STUDY PROTOCOL AND STATISTICAL ANALYSIS PLAN

Official title: Problem-Solving Training for Care Partners of Adults with Traumatic Brain Injury

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The University of Texas Southwestern Medical Center at Dallas
Institutional Review Board

Protocol Template (for Investigator Initiated Studies)

Title: Problem-Solving Training for Care Partners of Adults with Traumatic Brain Injury

1. Introduction and Purpose: The purpose of this project is to:

AIM 1: Assess the feasibility of delivering up to 6 sessions of Problem Solving Training (PST) to care partners of individuals with traumatic brain injuries (TBI) during the inpatient rehabilitation stay.

- **Hypothesis 1a:** Care partners will complete at least three intervention sessions (in person and/or via telephone) prior to discharge from inpatient rehabilitation and will report high satisfaction.
- **Aim1a:** Determine the number of sessions that it is feasible to complete during the inpatient rehabilitation stay and factors associated with non-compliance.

AIM 2: Assess the efficacy of PST plus TBI-specific education compared to TBI-specific education alone for improving the outcomes of care partners of individuals with TBI.

- **Hypothesis 2a:** PST will reduce care partners' burden and depressive symptoms (primary), while improving care partners' coping skills (secondary) at one-month post discharge more than TBI-specific education alone.
- **Hypothesis 2b:** Effects of the PST intervention on care partner burden, depressive symptoms, and coping will be maintained at 6 months post-intervention.

2. Background: The chronic consequences of TBI are recognized, but ongoing support for adults with TBI living in the community is limited. This puts undue burden on care partners, particularly during the transition from hospital to home. It often leads to adverse consequences among care partners, such as emotional distress and increased substance abuse.[1,2] Care partners of individuals with TBI often experience high levels of burden, which may result in depression, anxiety, increased somatic symptoms, and reduced quality of life.[1,3,4] Care partner burden is largely predicted by the extent to which care partners' perceived needs are met.[1,5,6] As the consequences of TBI continue to change over time, so too do the perceived needs of care partners.[7–11] One study suggests that only 55% of care partner needs are perceived as being met.[12] A systematic review of qualitative studies for care partners of adults with stroke revealed seven themes with regard to experiences, needs, and preferences of care partners during inpatient rehabilitation.[13] Care partners expressed a desire to be included, informed, and recognized as a stakeholder in recovery, the need to navigate an alien culture and environment, and the need to manage the transition home.[13] The authors concluded that "we need to make deliberate efforts to provide a more inclusive environment that better supports and prepares carers for their new role".[13] Despite this established need during inpatient rehabilitation, there are currently no evidence-based interventions for care partners of adults with TBI to prepare them for their new role prior to discharge of care recipients from inpatient rehabilitation. Hence, there is a critical need to provide care partners of individuals with TBI with the necessary skills to navigate this difficult transition from hospital to home.[14] Self-management training for care partners of adults with other chronic conditions demonstrates strong potential for application to care partners of adults with TBI.

Problem-Solving Training (PST) is an evidence-based, self-management approach that teaches a simple, systematic method for evaluating problems, generating and selecting solutions, creating and implementing realistic goals and action plans, and evaluating whether those plans effectively addressed the specific goal.[15,16] A growing body of evidence indicates that PST post-discharge is associated with reduced distress among care partners of adults with TBI.[17–19] Problems previously seen as overwhelming are regarded as solvable and manageable when approached in a stepwise

fashion using PST, thereby reducing perceived burden and emotional distress. PST empowers care partners to be active participants in directing health and rehabilitation services.

We anticipate that care partners will be able to complete a minimum of 3 sessions during the inpatient rehabilitation stay, with the goal of completing 6 sessions. We also anticipate that PST + Education will be more effective than Education alone for reducing caregiver burden and depressive symptoms and improving positive coping among care partners. This study will provide evidence for effective strategies to support and improve outcomes for care partners during the transition from hospital to home. This will benefit the TBIMS as a whole by providing an evidence-based and feasible intervention for care partners, upon whom the TBIMS relies heavily for participant enrollment and data collection, in addition to the ongoing support that care partners provide to the primary beneficiaries of TBIMS services, individuals with TBI. PST is an evidence-based, self-management approach with a strong theoretical foundation that has demonstrated efficacy for care partners of individuals with disabilities. Early work indicates that it is also effective for care partners of adults with TBI. However, there are no studies evaluating whether delivery of PST to care partners is feasible and effective during inpatient rehabilitation. The proposed project builds upon this foundation of evidence to address this critical gap in the literature.

