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TITLE: Telerehabilitation for OIF/OEF Returnees with Combat-Related Traumatic Brain Injury

PRINCIPAL INVESTIGATOR: **Kris Siddharthan, PhD**

CONTRACTING ORGANIZATION: Tampa VA Research & Education Foundation  
Zephyrhills, Florida 33539

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<b>14. ABSTRACT</b> The telerehabilitation for OEF/OIF returnees with mild or moderate combat related Traumatic Brain Injury (TBI) has as its objectives 1) care coordination for wounded veterans using distance technology via the internet and 2) monitoring of physical and mental health outcomes using a variety of instruments. We have enrolled a total of 75 veterans in the study. We have collected baseline, 6 and 12 month health status data on most veterans. Our findings indicate that 1) Functional capabilities measured by locomotion and mobility appear to have stabilized among our cohort of veterans while deficiencies in cognition (memory, problem solving), psychosocial adjustment (anger, emotional status) and problems in integrating into society pose challenges 2) Those with comorbid PTSD appear to display more erratic rehabilitation trajectories in cognition improvement and ultimate integration into society as compared to those without the diagnosis 3) Individualized treatment pathways are needed for rehabilitation and ultimate integration into society and 4) Veterans have expressed appreciation for the program.					
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## **Telerehabilitation for OIF/OEF Returnees with Combat-Related Traumatic Brain Injury.**

### **Introduction**

**Goals:** This is one project in a planned program of research to improve care for injured Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) veterans. With this study we tested a telerehabilitation program for veterans with combat related traumatic brain injury (TBI) with or without comorbid post traumatic stress disorders (PTSD) by monitoring functional, cognitive and mental health outcomes together with their integration into society using a variety of validated instruments. Coordinating medical care at a distance via secure messaging thereby reducing their utilization of the VA health system is another important goal of this telerehabilitation intervention.

The *long term* goal of this program of research is to optimally define telerehabilitation services for all veterans with multiple injuries (Polytrauma), including accurate and efficient screening instruments, educational material for patients and families, family support, and family counseling to enhance care coordination and to maximize functional outcomes and quality of life.

**The Telerehabilitation (telerehab) intervention:** Veterans who meet the inclusionary criteria of a clinical diagnosis of combat incurred mild or moderate TBI in Iraq and Afghanistan and who utilize the James A. Haley (JAH) Veterans Hospital in Tampa, FL. as their primary source of care and who in the opinion of care providers in the Polytrauma Clinic at JAH will possibly benefit from the program are eligible to be consented for participation. They are provided laptop computers to communicate at least once weekly on a secured VA server with the care coordinator (Ms. Vilma Rosada, RN) who also meets them at their scheduled outpatient visits at the JAH. The RN helps in a variety of care coordination efforts including scheduling appointments with specialists, medication management, counseling and monitoring outcomes. The RN coordinates care for Post Traumatic Stress Disorders (PTSD) with a clinical psychologist at the JAH. E-mail exchanges between veterans and the care coordinator are recorded as e-consults in the centralized Computerized Patient Recording System

## **Body**

### ***Task 1. Administrative tasks***

#### ***a. Obtain Institutional Review Board and conduct literature review.***

- IRB clearances from the University of South Florida, Tampa, Florida, necessary to conduct the study have been obtained.
- All DOD Human Research Protection Office's requirements have been met.
- Study personnel in the duration of the study have compliant with the Veteran Administration's Human Subjects Research, Human Subjects **Privacy and HIPPA requirements**.

#### ***b. Recruit care coordination team***

The telerehabilitation care coordination team is organized under a primary care physician, Steve G. Scott, DO, Chief Physical Medicine and Rehabilitation Services VA. The panel of providers participating in the telerehabilitation for wounded veterans includes: Georgia Laliotis, MD - Neurology/Pain Management, Brian Merritt, MD-Physiatrist, Michele Bosco, PhD – Psychologist, Lesli Culver - Social Worker, Sharon Haire - Speech Pathologist, Steve Scott DO, Physical Medicine and Rehabilitation. Andrea M. Spehar, DVM, MPH, JD was the Program Manager and a Co-Investigator. Two full time nurses specialized in the treatment of polytrauma, Vilma Rosada, RN and Sue Brock, ARNP, recruited veterans to the study and provided care coordination. Assisting them was William A. Lapcevic, MSST, MPH an expert in information technology and data management.

#### ***c. Recruit technical personnel (LAMP technician) and software analyst.***

- The Low ADL Monitoring Program (LAMP) VA server is based in Gainesville, FL and maintained by Mr. Steve Moore. Assisting him was William A. Lapcevic.

#### ***d. Order computers, load software programs/dialogues and set up web site on VA servers.***

The Veterans Integrated Service Network 8 (VISN 8) which includes the JAH currently uses the Health Hero patient management system and uses store and forward technology using the Health Buddy and web based solutions as part of its program to support patients with chronic conditions such as Congestive Heart Failure, diabetes, hypertension, COPD and mental illness. However, this technology does not allow for the posting of individualized questions for tracking health conditions and care coordination a key component of our proposed telerehabilitation intervention. Our challenge has been establishing a “secure virtual highway” to conduct the telerehab intervention. The VA had no national secure messaging program for providing individualized care coordination for veterans via telemedicine when this project was initiated. It does have an e-health portal (MyHealthevet) where veterans may submit and track vital signs such as BP readings and cholesterol levels but one that only recently was adapted for individualized care. Hence we utilized the LAMP server.

A total of 70 Dell laptop computers were ordered. Veterans communicated using their laptops with their care coordinator (Ms. Brock/Ms. Rosada) via the secured LAMP server. The LAMP website was provided as a desktop shortcut on the delivered equipment.

### ***Task 2. Patient recruitment***

- A list of all Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) returnees discharged from the Tampa PT/BRI Center with a primary or secondary diagnosis of mild/moderate TBI was

obtained from VA administrative data bases.

- Veterans were recruited for the study either at their clinic appointments at the Polytrauma Center at the James Haley Veterans Hospital (JAH) or were contacted by phone/internet. Patients who met the inclusion criterion and agreed to participate in the intervention signed informed consents.

### **Task 3. Initial home visits to assess functional status and home environment**

The Physical Medicine and Rehabilitation Service (PMRS) at the JAH conducts initial home visit to assess functional status and home environment. Visits to the homes of combat injured veterans are made by qualified Occupational Therapists who provide recommendations for assistive devices and environmental interventions. Functional aids can include hand rails and ramps for wheel chairs in the homes to aid in ambulatory function. Other assistive devices can include modifications to the kitchen to accommodate the needs of the veterans. The cost to the VA is limited to \$2,000 per veteran.

### **Task 4. Data Collection**

Data was collected from VA Administrative data bases and veteran's self-reported health, cognition and social integration status. Veterans' health Information Systems & Technology Architecture (VistA) medical record abstracts were used pertaining to health care utilization and treatments. Patient/caregiver surveys were conducted to determine acceptance of telerehabilitation and perceptions on facilitators and barriers to treating veterans at a distance.

### **Task 5. Data Analysis**

#### ***Patient characteristics***

**Demographics:** We collected data on a total of 75 veterans who consented to the telerehabilitation study. Some of the injured were transferred from the Walter Reed Army Medical Hospital in Washington DC to the Physical Medicine and Rehabilitation Service at the James A Haley Veterans Hospital in Tampa, FL. and were subsequently discharged but still utilize the outpatient services at the JAH. Others were discharged from other military or VA facilities and chose to reside in the Tampa area partly due to the availability of Polytrauma health care at the JAH. The 75 veterans comprise of two cohorts, namely those with a stand-alone diagnosis of mild TBI (n=61) and those with a confirmed comorbid diagnosis of Post-Traumatic Stress Disorders (TBI/PTSD) (n=14). The majority of enrollees, as expected are male. Female soldiers cannot serve on combat units though they may sustain injuries due to indirect fire or vehicle accidents in combat zones..

**Table 1: Demographic characteristics of veterans enrolled in TBI & TBI/PTSD Cohorts**

	TBI N=61	TBI/PTSD N=14
	N (%)	N (%)
Male, %	58 (95.1)	14 (100.0)
Age group (yrs.), %		
18-29	36 (59.02)	3 (21.43)
30-39	15 (24.59)	3 (21.43)
40-49	7 (11.48)	7 (50.00)

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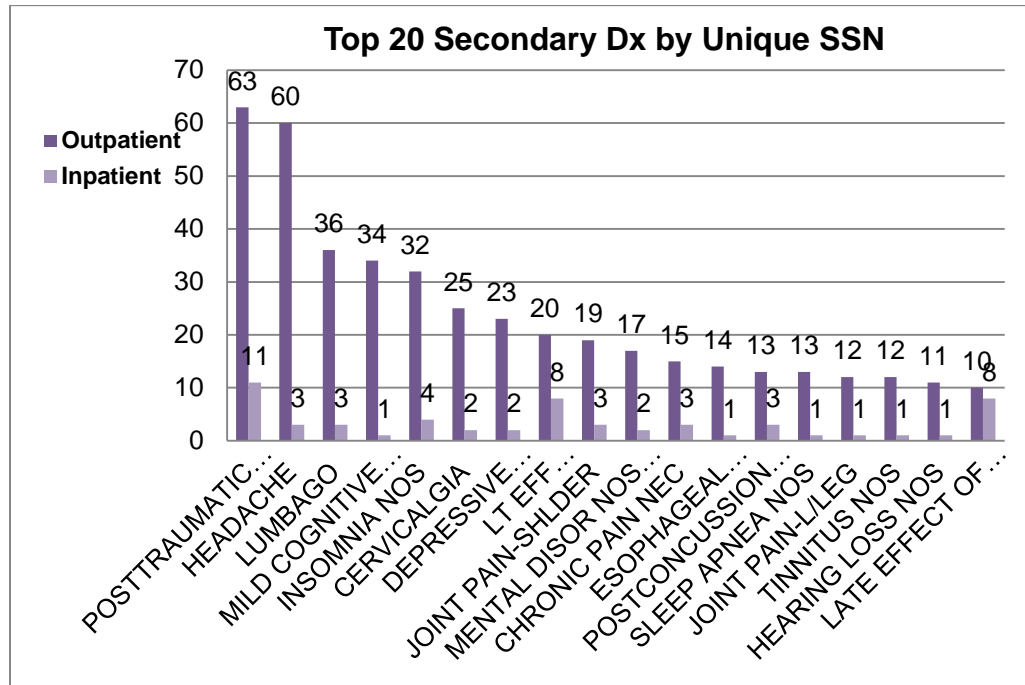
50+	3 (4.92)	1 (7.14)
Age, mean $\pm$ SD	31.1 (8.4)	37.9 (9.0)
Marital status		
Married	32 (52.5)	7 (50.0)
Divorced	5 (8.2)	1 (7.1)
Never Married	20 (32.8)	6 (42.9)
Single	4 (6.6)	0 (0.0)
Ethnicity, %		
Not Hispanic	44 (72.1)	9 (64.29)
Hispanic or Latino	15 (24.6)	4 (28.57)
Unanswered	2 (3.3)	1 (7.14)
Race, %		
White	50 (82.0)	10 (71.4)
Black	4 (6.6)	0 (0.0)
Native Hawaiian	2 (3.3)	1 (7.1)
Unanswered	5 (8.2)	3 (21.4)
Race/Ethnicity, %		
White	39 (63.9)	8 (57.1)
Black	4 (6.6)	0 (0.0)
Hispanic	15 (24.6)	4 (28.6)
Native Hawaiian	1 (1.6)	1 (7.1)
Unanswered	2 (3.3)	1 (7.1)
Service Connected, %		
0%	17 (27.9)	5 (35.7)
10-30%	10 (16.4)	0 (0.0)
40-60%	14 (23.0)	3 (21.4)
70-80%	9 (14.8)	3 (21.4)
80-100%	11 (18.0)	3 (21.4)

## Health Status of enrolled veterans

As per the inclusionary criteria for participation in telerehabilitation all veterans have a primary clinical diagnosis of Traumatic Brain Injury incurred in combat theatres in Iraq and Afghanistan. Though the mechanism of injury is not always identified in their medical charts in the VA, conversations with wounded warriors has revealed that the majority suffer from the effects of blast related injuries resulting from improvised explosive devices and mortar attacks. Vehicle accidents in combat theatres also contribute to TBI resulting from concussion. Many of the wounded suffer from the many adverse side effects of TBI.

