

Objective: Depression is highly prevalent in persons with multiple sclerosis (pwMS). A reformulated version of the learned helplessness theory posits that individuals who attribute the cause of negative events to personal factors (internal), perceive that the cause persists for a long period of time (stable), and believe it is present in all situations (global) are at an increased risk for depression. As such, it is critical to examine possible modifiable factors that buffer against the deleterious effects of negative attributional style. Therefore, the current study investigated whether stress moderates the relationship between negative attributional style and depression symptoms in an MS sample.

Participants and Methods: Thirty-six pwMS (30 Female, 6 Male) completed a comprehensive neuropsychological test battery and psychosocial questionnaires that assessed cognitive attributional style, daily stressors, and depression symptoms. The Attributional Style Questionnaire (ASQ) was used to create internal, stable, and global attribution dimension scores, as well as an overall attributional style score combining the three dimensions. Stress was quantified as the total score of perceived hassles from the Hassles and Uplifts Scale (HUS). Depression symptoms were measured using the Beck Depression Inventory-Fast Screen (BDI-FS). Hierarchical linear regressions were conducted with depression symptoms as the outcome variable. Each dimension of attributional style (internal, stable, global, or overall ASQ), stress, and their interactions were included as predictors. Simple effects tests were used to clarify the pattern of any significant interaction.

Results: Regression analyses revealed that the interaction between overall attributional style and stress was significant ($p = .025$). Simple effects tests revealed that overall attributional style was associated with depression symptoms only in pwMS with high levels of stress ($p = .015$). For the individual dimensions of the ASQ, several interactions were also significant. The interaction between the internal dimension and stress was significant ($p = .009$), such that internal attributions were associated with depression symptoms only in pwMS with high levels of stress ($p = .002$). The interaction between the stable dimension and stress was also significant ($p = .01$); stable attributional style was associated with depression symptoms only in pwMS with high levels of stress ($p = .009$).

The interaction between the global dimension and stress was not significant.

Conclusions: Stress moderated the relationship between negative attributional style and depression symptoms in pwMS. Specifically, the internal and stable dimensions and overall attributional style were associated with increased depression symptoms only in pwMS who reported high levels of stress, but not in those with low levels of stress. Interventions aimed at reducing and managing stress may help protect against the effects of negative cognitive schemas on depression symptoms in MS. Additionally, previous research demonstrates that attributional style may be a malleable target of evidence-based psychotherapy (Seligman et al., 1988; Proudfoot et al., 2009). Our findings suggest that cognitive therapy specifically targeting the internal and stable dimensions of attributional style may be effective in modifying attributional style, perceptions of stress and, subsequently, improve depression outcomes in MS.

Categories: Multiple

Sclerosis/ALS/Demyelinating Disorders

Keyword 1: multiple sclerosis

Keyword 2: depression

Keyword 3: emotional processes

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42 Real-time Associations Among MS Symptoms and Cognitive Dysfunction Using Ecological Momentary Assessment

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Objective: The current study aimed to examine real-time associations between non-cognitive symptoms and cognitive dysfunction (latter measured both objectively and subjectively in

real-time) using ecological momentary assessment (EMA).

Participants and Methods: Forty-five persons with MS completed EMA four times per day for three weeks. For each EMA, participants completed mobile versions of the Trail-Making Test part B (mTMT-B) and a finger tapping task, as well as surveys about symptom severity. Trait (usual levels of a symptom) and state (when symptom level was higher or lower than the individual's usual levels) aspects of each symptom's severity were calculated. Multilevel models were conducted to account for within-person clustering, with performance on the mTMT-B and self-reported rating of cognitive dysfunction as primary outcomes.

Results: A total of 3,174 EMA sessions were collected; compliance rate was 84%. There was significant intra-day variability in mTMT-B performance, anxiety, fatigue, and pain. More severe state depressive symptoms predicted lower performance on the mTMT-B in real-time. Self-reported difficulties with sleeping the night before predicted mTMT-B performance the following day. In contrast, state (but not trait) fatigue, depression, anxiety, and pain all predicted self-reported cognitive dysfunction in real time. Further, state self-reported cognitive dysfunction (but not mTMT-B performance) was associated with a higher perceived sense of accomplishment.

Conclusions: Self-reported cognitive dysfunction was more susceptible to influences of other MS symptoms (especially when the symptom is more severe than the individual's usual levels) and better predicted perceived sense of accomplishment than objectively measured executive functioning in real-time. Objective executive functioning performance was sensitive to effects of depressive symptoms and sleep difficulties. The current study demonstrated the feasibility of assessing real-time associations among MS symptoms using smartphone-administered EMA.

Categories: Multiple Sclerosis/ALS/Demyelinating Disorders

Keyword 1: cognitive functioning

Keyword 2: technology

Keyword 3: teleneuropsychology

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43 Symptoms of Apathy in Older Adults with Multiple Sclerosis

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Objective: Multiple sclerosis (MS) is a chronic neurodegenerative autoimmune disease of the central nervous system. Apathy is significantly higher in adults with MS compared to healthy populations. Apathy is a lack of motivation that can cause dysfunctions in each step of goal-directed behaviors. Apathy is associated with diminished ability to perform activities of daily living, tasks requiring normal executive function, and quality of life. Across various neurodegenerative disorders, apathy has been regarded as a predictor of poor cognition and functional outcomes. However, the severity of apathy and its association with cognitive function in older adults with MS have not been reported. This study's objective was to address this gap of knowledge. Hence, we evaluated: 1) the severity of apathy symptoms in older adults with MS compared to healthy older adults and, 2) the association of apathy symptoms and global cognitive functioning in older adults with MS compared to controls.

Participants and Methods: Participants were community-residing older adults (age ≥ 60 ys) enrolled in a cohort study, "Brain Predictors of Mobility and Falls in Older Adults with Multiple Sclerosis." Healthy controls (n=59; mean age=66.25 \pm 3.37; %female=47.5) and persons with MS (n=69; mean age=64.58 \pm 3.88; %female=62.3) were included in the analysis. Using McDonald criteria, MS diagnosis was physician-confirmed by medical record review, apathy symptoms were assessed through 4 apathy symptom questions on the 30-item Geriatric Depression Scale (GDS), and global cognitive functioning was assessed using the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS). Covariates included age, gender, years of education, global health score (GHS), and depression (GDS w/out apathy questions). For the first objective, a linear regression model was used with a bi-level group status variable (MS vs controls) serving as a predictor of apathy symptoms. For the second objective, two linear regression models stratified by group status were run with apathy symptoms as a predictor of global cognitive functioning.