3. Concise Summary of Project: Participants are care partners of adults with TBI who are inpatient patients at Zale Lisphy Hopsital or Parkland Memorial Hospital. They will complete baseline testing and follow-up testing at 1-month and 6-months post-intervention. They will participant in up to 6 sessions of the Problem Solving Training intervention, delivered in person or via telephone. These data will be used to assess the feasibility of delivering this intervention. These data will also be used for secondary analysis to determine relationships between baseline measures, demographics, and outcomes among care partners of adults with traumatic brain injuries.

4. Study Procedures: This will be a randomized controlled trial, with blocked randomization stratified by performance site, of PST + Education vs Education alone for care partners of adults with TBI admitted to inpatient rehabilitation. Baseline assessment and all intervention sessions will occur during the time the patient with TBI is in inpatient rehabilitation, with the exception of the last intervention session, which can occur via telephone post-discharge. Follow-up assessments will occur at 1-month and 6-months after the completion of the intervention.

Description of Interventions: Care partners in the intervention group will receive PST training in addition to TBI-specific education. Participants in the Control group will receive TBI-specific education alone. Both groups will receive up to 6 sessions, delivered in person or via telephone. Trained members of the research team with master's level education or equivalent experience will provide both interventions using a specific curriculum that has been validated in our previous research studies. These activities will take place prior to discharge from inpatient rehabilitation. Sessions will occur face-to-face whenever possible and over the telephone circumstances when face-to-face is not feasible. Up to 6 sessions will be delivered, with a target of 2/week, maximizing the likelihood of completing all sessions before discharge and providing sufficient time for care partners to put their plans into action between sessions. Sessions will conclude at discharge, with the exception of completing the final session via telephone if it was not completed prior to discharge. We will audio record the delivery of the sessions to ensure fidelity and evaluate feasibility, and document completion, reasons for non-compliance/non-completion, method of delivery, session length, participant engagement, and a brief summary of the PST steps covered during each session.

A trained research staff, blinded to intervention allocation, will perform all assessments in person, via telephone, or will send the assesments electronically to the participant through RedCap at baseline, 1-month, and 6-months post-intervention. Blinding will be ensured by allocating to group assignment after baseline assessment is complete, having different staff performing assessments vs delivering

the intervention, scheduling meetings with assessors and interventionists separately, and instructing participants to not discuss the intervention with the person calling to complete follow-up assessments. We will collect data on demographic (age, gender, race, ethnicity, education), care partners relationship information (nature, duration, living status), and outcome measures assessing mood, caregiver burden, coping skills, self-efficacy, and satisfaction with the intervention (data collection forms for each assessment time point are attached in a later section).

5. Sub-Study Procedures: n/a

6. Criteria for Inclusion of Subjects:
1. Identified as care partner of an individual with TBI admitted to inpatient rehabilitation. A care partner is defined as an individual (spouse, partner, family member, friends, or neighbor) involved in assisting the patient with activities of daily living and/or medical tasks or responsible in any way for the patient's well-being after discharge from inpatient rehabilitation.
2. >1-year relationship
3. Ability to communicate in English.
4. >18 years old
5. Capacity to self-consent

7. Criteria for Exclusion of Subjects:
1. Dispute over care partner's role in the care of patient.
2. Failure to meet all inclusion criteria.

8. Sources of Research Material: Participant-completed surveys/questionnaires. Members of the research team will record all data collected (demographic data, care partner relationship information, session-specific information, and outcome measures) on study forms. Paper forms will be kept in locked filing cabinets and data will be entered directly into an electronic database managed by the TBI Model Systems National Data and Statistical Center that meets standards required by UTSW. Assessment data may also be captured through secure RedCap. Intervention sessions will be audio-recorded for the purpose of monitoring intervention fidelity.

9. Recruitment Methods and Consenting Process: Participants will be willing care partners of individuals with TBI at either Zale Lipshy University Hospital, Parkland Memorial Hospital Centers, or Baylor Scott and White Rehabilitation Institute. Care partners of patients screened for the TBI Model Systems (STU 082010-092) studies will be approached about participation or given a flyer by the research coordinator for those studies. No screening for eligibility/screening for patients is necessary. We will not review/collect any PHI. Study staff will recruit care partners as close as possible to admission of the patient with TBI into acute or inpatient rehabilitation, to maximize the likelihood of completing PST training prior to discharge. Study staff will approach care partners in a private setting, such as the patient's room or private office, or via telephone to discuss the purpose of the project and to obtain informed consent. Additionally, study staff will fully explain all study procedures and will answer all questions regarding the project. Care partner participants who agree to be part of the study will then sign an IRB-approved consent form. The informed consent forms will include contact information for the IRB and the PI, who may be contacted at any time with questions or concerns. Participants will be given a subject ID, which will be used to refer to the participant on all research documents.