The counts of secondary diagnosis illustrated in Figure 1 are for unique veterans but are mutually inclusive in that the same diagnosis may be recorded twice for the same veteran at outpatient visits or at inpatient admissions. A total of 11 veterans were treated as inpatients at JAH. As can be observed, Post Traumatic Stress Disorders and the adverse effects of TBI manifested as headaches, sleep disorders and cognitive impairment were common ailments of our study cohort.

**Figure 1: Secondary diagnosis among veterans recorded during inpatient (n=11) and outpatient (n=63) visits.**



As can be observed, Post Traumatic headaches and the adverse effects of TBI manifested as musculoskeletal disorders and cognitive impairment were common ailments of our study cohort. This is clearly indicated in the care coordination provided to veterans with the issues pertaining to cognition and psychosocial complications requiring urgency and providing challenges in providing care as detailed later. Substance abuse, involving prescribed medications, alcohol and street drugs also complicates treatment.

## Baseline Surveys

We have collected data as required by our study protocol on a variety of functional, cognition, social integration and mental health outcomes to evaluate the efficacy of the telerehab intervention. As may be noticed many of the instruments have overlapping questions in the areas of function, cognition and psychosocial adjustments. Yet each instrument has its own peculiarity in assessing veterans' health status and has independently been shown to provide for reliability and validity in measurement. We therefore have maintained the integrity of each instrument and have not altered any of the questions posed. Repeated measures will be conducted over time and appropriate statistical analysis will reveal changes over time as indicated in the initial protocol and statement of work. When veterans return from the battlefield they are subjected to a battery of tests at VA facilities. As a result of this testing clinical pathways are individually tailored for wounded warriors.

The aim of gathering information is twofold: 1) To characterize rehabilitation trajectories over time in the areas of function, cognition, psychosocial adjustment, integration into society and mental health disorders over time and 2) To individualize treatment patterns customized to each veterans needs so as to maximize the effect of telerehabilitation. Unlike traditional telemedicine that deals with disease specific monitoring or intervention (diabetes, CHF, dementia etc.), our cohort exhibits a very diverse population in terms of disease affliction, complexity and propensity to respond to care.



## Instruments to measure outcomes

Veterans who consent are required to connect (via the internet) to a secured commercial website (SurveyMonkey.com<sup>TM</sup>) to provide responses to a variety of instruments to monitor their health outcomes over time. The cohort followed consisted of those with a diagnosis of stand-alone TBI (n=60) and those with a clinical diagnosis of comorbid PTSD as well (n=15). All participants completed the Functional Independence and Functional Assessment Measure<sup>TM</sup> (FIM/FAM), the Craig Handicap Assessment and Reporting Technique (CHART) and the Patient Competency Rating Scale (PCRS) while the cohort with a clinical diagnosis of Post Traumatic Stress Disorders completed the PTSD Checklist Military Form (PCL-M), Modified PTSD Symptom Scale (MPSS-SR), Self-Report Alcohol Use Disorders Identification Test (AUDIT) and the Self Report Beck Depression Inventory.

1. **Functional Independence Measure<sup>TM</sup> (FIM) and Functional Assessment Measure (FAM):** The (FIM<sup>TM</sup>) is a widely accepted functional assessment measure in use in the rehabilitation community. The FIM measures independent performance in motor and cognitive skills in addition to the ADLs pertaining to the self-care categories of feeding, grooming, bathing, dressing upper body, dressing lower body and toileting. The FIM is proprietary. We have therefore captured all elements of the FIM in an expanded version of the same which includes elements in Functional Assessment as well. Because disturbances in communication, cognition, and behavior are prominent characteristics after brain injury, additional items considering those issues were added to the FIM, resulting in a functional assessment measure, FIM+FAM. The FIM/FAM has been increasingly adopted as an outcome measure in brain injury rehabilitation.  
The Functional Independence Measures (FIM) provides an integration of FIM assessments into the Computerized Patient Record System (CPRS) and into the Functional Status and Outcomes Database (FSOD) at the Austin Automation Center (AAC), a Veterans Administration database containing the Personal Health Records of veterans. The FIM is an 18-item, 7-level functional assessment designed to evaluate the amount of assistance required by a person with a disability to perform basic life activities safely and effectively.
2. **Craig Handicap Assessment and Reporting Technique (CHART):** The original CHART, developed in 1992, included domains to assess five of the WHO dimensions of handicap: 1) Physical Independence: ability to sustain a customarily effective independent existence; 2) Mobility: ability to move about effectively in his/her surroundings; 3) Occupation: ability to occupy time in the manner customary to that person's sex, age, and culture; 4) Social Integration: ability to participate in and maintain customary social relationships; and 5) Economic Self-Sufficiency: ability to sustain customary socio-economic activity and independence. Table 2a in the Appendix details changes as self-reported on CHART.
3. **Patient Competency Rating Scale (PCRS):** The PCRS provides for a rating of basic competencies in performing everyday chores with responses on a 1-5 scale with 1 denoting the most difficulty in addressing a problem and a score of 5 implying ability to handle the problem with total ease.
4. **Alcohol Use Disorders Identification Test (AUDIT);** identify persons with hazardous and harmful patterns of alcohol consumption. The AUDIT was developed by the World Health Organization (WHO) as a simple method of screening for excessive drinking and to assist in brief assessment.
5. The **Beck Depression Inventory** is a 21-question multiple-choice self-report inventory and one of the most widely used instruments for measuring the severity of depression.

6. **PTSD Checklist** is a 17-item self-report measure reflecting DSM-IV symptoms of PTSD. The PCL has a variety of purposes, including: screening individuals for PTSD; aiding in diagnostic assessment of PTSD; and monitoring change in PTSD symptoms. There are three versions of the PCL for DSM-IV. We used the **PCL military version (PCL-M)** which associates responses to "stressful military experiences." It is often used with active service members and veterans.
7. **Modified PTSD Symptom Scale: Self-Report (MPSS-SR)** is a 17-item self-report measure that assesses the 17 DSM-III-R symptoms of PTSD. This scale is a modification of the PTSD Symptom Scale.

**Study objectives:** The main objective of this study was determining the feasibility of providing care coordination and rehabilitation services to wounded warriors from a distance using the internet and secure messaging on a VA server. The implementation of telerehabilitation has been well received as evidenced by the patient satisfaction surveys (Table 2) which indicate a strong support for services rendered. A secondary objective was to determine the efficacy of rehabilitation using the internet as the modality of care provision.

**Findings:** We have condensed the major findings from the veteran responses to the instruments capturing outcomes as illustrated in the Appendix. Results shown are self-scoring by veterans at baseline, 6, and 12 months after enrollment in the study. After 12 months of enrollment a steady decline in enrollees ensued. The decline resulted from veterans moving away from the area or no longer requiring services at JAH. A few veterans who did not respond to repeated efforts to reach them via the internet care portal were dropped from the study. Though data was collected at 18, 24 and 36 months after enrollment we have presented data only from the first year of observation in the appendix for the purpose of brevity.

The Appendix contains two tables for each of the instruments used to capture outcomes. The first table is a panel data of the means and standard deviations for each self-reported item in the instrument. The second table provides for t-test comparisons between scores at baseline and at 12 months for each of the scored items. We chose the 12 months after enrollment as we felt this captured the maximum effect of the intervention. As the numbers of enrollees declined rapidly thereafter we have not presented any data collected after 12 months except in the figures illustrating the differences in rehabilitation pathways for those with mental health disorders resulting from trauma.

**Methodology:** To evaluate the telerehab intervention we conducted two separate analyses of our data:

- 1) First, we conducted a pre-post intervention comparison on all veterans enrolled in the telerehab intervention. This included veterans with a TBI only diagnosis and those with comorbid PTSD (TBI/PTSD).
- 2) Second, we utilized statistical analysis (t-tests) to compare outcomes over time (baseline and 12 months) between the two cohorts.

### **Reportable Outcomes**

#### **Rehabilitation trajectories in functional capabilities:**

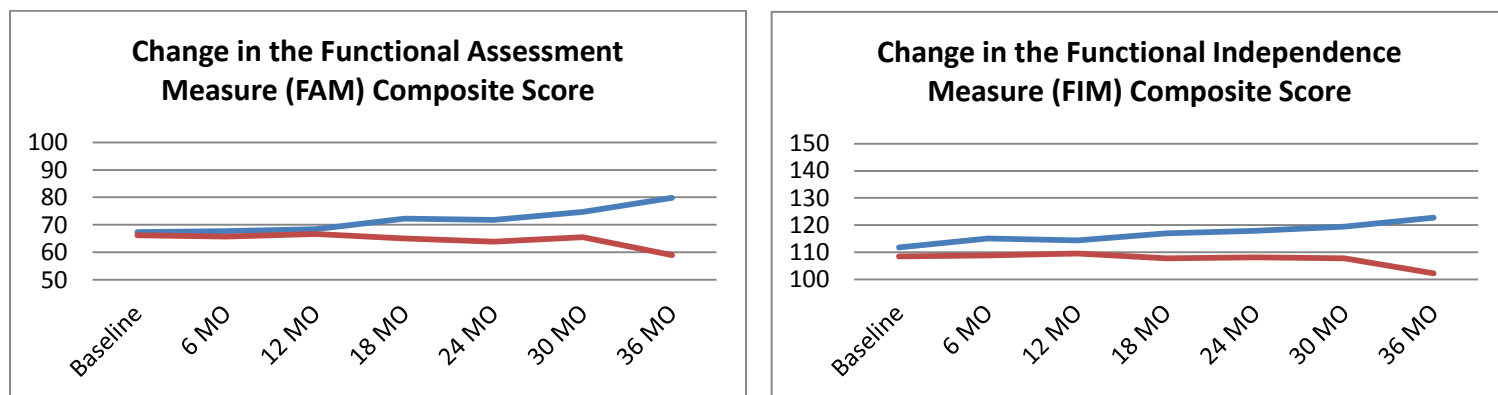
For the sake of conciseness we have confined ourselves in this report to illustrating findings mainly pertaining to the FIM/FAM instrument. Many of the other instruments used to monitor rehabilitation include items and domains similar to FIM/FAM and analyzing data from these instruments resulted in similar findings as those realized from FIM/FAM.

All veterans who received the intervention in general reported marginal improvements in self-care items such as grooming, feeding, bathing and dressing as well as toileting as self-reported on the FIM, FAM

instrument over 36 months of observation. Composite scores were calculated by adding the scores on each of the items comprising the instrument. A higher composite score indicates improvements in outcomes. Changes in composite scores for the FIM and FAM instruments are displayed in Figure 2. Changes in composite scores between baseline and 12 months were statistically insignificant as noted in Table 1b in the Appendix. No statistically significant differences, as well, were noted between any of the individual items or domains between baseline and 12 months. Except for one veteran confined to a wheelchair, as a group, they indicated good mobility and locomotion as expressed by transfers to chairs, cars, climbing stairs and using the tub or shower. Communication skills as expressed in reading and verbalizing were adequate. We could not ascertain whether the marginal improvements as reported in function were due to our care coordination intervention or the natural course of healing.

