

Statistical Analysis Plan

Study Title: Wellness Programs for Brain-Injured Individuals

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Behavioral Data. First, recruitment feasibility will be measured by tracking the total number of potential patients contacted, the number who indicate a willingness to participate, and the number who meet inclusion/exclusion criteria. Based on recommendations for pilot intervention studies,⁹⁰ the feasibility criterion for recruitment will be a minimum of 70% of eligible patients recruited from the available research participant pools. Retention will be based on the percentage of recruited patients who complete all components of the program, and our criterion will be 70% retention rates in both the MBSR intervention and Brain Health groups.⁹⁰

Criteria for effective participation in both the MBSR and Brain Health program are: a) all participants attending $\geq 70\%$ of the sessions; b) all participants logging an average of ≥ 3 hours of practice/homework per week; and c) comprehension of course material as reflected by a score of $\geq 75\%$ correct on a written quiz during post-testing. Treatment fidelity will be assessed by videotaping the instructor during the intervention and control sessions, and independent clinicians with extensive familiarity with the programs will rate a random sample of four sessions on a scale of 1-5, with higher numbers indicating better adherence to the manuals. The effectiveness of our blinding procedures will be evaluated with a forced-choice recognition test at the end of the study that asks the neuropsychologist doing the pre- and post-assessments to indicate which group (MBSR or Brain Health) a participant belongs to and how confident they are in their assessment. Randomization procedures will be evaluated by analyzing the demographic summary tables generated, comparing values between the MBSR and Brain Health groups.

With respect to study safety, a definitive determination of intervention safety can only be made with a much larger sample size (not as part of a pilot study), but our study criterion is that serious adverse events will be brought to the attention of Mental Health and reported to the VA IRB within 24 hours of occurring.

Acceptability will be measured with the same questionnaire used in our previous study of MBSR in Veterans with a history of mTBI to evaluate patients' satisfaction and the tolerability of the program. The intervention will be considered acceptable if: 1) the average response for each question is ≥ 4.0 out of 5 (e.g., "How satisfied were you with this program?"); and 2) 80% or more of the participants rate at least one course component with a score of ≥ 7 out of 10 (e.g., meditation, group discussions). The questionnaire also includes open-ended questions regarding the participants' experience in the research study overall (e.g., "Have there been any positive changes in your medical condition?"). These responses will be analyzed using freely available content analysis software¹⁰² to identify common themes (e.g., program is enjoyable; sessions are too long).

A battery of standardized psychological and cognitive measures will be administered 1) prior to the intervention (pre-testing) and 2) within one week following the intervention (post-testing). All pre- and post-testing will be conducted by a licensed neuropsychologist who will be blinded to the participant's intervention condition (MBSR vs. Brain Health/Education). Our primary outcome target for Aim 2 will be a reduction in depression and anxiety scores from pre- to post-MBSR intervention. Outcome measures include the Geriatric Depression Scale and the State-Trait Anxiety Inventory. These measures have been shown to have strong reliability and validity and are most appropriate for the current study, given the demographics of our sample. Our secondary outcome target for Aim 2 is a change in cognitive performance as assessed by Repeatable Battery for the Assessment of Neuropsychological Status.

Since using inferential statistics to assess treatment effects is not appropriate for pilot studies, we will preliminarily report descriptive statistics. Just as a point of reference, however, the type of inferential statistics we would use for a subsequent, efficacy study of MBSR would be a mixed

model-random effects analysis for longitudinal data that would include all participants who completed the baseline assessment and at least one session following intervention (including those with incomplete data), which would reduce attrition bias and increase generalizability, power, and precision. Treatment group, time, and their interaction would be the primary fixed effects in the model. Number of classes attended would be considered as an additional factor, and the model would assume ignorable attrition and would not take an intention-to-treat approach. The key value for hypothesis testing would be the group-by-time interaction term.