

completing activities of daily living. This information may assist in subsequent treatment planning and identifying treatment goals of cognitive rehabilitation consistent with rehabilitation psychology's goals of increasing levels of adaptive functioning and quality of life (Division 22 of the American Psychological Association, n.d.). Future research may examine if certain domains of adaptive functioning are more or less affected by impairments in cognitive flexibility. Future research may also examine patterns of set-shifting performance, such as sequencing errors vs. set-loss errors, associated with specific areas of insult.

**Categories:** Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Adult)

**Keyword 1:** brain injury

**Keyword 2:** adaptive functioning

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### 17 Value-Consistent Rehabilitation is Related to Long-Term Quality of Life and Psychological Adjustment After Traumatic Brain Injury

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**Objective:** Modern perspectives of rehabilitation after traumatic brain injury (TBI) emphasize the importance of individualized holistic approaches (i.e., physical and psychological adjustment) and collaboration toward goals (e.g., among the survivor, rehabilitation professionals, family/friends, etc.). Recent research has sought to employ a holistic, value-based approach (via the Valued Living Questionnaire) to measuring goals and whether those with TBI are acting in accordance with them, and quality of life outcomes. However, no research has examined whether rehabilitation practices are consistent with survivor values using this framework. The aim of the current study was to investigate the impact of value-consistent rehabilitation practices on quality of life and psychological adjustment outcomes in those with TBI.

**Participants and Methods:** The current study included a sample of 73 adults with a history of TBI (M years since injury = 7.6, SD = 9.7) between the ages of 18 and 72 (Mage = 44.0

years, SD = 13.1; 73% female, 90.4% white) who had participated in outpatient rehabilitation. Individuals were recruited from brain injury support groups on Facebook and completed a series of surveys measuring TBI severity [Ohio State University Traumatic Brain Injury Identification Method-Short Form (OSU-TBI-ID)], value-consistent rehabilitation practices [modified Valued Living Questionnaire (VLQ)], life satisfaction [Life Satisfaction Questionnaire-9 (LiSat-9)], and psychological flexibility [Acceptance & Action Questionnaire – Acquired Brain Injury (AAQ-ABI)]. Discrepancy scores were calculated to compare perceived importance of and how helpful rehabilitation was for each VLQ domain. Bivariate Pearson correlations were conducted to investigate the relationships between value-consistent rehabilitation, life satisfaction, and psychological flexibility.

**Results:** The VLQ domains with the greatest discrepancies were spirituality (-2.26), marriage/intimate relations (-2.06), and family relations (-2.02) such that rehabilitation helped less in these domains despite their importance. Greater levels of value-consistent rehabilitation were related to higher levels of life satisfaction overall ( $r = 0.40$ ,  $p < 0.001$ ) and lower levels of reactive avoidance of emotions related to one's brain injury ( $r = -0.26$ ,  $p = 0.03$ ). In terms of specific domains of life satisfaction, greater value-consistent rehabilitation was related to higher levels of vocational ( $r = 0.44$ ,  $p < .001$ ), physical self-care ( $r = 0.28$ ,  $p = 0.018$ ), and friendship satisfaction ( $r = 0.41$ ,  $p < .001$ ).

**Conclusions:** Our findings suggest rehabilitation practices may not be acting proportionately with TBI survivor values. Moreover, our results suggest value-consistent rehabilitation is important for long term quality of life and psychological adjustment outcomes. Future work should seek to identify factors that optimize opportunity for individualized treatment.

