

Physical Activity And Cognition Across Diverse Populations In Eighteen Countries

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TAKE HOME-MESSAGE: Physical activity was consistently associated with lower odds of cognitive impairment across diverse populations.

Introduction

Physical activity (PA) is associated with neuroprotective effects and a reduced risk of cognitive decline. However, evidence across diverse global populations remains limited. We examined the association between harmonized PA categories and cognitive impairment across seven large aging cohorts from Brazil, China, South Africa, Colombia, Europe, the United States, and India.

Methods

We conducted a pooled cross-cohort analysis including 227,392 participants from seven aging cohorts in Brazil (ELSI), China (CHARLS), South Africa (HAALSI), Colombia (SABE), Europe (SHARE), the United States (HRS), and India (LASI). Physical activity (PA) was harmonized into four categories (sedentary, insufficiently active, moderately active, and highly active) based on WHO 2020 guidelines. Cognitive impairment was defined as a cohort-specific global cognitive z-score < -1.5 SD. Multivariable logistic regression models estimated associations between PA categories and cognitive impairment, adjusting for age, sex, and cohort.

Results

Among 135,625 participants with complete data, all physical activity categories were associated with lower odds of cognitive impairment compared with sedentary individuals. Older age was independently associated with increased odds of impairment.

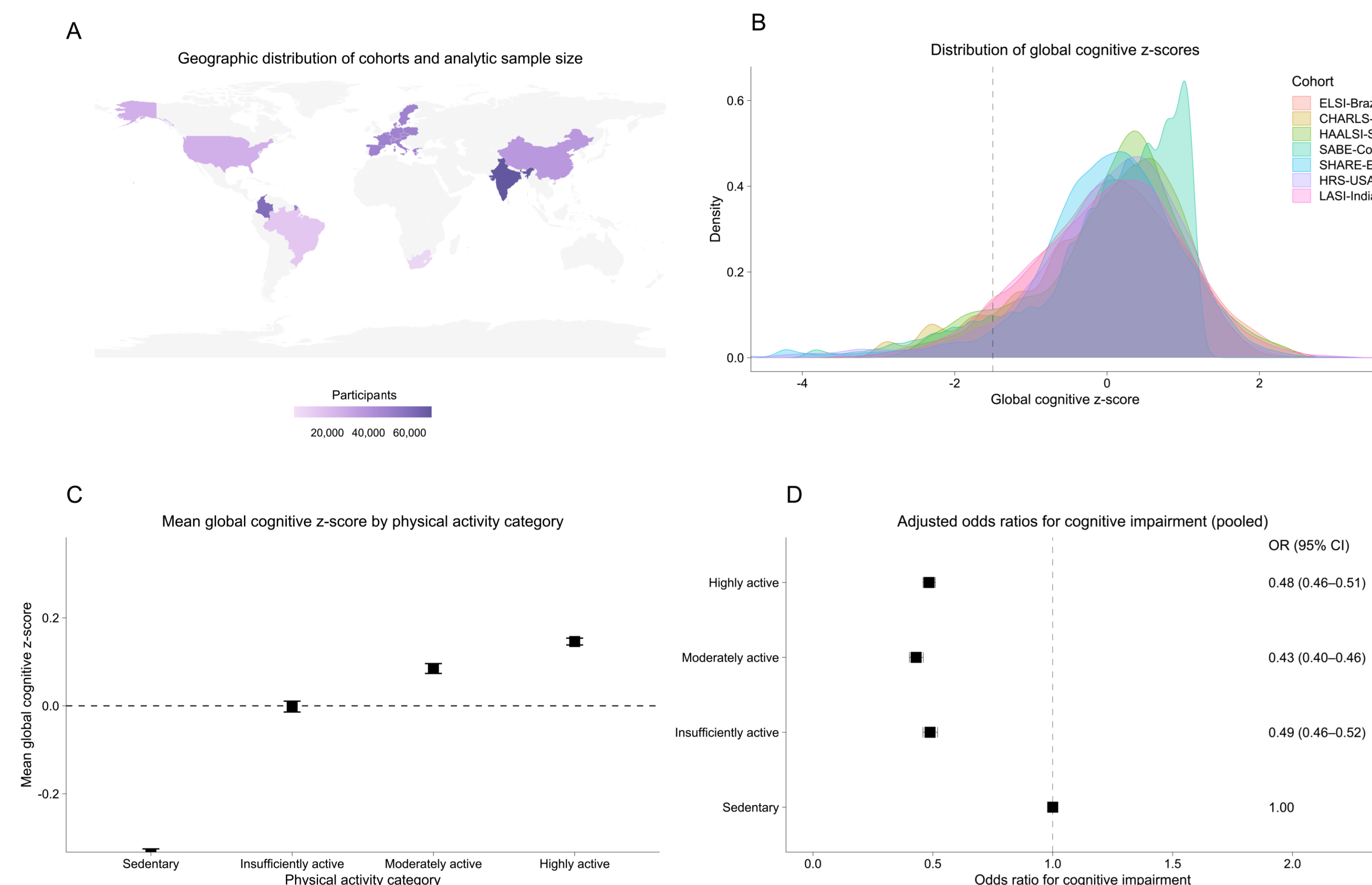


Figure 1. Physical activity and cognitive impairment across international aging cohorts. (A) Geographic distribution of cohorts and analytic sample size. (B) Distribution of global cognitive z-scores. The dashed line indicates the threshold for cognitive impairment ($z < -1.5$). (C) Mean global cognitive z-scores by physical activity category with 95% confidence intervals. (D) Adjusted pooled odds ratios (95% CI) for cognitive impairment. Models were adjusted for age, sex, and cohort.

