

Protective Effects Of Physical Activity Against Cognitive Impairment In A Nationwide Brazilian Cohort

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TAKE HOME-MESSAGE: Any level of physical activity was associated with lower odds of cognitive impairment compared with sedentary behavior.

Introduction

Alzheimer's disease (AD) is a leading cause of cognitive impairment (CI) worldwide. Physical inactivity is a potentially modifiable risk factor for cognitive decline, yet evidence from middle-income countries remains limited. We investigated the association between physical activity (PA) levels and CI in a nationally representative Brazilian aging cohort.

Results

Compared with sedentary participants, higher levels of PA were associated with lower odds of CI (Figure 1). Insufficiently active and moderately active participants had similarly lower odds of CI (OR = 0.47, $p < 0.001$ for both), whereas highly active individuals exhibited the lowest odds (OR = 0.33, $p < 0.001$). Increasing age was independently associated with higher odds of CI (OR = 1.03 per year, $p < 0.001$). CI prevalence decreased progressively across PA categories, from 11.5% among sedentary participants to 3.9% among highly active individuals (Figure 2). More active participants also exhibited consistently higher global cognitive scores across age (Figure 3).

Physical activity and odds of cognitive impairment

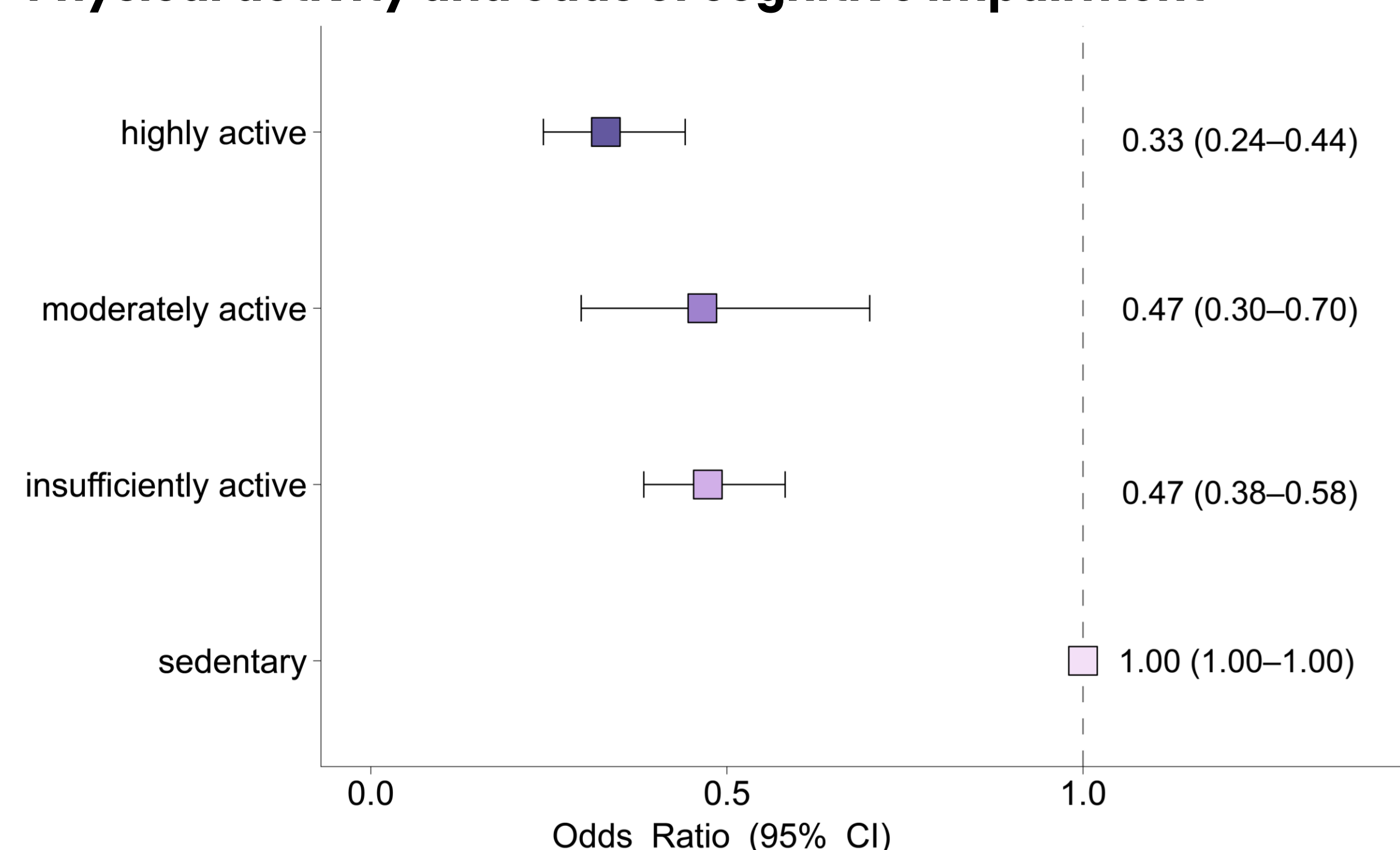


Figure 1. Adjusted odds ratios (95% CI) for cognitive impairment according to physical activity level. Models were adjusted for age and sex. Sedentary participants served as the reference group.

