBI patients maintain a self-sufficient lifestyle or raise their employment possibilities? Quality of life could be greatly increased for TBI patients who are afforded therapies that promote full or part time employment, which might be facilitated by addition of alternative therapies in the VA services. The heterogenous nature of the injuries would suggest that interventions need to be made on a case-by-case basis, since the problems for one patient can be completely different for another. They may have some common issues, but the treatment plans will likely need to be patient-centered and individualized. The treatment plans for these types of issues will involve rehabilitations, medicine, psychiatric support, neurological care, with an interdisciplinary team to formulate a short and long term treatment plan that will have a goal of helping the patient become independent.

### **Recommendations for Practical Application**

Practical applications relate most to research question 6 regarding a model for care. The implications are that patient-centered care is likely the best approach since TBI is a heterogenous type of injury. Although TBI patients share many common problems, the issues for one subject may be much more pronounced for one patient and non-existent in another. A strong focus upon interdisciplinary treatment approaches from different medical specialties will likely achieve the greatest success with this patient population. In addition, it is clear from the literature and the chart review that these patients experience acute, sub-acute, and chronic problems. Therefore, they will require

interventions that address not only the more immediate problems, but the long-term issues that will be residual effects of the brain injury. Supportive laypersons and caretakers, including family members, should be informed of these essential components so they can support the veterans' recommended treatments as determined by a multi-disciplinary team. This team would include, as appropriate for the particular patient, medical providers, occupational rehabilitation specialists, neurologists, alcohol and substance abuse counselors, psychotherapists, and if needed, a case manager to coordinate the complex care package to ensure continuity of care.

In evaluating current care of TBI patients through the present study, it is clear that some treatment modalities that seem clearly beneficial—CBT, psychoeducation, and occupational rehabilitation—as described in the literature review, have not been recorded as part of the treatment for the subjects of the chart reviews. This is probably the case for multiple reasons. Although the VA offers psychological counseling, the stigma associated with these types of treatment may prevent some veterans from following through if and when it is recommended. It may also be the case that physicians have not emphasized the importance of psychotherapy, neuro-psychoeducation, or occupational rehabilitation due to their understanding that it is not popular among the veterans they treat. These treatment modalities need to be emphasized as a critical part of the patient-centered model.

Another practical application is that findings will assist future researchers in discerning specific differences between blast and non-blast TBI, as they relate to age, pre-existing TBI, substance abuse, depressive symptoms, mood lability, chronic pain, and socio-economic factors. In addition, this study is a framework for the researcher's own

planned psycho-educational study related to TBI. The present study will provide a foundation for the study of group versus individual psycho-education interventions. Participants for that study will be recruited from those whose charts indicated their inclusion for the current study.

### **Recommendations for Future Research**

Future replications of the present study could correct the validity and reliability concerns in the present study and the methodological limitations by including a sufficient sample size. This would require use of the databases of several VA hospitals rather than only one. More information regarding the types of problems in relationship to the specific area of injury may improve the general treatment approaches that are best for these patients. This study will continue as more data are collected over time and more subjects are added to the database, we may see some additional trends not observed with this initial smaller sampling. Also, tracking the subjects over a longer period of time may be useful in ascertaining the types of resources needed for patients in the future. Interventions should receive consistent evaluation to refine and assess effectiveness.

### **Chapter Summary**

In this section, summarize all key points in Chapter 5. The conclusions, implications, and recommendations could be presented in bullet list or a numbered list.

The conclusions for this study are summarized as follows:

- Conclusion 1: The majority of TBI patients were perceived by clinicians as having moderate symptoms or moderate difficulty in social, occupational, or school functioning, and approximately the same number of patients were seen to have worsened symptoms as had alleviated symptoms at a later date.

