

ARE CEREBROVASCULAR FACTORS ASSOCIATED WITH INTRINSIC CAPACITY TOWARDS DEMENTIA PREVENTION IN AFRICAN POPULATIONS?

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BACKGROUND

- Dementia prevention demands scalable markers that capture both brain integrity and functional health.
- Intrinsic Capacity (IC) provides a multidomain framework for assessing functional health and captures an individual's reserve encompassing 5 domains; cognitive, psychological, locomotor, vitality, sensory domains.
- IC offers a framework for identifying risk and monitoring resilience in aging populations.
- Cerebral small vessel disease, reflected by white matter hyperintensities (WMH), and other markers of cerebrovascular burden are common but poorly linked to IC especially in Africa.

OBJECTIVE

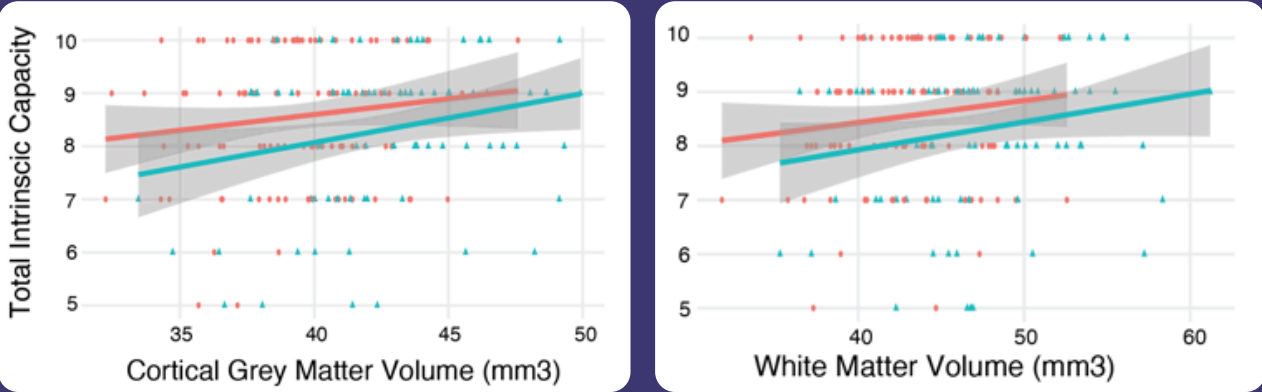
This study evaluates the association between neuroimaging markers of cerebrovascular disease and IC in an African population, where unique social and health contexts shape dementia risk and protective pathways.

METHODOLOGY

- Data from the Brain Resilience Kenya Study was employed (N=192, 56%female (1 intersex), mean-age: 50.5±11.5years).
- IC was assessed and categorized into two groups following WHO ICOPE guidelines: declining/unstable intrinsic capacity (0–8), and high/stable capacity (9–10).
- For the purpose of this study, each IC domain was assessed as follows:
 - i. Cognitive domain - Identification and Intervention for Dementia in Africa (IDEA) cognitive screening measure;
 - ii. Vitality domain - Nutrition/malnutrition using the 3-item Mini-Nutritional Assessment (MNA)
 - iii. Sensory domain - Vision was assessed using the WHO eyes test and hearing with the Whisper Test.
 - iv. Locomotion domain - Short physical performance battery tests (SPPB);
 - v. Psychological domain - depression was measure using PHQ-9 tool.
- MRI correlates of ADRD were derived from clinical radiologic data and included:
 - i. White matter hyperintensities, infarcts and hemorrhages captured as Fazekas scores.
 - ii. Quantitative derivation of whole-brain white and grey matter volumes, after adjusting for age, sex, and intracranial volume (Freesurfer v. 7.4.1).

II. GREY AND WHITE MATTER VOLUMES AND INTRINSIC CAPACITY

In addition, greater whole-brain white and grey matter volumes were significantly associated with higher intrinsic capacity (white matter: $p=0.0220$; grey matter: $p=0.0207$), after adjustment for age, sex, and intracranial volume.



CONCLUSION

Collectively, these findings demonstrate that both vascular burden and reduced global grey and white matter volume are associated with lower intrinsic capacity in this cohort of healthy cognitively unimpaired adults.

Intrinsic capacity is significantly associated with MRI markers of both cerebrovascular burden and global brain structural integrity in this African cohort.

These findings contribute novel evidence from sub-Saharan Africa, supporting the integration of IC and MRI measures for early dementia risk stratification.