Prevalence of cognitive impairment by physical activity level

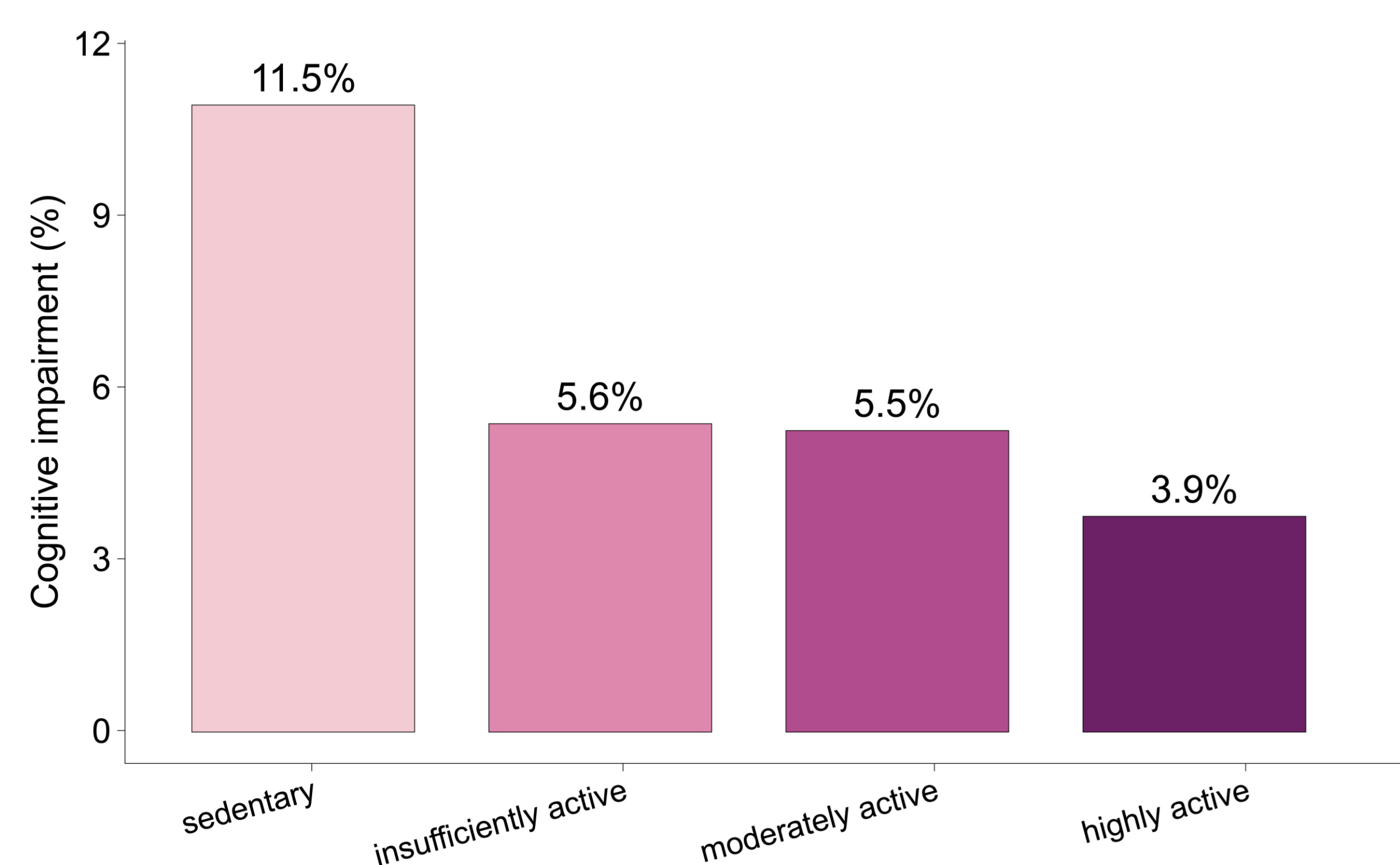


Figure 2. Prevalence of cognitive impairment by physical activity level. Cognitive impairment was progressively less frequent among participants reporting higher levels of physical activity.

