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39 Co-Occurring Depression and Anxiety is Associated with Greater Cognitive Variability in Persons with Multiple Sclerosis

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Objective: Research examining co-occurring anxiety and depression in persons with multiple sclerosis (PwMS) is scarce, though an estimated 20% of PwMS experience clinically significant anxiety and depression (Gascoyne et al., 2019). Recent work by Hanna & Strober (2020) found that PwMS with comorbid anxiety and depression reported worse outcomes in all constructs of symptomatology, disease management, psychological well-being, and quality of life. However, it is unclear how co-occurring anxiety and depression symptoms may influence or exacerbate cognitive difficulties in PwMS. Further, considering there are high levels of comorbidity between depression, anxiety, and fatigue in PwMS, this study aims to examine the unique variances of depression, anxiety, co-occurring depression and anxiety, and fatigue on cognitive functioning.
Participants and Methods: 86 PwMS (F=65,M=21) completed a comprehensive neuropsychological battery that included self-report measures of anxiety, depression, and fatigue. An intraindividual variability (IIV) composite score was calculated by combining standardized intraindividual standard deviation and maximum discrepancy scores on measures of attention/processing speed and memory for each participant. Lower scores indicate *worse* performance (i.e., greater variability). A hierarchical regression was conducted with IIV as the outcome variable and with depression, anxiety, cognitive fatigue, physical fatigue, and the interaction between depression and anxiety as predictors. Expanded Disability Status Scale (EDSS) scores were included as a covariate.
Results: The only model that included a statistically significant predictor of IIV was the final model, which included EDSS, depression, anxiety, cognitive fatigue, physical fatigue, and the interaction between depression and anxiety, $F(6,77)=2.97$, $p=.01$, $\Delta R^2=.08$.
While the main effects of depression and anxiety were not significant, the interaction between depression and anxiety was significant, $F(6,77)=7.20$, $p=.01$, $\eta^2=.09$. Simple effects tests revealed that the relationship between IIV and anxiety was marginally significant for those at the cutoff for clinical depression (square root BDI-FS=2; BDI-FS=4), $F(6,77)=3.52$, $p=.07$, $\eta^2=.04$. However, the effect of anxiety on IIV increased as depression increased. For example, in those with high levels of depression (1.5 SD above the mean), there was a significant relationship between anxiety and IIV, $F(6,77)=4.16$, $p=.04$, $\eta^2=.05$, though this was not the case for those with low levels of depression (1.5 SD below the mean), $F(6,77)=0.01$, $p=.92$, $\eta^2=.00$.
Conclusions: The interaction between depression and anxiety predicted variability in performance such that those with high levels of depression and anxiety demonstrated significantly greater IIV. Since dispersion is considered a marker for neurocognitive integrity, this may suggest that co-occurring psychological disturbances are associated with poorer cognitive integrity, an important consideration for interventions and outcomes. While interventions aimed at treating co-occurring depression and anxiety have been largely overlooked within the MS literature (Butler et al., 2016), transdiagnostic interventions have been beneficial for general adult populations with co-occurring anxiety and depression (McEvoy et al., 2009). Future work should examine the efficacy of interventions aimed at addressing co-occurring depression and anxiety in PwMS, as this may help to improve cognitive functioning, as well as perception of functioning, which will likely further improve quality of life and overall well-being.

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