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Objective: Factors such as physical activity and sports participation may have a positive effect on executive functioning. However, people involved in sports are at a higher risk of experiencing a concussion, which may have a detrimental effect. Previous research has yet to investigate those combined negative and positive effects while also utilizing a comprehensive assessment of executive function. This study aims precisely to examine the effects of physical activity, athletic status and concussion history on subjective (e.g., questionnaire) and objective measures (e.g., latent variables) of three well-established components of executive function (i.e., inhibiting, shifting, and updating) in young adults.
Participants and Methods: 247 Canadian university students (ages 18 – 25; 83% female) completed a remote assessment of executive function involving nine computerized tasks and a behavioural self-report, in addition to demographic questionnaires and items assessing weekly physical activity, athletic status, and concussion history. A linear regression analysis was used to assess the effects of the predictor variables (age, sex, concussion history, physical activity and athletic status) on subjective reporting of executive functioning using the Executive Function Index. Furthermore, structural equation modelling (SEM) was used to predict objective executive function using a three-factor model (shifting, updating, inhibition).
Results: The three-factor measurement model of executive function fit the data adequately: $\chi2$ = 26.10, df = 17, p = 0.07, CFI = 0.97, TLI = 0.95, RMSEA = 0.05 [90% CI: 0.00–0.09], SRMR = 0.04. Then, the three-factor SEM of executive function also fit the data adequately: $\chi2$ = 66.38, df = 51, p = 0.07, CFI = 0.95, TLI = 0.93, RMSEA = 0.04 [90% CI: 0.00–0.06], SRMR = 0.05. Using SEM, no direct relationship was found between the factors of executive function and the predictor variables (i.e., age, physical activity, concussion history, and athletic status). Sex was significantly related to inhibition (b = 0.52, p = 0.02), such that males had greater inhibition. For the regression, physical activity (b = 0.09, p < .01), concussion history (b = 3.29, p < .05) and athletic status (b = -4.01, p < .05) were found to be significant predictors for the Executive Function Index.
Conclusions: Concussion history, physical activity, and athletic status were all predictive of subjective but not objective measures of executive function. Interestingly, these findings align with previous research that demonstrated performance-based executive function measures often do not align with self-report measures, which may suggest they are complementary but measure slightly different aspects of the underlying executive function construct. Mixed findings in the extant literature regarding sex differences and executive function require continued research to understand better the relationship and mechanisms behind the sex differences in inhibition. In summary, these findings offer support for the differentiation between subjective and objective measures of executive function when investigating their relationship with physical activity, sport participation, concussion history, age and sex.

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42 White matter injury is driven by HIV duration, immune and vascular factors in virally suppressed people living with HIV: a longitudinal diffusion imaging study

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Objective: The aim of the current longitudinal study was to use improved brain white matter integrity outcomes (better at resolving white matter complexity, hence with improved biological significance compared to traditional diffusion tensor imaging - DTI outcomes) while considering baseline age, cardiovascular diseases (CVD), and HIV disease markers impacts on the health of major white matter tracts in virally suppressed people Living with HIV infection (PLHIV) versus demographically, geographically, and life-style comparable HIV-negative controls. Furthermore, white-matter hyperintensity (WMH) and normal-appearing white matter (NAWM) volumes and microstructure were considered.

Participants and Methods: At baseline 48 HIV-controls and 84 virally suppressed PLHIV (mean age 55), and at 24-month follow-up, 40 HIV-controls and 75 virally suppressed PLHIV underwent an MRI scan (3T Phillips) collecting a high-resolution anatomical MRI, FLAIR, and a 32-direction diffusion imaging. The diffusion data were processed using mrtrix and intra-cranial volume-corrected outcomes included fibre density (FD), fibre cross-section (log was used; logFC) and a composite fibre density and cross-section (FDC). The volumetric data was first processed in Freesurfer 6.0, and WMH were segmented using the "pgs" U-Net neural network. Using mixed models, we examine the longitudinal mrtrix outcomes across major white matter tracts by HIV status, and associations with CVD (sum of the scaled scores of total cholesterol, HDL, Systolic BP, current smoking, and diabetes) and HIV disease (HIV duration, historical AIDS, nadir CD4, baseline CD4) markers. Additionally, we assessed the volume, and FDC in the periventricular and deep WMH, as well as NAWM, and the associations with CVD and HIV disease markers. We used FDR control procedure (alpha = 0.05), and all p-values reported are FDR adjusted.

Results: Relative to controls, PLHIV showed significant reductions ($p<.05$ - $p<.01$) of FC, and FDC to a lesser extent, in multiple long cortical association tracts, and within striatal- and thalamic-frontoparietal connections. A small HIV by age interaction was only detected for FC of inferior longitudinal fasciculus (Beta = -0.004, SE = 0.002 $p<.04$). However, HIV duration (corrected for baseline age) was associated with worse FDC across multiple tracts ($p<03$ – $p<.001$). Baseline CD4 counts associated with lower FD in frontal association tracts ($p<.05$ – $p<.005$). Furthermore, WMH increased in size

with time, age, and higher CVD risk factors, but not HIV status. In PLHIV, deep WMH and NAWM microstructure were both associated with worse CVD but not HIV disease markers.

Conclusions: The fine integrity of major white matter tracts is impacted by HIV status, HIV duration and baseline CD4, whereas WMH and NAWM volumes and microstructure are affected by CVD. Our study provides further evidence of the immuno-vascular underpinning of HIV neuropathogenesis in virally suppressed PLHIV. The convergence of these effects in aging PLHIV may lead to early neurodegeneration. Hence, improving CVD health and maintaining high CD4 is critical.

Categories: Infectious Disease (HIV/COVID/Hepatitis/Viruses)
Keyword 1: HIV/AIDS
Keyword 2: cardiovascular disease
Keyword 3: neuroimaging: structural
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43 Application of the Moroccan Arabic Bedside Western Aphasia battery-Revised in Acute Stroke Care

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Objective: Despite the prevalence of aphasia in Morocco, standardized quick assessment tools are not available for use with patients in acute stroke care. The present study set out to (1) describe the processes of linguistic adaptation of a Moroccan Arabic (MA) version of the Bedside Western Aphasia Battery-Revised (WAB-R), (2) examine the test's sensitivity to the detection of aphasia in an acute clinical setting, and (3) measure the instrument's ability to detect improvement in language ability in the acute period.

Participants and Methods: To achieve the first objective, the English Bedside WAB-R was adapted to Moroccan Arabic by a group of