- Conclusion 2: TBI patients were much less employable than the general population, with employment difficulties that are likely to persist.
- Conclusion 3: There are a greater percentage of subjects with non-blast TBI who are unemployed than there are with blast TBI who are unemployed.
- Conclusion 4: Related to emotional lability, over three-fourths of the subject group reported symptoms leading to the diagnosis of depression, and a similar proportion was diagnosed with PTSD, which indicates substantial challenges in employability would be expected.
- Conclusion 5: Of those with depression, most (74%) were prescribed depression medication, but had no indication of utilizing available services such as individual or group counseling.

Conclusion 6: Patient-centered care is likely the best approach since this is a type of injury with heterogenous symptoms.

The implications and recommendations for this study are summarized as follows:

- Implication and recommendation 1: This population is likely to have difficulties in employment that would be expected of persons with a serious mental disorder, thus they would need vocational assistance as well as assistance with symptoms related to their diagnosis in order to function effectively in the workforce.
- Implication and recommendation 2: The implication of having only 18% of the TBI patients in this sample fully employed shows that a particular emphasis needs to be placed on rehabilitation of this group that is adequate to help them find employment that meets their level of functioning.

- Implication and recommendation 3: The implication of having the majority of the sample at a GAF of 55 is that many will likely remain unemployed unless they receive long-term and intensive treatment and assistance.
- Implication and recommendation 4: The implication of having the majority of the sample at a GAF of 55 is that many will likely remain unemployed unless they receive long-term and intensive treatment and assistance.
- Implication and recommendation 5: TBI patients may not be availing themselves of treatments that are offered other than medication.
- Implication and recommendation 6: Quality of life could be greatly increased for TBI patients who are afforded therapies that promote full or part time employment, which might be facilitated by VA medical personnel connecting TBI patients with VA employment specialists. VA medical facilities or VA employment organizations need to offer patient-centered treatment tailored to individual needs.

## REFERENCES

- Ainspan, N. D. (2008). Finding employment as a veteran with a disability. In N. D. Ainspan & W. E. Penk (Eds.), *Returning wars' wounded, injured, and ill: A reference handbook* (pp. 102-138). Westport, CT: Praeger Security International.
- Alderfer, B. S., Arciniegas, D. B., & Silver, J. M. (2005). Treatment of depression following traumatic brain injury. *Journal of Head Trauma Rehabilitation, 20*, 544-562. doi: 10.1097/00001199-200511000-00006
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., rev. ed.). Washington, DC: Author.
- Anson, K. (2006). Evaluation of a coping skills group following traumatic brain injury. *Brain Injury, 20*(2), 167-178. doi: 10.1080/02699050500442956
- Arlinghaus, K. A., Shoaib, A. M., & Price, T. R. P. (2005). Neuropsychiatric assessment. In J. M. Silver, T. W. McAllister, & S. C. Yudofsky (Eds.), *Textbook of traumatic brain injury* (pp. 63–65). Washington, DC: American Psychiatric Association.
- Asch, S. M., McGlynn, E. A., Hogan, M. M., Hayward, R. A., Shekelle, P., Rubenstein, L. . . . Kerr, E. A. (2004). Comparison of quality of care for patients in the veterans health administration and patients in a national sample. *Annals of Internal Medicine, 141*, 938-45. Retrieved from [www.annals.org/](http://www.annals.org/)
- Bäumli, J., Froböse, T., Kraemer, S., Rentrop, M., & Pitschel-Walz, G. (2006). Psychoeducation: A basic psychotherapeutic intervention for patients with schizophrenia and their families. *Schizophrenia Bulletin, 32*(1), S1–S9. doi: 10.1093/schbul/sbl017



- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. Madison, CT: International Universities Press.
- Beck, A. T., Steer, R. A., & Brown, G. K. (2006). *RCMAR measurement tools: Beck Depression Inventory - 2nd Edition (BDI-II)*. Retrieved from <http://www.musc.edu/dfm/RCMAR/Beck.html>
- Beetar, J. T., Guilmette, T. J., & Sparadeo, F. R. (1996). Sleep and pain complaints in symptomatic traumatic brain injury and neurologic populations. *Archives of Physical Medicine and Rehabilitation*, 77(12), 1298-1302. doi: 10.1016/S0003-9993(96)90196-3
- Benazzi, F. (2006). Impact of temperamental mood lability on depressive mixed state. *Psychopathology*, 39, 19-24. doi: 10.1159/000089659
- Bisson, J., & Andrew, M. (2007). Psychological treatment of post-traumatic stress disorder (PTSD). *Cochrane Database of Systematic Reviews*, 3, 1-105. doi: 10.1002/14651858
- Bond, G. R., & Campbell, K. (2008). Evidence-based practices for individuals with severe mental illness. *Journal of Rehabilitation*, 74(2), 33-44. Retrieved from [www.rehab.research.va.gov/jrrd/index.html](http://www.rehab.research.va.gov/jrrd/index.html)
- Bootes, K., & Chapparo, C. (2010). Difficulties with multitasking on return to work after TBI: A critical case study. *Work*, 36(2), 207-216. Retrieved from [www.iospress.nl/journal/work/](http://www.iospress.nl/journal/work/)
- British Association for Behavioural and Cognitive Psychotherapies. (2005). *What are cognitive and/or behavioural psychotherapies?* Retrieved from <http://www.babcp.com/silo/files/what-is-cbt.pdf>

- Churchill, R., Hunot, V., Corney, R., Knapp, M., McGuire, H., Tylee, A., & Wessely, S. (2001). A systematic review of controlled trials of the effectiveness and cost effectiveness of brief psychological treatments for depression. *Health Technology Assessment, 5*(35), 1-173. Retrieved from [www.hta.ac.uk/research/HTAJournal.shtml](http://www.hta.ac.uk/research/HTAJournal.shtml)
- Cicerone, K. D., Dahlberg, C., Kalmar, K., Langenbahn, D. M., Malec, J. F., Bergquist, T. F., & Wessely, S. (2000). Evidence-based cognitive rehabilitation: Recommendations for clinical practice. *Archives of Physical Medicine and Rehabilitation, 81*(12), 1596-1615. Retrieved from [www.health-evidence.ca/articles/show/20573](http://www.health-evidence.ca/articles/show/20573)
- Cognitive-behavioral therapy. (2007). In *Encyclopedia of Mental Disorders*. Retrieved from <http://www.minddisorders.com/index.html>
- Congressional Research Service. (1996). *Women in the armed forces*. Retrieved from <http://www.fas.org/man/crs/92-008.htm>
- Conner, M. G. (2009). *Transference: Are you a biological time machine?* Retrieved from <http://www.crisiscounseling.com/Articles/Transference.htm>
- Definition of cognitive therapy. (2004). Retrieved from <http://www.medterms.com/script/main/art.asp?articlekey=31748>
- Department of Defense, Statistical Information Analysis Division. (2008). *Military casualty information*. Retrieved from <http://siadapp.dmdc.osd.mil/personnel/CASUALTY/castop.htm>

- Dombeck, M., & Wells-Moran, J. (2006). *Self-soothing techniques: Venting and journaling*. Retrieved from [http://www.mentalhelp.net/poc/view\\_doc.php?type=doc&id=9758&cn=353](http://www.mentalhelp.net/poc/view_doc.php?type=doc&id=9758&cn=353)
- Donley, P. M. (1998). The foreign language anxieties and anxiety management strategies of students taking Spanish at a community college. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 59(1-A), 0110.
- Douglas, J. M., & Spellacy, F. J. (2000). Correlates of depression in adults with severe traumatic brain injury and their careers. *Brain Injury*, 14, 71-88. Retrieved from [internationalbrain.org/?q=Brain\\_Injury](http://internationalbrain.org/?q=Brain_Injury)
- Economic Roundtable. (2011). *Unemployment and under-employment*. Retrieved from [http://www.economicrt.org/pub/Unemployment\\_Tracking/Unemployment%20%20Under-employment%20Aug%202011.pdf](http://www.economicrt.org/pub/Unemployment_Tracking/Unemployment%20%20Under-employment%20Aug%202011.pdf)
- Elovic, E., Baerga, E., & Cuccurullo, S. (2004). Traumatic brain injury. In S. Cuccurullo (Ed.), *Physical Medicine and Rehabilitation Board Review* (pp. 47-53). New York, NY: Demos Medical.
- Exec. Order No. 13518, CFR 1 (2009).
- Farmer, R. F., & Chapman, A. L. (2008). Overview. In R. F. Farmer & A. L. Chapman (Eds.), *Behavioral interventions in cognitive behavior therapy: Practical guidance for putting theory into action* (pp. 3-20). Washington, DC: American Psychological Association.
- Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). Mini-mental state: A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, 12(3), 189-198. doi: 10.1016/0022-3956(75)90026-6