Global cognition across age by physical activity level

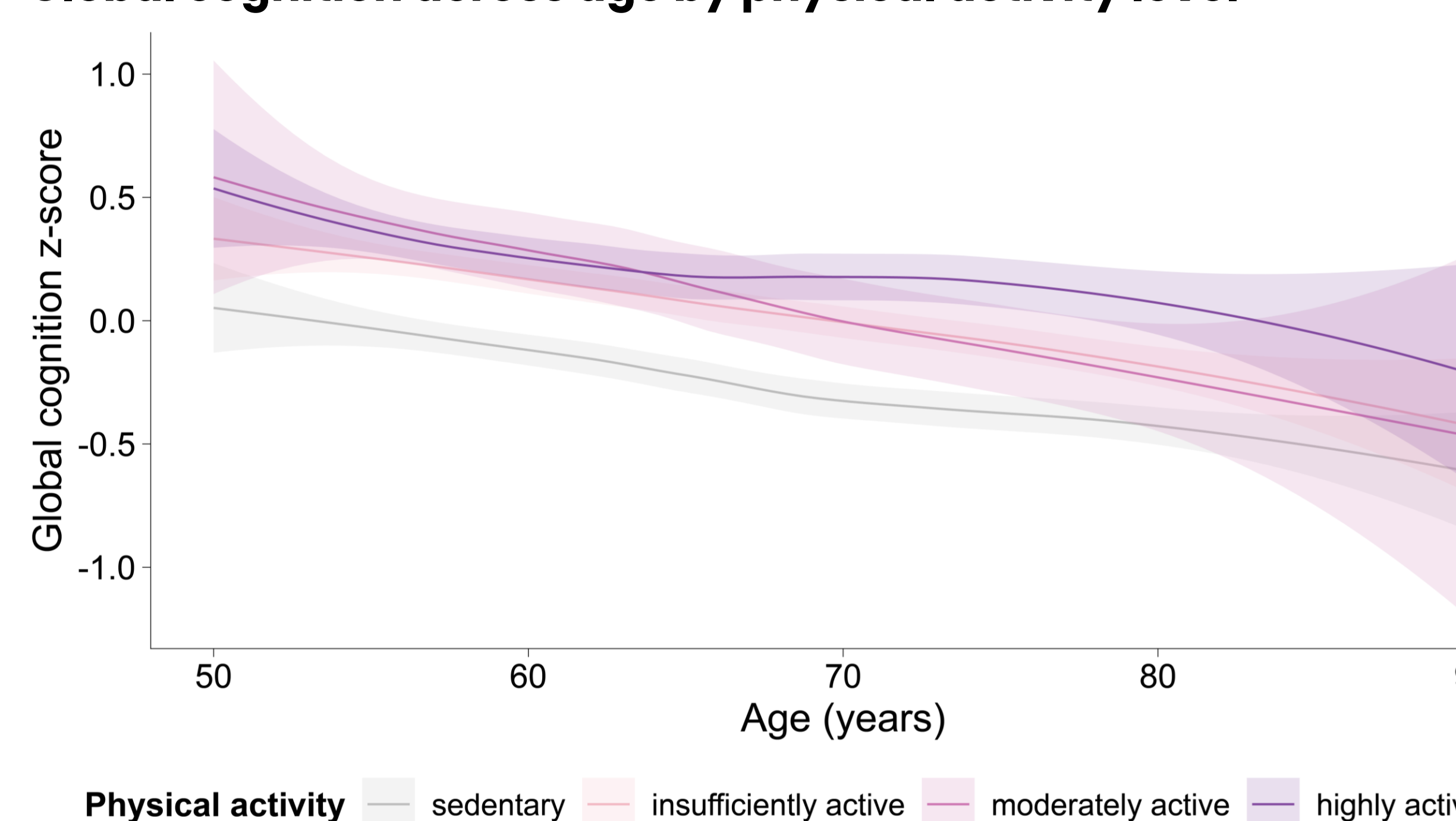


Figure 3. Global cognitive performance across age according to physical activity level. LOESS-smoothed curves with 95% confidence intervals are shown. Higher physical activity levels were associated with higher cognitive scores across the aging spectrum.

Methods

Study population:

- ELSI-Brazil 2019

Participants:

- Interviewed: $n = 9,808$
- Included: $n = 7,378$

Physical Activity criteria:

- WHO 2020 classification
- Sedentary
- Insufficiently active
- Moderately active
- Highly active

Outcome

- Cognitive impairment
- Global cognition z-score < -1.5 SD

Analysis

- Logistic regression
- Adjusted for age and sex

Conclusion

Higher physical activity levels were consistently associated with better cognitive outcomes in this nationally representative Brazilian aging cohort. Even activity levels below current WHO recommendations were associated with substantially lower odds of cognitive impairment compared with sedentary behavior. These findings reinforce physical activity as a key modifiable factor for cognitive health and support public health strategies aimed at reducing sedentary behavior among older adults.

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Acknowledgments

