

compared to healthy controls at 2W, $p=.008$, 3M, $p<.001$, and 6M, $p=.012$, but not 12M, $p=.313$, suggesting that depressive symptoms resolved by 12M in those with mTBI. To explain this, we investigated sex differences, as males tend to experience fewer depressive disorders than females. However, females reported fewer depressive symptoms than males at chronic stages of mTBI. This finding was not statistically significant as females had a $Mbdi_total=6.84$, $SD=7.98$ and males had a $Mbdi_total=5.38$, $SD=6.078$; still, this could be due to the low statistical power of the study, and with a larger sample size, could produce statistically significant differences between the sexes. Despite this, there is a statistically significant difference in the depression score for females between 2W and 12M post-mTBI ($p=.046$; effect size of $d=.99$). Comparatively, males showed no significant divergence between depression and sleep scores.

Conclusions: Sleep disruption and depressive symptoms were correlated in individuals with mTBI in both acute and chronic stages; however, at 12M, there was a decrease in this correlation due to females exhibiting fewer depressive symptoms in combination with greater sleep disruption in the chronic phase of mTBI. Further research investigating the relationship between depression and sleep quality by looking at females with a much larger sample size would be helpful in clarifying these associations.

Categories: Concussion/Mild TBI (Adult)

Keyword 1: concussion/ mild traumatic brain injury

Keyword 2: depression

Keyword 3: sleep

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59 Neuropsychiatric Clustering of Veterans with TBI: The Link Between Neuropsychological Test Validity and Somatic Post-Concussive Symptoms

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Objective: There is a wide variability in the neuropsychiatric presentation of mild traumatic brain injury (mTBI), and accurate diagnosis and treatment is complicated by within-condition heterogeneity and overlapping symptoms of common comorbidities (e.g., PTSD). Such diagnostic complexities can obfuscate clinical decision-making and lead to suboptimal treatment response. In contrast to traditional diagnostic categories, person-centered analysis methods create data-derived groupings wherein individuals within a cluster are similar and individuals across clusters are different. The current study sought to apply clustering to dimensional emotional and neuropsychological features in treatment-seeking Veterans with mTBI, with the goal of identifying more precise, homogeneous clinical profiles.

Participants and Methods: Study participants were 190 Veterans with mTBI history participating in a clinical neuropsychological assessment of cognitive complaints (Mean age: 34.38, 89.6% male, average years of education: 13.14). Participants completed a diagnostic interview, neuropsychological tests, and symptom questionnaires (NBSI, PCL, BDI, BAI, AUDIT, PSQI). To identify clusters of similar neuropsychiatric presentations, we first conducted dimension reduction on data from the cognitive tests and self-report measures using principal components analysis. Second, cluster analysis and cluster validation was performed on the resultant principal components (R: kmeans, clusterboot, clusterValid) to find homogeneous subgroups of participants.

Results: The clinical data was best represented by principal components reflecting anxious arousal, depressive cognitions, somatic post-concussive symptoms, reexperiencing and avoidance symptoms, and objective cognitive deficits. Cluster analysis using bootstrapping and cluster validity indices (e.g., Silhouette width, Dunn index) indicated that a 6-subgroup solution was optimal (subgroups were labeled Group A-Group F). Group A was characterized by moderate levels across all dimension scores. Group B was characterized by elevated somatic post-concussive symptoms and cognitive deficits. Group C was characterized by intact cognitive performance and low somatic post-

concussive symptoms. Group D was characterized by elevated depressive cognitions. Group E was characterized by high anxious arousal but low depressive cognitions and reexperiencing and avoidance. Group F was characterized by elevated reexperiencing and avoidance. The subgroups did not differ statistically on any demographic items, such as years of education, age, or gender. However, there were statistically significant differences across groups in performance validity failure ($\chi^2(10) = 27.17, p = .002$); Group B showed the highest rate of failure.

Conclusions: Results demonstrate that phenotypically similar subgroups of individuals can be identified within treatment-seeking Veterans with mTBI. Data suggest that somatic post-concussive symptoms may be linked to cognitive deficits, however the rate of validity failure indicates that neuropsychological test scores may not reflect true cognitive ability. In contrast to prior studies that treat mTBI as a unitary construct that accounts for symptoms, our data suggest that a nuanced evaluation yields vastly diverse clinical presentations. Cluster analytic frameworks hold promise for better assessment and treatment planning for Veterans, as both patients and their treating clinicians would be greatly served by the ability to use common clinical assessment tools to better identify a given individual's clinical needs. A critical next step is to validate subgroups using novel samples and data sources (e.g., neurobiology, genetics) and to determine if these subgroupings can be effectively utilized to personalize treatment assignment.

Categories: Concussion/Mild TBI (Adult)

Keyword 1: mood disorders

Keyword 2: traumatic brain injury

Keyword 3: post-traumatic stress disorder

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60 Coping and social participation following mild traumatic brain injury: An observational rehabilitation cohort study in rehabilitation.

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Objective: A non-negligible proportion of individuals who have sustained a mild traumatic brain injury (TBI) are at risk of developing persistent symptoms. The impact of persistent post-mTBI symptoms can be profound, causing significant disruptions in well-being, functioning and quality of life (Agtarap, et al., 2021). Reduced social participation often extends beyond the acute recovery period and continues to be associated with lower quality of life for many months after mTBI (Voormolen et al., 2019). Coping was found to be essential in order to decrease physical symptoms, have better psychological health, as well as increase social participation (Vos et al., 2019). The variables of perceived stress and depression were also linked directly and indirectly to mild post-TBI adjustment in terms of their return-to-work status (Strom and Kosciulek, 2007). Furthermore, a greater percentage of individuals with mTBI report chronic pain as compared to individuals with more severe TBIs (Weyer Jamora, Schroeder & Ruff, 2013). Given these implications and the growing concern for mTBI as a potentially disabling and chronic medical condition, it is important to focus on identifying the processes that can lead to persistent symptoms and related preventive interventions that can be applied. This present study aimed to investigate the association between coping and social participation according to anxiety, depression, and pain symptomatology, before and after rehabilitation in a mild TBI population benefiting from an outpatient rehabilitation program.

Participants and Methods: A prospective longitudinal cohort study design was employed, with two-time points for outcome assessment (i.e., start and end of rehabilitation). This study included 70 adults aged between 18 and 78 who experienced a mTBI between February 2016 and January 2020 and received interdisciplinary outpatient rehabilitation services at a major rehabilitation centre in the Greater Montreal region. Measures administered pre and post