- Forbes, E. J., & Pekala, R. J. (1993). Psychophysiological effects of several stress management techniques. *Psychological Reports, 72*(1), 19-27. doi: 10.2466/pr0.1993.72.1.19
- Franulic, A., Carbonell, C. G., Pinto, P., & Sepulveda, I. (2004). Psychosocial adjustment and employment outcome 2, 5 and 10 years after TBI. *Brain Injury, 18*, 119-129. doi: 10.1080/0269905031000149515
- Friedman, E. S., & Thase, M. E. (2008). Cognitive and behavioral therapies. In Fatemi S. H., & Clayton, P. J. (Eds.), *The medical basis of psychiatry* (3rd ed., pp. 635-650). Totowa, NJ: Humana Press.
- Gamble, D., & Moore, C. L. (2003). The relation between VR services and employment outcomes of individuals with traumatic brain injury. *Journal of Rehabilitation, 69*(3), 31-39. Retrieved from [www.rehab.research.va.gov/jrrd/index.html](http://www.rehab.research.va.gov/jrrd/index.html)
- Gellatly, J., Bower, P., Hennessy, S., Richards, D., Gilbody, S., & Lovell, K. (2007). What makes self-help interventions effective in the management of depressive symptoms? Meta-analysis and metaregression. *Psychological Medicine, 37*(9), 1217-1228. doi: 10.1017/S0033291707000062
- Gollaher, K., High, W. Sherer, M., Bergloff, P., Boake, C., Young, M. E., & Ivanhoe, C. (1998). Prediction of employment outcome one to three years following traumatic brain injury (TBI). *Brain Injury, 12*(4), 255-263. Retrieved from [internationalbrain.org/?q=Brain\\_Injury](http://internationalbrain.org/?q=Brain_Injury)
- Greenberg, G. A., & Rosenheck, R. A. (2005). Using the GAF as a national mental health outcome measure in the Department of Veterans Affairs. *Psychiatric Services, 56*(4), 420-426. Retrieved from [ps.psychiatryonline.org/](http://ps.psychiatryonline.org/)

- Holbrook, T. L., & Hoyt, D. B. (2004). The impact of major trauma: Quality-of-life outcomes are worse in women than in men, independent of mechanism and injury severity. *Journal of Trauma: Injury, Infection, and Critical Care*, *56*(2), 284-290. doi: 10.1097/01.TA.0000109758.75406.F8
- Hommet, C., Mondon, K., de Toffol, B., & Constans, T. (2007). Reversible cognitive and neurological symptoms during valproic acid therapy. *Journal of the American Geriatrics Society*, *55*(4), 628. doi: 10.1111/j.1532-5415.2007.01117.x
- HRfocus. (2010). Veterans hiring 'toolkit' available to employers. *News Briefs*, *87*(12), 11. Retrieved from [www.worldcat.org/title/hr-focus...human-resources.../24642533](http://www.worldcat.org/title/hr-focus...human-resources.../24642533)
- Jorge, R. E., & Starkstein, S. E. (2005). Pathophysiologic aspects of major depression following traumatic brain injury. *Journal of Head Trauma Rehabilitation*, *20*, 475-487. doi: 10.1097/00001199-200511000-00001
- Jovanović, A. A., GaSic, M. J., Ivković, M., Milovanović, S., & Damjanović, A. (2008). Reliability and validity of DSM-IV Axis V scales in a clinical sample of veterans with posttraumatic stress disorder. *Psychiatria Danubina*, *20*(3), 286-300. Retrieved from [hrcak.srce.hr/psychiatria-danubina?lang=en](http://hrcak.srce.hr/psychiatria-danubina?lang=en)
- Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., . . . Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry*, *60*(2), 184-189. doi: 10.1001/archpsyc.60.2.184
- Knowles, M. S. (1996). Adult learning. In R. L. Craig (Ed.), *The ASTD training & development handbook* (4th ed., pp. 253-265). New York, NY: McGraw-Hill.

