

study aimed to describe the relationship between mental wellbeing and subjective decline in multiple cognitive domains and examine whether this relationship differs between older adults with normal cognition and those with mild cognitive impairment (MCI).

Participants and Methods: Community-dwelling older adults (normal: $n = 58$, $M_{age} = 73.7 \pm 5.6$; MCI: $n = 43$, $M_{age} = 75.9 \pm 6.1$) completed the Everyday Cognition scale, a validated self-report measure of SCD, and the RAND-36 Health Survey, a validated self-report measure of health-related quality of life which includes a mental wellbeing subscale. Spearman's rank correlations were conducted between self-reported mental wellbeing and each self-reported cognitive domain (i.e., memory, language, visuospatial, and executive function) for the Normal Cognition and MCI groups.

Results: Worse mental wellbeing was associated with worse subjective language and executive function in the normal group, $r_s(56) = .42$, $p = .001$; $r_s(56) = -.37$, $p = .005$, but not for the MCI group, $r_s(41) = -.23$, $p = .15$; $r_s(41) = -.12$, $p = .46$. Worse mental wellbeing was associated with worse subjective visuospatial function in the MCI group, $r_s(41) = -.39$, $p = .009$, but not in the normal group, $r_s(56) = -.11$, $p = .39$. For both groups, worse mental wellbeing was associated with worse subjective memory, $r_s(56) = -.45$, $p < .001$; $r_s(41) = -.37$, $p = .02$. While this correlation was greater in the normal group, the difference was not significant ($z = 0.38$, $p = .71$).

Conclusions: These results suggest that perceptions of mental wellbeing are related to perceptions of cognitive decline in multiple domains, and that the specific domains involved differ between normal and MCI groups. The differential associations may mean perception of specific cognitive domains more strongly affect mental wellbeing, or mental wellbeing more acutely influences perception of those domains. The overall observed relationship between SCD and mental wellbeing may have several explanations: the impact of broader health perceptions may extend to cognitive perception, behavioral changes associated with poor wellbeing may reduce subjective cognitive function, or worse subjective cognitive function may lead to negative experiences of wellbeing. Future longitudinal investigation could inform causal inferences. The more limited associations between mental wellbeing and SCD among MCI individuals may point to the role of decreased self-awareness (due to cognitive impairment)

precluding detection of subtle changes in cognition or wellbeing. This study highlights the importance of better understanding mental wellbeing in experiences of SCD in both normal and MCI older adults to improve cognitive and mental health outcomes.

Categories: Aging

Keyword 1: cognitive functioning

Keyword 2: quality of life

Keyword 3: mild cognitive impairment

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35 Impact of Cardiorespiratory Fitness and White Matter Lesions on Processing Speed with Age

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Objective: Processing speed declines with age and is a strong predictor of age-related cognitive decline in other domains, and in predicting who will need help with tasks of daily living in later years. Higher cardiorespiratory fitness (CRF) reflects better cardiopulmonary health and is related to maintenance of processing speed and cognition into late life. On the other hand, white matter lesions (WML) are reflective of age-related brain network disconnections from damage to white matter tracts in the brain. Lower CRF and higher WML burden have each been related to poorer cognitive performance. Although higher CRF provides a protective effect on cognition, the combined effects of CRF and WML on processing speed have yet to be determined. Specifically, whether CRF and WML independently affect processing speed or if WML moderates the effect of CRF on processing speed is yet to be established. We predicted WML may moderate CRF benefits on cognitive aging if CRF-related cognitive benefits are weakened by high WML load. Here, we test this question with the gold-standard measure of CRF, maximal exercise oxygen uptake (relative VO_2 max, mL/kg/min) during a graded exercise test, and a validated neuropsychological

measure of processing speed, the Digit Symbol Substitution Test (DSST).

Participants and Methods: CRF, DSST scores, and WML volumes of cognitively normal adults (n=91) aged 55-80 years were included in this analysis. The WML data was corrected for total intracranial volume and was log transformed. A linear regression model included the number of accurately completed items on the DSST as the dependent variable and age, sex, relative VO₂ max, WML volumes and the interaction between relative VO₂ max and WML volume as the predictor variables.

Results: Main effects of age, sex, VO₂ max and WML volume on the DSST were observed. Greater age, higher WML volume, and lower relative VO₂ max were associated with poorer performance on the DSST. In addition, females (n=55) performed better than males (n=36) on the DSST. No significant interaction was observed between VO₂ max and WML volume on DSST scores.

Conclusions: Our results show that 1) WML and relative VO₂ max independently contribute to processing speed performance in older adults as measured by the DSST, and 2) WML do not moderate the relation between VO₂ max and the DSST. Strengths of this study include gold-standard measurement of CRF and WML volumes as predictors of performance on the DSST in older adults. Further research is warranted to understand how vascular aging and brain health indicators interactively or interdependently impact cognition in aging.

Categories: Aging

Keyword 1: aging (normal)

Keyword 2: information processing speed

Keyword 3: brain function

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36 Regional Amyloid and Memory in Amyloid Positive and Negative Older Adults

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Objective: Alzheimer's disease (AD) pathophysiology, including β -amyloid (A β), can be appreciated with molecular PET imaging. Among older adults, the distribution of A β standard uptake value ratios (SUVR) is typically bimodal and a diagnostic cut is applied to define those who are amyloid 'positive' and 'negative'. However, it is unclear whether the dynamic range of SUVRs in amyloid positive and negative individuals is meaningful and associated with cognition. Previous work by Insel and colleagues (2020) used screening data from the Anti-Amyloid Treatment in Asymptomatic Alzheimer's (A4) trial to demonstrate subtle associations between a cortical summary SUVR and cognition, particularly on the Free and Cued Selective Reminding Test (FCSRT). We followed up this study to determine the extent to which regional SUVR is associated with performance on the FCSRT in amyloid positive and negative participants screened for participation in the A4 study.

Participants and Methods: We accessed regional A β SUVR, including anterior cingulate, posterior cingulate, parietal, precuneus, temporal, and medial/orbital frontal regions, along with FCSRT15 and demographic data from 4492 A4 participants at screening. Participants were coded as amyloid positive (n=1329; 30%) or amyloid negative (n=3169; 70%) based on a summary SUVR of greater than or equal to 1.15. We used separate general linear models to examine the association of total or regional SUVR, amyloid positivity status, and the interaction of SUVR and amyloid status with FCSRT scores. We compared model fits across regions with the Akaike Information Criterion (AIC). We ran post hoc correlational analyses examining the relationship between SUVR and FCSRT scores stratified by amyloid status in the case of significant interactions. Results were similar with and without demographic adjustment.

Results: There was a significant interaction of summary and all regional SUVR with FCSRT scores in addition to main effects of amyloid positivity. In all models, there were small negative associations between SUVR and memory in amyloid positive individuals. For amyloid negative individuals, there was a significant and very small negative association