**Categories:** Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Adult)

**Keyword 1:** brain injury

**Keyword 2:** quality of life

**Keyword 3:** activities of daily living

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### 18 Vascular Risk, Cerebral White Matter, and Executive Functioning in Vietnam-

## Era Veterans with Traumatic Brain Injury and/or Post-Traumatic Stress Disorder: A Department of Defense Alzheimer's Disease Initiative (DoD-ADNI) Study

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**Objective:** Research indicates that Veterans with a history of traumatic brain injury (TBI) are at increased risk for dementia. Although the precise mechanisms underlying this relationship are poorly understood, remote TBI may exacerbate normal age-related changes to cerebral white matter (WM) and result in cognitive decline. However, Veterans commonly experience a constellation of mental (e.g., post-traumatic stress disorder [PTSD] and depression) and vascular (e.g., diabetes, hypertension, obesity) health conditions that have also been implicated in pathologic cerebral WM and cognitive aging trajectories. Therefore, the present study sought to (1) clarify the effects of remote TBI within the context of PTSD, depression, and vascular risk on WM micro- and macrostructure, and (2) explore if WM integrity is associated with cognition in a sample of Vietnam-Era Veterans.

**Participants and Methods:** The sample consisted of 195 male Veterans ages 60-80 (mean age=69.3) enrolled in the Department of Defense-Alzheimer's Disease Neuroimaging Initiative (DoD-ADNI) study. 102 Veterans met criteria for TBI by sustaining a head-injury that resulted in a loss of consciousness, alteration of consciousness, or post-traumatic amnesia. Current and/or lifetime PTSD was designated by scores  $\geq 30$  on the Clinician-Administered PTSD Scale. The Geriatric Depression Scale was used as a continuous measure of depression. A vascular risk score (0-3) was calculated based on diabetes, hypertension, and obesity (BMI  $\geq 30$  kg/m<sup>2</sup>). An executive functioning composite was created by averaging sample-specific z-scores for Trail Making Tests (A and B), with higher scores indicating worse performance. Voxelwise analysis of WM microstructure (fractional anisotropy [FA]) was conducted with Tract-Based Spatial Statistics (TBSS), using non-parametric permutation testing with threshold-free cluster enhancement. SPM's Lesion Segmentation Tool was used to investigate WM macrostructure (WM hyperintensity [WMH]

volume). Lesion probability maps were masked to restrict WMH volume calculations to WM. Robust regression using M-estimation and predictive R<sup>2</sup> calculated using 10-fold cross-validation examined WMH volume, predictor, and cognitive associations. Age was a covariate in all WM analyses, and education was a covariate in all cognitive analyses.

**Results:** TBSS analysis revealed widespread, significant negative relationships between vascular risk and FA across numerous WM tracts ( $p$ 's $\leq 0.05$ ). These associations remained significant after adjusting for TBI history, PTSD, and depression. TBSS identified significant positive relationships between executive functioning performance and FA across similar brain regions ( $p$ 's $\leq 0.05$ ). Robust regressions revealed that vascular risk significantly predicted WMH volume ( $p=0.006$ ;  $\beta=0.161$ ;  $R^2=0.093$ ), whereas TBI history, PTSD, and depression did not ( $p$ 's=0.107-0.166;  $\beta$ 's=-0.089-0.101). WMH volume significantly predicted executive functioning ( $p=0.002$ ;  $\beta=0.216$ ;  $R^2=0.105$ ), whereas TBI history, PTSD, depression, and vascular risk did not ( $p$ 's=0.123-0.888;  $\beta$ 's=-0.012-0.125).

**Conclusions:** Our results suggest that vascular health, relative to remote TBI, PTSD, and depression, may be more robustly associated with cerebral WM micro- and macrostructure in older Veterans. Furthermore, poorer WM integrity is associated with poorer cognitive performance. These findings underscore the importance of vascular health interventions in preventing negative brain and cognitive aging outcomes in Veterans, independent of TBI history. Future studies might leverage other neuroimaging modalities (e.g., functional MRI) to further investigate the effects of vascular health on aging in Veterans with a history of TBI.

**Categories:** Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Adult)

**Keyword 1:** traumatic brain injury

**Keyword 2:** aging (normal)

**Keyword 3:** neuroimaging: structural connectivity

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**19 Impact of Rehabilitation Pathway on the Prediction of Social Participation**