- Knowles, M. (1998). *The adult learner: The definitive classic in adult education and human resource development*. Huston, TX: Gulf.
- Knowles, M. S., Holton, E. F., & Swanson, R. A. (1998). *The adult learner* (5th ed.). Houston, TX: Gulf.
- Lange, A., Dehghani, B., & De Beurs, E. (1995). Validation of the Dutch adaptation of the Buss-Durkee Hostility Inventory. *Behaviour Research and Therapy*, 33(2), 229-233. doi: 10.1016/0005-7967(94)00044-K
- Lintecum, S., & Lintecum, L. (1998). *The humane guide to VA benefits for veterans with PTSD*. Retrieved from [ptsdhelp2000.com/ptsd1.html](http://ptsdhelp2000.com/ptsd1.html)
- Litz, B. T., Engel, C. C., Bryant, R. A., & Papa, A. (2007). A randomized, controlled proof-of-concept trial of an internet-based, therapist-assisted self-management treatment for posttraumatic stress disorder. *American Journal of Psychiatry*, 164, 1676-1683. doi: 10.1176/appi.ajp.2007.06122057
- Maas, A. I., Stocchetti, N., & Bullock, R. (2008). Moderate and severe traumatic brain injury in adults. *Lancet Neurology*, 7(8), 728-741. doi: 10.1016/S1474-4422(08)70164-9
- MacLean, A. (2010). The things they carry: Combat, disability, and unemployment among U.S. men. *American Sociological Review*, 75(4), 563-585. doi: 10.1177/0003122410374085
- Malec, J. F., Brown, A. W., Leibson, C. L., Flaada, J. T., Mandrekar, J. N., Diehl, N. N., et al. (2007). The mayo classification system for traumatic brain injury severity. *Journal of Neurotrauma*, 24(9), 1417-1424. doi: 10.1089/neu.2006.0245

- Marshall, G. (1998). Intervening variable. In *A Dictionary of Sociology*. Retrieved from <http://www.encyclopedia.com/doc/1O88-interveningvariable>
- McIntosh, G. C. (1997). Medical management of noncognitive sequelae of minor traumatic brain injury. *Applied Neuropsychology*, 4(1), 62-68. doi: 10.1207/s15324826an0401\_8
- McNamee, S., Walker, W., Cifu, D. X., & Wehman, P. H. (2009). Minimizing the effect of TBI-related physical sequelae on vocational return. *Journal of Rehabilitation Research & Development*, 46(6), 893-908. Retrieved from [www.rehab.research.va.gov/jrrd/index.html](http://www.rehab.research.va.gov/jrrd/index.html)
- Melton, L. (n.d.). *Aaron Beck's cognitive therapy approach to the treatment of depression*. Retrieved from <http://www.helium.com/items/821843-aaron-becks-cognitive-therapy-approach-to-the-treatment-of-depression>
- Miller, M. W., Wolf, E. J., Martin, E., Kaloupek, D. G., & Keane, T. M. (2008). Structural equation modeling of associations among combat exposure, PTSD symptom factors, and Global Assessment of Functioning. *Journal of Rehabilitation Research & Development*, 45(3), 359-369. Retrieved from [www.rehab.research.va.gov/jrrd/index.html](http://www.rehab.research.va.gov/jrrd/index.html)
- Minority News. (2009). *California under-employment rate reaches 16.2 percent; 3.2 million*. Retrieved from [http://www.blackradionetwork.com/California\\_underemployment\\_rate\\_reaches\\_162\\_percent\\_32\\_million\\_people](http://www.blackradionetwork.com/California_underemployment_rate_reaches_162_percent_32_million_people)
- Mittenburg, W., Tremont, G., Zeilinski, R., Ficjera, S. J., & Rayls, K. (1996). Cognitive-behavioral prevention of postconcussion syndrome. *Elsevier Science*, II(2), 139-145. Retrieved from [www.elsevier.com/wps/find/journal\\_browse.cws\\_home](http://www.elsevier.com/wps/find/journal_browse.cws_home)

