Interdisciplinary Rehabilitation for Veterans Returning to Functional Skills Following TBI

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Background

- The number of U.S. veterans with TBI is 260,000 from OIF/OEF (Veeravagu, 2013).
- An important outcome for this population is functional outcomes in regards to quality of life, community integration, and occupational activity.
- Traditionally functional outcomes are treated via separate domains of rehabilitation without collaboration amongst clinicians.
- Comparatively, interdisciplinary treatment approach is an alternative, more efficient treatment.
- The purpose of this project is to present a meta-analysis about U.S. veterans of current wars with TBIs returning to functional independence following deployment. The specific **research question** is: Do functional outcomes improve for U.S. veterans of current wars with combat-related TBIs following an interdisciplinary intervention approach?

Literature Search

- The following databases/search techniques were used to retrieve articles: EBSCO HOST, Google Scholar, Science Direct, PubMed, PsychInfo, CINAHL, and ERIC. For this literature search, the listed terms were inserted into these databases. The "Cited By" option was utilized for articles found within Google Scholar. Additionally, the references within the seven articles used in this meta-analysis were also examined.
- The **search terms/key words** used were: TBI, traumatic brain injury, brain injury, military TBI, speech-language pathology, veterans, polytrauma, community integration, functional, multidisciplinary, interdisciplinary, vocational rehabilitation, family involvement.
- Additional search criteria included: U.S. veterans from current wars with TBIs, the intervention protocols within the studies needed to incorporate treatment within the scope of practice of a speech-language pathologist.
- Articles were excluded based on the following criteria: any outcomes focusing on PTSD, anger, and/or depression as primary outcome measures, veterans with alcohol and/or substance abuse or those participating in any other treatments at the time of studies.

Patient Characteristics

Across studies, participants range in age from 18 to 69 years. Participants were both male and female U.S. veterans with TBI. For this meta-analysis, the severity of TBI differed across all studies. and other relevant demographics presented as a range of scores.

Dosage

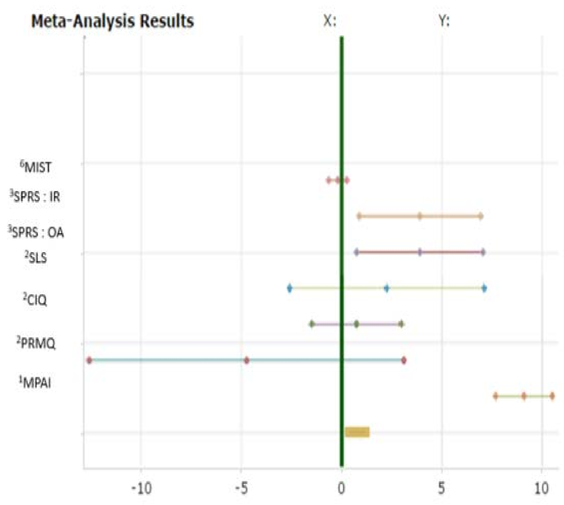
The length of treatment approaches ranged from six weeks to nine months. The length of sessions varied with some ranging from one hour weekly sessions to six hour sessions throughout a week's time.

