

Racial inequities in dementia frequency persist across the educational spectrum: Findings from the ELSA-Brasil study

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INTRODUCTION

Educational attainment is a primary component of cognitive reserve, yet its protective effects may not be distributed equally across different racial groups due to systemic factors. This study investigated whether the protective association between education and dementia frequency varies across racial groups.

METHODS

We analyzed data from 5,996 participants aged 60 years and older from Wave 3 of the ELSA-Brasil. Dementia was classified via an algorithmic approach requiring both cognitive impairment (≤ -1.5 SD in ≥ 2 neuropsychological tests or MMSE below educational cutoffs) and functional impairment (difficulty in ≥ 1 instrumental activity of daily living), or use of dementia-specific medications. The association between education and dementia was modeled using logistic regression. To avoid assuming that the association between education and dementia is linear, we used Restricted Cubic Splines (RCS) with four knots (placed at the 5th, 35th, 65th, and 95th percentiles of educational distribution, following Harrell’s recommendations) to follow the actual data distribution. We included an interaction term between the education variable and race in the model with splines to test if the protective association of education differed by racial group, while adjusting for age and sex.

CONCLUSIONS

While education provides a robust and linear protective effect against dementia, it does not mitigate the independent risk associated with race in Brazil. These results suggest that educational attainment alone is insufficient to overcome the cumulative impact of racial inequities on cognitive health in older age.

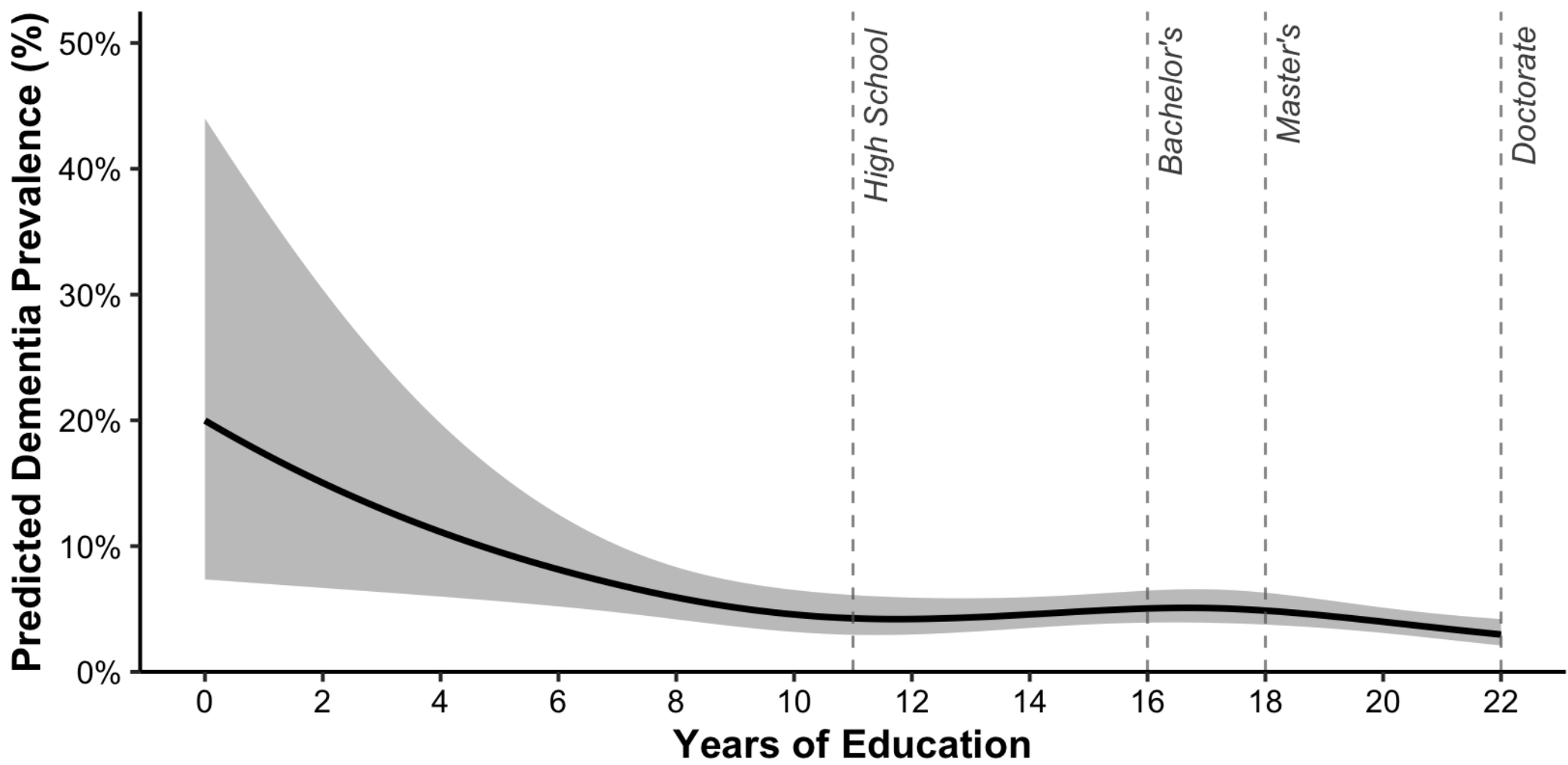
RESULTS

Among participants aged 60 and older (Table 1), dementia frequency was 6.6% (95%CI = 6.0-7.3). Education was associated with lower dementia frequency (Wald $\chi^2 = 25.02$, $p = 0.003$). The protective effect of education follows a consistent linear trend rather than having plateaus at specific stages ($p = 0.308$) (Figure 1). Within the same level of education, Black/Pardo individuals had 50% higher odds of dementia compared to White individuals (OR = 1.50; 95% CI: 1.01–2.24). The interaction between race and education was not significant ($p = 0.491$), suggesting that even at the highest levels of education, the racial disparity in dementia frequency remains largely unchanged.

Table 1. Descriptives characteristics

Characteristic	N = 5,996 ¹
Age (years)	67.3 (5.7)
Sex (Women)	3,372 (56%)
Education (years)	15.1 (5.2)
Race/Color	
White	3,297 (56%)
Black/Pardo	2,368 (40%)
Other	246 (4.2%)
¹ n (%); Mean (SD)	

Figure 1. Restricted cubic spline plot of the association between educational attainment and predicted dementia prevalence.



Legend: Non-linear association between years of education and predicted dementia prevalence. The solid line represents the predicted probability from the logistic regression model using restricted cubic splines, and the shaded area indicates the 95% confidence interval. Vertical dashed lines represent educational milestones.

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