Rehabilitation trajectories in function are illustrated for two cohorts of interest, namely those with a diagnosis of TBI only and those diagnosed with TBI/PTSD. As is illustrated on both instruments those with post traumatic stress disorders performed less well. Fairly equivalent in functional capabilities at baseline (67.4 vs 66.2) as measured by FAM the two groups diverge subsequently on improvement. At 36 months this disparity is particularly evident with the PTSD cohort recording a decline from baseline in overall functional capability (59 vs 66.2) while those without post traumatic disorder record an improvement (67.4 vs 79.8). From a clinical viewpoint we were unable to determine what, if any effect, our telerehab intervention had on those with post traumatic disorders. A similar characteristic may be noted in the change in FIM composite scores. However, all veterans were appreciative of the care coordination provided as detailed later in the report leading us to conclude that our intervention did have a positive effect.

**Figure 2: Change in FAM and FIM Composite Scores: TBI with comorbid PTSD (red) and stand-alone (blue)**



**Table 2: Composite FAM/FIM scores at baseline and every six months thereafter.**

	PTSD	Baseline	6 MO	12 MO	18 MO	24 MO	30 MO	36 MO
<b>FAM Score</b>	NO	67.4	67.7	68.4	72.3	71.8	74.7	79.8
<b>FAM Score</b>	YES	66.2	65.7	66.7	65	63.9	65.5	59

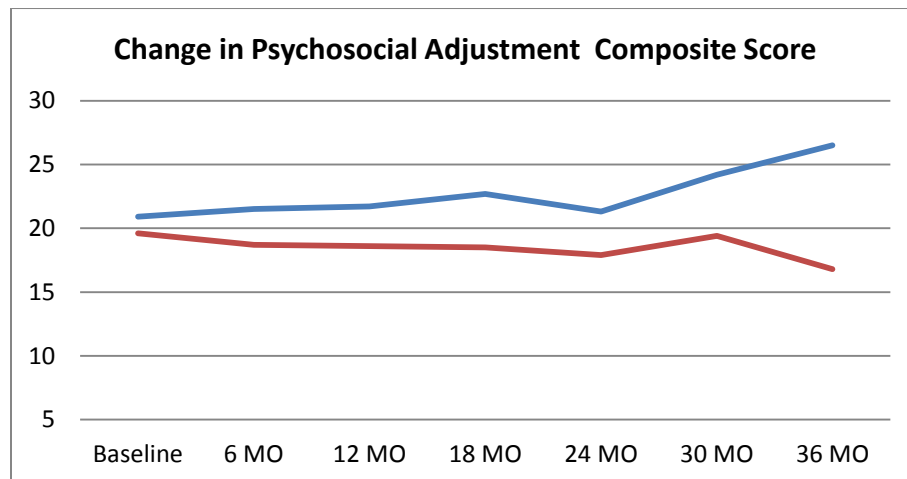
	PTSD	Baseline	6 MO	12 MO	18 MO	24 MO	30 MO	36 MO
<b>FIM Score</b>	NO	111.8	115.1	114.4	117	117.9	119.4	122.8
<b>FIM Score</b>	YES	108.5	108.8	109.6	107.8	108.1	107.8	102.2

**Effect of PTSD on Psychological adjustment:**

One of the items scored in the Functional Independence Measure is Psychosocial Adjustment which captures changes in Social Interaction, Emotional Status, Adjustment to Limitations and Employability. From Table 1b in the Appendix there are no discernible changes in the individual items comprising the domain of Psychosocial Adjustment. However, as illustrated in Figure 4 the effect of post traumatic disorders is evident in the rapid divergence in the trajectories especially pronounced after month 30. While those without PTSD appear to improve in this vital area, the condition of those afflicted with the same appears to deteriorate.

In our observational study Psychological Adjustment is one of the major impediments to return to normality by wounded warriors. Anger issues, irritability, the inability to concentrate and hold employment, presence of anxiety, depression, and functional dependence were associated with impaired quality of life. A clinical diagnosis of disability associated with combat related trauma qualifies veterans for disability benefits. We could not ascertain as to how this influenced employability as recorded in the domain of Psychological adjustment. In secure messages with the care coordinator, veterans in this vulnerable group frequently expressed suicidal tendencies and an inclination to harm themselves.

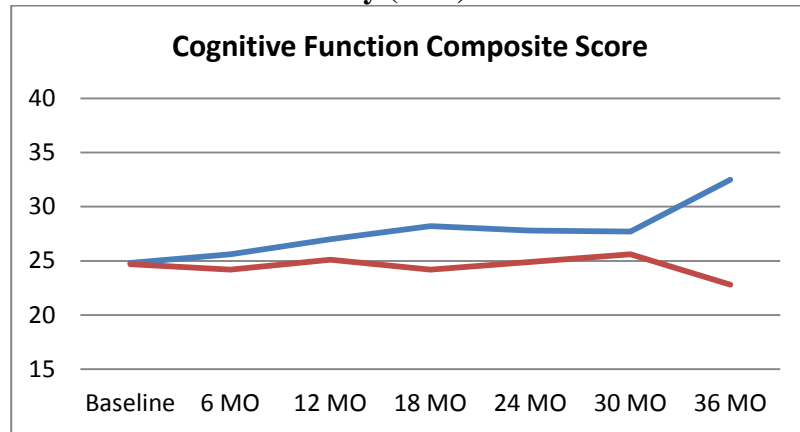
**Figure 4: Change in Psychological Adjustment scores: TBI with comorbid PTSD (red) and stand-alone TBI (blue)**



	PTSD	Baseline	6 MO	12 MO	18 MO	24 MO	30 MO	36 MO
Adjustment Score	NO	20.9	21.5	21.7	22.7	21.3	24.2	26.5
Adjustment Score	YES	19.6	18.7	18.6	18.5	17.9	19.4	16.8

**Cognition and Social Integration:** Similar findings are realized in cognition and social integration as contained in the Functional Independence Measure. The Cognitive subscale consists of five items: Comprehension, Expression, Social Interaction, Problem-solving and Memory. As with functional outcomes no statistically significant differences were observed in measures capturing cognition and social integration. The standard deviations in Table 2a in the Appendix, however, indicates variability among veterans in each of the categories listed substantiating our prior finding that our cohort is binary in nature on care needs especially in the areas of cognition and integration into society. The decline in cognition and social interaction especially after 30 months is noticeable and suggests studies are needed to investigate long term effects of combat trauma. In our study it was noticed that a small number of veterans (<5) contributed most to the divergence in rehabilitation trajectories.

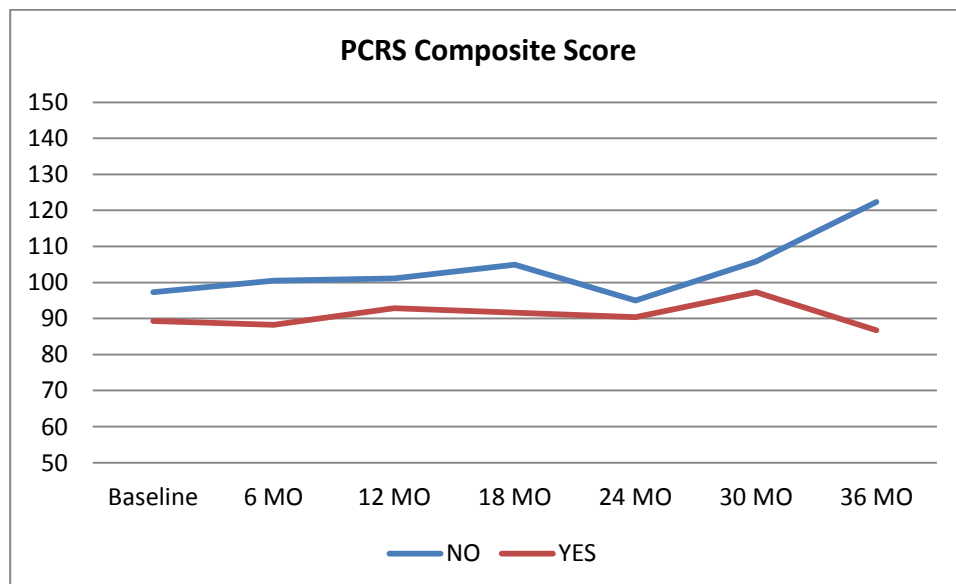
**Fig 5: Change in composite Cognition Domain score: TBI with comorbid PTSD (red) and TBI only (blue)**



	PTSD	Baseline	6 MO	12 MO	18 MO	24 MO	30 MO	36 MO
Cognitive Score	NO	24.8	25.6	27	28.2	27.8	27.7	32.5
Cognitive Score	YES	24.7	24.2	25.1	24.2	24.9	25.6	22.8

**Self- rated Patient Competency:** The primary purpose of the PCRS instrument is to evaluate self-awareness (the ability to appraise one's current strengths and weaknesses) following traumatic brain injury. The PCRS is a 30-item self-report instrument which asks the subject to use a 5-point Likert scale to rate his or her degree of difficulty in a variety of tasks and functions. Noteworthy, is the reporting by veterans of perceived patient competency as other instruments.

**Fig 6: Change in composite Patient Competency Rating Scale score (PCRS): TBI with comorbid PTSD (red) and TBI only (blue)**



	PTSD	Baseline	6 MO	12 MO	18 MO	24 MO	30 MO	36 MO
<b>PCRS Score</b>	NO	97.3	100.5	101.1	104.9	95	105.8	122.3
<b>PCRS Score</b>	YES	89.3	88.2	92.9	91.6	90.4	97.3	86.7

### Post Traumatic Stress Disorders:

The *PTSD Checklist Military Form (PCL-M)* and *Modified PTSD Symptom Scale* Instruments were administered only to those with a clinical diagnosis of PTSD. Results of the self-reported symptoms are contained in Tables 4 and 5 in the Appendix. A total of 14 veterans participated at baseline though the sample reduced to 10 individuals after 12 months. The sample sizes involved were too small to make comparisons but in the both instruments veterans appear to indicate an easing of the symptoms associated with PTSD as outlined by the composite scores in both instruments. We were unable to ascertain if the observed decrease was a natural progression of rehabilitation or whether our care coordination contributed to the same.

**Alcohol Use Disorders Identification Test and the Beck Depression Inventory Score** were administered only to those with post traumatic stress disorders, the group most vulnerable to these afflictions. Generally the patients performed well without a significant decline in measures on alcohol consumption and depression. The high variability in the means of the composite scores on both measures indicates a few veterans who are at risk.

### Patient satisfaction surveys

Our continuing patient satisfaction surveys reveal the enrollees are highly appreciative of the care provided as indicated in Table 3 with the scoring mechanism on a Likert scale with 5 denoting strongly agreeing and 1 equal to a strong disagreement to the question posed. We consider care coordination as one of the key accomplishments of our intervention. The number of missed diagnosis uncovered, medication profile resets, drug tapering and the timely scheduling of appointments are too numerous to enumerate in this report. An insight into the improved quality of care resulting from this effort is contained in the satisfaction survey. Veterans rated the interventionist (Ms. Sue Brock, ARNP) highly for her caring nature in providing care coordination and overwhelmingly rated the telerehabilitation intervention as superior to traditional VA care obtained at the Tampa VA.

