



Irritability among OEF/OIF/OND Veterans with a History of Blast-related mTBI: Associations with Neuropsychological Functioning and Quality of Life

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OVERVIEW

- Irritability is commonly reported by Veterans with a history of mild traumatic brain injury (mTBI).
- However, little is known about the neuropsychological correlates of irritability following mTBI, or its real-world impact.

Objective: To examine the association between reported irritability among OEF/OIF/OND Veterans and performance on measures of neuropsychological functioning and quality of life (i.e., health and social support)

METHODS

Participants (all male)

	mTBI (n=53)	Controls (n=22)
Age (SD)	35.32 (9.28)	34.50 (7.78)
Years of Education	14.31 (1.67)	13.30 (1.81)
% Caucasian	69.2%	75.3%

Measures

Neuropsychological Functioning:

- **Prospective Memory**
Memory for Intention Test (MIST): Total performance score
- **Set-shifting**
Trails B: Completion time
- **Novel Problem Solving**
Wisconsin Card Sorting Test (WCST): Failure to maintain set; Total categories completed
- **Working Memory**
Auditory Consonant Trigrams (ACT): 18 second delay score
- **Selective & Sustained Attention**
Ruff 2 & 7: Automatic detection trial, total errors; Controlled search trial, total errors

Physical Health & Psychiatric Symptomatology:

- World Health Organization Quality of Life Measure (WHOQOL), Physical and Psychological Health subscales
- Patient Health Questionnaire-9 (PHQ-9), Total score
- Pittsburgh Sleep Quality Inventory (PSQI), Limitations due to difficulty staying awake item.



Social Support:

- Deployment Risk and Resilience Inventory (DRRI), Support from family/friends during deployment item; Post-deployment support item
- WHOQOL, Social relationships item

Irritability:

A composite score of self-reported irritability was computed by averaging three items assessing irritable mood and poor frustration tolerance (Cronbach's alpha = 0.9).

- PTSD Symptom Checklist- Military Version-item 14: Feeling irritable or having angry outbursts?
- Neurobehavioral Symptom Inventory-Irritability, easily annoyed? ; Poor frustration tolerance, feeling easily overwhelmed by things?

Covariates:

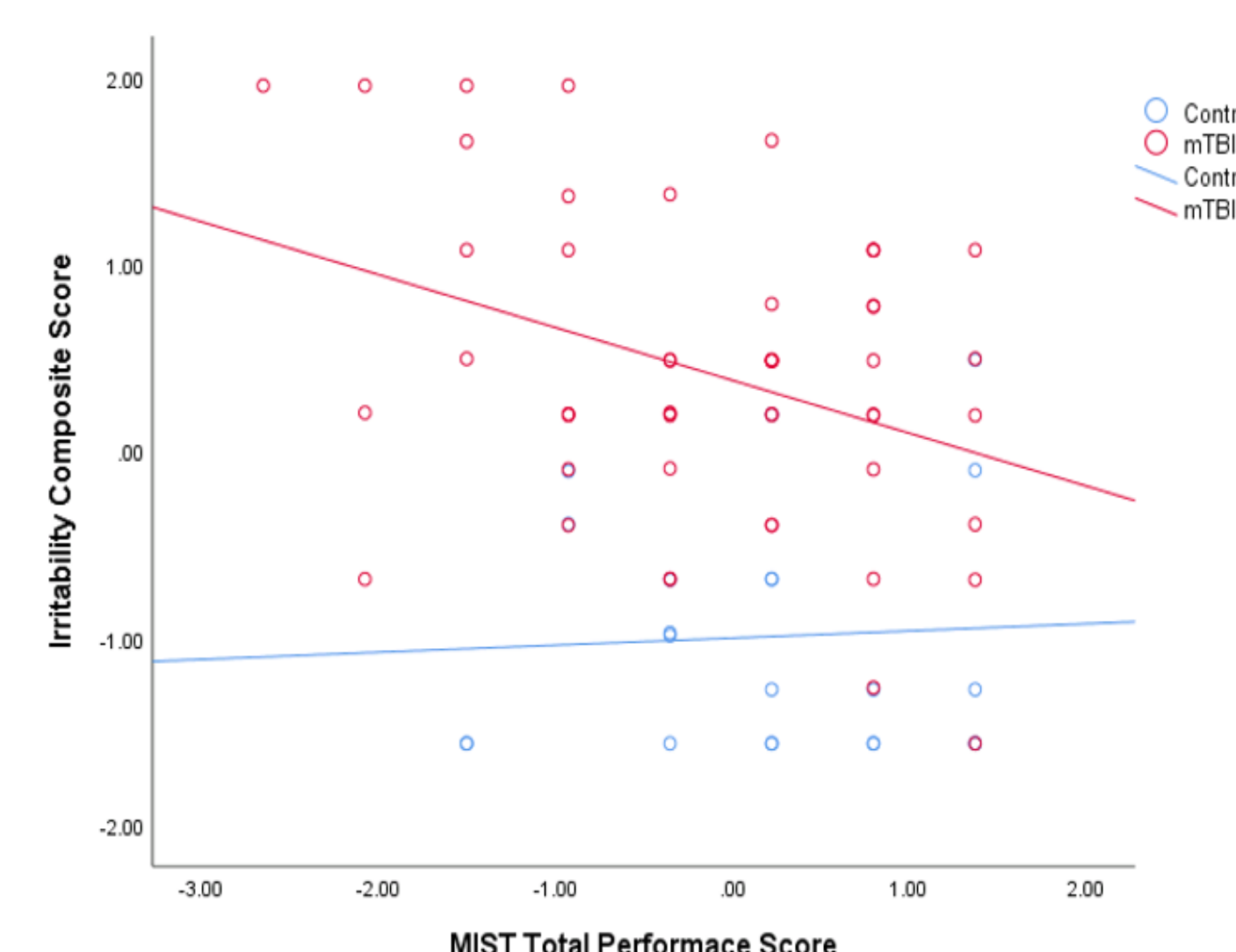
- **Participant Premorbid IQ:** Participant premorbid IQ was assessed using the Wechsler Test of Adult Reading (WTAR), predicted verbal IQ score.
- **Participant Age**