10. Potential Risks: The proposed study involves minimal risk to participants. There is always a risk of a breach of confidentiality of personal information and associated privacy of participants. The baseline screening, problem-solving therapy sessions, and follow up data collection visits may produce discomfort or anxiety secondary to the discussion of emotionally laden topics. Questionnaire

items assess sensitive topics, including substance use, coping, depression, caregiver burden, and satisfaction with health-related services.

11. Subject Safety and Data Monitoring: A detailed Data and Safety Monitoring Plan will be submitted to the IRB. The study staff (PI, Co-Investigators, research coordinator, interventionist) will be responsible for collecting and recording all data. As results are collected, all Adverse Events will be identified, graded for severity and assigned causality, reported to the required entities, and compiled for periodic review. After assigning causality, the PI will decide the course of action for the study participant. The PI will evaluate all Adverse Events and determine whether the Adverse Event affects the risk/benefit ratio of the study and whether modifications to the protocol or informed consent form are required. Throughout this process, the PI will inform and collaborate with the research team. The plan to monitor participant data and safety will specifically include the following: (1) Dr. Juengst will inspect collected data; (2) The IRB offices will be contacted if there is an Adverse Event due to participation; (3) the research protocol will be revised if it is determined that the protocol or intervention presents an unforeseen risk to participants; (4) if an event occurs that requires immediate attention and Dr. Juengst is unavailable, then members of the research team will follow the emergency procedures put in place by the research team, which may include calling emergency medical services. Dr. Juengst will develop procedures for all data management functions including data quality checks and verification, in collaboration with the TBI Model Systems National Data and Statistical Center. Internal edit and logic checks (e.g., out of range values, internal inconsistencies) will be developed and run quarterly. Descriptive statistics will be at calculated and included into quarterly reports to ensure the quality of data and progress of the study.

12. Procedures to Maintain Confidentiality: In order to assure participant confidentiality, all participants will be assigned a unique study identification number. Links to identifiers will be maintained at UTSW by study staff. All databases will use the subject ID number rather than private health information. The only exception will be that the RedCap database will include the participant e-mails and information necessary to obtain eConsents. This is necessary in order to send out the assessments via RedCap and to obtain participant consent through RedCap. PHI in RedCap will be marked as patient health information, for which only study personnel will have access. Signed consent forms and all paper study documents will be maintained by the PI and co-investigators at participating centers behind a locked door in a locked file cabinet or in RedCap.

13. Potential Benefits: Participants receiving the PST intervention may benefit from reduced symptoms of burden and depression and improvements in adaptive coping. Participants receiving Education may also benefit from reduced symptoms or greater self-efficacy. Further, from this study, we hope to improve clinical programming to better support care partners of patients in acute hospitalization and inpatient rehabilitation. This could lead to improving not only the long-term health and well-being of care partners, but also of individuals with acquired disabilities.

14. Biostatistics: ***Specific Aim 1:*** The primary outcome is the total number of sessions completed prior to discharge, with a threshold of 80% of participants completing a minimum of 3 sessions as an indicator of feasibility. We will descriptively present reasons for non-compliance and explore factors associated with non-compliance (e.g. demographics, hospital length of stay, etc.). The secondary outcome for feasibility is satisfaction, with an item mean of $\geq$3.5 on the CSQ-8 as an indicator of high satisfaction. ***Specific Aim 2:*** To test our first hypothesis, we will use intent-to-treat analyses to measure the pre-post-test differences in each outcome between baseline and 1-month follow-up using a paired t-test or Wilcoxon signed rank test as appropriate. To address our second hypothesis, we will use intent-to-treat analyses to measure the pre-post-test differences in each outcome between baseline and 6-month follow-up (all participants) using paired t-tests or Wilcoxon signed rank tests. Effect sizes will be calculated and interpreted as follows: <0.2=no/minimal effect; 0.2-0.5= small effect; 0.5-0.8=medium effect; $\geq$0.8=large effect.

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