**Table 3: Patient satisfaction survey**

	Question	N	Mean	Median	Std Dev
Q1	The Telerehab website was easy for me to use.	51	4.55	5	0.54
Q2	I found the Telerehab communications convenient.	51	4.69	5	0.51
Q3	I found the amount of time the Telerehab communications take to be about right.	51	4.47	5	0.61
Q4	I found the time between Telerehab communications about right.	51	4.35	4	0.63
Q5	The RN (Sue Brock) returned my messages in a timely manner.	51	4.92	5	0.27
Q6	The RN was able to provide the services requested.	51	4.82	5	0.43
Q7	The overall care and services provided by the RN met my needs.	51	4.84	5	0.37
Q8	When I had questions about care coordination the answers provided were helpful to me.	51	4.69	5	0.73

Q9	I had no concerns about whether the privacy of personal medical information was protected.	51	4.63	5	0.66
Q10	The Telerehab care coordination was more convenient than arranging through the James A Haley Veteran's Hospital.	50	4.78	5	0.51
Q11	The Telerehab communications can substitute for some visits to the James A Haley Veteran's Hospital.	49	4.22	4	0.85
Q12	Overall, I am satisfied with the Telerehab service I am enrolled in.	51	4.78	5	0.42

### **Efficacy of Telerehabilitation for combat wounded veterans**

It is difficult to ascertain the efficacy of the telerehab intervention as this study was not a randomized clinical trial. Lack of a control group and pre intervention data necessitated comparisons between baseline measurements and discrete time intervals (12 months after enrollment) to determine the efficacy of the telerehabilitation intervention on physical and cognitive outcomes on enrolled veterans. We did not choose a comparison group for evaluation purposes because we did not have a sufficient propensity scored sample size for unbiased comparisons. By protocol, most of the instruments used to measure outcomes are to be administered by a care-giver or clinician together with patient input. However, given the nature of our secure messaging intervention and use of a server based application to collect data (SurveyMonkey<sup>R</sup>) we requested the veterans to self-report on functional, cognition and social integration outcomes. This may result in biased reporting by veterans.

To address many of the shortcomings of this study the Congressionally Directed Medical Research Program, thankfully, funded support for research entitled "Effectiveness of Telerehabilitation for OIF/OEF returnees with Combat Related Trauma": Grant/Cooperative Agreement number: W81XWH-11-2-00632. This randomized control study, with broader objectives is scheduled to end early next year when we expect to provide robust estimates on the effectiveness of treating wounded warriors at a distance.

***Effect on all veterans enrolled in the study:*** As may be observed, many of the domains that constitute functional, cognition and social interaction capabilities displayed statistically non-significant differences at the points of measurement in all instruments. However, this should not be construed as reflecting on the efficacy of the intervention. The number of missed diagnosis uncovered during care coordination were many and include life threatening conditions such as seizures, suicidal tendencies, depression and sleep disorders. On at least two occasions veterans with suicidal tendencies were referred to clinical psychologists who prevented the wounded warriors from harming themselves. Veterans frequently expressed appreciation on the help provided to obtain medications, make clinic appointments. We frequently receive notes via email expressing gratitude of our efforts. A sampling (verbatim) of the messages of appreciation follows. The words convey their gratitude for the care coordination rendered:

1) JH was injured in an IED blast in Iraq and diagnosed with Traumatic brain injury/right transfemoral amputation/polytrauma including right hand second digit amputation and originally treated at Walter Reed AMC.

He writes (5/18/14) "i really do apprieciate what you do for me. i just want to say how helpful this program is, thank you it has been extremely helpful".

2) RP was injured when his truck hit an anti-tank mine in Iraq.

He writes (4/15/13) " Thanks alot Sue, I really appreciate it. I love this thing. The computer is great. Ill really be disappointed if the va doesnt continue this program. The possibilities are endless."

3) RPs brother writes (4/28/13)" I have 90% disavility because of my PTSD(70%). You help my brother (KL), and he told me great things about the (program). how can you help me aquire some of the benefits. Thank You very much, God Bless".

## **Conclusions**

The major findings of our research indicate:

1. Functional capabilities measured by locomotion and mobility appear to have stabilized among our cohort of veterans while deficiencies in cognition (memory, problem solving), psychosocial adjustment (anger, emotional status) and problems in integrating into society pose challenges especially with those affected by post traumatic stress disorders. Our care coordination has been mostly directed towards facilitating psychological counseling and psychiatric care. Due to the shortage of mental health experts in the VA compared to the large number of veterans who require this service our efforts at obtaining the needed care for our cohort has been challenging. As clearly evident, psychosocial adjustment, cognitive function and integration into society are the main areas of concern in coordinating care.
2. Individualized treatment pathways are needed for rehabilitation and ultimate integration into society especially for those afflicted with PTSD.
3. Veterans have expressed a deep appreciation for the program and continue to avail of the care coordination provided.

### **Task 6.** Implementation of telerehabilitation at the Tampa VA: Months 50-64

- a. Transition existing veterans in telerehabilitation to the VA approved and provided MvHealtheVet secure messaging system
- b. Set up a provider panel at the James A Haley Veterans Hospital comprising a Physical Medicine and Rehabilitation Physician, clinical psychologist. Pain expert, care coordinator and social worker.

***Transitioning veterans to a Secure messaging/provider panel:*** We have worked with the Tampa VA MyHealtheVet (MHV) administrator to set up a panel of providers for care coordination using secure messaging. A panel of providers willing to participate in MHV for wounded veterans has been identified as follows: Georgia Laliotis, MD - Neurology/Pain Management, Brian Merritt, MD-Physiatrist, Michele Bosco, PhD – Psychologist, Lesli Culver - Social Worker, Sharon Haire - Speech Pathologist, Steve Scott DO, Physical Medicine and Rehabilitation. Vilma Rosada, RN is the point of contact for veterans enrolled in MHV. We have recruited 7 veterans for care coordination using the MHV platform. Use of the MHV system has increased with enrollees comfortable with the systems various functions. The most commonly used application is medication refills and scheduling clinical appointments.



**Key Research Accomplishments resulting from the study:**

**Publications:**

1. Chapman P, Elnitsky C, Thurman R, Spehar A & Siddharthan K. Exploring Combat-Related Loss and Behavioral Health Among OEF/OIF Veterans with Chronic PTSD. *Journal of Traumatology*, 2013, Volume 19 (2), 154-157.
2. Siddharthan K, Spehar AM, Lapcevic WA, Rosada V. The effect of Post Traumatic Stress Disorders on Rehabilitation among combat wounded veterans. *Global TeleHealth*, Vol. 182, December 2012, 114-124.
3. Siddharthan K. Telerehabilitation for Veterans with Combat related TBI/PTSD. *Proceedings: NATO Symposium on Mental Health and Well Being across the Military Spectrum*. Bergen, Norway, April, 2011.

**Presentations at professional meetings:**

1. The VA HSR & D Women's Health Conference: "Effect of care coordination on Health Resilience among OEF/OIF female combat wounded veterans.", Washington DC July 11-13, 2014
2. The 2009 Military Health Research Forum: "Telerehabilitation for combat wounded with Traumatic Brain Injury (TBI) and Post traumatic Stress Disorders (PTSD)". August 31 - September 3, 2009.
3. The Veterans Administration (VA) Patient Centered Home Conference, "Rehabilitation at a distance for combat wounded veterans": Las Vegas, Nevada, April 13-15, 2010.
4. The VA Health Services Research & Development (VA HSR & D) Annual Mental Health Conference, "The Effect of Post-Traumatic Stress Disorders on integration into society for combat wounded veterans": Little Rock, Arkansas: April 27-29, 2010.
5. The VA HSR & D Telehealth Conference: "Telerehabilitation for combat wounded with traumatic Brain Injury and Post Traumatic Stress Disorders", St. Louis, Missouri: May 11-13, 2010.
6. The Third Annual Trauma Spectrum Conference: "Telerehabilitation for combat wounded with Traumatic Brain Injury and Post Traumatic Stress Disorders", Bethesda, Maryland, December 7-8.
7. NATO Symposium on Mental Health and Well Being across the Military Spectrum. "Telerehabilitation for Veterans with Combat Related TBI/PTSD", Bergen, Norway, April 2011.
8. Department of Defense Health Forum, "Telerehabilitation for OIF/OEF Returnees with Combat-Related Traumatic Brain Injury", Fairfield, VA, July 2011.
9. 2011 VA Improvement Forum, "Redesigning Care Coordination for Combat-wounded Veterans via Telerehabilitation", Las Vegas, NV, September 2011.
10. The VA HSR & D Cyber seminar Telehealth Conference on the [Management of TBI / Rehabilitation](#), "Telerehabilitation for Veterans with Combat Related Traumatic Brain Injury", October 25, 2012.

**APPENDIX**

**Table 1a: Functional Independence Measure™ (FIM) and Functional Assessment Measure (FAM)**

	<i>Baseline</i>		<i>6 Months</i>		<i>12 Months</i>	
	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>
<b><i>FIMFAM</i></b>						
<b>FIMFAM Total Score: Higher value indicates Improvement in Function</b>	65	175.7+-33.7	51	176.3+-29.8	47	177.6+-26.7
<b>Functional Independence Measure Total</b>	65	109.2+-18.6	51	110.1+-15	47	110.5+-13.9
<b>Functional Assessment Measure Total</b>	65	66.5+-16.1	51	66.1+-15.6	47	67.1+-13.8
<b>Self-Care Items Total</b>	65	45.6+-6.3	51	45.2+-6.1	47	45.9+-5.5
<b>Feeding</b>	65	6.6+-1	51	6.4+-1.1	47	6.7+-0.7
<b>Grooming</b>	65	6.5+-0.9	51	6.3+-1.3	47	6.4+-0.9
<b>Bathing</b>	65	6.3+-1.3	51	6.4+-1.1	47	6.4+-1.2
<b>Dressing - Upper Body</b>	65	6.5+-1.2	51	6.5+-1	47	6.6+-1
<b>Dressing - Lower Body</b>	65	6.3+-1.2	51	6.4+-1	47	6.3+-1.3
<b>Toileting</b>	65	6.6+-1.1	51	6.6+-0.9	47	6.7+-1
<b>Swallowing</b>	65	6.8+-0.7	51	6.7+-0.8	47	6.9+-0.6
<b>Sphincter Control Total</b>	64	13.3+-1.7	51	13.3+-1.8	47	13.3+-1.3
<b>Bladder Management</b>	64	6.7+-0.8	51	6.7+-0.8	47	6.6+-0.7
<b>Bowel Management</b>	64	6.6+-1	51	6.6+-1	47	6.7+-0.6
<b>Mobility Items (Type of Transfer) Total</b>	64	26.1+-4.3	51	26.4+-2.7	47	26.2+-3.6
<b>Bed/Chair/Wheelchair</b>	64	6.6+-1.1	51	6.6+-0.7	47	6.5+-0.9
<b>Bed</b>	53	6.6+-1	51	6.4+-1	47	6.2+-1.3
<b>Chair</b>	64	6.6+-1.1	51	6.6+-0.7	47	6.6+-1
<b>Wheelchair</b>	42	6.7+-1	49	6.8+-0.7	47	6.7+-0.9
<b>Toiler</b>	64	6.6+-1.1	51	6.7+-0.7	47	6.7+-0.9
<b>Tub or Shower</b>	64	6.4+-1.2	51	6.5+-0.8	47	6.4+-1.2
<b>Car Transfer</b>	63	6.6+-1	51	6.6+-0.8	47	6.6+-1
<b>Locomotion Total</b>	64	18.7+-3.4	51	18.5+-3.4	47	18.4+-3.5
<b>Car Transfer</b>	64	6.4+-0.9	51	6.5+-0.8	47	6.4+-1.1
<b>Walking</b>	63	6.2+-1.1	51	6.1+-1.2	47	6.1+-1.4
<b>Wheelchair</b>	42	6.7+-1	49	6.9+-0.6	47	6.7+-1
<b>Stairs</b>	64	6+-1.4	51	6.1+-1.3	47	5.9+-1.5
<b>Ability to Access the Community</b>	64	6.2+-1.5	51	5.9+-1.8	47	6.1+-1.5
<b>Communication Items Total</b>	64	29.8+-5.7	51	29.1+-5.9	47	29.7+-5.5
<b>Audio Comprehension</b>	61	5.7+-1.5	51	5.6+-1.4	47	5.6+-1.3