- Morris, T. (2010). Traumatic brain injury. In C. L. Armstrong & L. Morrow (Eds.), *Handbook of medical neuropsychology: Applications of cognitive neuroscience* (pp. 17-32). New York, NY: Springer Science.
- National Collaborating Centre for Mental Health. (2005). *Post-traumatic stress disorder: The management of PTSD in adults and children in primary and secondary care*. London, UK: National Institute for Clinical Excellence.
- National Institute for Clinical Excellence. (2005). *Post-traumatic stress disorder (PTSD): The treatment of PTSD in adults and children*. Retrieved from <http://www.nice.org.uk/nicemedia/pdf/CG026publicinfo.pdf>
- National Institute of Neurological Disorders and Stroke. (2002). *Traumatic brain injury: Hope through research* (NIH Publication No. 02-2478). Retrieved from [http://en.wikipedia.org/wiki/Traumatic\\_brain\\_injury#Treatment](http://en.wikipedia.org/wiki/Traumatic_brain_injury#Treatment)
- Narud, K., Mykletun, A., & Dahl, A. A. (2005). Quality of life in patients with personality disorders seen at an ordinary psychiatric outpatient clinic. *BMC Psychiatry*, 5, 10. doi: 10.1186/1471-244X-5-10
- Nyenhuis, D. L., Yamamoto, C., Luchetta, T., Terrien, A., & Parmentier, A. (1999). Adult and geriatric normative data and validation of the Profile of Mood States. *Journal of Clinical Psychology*, 55(1), 79-86. doi: 10.1002/(SICI)1097-4679(199901)55:1<79::AID-JCLP8>3.0.CO;2-7
- O'Keefe, B., Birger, J., & Burke, D. (2010). Battle-tested. *Fortune*, 161(4), 108-118. Retrieve from [money.cnn.com/magazines/fortune/fortune\\_archive/](http://money.cnn.com/magazines/fortune/fortune_archive/)
- Ottomanelli, L., Goetz, L., McGeough, C., Suris, A., Sippel, J., Sinnott, P., . . . CIPHER, D. J. (2009). Methods of a multisite randomized clinical trial of supported



employment among veterans with spinal cord injury. *Journal of Rehabilitation Research & Development*, 46(7), 919-930. Retrieved from [www.rehab.research.va.gov/jrrd/index.html](http://www.rehab.research.va.gov/jrrd/index.html)

Owensworth, T., & McKenna, K. (2004). Investigation of factors related to employment outcome following traumatic brain injury: A critical review and conceptual model. *Disability & Rehabilitation*, 26(13), 765-784. doi: 10.1080/09638280410001696700

Patient information about traumatic brain injury. (2009). Retrieved from <http://www.healthcommunities.com/traumatic-brain-injury/patient-information/questions-to-ask-doctor.shtml>

Paul, G., Elam, B., & Verhulst, S. J. (2007). A longitudinal study of students' perceptions of using deep breathing meditation to reduce testing stresses. *Teaching and Learning in Medicine*, 19(3), 287-292. doi: 10.1080/10401330701366754