Results

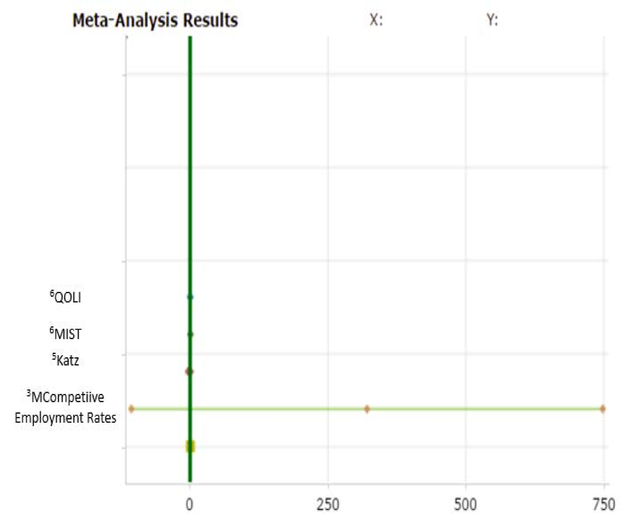
Study	Participants	Dosage	Outcome Measures	Qualitative Tool	SLP Role
[1]Duchnick et al., (2015)	N = 286 Mostly male with some female, not otherwise specified Mean age = 30 years TBI occurred less than 36 months ago	24 hour nursing services 5-6 hours of weekday therapy Individual and group	Within Group Differences: Community Integration (*d* = 1.05)	MPAI	Pragmatic speech functional communication, EF functions such as planning, organization, strategies to improve cognitive functioning, strategies for maintaining attention, functional compensatory strategies (note-taking), frequently asked questions calling attention to patients' self-awareness and task performance (e.g., How do you think you did? What went wrong there? What do you need to do now?), encourage trial-and-error problem solving and necessary support for task completion in "errorless learning manner", improving prospective memory.
[2]Huckans et al., (2010)	N = 21 21 male Mean age = 33.8 years One or more TBIs Mild cognitive disorder	6-8 weekly 2-hour treatment sessions	Within Group Differences: Quality of Life (*d* = 0.32) Community Integration (*d* = 0.23) Occupational Activity (*d* = 0.42)	SLS CIQ PRMQ	
[3]O'Connor et al., (2016)	N = 18 18 male Mean age = 51 years History of mild TBI Impairment in cognitive functioning	12 individual sessions	Between Group Differences: Occupational Activity (*d* = 0.32)	Competitive Employment Rates	
[4]Perlick et al., (2013)	N = 14 11 male, 3 female Mean age = 36. 1 years TBI sustained from OEF/OIF war	Three phases across 9 months Phase 1: meetings Phase 2: Two 3-hour workshops Phase 3: Multifamily group meetings bimonthly for 6 months	Within Group Differences: Community Integration (*d* = 1.07) Occupational Activity (*d* = 1.03)	SPRS: IR SPRS: OA	**Main Focus of Treatment:** Cognitive Vocational Social
[5]Salazar et al., (2000)	N = 120 Mean age = 25.5 years 113 male and 7 female Moderate to severe closed head injury within 3 months of randomization	8 weeks Hospital group had morning sessions with free time in the afternoon and evening Home group = spent 30 min a day on their exercises and had weekly 30-minute phone calls with nurse	Between Group Differences Quality of Life (*d* = 0.41) Occupational Activity (*d* incalculable)	Katz % of Those Returning to Work in 12 Months	
[6]Twamley et al., (2014)	N = 34 Mean age = 31.85 years 32 male and 2 female Mild to moderate TBI Impairment in at least one neuropsychological domain	12 weeks 1 hour a week of CogSMART treatment	Within Group Differences: Occupational Activity (*d* = 0.31) Between Group Differences: Quality of Life (*d* = 0.2) Occupational Activity (*d* = 0.74)	QOLI MIST	**Across All 7 Studies:** -Quality of Life: 3 Studies -Community Integration: 3 studies -Occupational Activity: 6 studies
[7]Vanderploeg et al., (2008)	N = 360 335 males and 25 females 18 years or older Moderate to severe nonpenetrating TBI within the last 6 months	Total treatment varied from 20-60 days 1.5-2.5 hours a day of cognitive-didactic or functional-experimental rehabilitation with 2-2.5 hours of OT and PT daily	Between Group Differences: Occupational Activity (*d* incalculable)	% of Those Returning to Work % of Those Living Independently	

CIQ = Community Integration Questionnaire; Competitive Employment Rates = jobs in integrated settings, paying at least minimum wage; Katz = Katz Adjustment Scale; MIST = Memory for Intentions Screening Test; MPAI = Mayo-Portland Adaptability Inventory; PRMQ = Prospective-Retrospective Memory Questionnaire; QOLI = Quality of Life interview; SLS = Satisfaction with Life Scale; SPRS-IR = Sydney Psychosocial Reintegration Scale: Interpersonal Relationships; SPRS-OA = Sydney Psychosocial Reintegration Scale: Occupational Activity
*Note: Effect sizes regarding return to work or school were not calculable for studies 5 & 7

Within Group



Between Group



Clinical Recommendations

- Treatment utilizing an interdisciplinary team approach is recommended for U.S. veterans of current wars with TBIs.
- Goals of treatment should relate to preinjury functional independence of veterans.
- Home-based treatment and collaboration amongst family/caregivers with the clinicians shows promising treatment success along with clinicians working in a collaborative, interdisciplinary fashion.
- The interdisciplinary team should collaborate in order to determine which area should be primary treatment targets.
- Service providers in those disciplines should then ensure treatment addresses these core areas primarily.
- Across studies and using Cohen's d, within group differences yielded a medium effect size of 0.64. Between group differences yielded a medium effect size of 0.44
- Seven studies contained information related to within group differences (pre and post test), 4 studies contained information related to between group differences (control and experimental), and 2 studies contained information related to improvement, but effect sizes were not calculable.

Limitations

- Due to limited research on this population and treatment approach, researchers should continue to assess functionality and efficiency of this interdisciplinary team approach with goals directed towards improving functional skills and independence.
- Although all seven studies were interdisciplinary approaches, the specific intervention protocols differed.
- This meta-analysis did not focus on veterans that had comorbid conditions that are frequently seen within this population (e.g., PTSD, depression, and/or substance misuse). Future studies could involve research on U.S. veterans with TBIs and comorbid conditions that they may encounter after deployment.

Interdisciplinary Team

The following members make up the interdisciplinary team. They focus on functional skills and working towards independence in everyday life post-deployment for the veteran.

- Client
- Speech-language pathologist
- Occupational therapist
- Physical therapist
- Recreational therapist
- Vocational therapist
- Nurse
- Neuropsychologist
- Physician
- Psychiatrist
- Family/Caregiver

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