<b>Visual Comprehension</b>	59	5.9+-1.3	51	6+-1.2	47	6.2+-1
<b>Verbal Expression - What is your ability to express yourself verbally?</b>	64	6.2+-1.2	51	5.9+-1.4	47	5.9+-1.4
<b>Nonverbal Expression</b>	54	6.4+-1.1	51	6.1+-1.2	47	6.2+-1.1
<b>Reading</b>	64	5.9+-1.5	51	5.5+-1.6	47	5.8+-1.4
<b>Writing</b>	64	5.8+-1.4	51	5.8+-1.6	47	5.9+-1.4
<b>Speech Intelligibility</b>	63	6.1+-1.3	51	6.1+-1.4	47	6.1+-1.1
<b>Psychosocial Adjustment Total</b>	63	19.8+-7.2	51	19.3+-7.7	47	19.1+-6.5
<b>Social Interaction</b>	63	5.2+-2	51	5+-2	47	4.9+-1.9
<b>Emotional Status</b>	63	5+-1.9	51	4.8+-2	47	4.6+-1.8
<b>Adjustment to Limitations</b>	62	5.3+-1.9	51	5.1+-1.8	47	5.2+-1.7
<b>Employability</b>	62	4.6+-2.4	51	4.4+-2.5	47	4.4+-2.5
<b>Cognitive Function Total</b>	64	24.7+-7.8	51	24.5+-7.8	46	25.4+-6.6
<b>Problem Solving</b>	64	5.1+-1.8	51	5.3+-1.8	46	5.5+-1.5
<b>Memory</b>	64	3.9+-1.7	51	3.8+-1.8	46	4.2+-1.6
<b>Orientation</b>	64	5.4+-1.8	51	5.3+-1.8	46	5.3+-1.7
<b>Attention</b>	64	4.8+-1.7	51	4.5+-1.9	46	4.7+-1.6
<b>Safety Judgment</b>	64	5.6+-1.9	51	5.6+-1.7	46	5.7+-1.5

**Table 1b: Functional Independence Measure™ (FIM) and Functional Assessment Measure (FAM)  
Pre and Post Intervention analysis**

<i>FIMFAM</i>	Month	N	Mean	STD	Method	Variances	t- Value	DF	Prob
<b>FIMFAM Total</b>	0	65	176.2	33.5	Pooled	Equal	-0.452	110	0.65198
	12	47	178.9	26	Satterthwaite	Unequal	-0.471	109.4	0.63878
<b>Functional Assessment Measure (FAM) Total</b>	0	65	66.5	16.1	Pooled	Equal	-0.207	110	0.83642
	12	47	67.1	13.8	Satterthwaite	Unequal	-0.212	106.9	0.83226
<b>Functional Independence Measure (FIM) Total</b>	0	65	109.8	18.4	Pooled	Equal	-0.649	110	0.51766
	12	47	111.8	13.3	Satterthwaite	Unequal	-0.683	110	0.49616
<b>Self Care Items Total</b>	0	65	45.6	6.3	Pooled	Equal	-0.233	110	0.8161
	12	47	45.9	5.5	Satterthwaite	Unequal	-0.238	106.1	0.8121
<b>Feeding</b>	0	65	6.6	1	Pooled	Equal	-0.595	110	0.5528
	12	47	6.7	0.7	Satterthwaite	Unequal	-0.63	109.9	0.53025
<b>Grooming</b>	0	65	6.5	0.9	Pooled	Equal	0.446	110	0.65664
	12	47	6.4	0.9	Satterthwaite	Unequal	0.451	103.3	0.65284
<b>Bathing</b>	0	65	6.3	1.3	Pooled	Equal	-0.286	110	0.7752
	12	47	6.4	1.2	Satterthwaite	Unequal	-0.29	103.6	0.77234

<b>Dressing - Upper Body</b>	0	65	6.5	1.2	Pooled	Equal	-0.419	110	0.67625
	12	47	6.6	1	Satterthwaite	Unequal	-0.429	106.8	0.66858
<b>Dressing - Lower Body</b>	0	65	6.3	1.2	Pooled	Equal	0.257	110	0.79771
	12	47	6.3	1.3	Satterthwaite	Unequal	0.252	91.6	0.80173
<b>Toileting</b>	0	65	6.6	1.1	Pooled	Equal	-0.435	110	0.66429
	12	47	6.7	1	Satterthwaite	Unequal	-0.445	106.3	0.65703
<b>Swallowing</b>	0	65	6.8	0.7	Pooled	Equal	-0.387	110	0.69983
	12	47	6.9	0.6	Satterthwaite	Unequal	-0.397	107	0.69243
<b>Sphincter Control Total</b>	0	64	13.3	1.7	Pooled	Equal	-0.057	109	0.95479
	12	47	13.3	1.3	Satterthwaite	Unequal	-0.059	108.6	0.95306
<b>Bladder Management</b>	0	64	6.7	0.8	Pooled	Equal	0.44	109	0.66103
	12	47	6.6	0.7	Satterthwaite	Unequal	0.445	103	0.65751
<b>Bowel Management</b>	0	64	6.6	1	Pooled	Equal	-0.501	109	0.61759
	12	47	6.7	0.6	Satterthwaite	Unequal	-0.533	107.7	0.59524
<b>Walking/Wheelchair Average</b>	0	64	6.6	0.9	Pooled	Equal	-0.73	109	0.46719
	12	47	6.8	0.9	Satterthwaite	Unequal	-0.72	94.3	0.47322
<b>Stairs</b>	0	64	6	1.4	Pooled	Equal	0.462	109	0.64479
	12	47	5.9	1.5	Satterthwaite	Unequal	0.453	91.6	0.65137
<b>Ability to Access the Community</b>	0	64	6.2	1.5	Pooled	Equal	0.435	109	0.66456
	12	47	6.1	1.5	Satterthwaite	Unequal	0.436	100	0.66404
<b>Locomotion Total</b>	0	64	18.9	3.3	Pooled	Equal	0.206	109	0.8373
	12	47	18.7	3.3	Satterthwaite	Unequal	0.205	98.4	0.83774
<b>Audio/Visual Comprehension Average</b>	0	64	5.9	1.3	Pooled	Equal	-1.795	109	0.07544
	12	47	6.3	0.9	Satterthwaite	Unequal	-1.902	108.3	0.05978
<b>Audio Comprehension</b>	0	61	5.7	1.5	Pooled	Equal	0.121	106	0.90355
	12	47	5.6	1.3	Satterthwaite	Unequal	0.124	104.2	0.90188
<b>Visual Comprehension</b>	0	59	5.9	1.3	Pooled	Equal	-1.074	104	0.28514
	12	47	6.2	1	Satterthwaite	Unequal	-1.107	103.9	0.2709
<b>Verbal/Nonverbal Expression Average</b>	0	64	6.5	1.1	Pooled	Equal	0.844	109	0.4006
	12	47	6.3	1.1	Satterthwaite	Unequal	0.842	98.5	0.40177
<b>Verbal Expression - What is your ability to express yourself verbally?</b>	0	64	6.2	1.2	Pooled	Equal	1.395	109	0.16588

	12	47	5.9	1.4	Satterthwaite	Unequal	1.37	92.4	0.17387
<b>Nonverbal Expression</b>	0	54	6.4	1.1	Pooled	Equal	0.802	99	0.42467
	12	47	6.2	1.1	Satterthwaite	Unequal	0.8	96.3	0.42563
<b>Reading</b>	0	64	5.9	1.5	Pooled	Equal	0.342	109	0.73288
	12	47	5.8	1.4	Satterthwaite	Unequal	0.345	102.5	0.73049
<b>Communication Total</b>	0	64	30	5.7	Pooled	Equal	-0.316	109	0.75241
	12	47	30.4	5.4	Satterthwaite	Unequal	-0.319	102.3	0.75036
<b>Writing</b>	0	64	5.8	1.4	Pooled	Equal	-0.401	109	0.68885
	12	47	5.9	1.4	Satterthwaite	Unequal	-0.401	99	0.68916
<b>Speech Intelligibility</b>	0	63	6.1	1.3	Pooled	Equal	0.02	108	0.98438
	12	47	6.1	1.1	Satterthwaite	Unequal	0.02	105.5	0.98405
<b>Psychosocial Adjustment Total</b>	0	63	19.8	7.2	Pooled	Equal	0.516	108	0.60659
	12	47	19.1	6.5	Satterthwaite	Unequal	0.524	104	0.6013
<b>Social Interaction</b>	0	63	5.2	2	Pooled	Equal	0.693	108	0.49003
	12	47	4.9	1.9	Satterthwaite	Unequal	0.701	103.3	0.48479
<b>Emotional Status</b>	0	63	5	1.9	Pooled	Equal	0.968	108	0.33539
	12	47	4.6	1.8	Satterthwaite	Unequal	0.977	102.5	0.33093
<b>Adjustment to Limitations</b>	0	62	5.3	1.9	Pooled	Equal	0.193	107	0.84705
	12	47	5.2	1.7	Satterthwaite	Unequal	0.196	103.7	0.84494
<b>Employability</b>	0	62	4.6	2.4	Pooled	Equal	0.36	107	0.71938
	12	47	4.4	2.5	Satterthwaite	Unequal	0.358	96.6	0.72128
<b>Cognitive Function Total</b>	0	64	24.7	7.8	Pooled	Equal	-0.516	108	0.60725
	12	46	25.4	6.6	Satterthwaite	Unequal	-0.529	104.9	0.59767
<b>Problem Solving</b>	0	64	5.1	1.8	Pooled	Equal	-1.152	108	0.25203
	12	46	5.5	1.5	Satterthwaite	Unequal	-1.184	105.1	0.23916
<b>Memory</b>	0	64	3.9	1.7	Pooled	Equal	-0.848	108	0.39841
	12	46	4.2	1.6	Satterthwaite	Unequal	-0.856	100.4	0.39396
<b>Orientation</b>	0	64	5.4	1.8	Pooled	Equal	0.079	108	0.93694
	12	46	5.3	1.7	Satterthwaite	Unequal	0.08	101.4	0.93612
<b>Attention</b>	0	64	4.8	1.7	Pooled	Equal	0.081	108	0.9355
	12	46	4.7	1.6	Satterthwaite	Unequal	0.082	101.3	0.93467
<b>Safety Judgment</b>	0	64	5.6	1.9	Pooled	Equal	-0.386	108	0.70007
	12	46	5.7	1.5	Satterthwaite	Unequal	-0.401	106.7	0.68957

**Table 2a: Craig Handicap Assessment and Reporting Technique (CHART)**

	<i>Baseline</i>		<i>6 Months</i>		<i>12 Months</i>	
	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>
<b>Physical Independence</b>	66	85.4+-34.5	51	87.3+-28.5	47	70.5+-117.1
<b>Cognitive Independence</b>	66	66.8+-28.5	51	58.1+-29.4	46	63.4+-30.2
<b>Mobility</b>	66	79.6+-24.1	51	78.9+-23.4	47	79.2+-25
<b>Occupation</b>	66	69.8+-36.9	51	71+-36.6	47	73.1+-38.8
<b>Social Integration</b>	66	84.4+-22.2	51	76.1+-25.9	47	82.5+-21.4
<b>Economic Self Sufficiency</b>	65	81+-24.2	50	79.7+-27.2	44	77.4+-26.5