Pepperdine University Institutional Review Board's. (n.d.) *Expedited or full IRB application*. Retrieved from <http://community.pepperdine.edu/irb/irbforms/#apps>

Perucca, E., & Johannessen, S. I. (2003). The ideal pharmacokinetic properties of an antiepileptic drug: How close does levetiracetam come? *Epileptic disorders*, 5(1), S17-S26. doi: 10.1080/10401330701366754

Povlishock, J. (2009). The future of combinational therapy in the treatment of traumatic brain injury. *Journal of Neurotrauma*, 26, 923. doi: 10.1089/neu.2009.9954

President's Commission on Care for America's Returning Wounded Warriors. (2007). *Findings of the president's commission on care for America's returning wounded*

warriors. Retrieved from <http://www.gpo.gov/fdsys/pkg/CHRG-110hrg39452/pdf/CHRG-110hrg39452.pdf>

- Rao, V., & Lyketsos, C. (2000). Neuropsychiatric sequelae of traumatic brain injury. *Psychosomatics, 41*, 95-103. doi: 10.1176/appi.psy.41.2.95
- Reis, J. (2009, August 8). After brain injury, fighting to regain a sense family and self. *NY Times*, p. A1. Retrieved from [www.nytimes.com/](http://www.nytimes.com/)
- Resnick, S. G., & Rosenheck, R. A. (2008). Posttraumatic stress disorder and employment in veterans participating in Veterans Health Administration Compensated Work Therapy. *Journal of Rehabilitation Research & Development, 45*(3), 427-435. Retrieved from [www.rehab.research.va.gov/jrrd/index.html](http://www.rehab.research.va.gov/jrrd/index.html)
- Roth, C. R. (2007). Mechanisms and sequelae of blast injuries. *Perspectives on Neurophysiology and Neurogenic Speech and Language Disorders, 3*, 20-24. doi: 10.1044/nnsld17.3.20
- Schein, E. H. (1999). *Process consultation revisited: Building the helping relationship* (1st ed.). New York, NY: Addison-Wesley.
- Shaffer, C. S., Shapiro, J., Sank, L. I., & Coghlan, D. J. (1981). Positive changes in depression, anxiety, and assertion following individual and group cognitive behavior therapy intervention. *Cognitive Therapy and Research, 5*(2), 149-157. doi: 10.1007/BF01172523
- Shames, J., Treger, I., Ring, H., & Giaquinto, S. (2007). Return to work following traumatic brain injury: Trends and challenges. *Disability & Rehabilitation, 29*(17), 1387-1395. doi: 10.1080/09638280701315011

- Shoumitro, D., Lyons, I., Koutzoukis, C., Ali, I., & McCarthy, G. (1999). Rate of psychiatric illness 1 year after traumatic brain injury. *American Journal of Psychiatry*, *156*, 374-378. Retrieved from [ajp.psychiatryonline.org/](http://ajp.psychiatryonline.org/)
- Smith, L. A., Cornelius, V., Warnock, A., Bell, A., & Young, A. H. (2007). Effectiveness of mood stabilizers and antipsychotics in the maintenance phase of bipolar disorder: A systematic review of randomized controlled trials. *Bipolar Disorders*, *9*(4), 394-412. doi: 10.1111/j.1399-5618.2007.00490.x
- Söderberg, P., Tungström, S., & Armelius, B. A. (2005). Special section on the GAF: Reliability of global assessment of functioning ratings made by clinical psychiatric staff. *Psychiatric Services*, *56*, 434-438. Retrieved from <http://ps.psychiatryonline.org/article.aspx?Volume=56&page=434&journalID=18>
- Southwick, S. M., Morgan, C. A. III, Darnell, A., Bremner, D., Nicolau, A. L., Nagy, L. M., & Charney, D. S. (1995). Trauma-related symptoms in veterans of operation desert storm: A 2 year follow-up. *American Journal of Psychiatry*, *152*, 1150-1155. Retrieved from [ajp.psychiatryonline.org/](http://ajp.psychiatryonline.org/)
- Spielberger, C. D., Sydeman, S. J., Owen, A. E., & Marsh, B. J. (1999). Measuring anxiety and anger with the State-Trait Anxiety Inventory (STAI) and the State-Trait Anger Expression Inventory (STAXI). In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (2nd ed., pp. 993-1021). Mahwah, NJ: Lawrence Erlbaum Associates.
- SPSS Inc. (2006). *Statistical package for the social sciences* (Version 15.0). Chicago IL: Author.