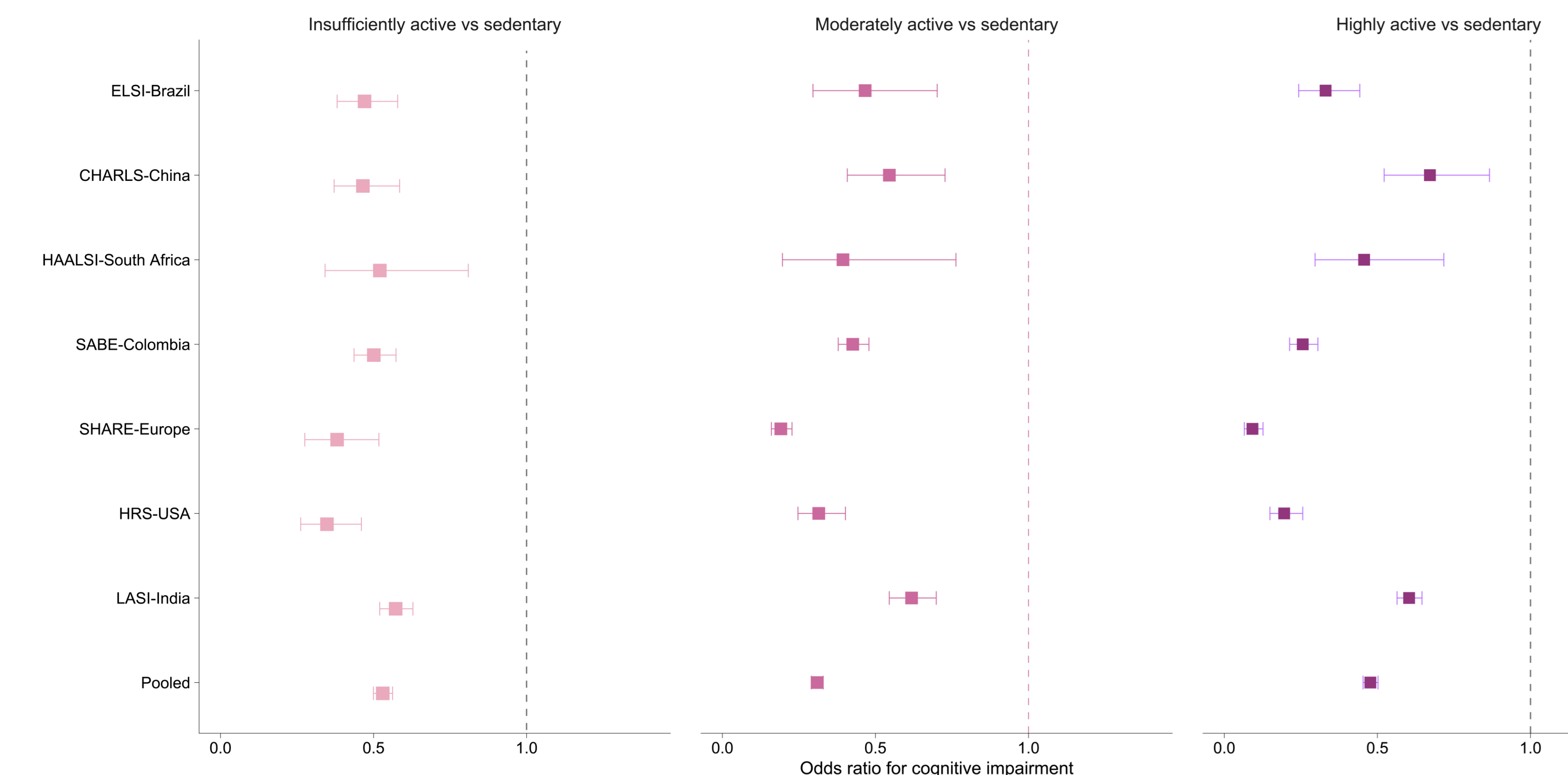


Figure 2. Adjusted odds ratios for cognitive impairment according to physical activity level across cohorts.

Conclusion

Across 18 countries, any level of PA was associated with lower odds of cognitive impairment. These findings highlight physical activity as a key modifiable determinant of cognitive health and support public health strategies to reduce sedentary behavior and promote regular activity.

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