**Table 2b: Craig Handicap Assessment and Reporting Technique  
Pre and Post Intervention analysis**

<i>CHART</i>	<i>Month</i>	<i>N</i>	<i>Mean</i>	<i>StdDev</i>	<i>Method</i>	<i>Variances</i>	<i>tValue</i>	<i>DF</i>	<i>Prob</i>
<b>Physical Independence</b>	0	66	85.4	34.5	Pooled	Equal	0.979	111	0.32961
	12	47	70.5	117.1	Satterthwaite	Unequal	0.848	51.7	0.40031
<b>Cognitive Independence</b>	0	66	66.8	28.5	Pooled	Equal	0.602	110	0.54814
	12	46	63.4	30.2	Satterthwaite	Unequal	0.596	93.2	0.55261
<b>Mobility</b>	0	66	79.6	24.1	Pooled	Equal	0.079	111	0.9372
	12	47	79.2	25	Satterthwaite	Unequal	0.079	97.1	0.93758
<b>Occupation</b>	0	66	69.8	36.9	Pooled	Equal	-0.45	111	0.65368
	12	47	73.1	38.8	Satterthwaite	Unequal	-0.446	96.2	0.65653
<b>Social Integration</b>	0	66	84.4	22.2	Pooled	Equal	0.446	111	0.65682
	12	47	82.5	21.4	Satterthwaite	Unequal	0.448	101.2	0.6551
<b>Economic Self Sufficiency</b>	0	65	81	24.2	Pooled	Equal	0.737	107	0.46287
	12	44	77.4	26.5	Satterthwaite	Unequal	0.724	86.6	0.4712

**Table 3a: Patient Competency Rating Scale (PCRS)**

	<i>Baseline</i>		<i>6 Months</i>		<i>12 Months</i>	
	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>
<b>PCRS Total Score</b>	66	91+-16.2	51	90.9+-20.6	45	94.4+-21.1
<b>How much of a problem do I have in preparing my own meals?</b>	66	3.8+-0.9	51	3.8+-1	45	3.8+-1.1
<b>How much of a problem do I have in dressing myself?</b>	66	4.1+-0.9	51	4.1+-0.9	45	4.2+-0.8
<b>How much of a problem do I have in taking care of my personal hygiene?</b>	66	4.1+-1	51	4.2+-0.8	45	4.2+-1
<b>How much of a problem do I have in washing the dishes?</b>	66	3.8+-1	51	3.9+-1.1	45	3.8+-1.3
<b>How much of a problem do I have in doing the laundry?</b>	66	3.7+-1	51	3.8+-1	45	3.9+-1.2
<b>How much of a problem do I have in taking care of my finances?</b>	66	2.9+-1.1	51	3.1+-1.3	45	3+-1.1
<b>How much of a problem do I have in keeping appointments on time?</b>	66	2.7+-0.8	51	2.8+-1	45	2.8+-0.8
<b>How much of a problem do I have in starting conversation in a group?</b>	66	2.7+-1	51	2.6+-1.1	45	2.6+-1.1
<b>How much of a problem do I have in staying involved in work activities even when bored or tired?</b>	66	2.4+-0.7	51	2.3+-0.9	45	2.4+-0.9
<b>How much of a problem do I have in remembering what I had for dinner last night?</b>	66	2.8+-0.9	51	2.7+-0.9	45	2.8+-1
<b>How much of a problem do I have in remembering names of people I see often?</b>	66	2.6+-0.9	51	2.8+-0.9	45	2.9+-0.9
<b>How much of a problem do I have in remembering my daily schedule?</b>	66	2.6+-0.8	51	2.6+-1	45	2.9+-1
<b>How much of a problem do I have in remembering important things I must do?</b>	66	2.5+-0.7	51	2.4+-0.8	45	2.6+-0.8
<b>How much of a problem would I have driving a car if I had to?</b>	66	3.9+-1.1	51	3.9+-1.2	45	4.1+-1.1
<b>How much of a problem do I have in getting help when I'm confused?</b>	66	3.1+-0.9	51	3.2+-1.1	45	3.2+-1

<b>How much of a problem do I have in adjusting to unexpected changes?</b>	66	2.7+-0.8	51	2.8+-1	45	3+-1.1
<b>How much of a problem do I have in handling arguments with people I know well?</b>	66	2.4+-1	51	2.5+-1	45	2.7+-1.1
<b>How much of a problem do I have in accepting criticism from other people?</b>	66	2.8+-1	51	2.9+-1.1	45	3+-1.2
<b>How much of a problem do I have in controlling crying?</b>	66	3.4+-1.1	51	3.7+-1.2	45	3.6+-1.2
<b>How much of a problem do I have in acting appropriately when I'm around friends?</b>	66	3.6+-1	50	3.6+-0.9	45	3.7+-1
<b>How much of a problem do I have in showing affection to people?</b>	66	2.6+-1	50	2.5+-1.1	45	2.5+-1.1
<b>How much of a problem do I have in participating in group activities?</b>	66	2.7+-0.9	50	2.6+-1	45	2.9+-1
<b>How much of a problem do I have in recognizing when something I say or do has upset someone else?</b>	66	2.9+-0.9	50	2.7+-1	45	2.9+-1.1
<b>How much of a problem do I have in scheduling daily activities?</b>	66	2.7+-0.9	50	2.8+-1.1	45	2.9+-1.1
<b>How much of a problem do I have in understanding new instructions?</b>	66	3.1+-0.8	50	3+-0.9	45	3.2+-1.1
<b>How much of a problem do I have in consistently meeting my daily responsibilities?</b>	66	3.1+-0.8	50	2.9+-1	45	3+-1
<b>How much of a problem do I have in controlling my temper when something upsets me?</b>	66	2.3+-0.8	50	2.3+-1	45	2.4+-1
<b>How much of a problem do I have in keeping from being depressed?</b>	66	2.5+-1	50	2.4+-1	45	2.6+-1
<b>How much of a problem do I have in keeping my emotions from affecting my ability to go about the day's activities?</b>	66	2.8+-0.9	50	2.5+-0.9	45	2.8+-1
<b>How much of a problem do I have in controlling my laughter?</b>	66	3.8+-0.9	50	4.1+-1	45	3.8+-1.1



**Table 3b: Patient Competency Rating Scale  
Pre and Post Intervention analysis**

<i>PCRS</i>	Month	N	Mean	StdDev	Method	Variances	tValue	DF	Prob
<b>Patient Competency Rating Total</b>	0	66	91	16.2	Pooled	Equal	-0.96	109	0.33939
	12	45	94.4	21.1	Satterthwaite	Unequal	-0.913	77.7	0.36425
<b>How much of a problem do I have in preparing my own meals?</b>	0	66	3.8	0.9	Pooled	Equal	-0.106	109	0.91576
	12	45	3.8	1.1	Satterthwaite	Unequal	-0.102	81.2	0.91909
<b>How much of a problem do I have in dressing myself?</b>	0	66	4.1	0.9	Pooled	Equal	-0.759	109	0.44933
	12	45	4.2	0.8	Satterthwaite	Unequal	-0.771	99.7	0.44228
<b>How much of a problem do I have in taking care of my personal hygiene?</b>	0	66	4.1	1	Pooled	Equal	-0.464	109	0.64326
	12	45	4.2	1	Satterthwaite	Unequal	-0.466	95.4	0.64261
<b>How much of a problem do I have in washing the dishes?</b>	0	66	3.8	1	Pooled	Equal	-0.122	109	0.90281
	12	45	3.8	1.3	Satterthwaite	Unequal	-0.117	79.8	0.90704
<b>How much of a problem do I have in doing the laundry?</b>	0	66	3.7	1	Pooled	Equal	-1.07	109	0.28704
	12	45	3.9	1.2	Satterthwaite	Unequal	-1.041	85.3	0.30091
<b>How much of a problem do I have in taking care of my finances?</b>	0	66	2.9	1.1	Pooled	Equal	-0.48	109	0.63203
	12	45	3	1.1	Satterthwaite	Unequal	-0.479	94.1	0.63272
<b>How much of a problem do I have in keeping appointments on time?</b>	0	66	2.7	0.8	Pooled	Equal	-1.097	109	0.275
	12	45	2.8	0.8	Satterthwaite	Unequal	-1.103	96.4	0.27284
<b>How much of a problem do I have in starting conversation in a group?</b>	0	66	2.7	1	Pooled	Equal	0.185	109	0.85333
	12	45	2.6	1.1	Satterthwaite	Unequal	0.181	87.5	0.85643

<b>How much of a problem do I have in staying involved in work activities even when bored or tired?</b>	0	66	2.4	0.7	Pooled	Equal	-0.187	109	0.85203
	12	45	2.4	0.9	Satterthwaite	Unequal	-0.181	82.9	0.85712
<b>How much of a problem do I have in remembering what I had for dinner last night?</b>	0	66	2.8	0.9	Pooled	Equal	-0.405	109	0.68635
	12	45	2.8	1	Satterthwaite	Unequal	-0.396	87.5	0.69275
<b>How much of a problem do I have in remembering names of people I see often?</b>	0	66	2.6	0.9	Pooled	Equal	-1.293	109	0.19862
	12	45	2.9	0.9	Satterthwaite	Unequal	-1.283	92	0.20268
<b>How much of a problem do I have in remembering my daily schedule?</b>	0	66	2.6	0.8	Pooled	Equal	-1.985	109	0.04961
	12	45	2.9	1	Satterthwaite	Unequal	-1.886	77.4	0.06299
<b>How much of a problem do I have in remembering important things I must do?</b>	0	66	2.5	0.7	Pooled	Equal	-1.022	109	0.30926
	12	45	2.6	0.8	Satterthwaite	Unequal	-1.007	89.9	0.31649
<b>How much of a problem would I have driving a car if I had to?</b>	0	66	3.9	1.1	Pooled	Equal	-0.993	109	0.32312
	12	45	4.1	1.1	Satterthwaite	Unequal	-0.978	89.7	0.33063
<b>How much of a problem do I have in getting help when I'm confused?</b>	0	66	3.1	0.9	Pooled	Equal	-0.638	109	0.52474
	12	45	3.2	1	Satterthwaite	Unequal	-0.631	90.8	0.52974
<b>How much of a problem do I have in adjusting to unexpected changes?</b>	0	66	2.7	0.8	Pooled	Equal	-1.395	109	0.1659
	12	45	3	1.1	Satterthwaite	Unequal	-1.334	79.6	0.18591
<b>How much of a problem do I have in handling arguments</b>	0	66	2.4	1	Pooled	Equal	-1.571	109	0.11912

<b>with people I know well?</b>									
	12	45	2.7	1.1	Satterthwaite	Unequal	-1.532	86.3	0.12907
<b>How much of a problem do I have in accepting criticism from other people?</b>	0	66	2.8	1	Pooled	Equal	-1.184	109	0.23898
	12	45	3	1.2	Satterthwaite	Unequal	-1.149	84.5	0.25373
<b>How much of a problem do I have in controlling crying?</b>	0	66	3.4	1.1	Pooled	Equal	-0.837	109	0.40449
	12	45	3.6	1.2	Satterthwaite	Unequal	-0.814	85.2	0.41798
<b>How much of a problem do I have in acting appropriately when I'm around friends?</b>	0	66	3.6	1	Pooled	Equal	-0.645	109	0.5201
	12	45	3.7	1	Satterthwaite	Unequal	-0.644	94.2	0.52095
<b>How much of a problem do I have in showing affection to people?</b>	0	66	2.6	1	Pooled	Equal	0.684	109	0.49513
	12	45	2.5	1.1	Satterthwaite	Unequal	0.679	92.1	0.49871
<b>How much of a problem do I have in participating in group activities?</b>	0	66	2.7	0.9	Pooled	Equal	-0.902	109	0.3688
	12	45	2.9	1	Satterthwaite	Unequal	-0.885	88.1	0.37854
<b>How much of a problem do I have in recognizing when something I say or do has upset someone else?</b>	0	66	2.9	0.9	Pooled	Equal	0.103	109	0.91804
	12	45	2.9	1.1	Satterthwaite	Unequal	0.099	81.6	0.92119
<b>How much of a problem do I have in scheduling daily activities?</b>	0	66	2.7	0.9	Pooled	Equal	-1.079	109	0.28293
	12	45	2.9	1.1	Satterthwaite	Unequal	-1.04	82.1	0.30145
<b>How much of a problem do I have in understanding new instructions?</b>	0	66	3.1	0.8	Pooled	Equal	-0.188	109	0.85093
	12	45	3.2	1.1	Satterthwaite	Unequal	-0.179	77.8	0.85822