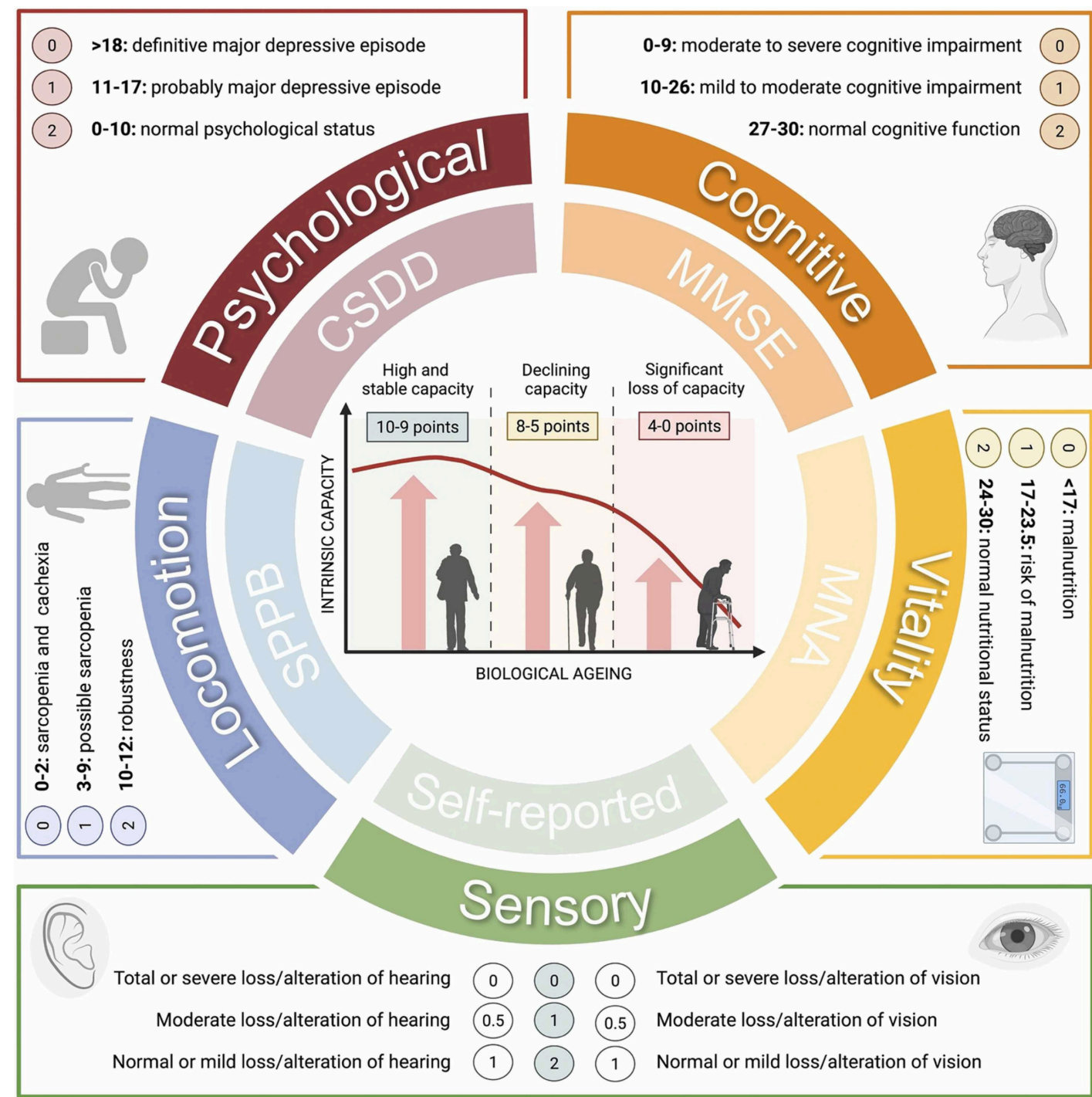
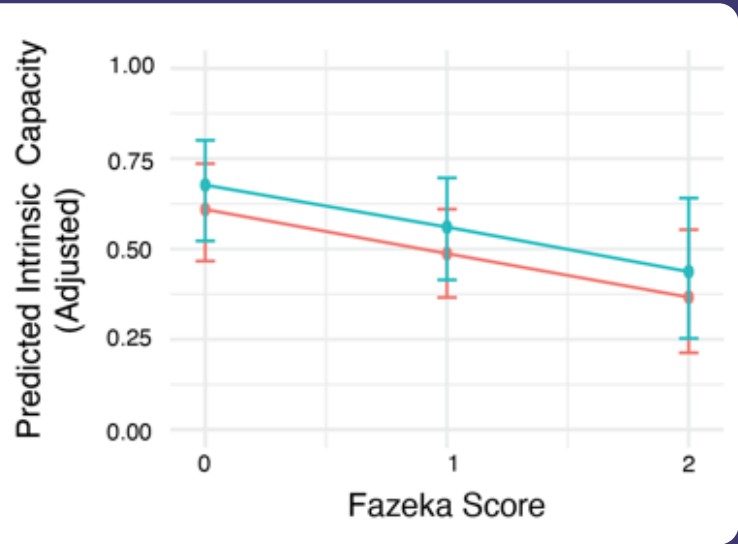


Fig. 1. A proposed approach for the assessment of intrinsic capacity (IC) in older people (Susana López-Ortiz et. al (2022). Abbreviations: CSDD, Cornell scale for depression in dementia; MMSE, mini mental state examination; MNA, mini nutritional assessment; SPPB, short physical performance battery. (<https://doi.org/10.1016/j.arr.2022.101640>)

RESULTS

I. FAZEKA SCORE AND INTRINSIC CAPACITY



Higher Fazekas score was significantly associated with lower intrinsic capacity. Each 1-point increase in Fazekas score was associated with 1.64-fold higher odds of low intrinsic capacity (OR 1.64, 95% CI 1.04–2.62; $p=0.0338$), independent of age, sex, and intracranial volume.

REFERENCES