- Strisik, P., & Strisik, S. W. (2009). *Types of psychotherapy (approaches)*. Retrieved from <http://www.strisik.com/therapy/approaches.htm>
- Taber, K. H., Warden, D. L., & Hurley, R. A. (2006). Blast-related traumatic brain injury: What is known? *Journal of Neuropsychiatry and Clinical Neuroscience*, *18*, 141-145. doi: 10.1176/appi.neuropsych.18.2.141
- Thase, M. E. (2002). Some (comments) on recent developments in psychosocial treatments for bipolar disorder. In M. Maj, H. S. Akiskal, J. J. López-Ibor, & N. Sartorius (Eds.), *Bipolar disorders* (pp. 325-332). New York, NY: John Wiley & Sons.
- Tsaousides, T., Ashman, T., & Seter, C. (2008). The psychological effects of employment after traumatic brain injury. *Rehabilitation Psychology*, *53*(4), 456-463. doi: 10.1037/a0012579
- U.S. Census Bureau. (2010). *State and county quickfacts: Los Angeles County*. Retrieved from <http://quickfacts.census.gov/qfd/states/06/06037.html>
- U.S. Department of Veteran's Affairs. (2011). *Terminology and definitions*. Retrieved from <http://www.polytrauma.va.gov/news-and-resources/terminology-and-definitions.asp>
- U.S. Government Accountability Office. (2007). *Veterans' employment and training service: Labor could improve information on reemployment services, outcomes, and program impact*. Retrieved from [www.gao.gov/new.items/d07594.pdf](http://www.gao.gov/new.items/d07594.pdf)
- U.S. Government Accountability Office. (2009). VR&E has implemented its five-track employment process and strengthened its focus on employment. *GAO Reports*, 8-11. Retrieved from [www.gao.gov/browse/date/week](http://www.gao.gov/browse/date/week)

- Waldron-Perrine, B., Hanks, R. A., & Perrine, S. A. (2008). Pharmacotherapy for postacute traumatic brain injury: A literature review for guidance in psychological practice. *Rehabilitation Psychology, 53*(4), 426-444. doi: 10.1037/a0013530
- Walker, J. A. (2010). Employment and earnings of recent veterans: Data from the CPS. *Monthly Labor Review, 133*(7), 3-9. Retrieved from [www.bls.gov/mlr/welcome.htm](http://www.bls.gov/mlr/welcome.htm)
- Wallis, R. A., Licht, E., Babineau, C., & Dergalust, S. (in press). *Coping mechanisms for traumatic brain injury patients who are experiencing mood lability or behavioral abnormalities*. Los Angeles, CA: Veteran's Association Greater Los Angeles Health Care System.
- Williams, M. (2010). Companies finding success hiring disabled veterans. *HRFocus, 55*(11), 16. Retrieved from [www.worldcat.org/title/hr-focus...human-resources.../24642533](http://www.worldcat.org/title/hr-focus...human-resources.../24642533)

## APPENDIX

## Electronic Data Entry Form

Coding of Characteristics/Variables	P1	P2	P3	P4
GAF score				
Difficulties at work = 1, underemployment = 2, unemployment = 3				
Mood lability present = 1, not present = 0				
Medication as TBI treatment = 1				
CBT as TBI treatment = 1				
Psychoeducation as TBI treatment = 1				