<b>How much of a problem do I have in consistently meeting my daily responsibilities?</b>	0	66	3.1	0.8	Pooled	Equal	0.694	109	0.48931
	12	45	3	1	Satterthwaite	Unequal	0.665	80.1	0.50821
<b>How much of a problem do I have in controlling my temper when something upsets me?</b>	0	66	2.3	0.8	Pooled	Equal	-0.429	109	0.66841
	12	45	2.4	1	Satterthwaite	Unequal	-0.414	82.1	0.67997
<b>How much of a problem do I have in keeping from being depressed?</b>	0	66	2.5	1	Pooled	Equal	-0.484	109	0.62907
	12	45	2.6	1	Satterthwaite	Unequal	-0.484	94.4	0.62946
<b>How much of a problem do I have in keeping my emotions from affecting my ability to go about the day's activities?</b>	0	66	2.8	0.9	Pooled	Equal	-0.192	109	0.84834
	12	45	2.8	1	Satterthwaite	Unequal	-0.188	87.9	0.85137
<b>How much of a problem do I have in controlling my laughter?</b>	0	66	3.8	0.9	Pooled	Equal	-0.374	109	0.70947
	12	45	3.8	1.1	Satterthwaite	Unequal	-0.357	79.7	0.72173

**Table 4: PTSD Checklist Military Form (PCL-M)**

	<i>Baseline</i>		<i>6 Months</i>		<i>12 Months</i>	
	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>
<b>PTSD Checklist Military Form Total Score</b>	14	63.6+-10.6	11	64.1+-14	10	59.4+-12.4
<b>Repeated, disturbing memories, thoughts, or images of a stressful military experience?</b>	14	3.9+-1.1	11	3.6+-1.1	10	3.6+-1
<b>Repeated, disturbing dreams of a stressful military experience?</b>	14	3.8+-1	11	3.6+-1.1	10	3.9+-0.9
<b>Suddenly acting or feeling as if a stressful military experience were happening again (as if you were reliving it)?</b>	14	3.4+-1.1	11	3.5+-1.2	10	3.1+-1.1
<b>Feeling very upset when something reminded you of a stressful military experience?</b>	14	3.7+-1.1	11	4+-0.8	10	3.5+-0.7
<b>Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of a stressful military experience?</b>	14	3.9+-1.1	11	4+-1	10	3.5+-0.7
<b>Avoid thinking about or talking about a stressful military experience or avoid having feelings related to it?</b>	14	3.9+-1	11	3.9+-0.9	10	3.5+-0.8
<b>Avoid activities or situations because they remind you of a stressful military experience?</b>	14	3.7+-1	11	3.9+-1.4	10	3.7+-0.8
<b>Trouble remembering important parts of a stressful military experience?</b>	14	3.1+-1.2	11	2.7+-1.4	10	2.9+-1.1
<b>Loss of interest in things that you used to enjoy?</b>	14	1.8+-1	11	2.1+-0.8	10	1.8+-0.9
<b>Feeling distant or cut off from other people?</b>	14	4.1+-1.2	11	4.3+-1.1	10	3.7+-0.9
<b>Feeling emotionally numb or being unable to have loving feelings for those close to you?</b>	14	3.9+-0.8	11	4.5+-1	10	3.8+-0.9
<b>Feeling as if your future will somehow be cut short?</b>	14	3.9+-1.3	11	3.5+-1.5	10	3.5+-1.4
<b>Trouble falling or staying asleep?</b>	14	4.4+-0.6	11	4.2+-0.9	10	4.2+-0.8
<b>Feeling irritable or having angry outbursts?</b>	14	3.9+-1.1	11	3.9+-1.1	10	3.6+-1.2
<b>Having difficulty concentrating?</b>	14	4.1+-0.8	11	4.3+-0.8	10	3.8+-1.1
<b>Being “super alert” or watchful on guard?</b>	14	4.1+-0.8	11	3.8+-1	10	3.8+-1.1
<b>Feeling jumpy or easily startled?</b>	14	3.9+-0.8	11	4.3+-0.9	10	3.5+-0.8

**Table 5: Modified PTSD Symptom Scale: Self-Report – Frequency**

	<i>Baseline</i>		<i>6 Months</i>		<i>12 Months</i>	
	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>
<b>Modified PTSD Symptom Scale: Self-Report - Frequency Total Score</b>	14	54.2+-8.5	11	53.3+-11.5	10	49.1+-14.4
<b>Have you had recurrent or intrusive distressing thoughts or recollections about the experience?</b>	14	3.3+-0.7	11	3.1+-0.8	10	2.8+-1
<b>Have you been having recurrent bad dreams or nightmares about the experience?</b>	14	3+-0.7	11	2.7+-1	10	2.7+-0.9
<b>Have you had the experience of suddenly reliving the experience flashbacks, acting or feeling as if it were re-occurring?</b>	14	2.6+-0.9	11	2.8+-0.9	10	2.5+-1
<b>Have you been intensely EMOTIONALLY upset when reminded of the experience (includes anniversary reactions)?</b>	14	2.7+-0.8	11	3.1+-1	10	2.6+-1
<b>Have you been having intense physical reactions (e.g., sweaty, heart palpitations) when reminded of the experience?</b>	14	2.8+-1.1	11	3+-1	10	2.7+-1.1
<b>Have you persistently been making efforts to avoid thoughts or feelings associated with the experience?</b>	14	3.1+-1	11	3.2+-0.9	10	3+-1.2
<b>Have you persistently been making efforts to avoid activities, situations, or places that remind you of your experience?</b>	14	3.2+-1.1	11	2.7+-1.3	10	2.7+-1.2
<b>Are there any important aspects about your experience that you cannot recall?</b>	14	2.6+-1	11	2.3+-0.8	10	2.2+-1
<b>Have you markedly lost interest in free time activities?</b>	14	3.4+-0.6	11	3.3+-1	10	3.2+-1
<b>Have you felt detached or cut off from others around you?</b>	14	3.6+-0.9	11	3.5+-0.7	10	3.4+-1.1
<b>Have you felt that your ability to experience the whole range of emotions is impaired (e.g., unable to have loving feelings)?</b>	14	3.4+-0.8	11	3.8+-0.6	10	2.9+-1.1

<b>Have you felt that any future plans or hopes have changed because of your experience (e.g., no career, marriage, children, or long life)</b>	14	3.2+-0.8	11	2.9+-1.3	10	2.9+-0.9
<b>Have you been having persistent difficulty falling or staying asleep?</b>	14	3.6+-0.5	11	3.8+-0.4	10	3.6+-1
<b>Have you been continuously irritable or having outbursts of anger?</b>	14	3.2+-0.9	11	3.1+-0.9	10	2.7+-0.8
<b>Have you been having persistent difficulty concentrating?</b>	14	3.5+-0.7	11	3.5+-0.7	10	3+-1.2
<b>Are you overly alert (e.g., always check to see who is around you, etc.)?</b>	14	3.7+-0.6	11	3.3+-0.6	10	3.3+-1.1
<b>Have you been jumpier, more easily startled?</b>	14	3.3+-0.7	11	3.1+-1	10	2.9+-1

**Table 6: Modified PTSD Symptom Scale: Self-Report – Severity**

	<i>Baseline</i>		<i>6 Months</i>		<i>12 Months</i>	
	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>
<b>Modified PTSD Symptom Scale: Self-Report - Severity Total Score</b>	14	64.1+-14.3	11	62.7+-17.8	10	55.3+-20.6
<b>Have you had recurrent or intrusive distressing thoughts or recollections about the experience?</b>	14	3.6+-1.1	11	3.5+-1.2	10	3.5+-1.4
<b>Have you been having recurrent bad dreams or nightmares about the experience?</b>	14	3.8+-0.9	11	3.3+-1.3	10	3.2+-1.4
<b>Have you had the experience of suddenly reliving the experience flashbacks, acting or feeling as if it were re-occurring?</b>	14	3.7+-1.3	11	3.6+-1.3	10	3.2+-1.7
<b>Have you been intensely EMOTIONALLY upset when reminded of the experience (includes anniversary reactions)?</b>	14	3.9+-1.2	11	3.8+-1.2	10	3.4+-1.3
<b>Have you been having intense physical reactions (e.g., sweaty, heart palpitations) when reminded of the experience?</b>	14	3.7+-1.5	11	3.7+-1.2	10	3.3+-1.5
<b>Have you persistently been making efforts to avoid thoughts or feelings associated with the experience?</b>	14	3.4+-1.3	11	3.5+-1.4	10	2.9+-1.5
<b>Have you persistently been making efforts to avoid activities, situations, or places that remind you of your experience?</b>	14	3.6+-1.3	11	3.1+-1.8	10	3+-1.4
<b>Are there any important aspects about your experience that you cannot recall?</b>	14	3.2+-1.3	11	3+-1.7	10	2.7+-1.3
<b>Have you markedly lost interest in free time activities?</b>	14	3.6+-1.1	11	3.9+-1.1	10	3.2+-1.5
<b>Have you felt detached or cut off from others around you?</b>	14	3.9+-1.3	11	4.3+-1.3	10	3.7+-1.6
<b>Have you felt that your ability to experience the whole range of emotions is impaired (e.g., unable to have loving feelings)?</b>	14	3.9+-1.2	11	4.4+-1	10	3.2+-1.4



<b>Have you felt that any future plans or hopes have changed because of your experience (e.g., no career, marriage, children, or long life)</b>	14	3.9+-1.2	11	3.3+-1.7	10	3.5+-1.3
<b>Have you been having persistent difficulty falling or staying asleep?</b>	14	4.1+-0.9	11	4.5+-0.8	10	4.1+-1.4
<b>Have you been continuously irritable or having outbursts of anger?</b>	14	4+-1.1	11	3.6+-1.1	10	2.7+-1.6
<b>Have you been having persistent difficulty concentrating?</b>	14	4+-1	11	4.1+-0.9	10	3.4+-1.6
<b>Are you overly alert (e.g., always check to see who is around you, etc.)?</b>	14	4+-1.2	11	3.6+-1.3	10	3.4+-1.6
<b>Have you been jumpier, more easily startled?</b>	14	3.7+-0.9	11	3.6+-1.3	10	2.9+-1.4