Statistical Analyses

- Group differences on demographic and clinical variables were examined using one-way analyses of variance (ANOVA).
- The association between irritability scores and performance on neuropsychological measures was examined using a stepwise hierarchical linear regression. Premorbid IQ and age were entered in the first step as covariates and composite irritability scores were entered as the dependent variable. In the second step, raw scores of neuropsychological measures were entered as independent variables.
- Follow up moderation analyses were performed to examine diagnosis as a moderator on any significant relationships between irritability scores and performance on neuropsychological measures.
- Pearson correlations were used to examine the association between irritability and quality of life variables.

RESULTS

- ◆ Significant group difference in irritability, $F(1,73) = 51.68, p < .001$, with the mTBI group reporting greater irritability compared to the control group (mTBI $M = .38$, Control $M = -.88$).
- ◆ Greater irritability was associated with poorer performance on MIST, $\beta = -.48, p = .005$.



- ◆ The association between irritability and PM ability persisted after adjusting for PTSD severity.
- ◆ Group membership did not moderate the association between PM ability and irritability, $\Delta R^2 = .015, \Delta F(1,74) = 2.07, p = .155, \beta = -.268, t(5,74) = -1.44, p = .155$.

↑ Irritability ↓ Health

- ◆ Greater irritability was associated with lower overall physical ($r = -.365, p = .002$) and psychological health ($r = -.449, p < .000$).
- ◆ Greater irritability was also associated with greater depression symptomology ($r = .667, p < .000$) and greater functional limitations due to difficulty staying awake ($r = .314, p = .006$).

↑ Irritability ↓ Social Support

- ◆ Greater irritability was associated with lower quality social support from family and friends during deployment ($r = -.362, p < .000$), lower quality social support post-deployment ($r = -.358, p = .005$), and lower quality of current social relationships ($r = -.563, p < .000$).

CONCLUSION

- OEF/OIF/OND Veterans with history of mTBI showed higher levels of irritability compared to healthy controls.
- Greater irritability among Veterans is associated with poorer prospective memory.
- Veteran irritability is negatively associated with important quality of life variables, including physical and mental health and self-reported social support.
- Current findings highlight the importance of better understanding irritability in the Veteran population, and suggest neurocognitive mechanisms supporting increased irritability in mTBI.