**Table 7: Alcohol Use Disorders Identification Test (AUDIT)**

	<i>Baseline</i>		<i>6 Months</i>		<i>12 Months</i>	
	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>
<b><i>Alcohol Use Disorders Identification Test (AUDIT): Self Report Score</i></b>	14	5.1+-7.2	11	4.8+-5.6	10	6+-5.6
<b>How often do you have a drink containing alcohol?</b>	14	1.4+-1.3	11	1.6+-1.3	10	1.5+-1.4
<b>How many drinks containing alcohol do you have on a typical day when you are drinking?</b>	14	0.6+-1.1	11	0.6+-0.9	10	0.8+-1.2
<b>How often do you have six or more drinks on one occasion?</b>	14	0.8+-1.1	11	0.8+-1.2	10	0.8+-0.9
<b>How often during the last year have you found that you were not able to stop drinking once you had started?</b>	14	0.5+-0.9	11	0.5+-0.8	10	0.5+-0.7
<b>How often during the last year have you failed to do what was normally expected of you because of drinking?</b>	14	0.2+-0.6	11	0.2+-0.4	10	0.3+-0.5
<b>How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?</b>	14	0.1+-0.3	11	0.1+-0.3	10	0+-0
<b>How often during the last year have you had a feeling of guilt or remorse after drinking?</b>	14	0.3+-0.8	11	0.4+-0.9	10	0.4+-0.5
<b>How often during the last year have you been unable to remember what happened the night before because of your drinking?</b>	14	0.3+-0.6	11	0.3+-0.9	10	0.1+-0.3
<b>Have you or someone else been injured because of your drinking?</b>	14	0+-0	11	0.2+-0.6	10	0.6+-1.3
<b>Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?</b>	14	1+-1.5	11	0.2+-0.6	10	1+-1.7

**Table 12: Alcohol Use Disorders Identification  
Pre and Post Intervention analysis**

<i>AUDIT</i>	Class	N	Mean	STD	Method	Variances	tValue	DF	Probt
Alcohol Use Disorders Identification Test - MEAN	0	14	0.5	0.7	Pooled	Equal	-0.315	22	0.75592
	12	10	0.6	0.6	Satterthwaite	Unequal	-0.328	21.7	0.74596
Alcohol Use Disorders Identification Test - SCORE	0	14	5.1	7.2	Pooled	Equal	-0.315	22	0.75592
	12	10	6	5.6	Satterthwaite	Unequal	-0.328	21.7	0.74596
How often do you have a drink containing alcohol?	0	14	1.4	1.3	Pooled	Equal	-0.257	22	0.79972
	12	10	1.5	1.4	Satterthwaite	Unequal	-0.256	19.4	0.80049
How many drinks containing alcohol do you have on a typical day when you are drinking?	0	14	0.6	1.1	Pooled	Equal	-0.332	22	0.7433
	12	10	0.8	1.2	Satterthwaite	Unequal	-0.324	17.9	0.74942
How often do you have six or more drinks on one occasion?	0	14	0.8	1.1	Pooled	Equal	-0.033	22	0.97392
	12	10	0.8	0.9	Satterthwaite	Unequal	-0.034	21.5	0.97302
How often during the last year have you found that you were not able to stop drinking once you had started?	0	14	0.5	0.9	Pooled	Equal	0	22	1
	12	10	0.5	0.7	Satterthwaite	Unequal	0	21.9	1
How often during the last year have you failed to do what was normally expected of you because of drinking?	0	14	0.2	0.6	Pooled	Equal	-0.382	22	0.70604
	12	10	0.3	0.5	Satterthwaite	Unequal	-0.394	21.4	0.69732
How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	0	14	0.1	0.3	Pooled	Equal	0.84	22	0.4101
	12	10	0	0	Satterthwaite	Unequal	1	13	0.33556
How often during the last year have you had a feeling of guilt or remorse after drinking?	0	14	0.3	0.8	Pooled	Equal	-0.386	22	0.70329
	12	10	0.4	0.5	Satterthwaite	Unequal	-0.416	21.7	0.68121

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How often during the last year have you been unable to remember what happened the night before because of your drinking?	0	14	0.3	0.6	Pooled	Equal	0.877	22	0.39006
	12	10	0.1	0.3	Satterthwaite	Unequal	0.97	20.4	0.3436
Have you or someone else been Injured because of your drinking?	0	14	0	0	Pooled	Equal	-1.678	22	0.10742
	12	10	0.6	1.3	Satterthwaite	Unequal	-1.406	9	0.19342
Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	0	14	1	1.5	Pooled	Equal	0	22	1
	12	10	1	1.7	Satterthwaite	Unequal	0	18.1	1

**Table 8a: Beck Depression Inventory Score**

	<i>Baseline</i>		<i>6 Months</i>		<i>12 Months</i>	
	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>	<i>N</i>	<i>Mean+-SD</i>
<b>Beck Depression Inventory Score</b>	14	33.1+-13.6	11	33.7+-13.7	10	30.6+-11.8
<b>Sadness</b>	14	1.2+-1	11	1.1+-0.8	10	1.1+-1.2
<b>Pessimism</b>	14	1.5+-0.8	11	1.5+-1	10	1.5+-1
<b>Past Failure</b>	14	1.1+-1	11	1.3+-1	10	1.1+-0.7
<b>Loss of Pleasure</b>	14	1.9+-0.7	11	2.3+-1.1	10	1.7+-0.7
<b>Guilty Feelings</b>	14	1.5+-1.2	11	1+-1	10	1.2+-0.9
<b>Punishment Feelings</b>	14	1.6+-1.4	11	1.1+-1	10	1.2+-1.1
<b>Self Dislike</b>	14	1.2+-1.1	11	1.4+-1.1	10	1.4+-1
<b>Self-Criticalness</b>	14	1.5+-1	11	1.6+-0.8	10	1.2+-0.9
<b>Suicidal Thoughts or Wishes</b>	14	0.9+-0.9	11	0.4+-0.5	10	0.5+-0.5
<b>Crying</b>	14	1.4+-1.2	11	1.5+-1.3	10	1.1+-1.2
<b>Agitation</b>	14	1.8+-0.8	11	1.8+-1	10	1.7+-0.8
<b>Loss of Interest</b>	14	1.8+-1	11	2.1+-0.8	10	1.8+-0.9
<b>Indecisiveness</b>	14	1.9+-0.7	11	2+-0.9	10	1.8+-0.9
<b>Worthlessness</b>	14	1.3+-1.1	11	1.5+-1.1	10	1.5+-1
<b>Loss of Energy</b>	14	1.6+-0.6	11	2.1+-0.8	10	1.6+-0.8
<b>Changes in Sleeping Patterns</b>	14	2+-0.4	11	1.8+-0.9	10	2+-0.5
<b>Irritability</b>	14	1.8+-0.8	11	1.9+-0.9	10	1.8+-1
<b>Changes in Appetite</b>	14	1.5+-1	11	1.7+-0.6	10	1.5+-1
<b>Concentration Difficulty</b>	14	1.9+-0.7	11	2.1+-0.8	10	1.7+-0.7
<b>Tiredness or Fatigue</b>	14	1.9+-1	11	1.6+-0.8	10	1.5+-0.8
<b>Loss of Interest in Sex</b>	14	1.8+-0.9	11	2+-0.8	10	1.7+-0.9

**Table 8b: Beck Depression Inventory  
Pre and Post Intervention analysis**

<b>BECK</b>	<b>Class</b>	<b>N</b>	<b>Mean</b>	<b>STD</b>	<b>Method</b>	<b>Variances</b>	<b>tValue</b>	<b>DF</b>	<b>Probt</b>
Beck Depression Inventory - MEAN	0	14	1.6	0.6	Pooled	Equal	0.478	22	0.63765
Beck Depression Inventory - MEAN	12	10	1.5	0.6	Satterthwaite	Unequal	0.489	21	0.62972
Beck Depression Inventory - SCORE	0	14	33.1	13.6	Pooled	Equal	0.478	22	0.63765
Beck Depression Inventory - SCORE	12	10	30.6	11.8	Satterthwaite	Unequal	0.489	21	0.62972
Sadness	0	14	1.2	1	Pooled	Equal	0.258	22	0.7991
Sadness	12	10	1.1	1.2	Satterthwaite	Unequal	0.249	16.9	0.80661

Pessimism	0	14	1.5	0.8	Pooled	Equal	0	22	1
Pessimism	12	10	1.5	1	Satterthwaite	Unequal	0	16.4	1
Past Failure	0	14	1.1	1	Pooled	Equal	-0.077	22	0.93959
Past Failure	12	10	1.1	0.7	Satterthwaite	Unequal	-0.081	21.9	0.93645
Loss of Pleasure	0	14	1.9	0.7	Pooled	Equal	0.78	22	0.44387
Loss of Pleasure	12	10	1.7	0.7	Satterthwaite	Unequal	0.79	20.4	0.43836
Guilty Feelings	0	14	1.5	1.2	Pooled	Equal	0.678	22	0.50462
Guilty Feelings	12	10	1.2	0.9	Satterthwaite	Unequal	0.706	21.7	0.48774
Punishment Feelings	0	14	1.6	1.4	Pooled	Equal	0.827	22	0.4172
Punishment Feelings	12	10	1.2	1.1	Satterthwaite	Unequal	0.856	21.5	0.40123
Self-Dislike	0	14	1.2	1.1	Pooled	Equal	-0.441	22	0.6635
Self-Dislike	12	10	1.4	1	Satterthwaite	Unequal	-0.448	20.5	0.6592
Self-Criticalness	0	14	1.5	1	Pooled	Equal	0.74	22	0.46721
Self-Criticalness	12	10	1.2	0.9	Satterthwaite	Unequal	0.753	20.7	0.45978
Suicidal Thoughts or Wishes	0	14	0.9	0.9	Pooled	Equal	1.325	22	0.19881
Suicidal Thoughts or Wishes	12	10	0.5	0.5	Satterthwaite	Unequal	1.446	21.2	0.16273
Crying	0	14	1.4	1.2	Pooled	Equal	0.655	22	0.51948
Crying	12	10	1.1	1.2	Satterthwaite	Unequal	0.657	19.8	0.51873
Agitation	0	14	1.8	0.8	Pooled	Equal	0.255	22	0.8008
Agitation	12	10	1.7	0.8	Satterthwaite	Unequal	0.254	19.2	0.80204
Loss of Interest	0	14	1.8	1	Pooled	Equal	-0.036	22	0.97143
Loss of Interest	12	10	1.8	0.9	Satterthwaite	Unequal	-0.037	20.2	0.97116
Indecisive	0	14	1.9	0.7	Pooled	Equal	0.382	22	0.70604
Indecisive	12	10	1.8	0.9	Satterthwaite	Unequal	0.367	16.6	0.71801
Worthlessness	0	14	1.3	1.1	Pooled	Equal	-0.482	22	0.63452
Worthlessness	12	10	1.5	1	Satterthwaite	Unequal	-0.495	21.2	0.62538
Loss of Energy	0	14	1.6	0.6	Pooled	Equal	-0.094	22	0.92587
Loss of Energy	12	10	1.6	0.8	Satterthwaite	Unequal	-0.09	16.2	0.92945
Changes in Sleeping Pattern	0	14	2	0.4	Pooled	Equal	0	22	1
Changes in Sleeping Pattern	12	10	2	0.5	Satterthwaite	Unequal	0	17.2	1
Irritability	0	14	1.8	0.8	Pooled	Equal	-0.038	22	0.96988
Irritability	12	10	1.8	1	Satterthwaite	Unequal	-0.037	16.3	0.97127
Changes in Appetite	0	14	1.5	1	Pooled	Equal	0	22	1
Changes in Appetite	12	10	1.5	1	Satterthwaite	Unequal	0	20.1	1
Concentration Difficulty	0	14	1.9	0.7	Pooled	Equal	0.78	22	0.44387
Concentration Difficulty	12	10	1.7	0.7	Satterthwaite	Unequal	0.79	20.4	0.43836
Tiredness of Fatigue	0	14	1.9	1	Pooled	Equal	0.9	22	0.37793
Tiredness of Fatigue	12	10	1.5	0.8	Satterthwaite	Unequal	0.93	21.4	0.36289
Loss of Interest in Sex	0	14	1.8	0.9	Pooled	Equal	0.226	22	0.82327
Loss of Interest in Sex	12	10	1.7	0.9	Satterthwaite	Unequal	0.224	18.8	0.82546