

EPIDEMIOLOGY

Risk and protective factors for cognitive decline in lower educated older adults with 15-year follow-up

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Email: fabiana.ribeiro@uni.lu**Abstract**

Background: Studies have identified modifiable risk factors for both prevalence and incidence of cognitive impairment in lower educated older adults. However, patterns of cognitive change, and risk and protective factors for declining versus stable cognitive trajectories have rarely been described in this population. Our goal was to explore the long-term trajectories of cognitive function and identify modifiable risk and protective factors for cognitive decline beyond education.

Method: We applied group-based trajectory modelling and multinomial logistic regressions to explore possible trajectories and associated baseline factors on data from a population-based Health, Welfare and Aging (SABE) survey collected in 2000, 2006, 2010, and 2015 in Sao Paulo, Brazil. Cognitive functioning was assessed using the abbreviated Mini-Mental State Exam. A total of 354 respondents aged 60 + participating in all follow-ups were included in the statistical analyses.

Result: Group-based trajectory modelling identified three different cognitive trajectories, specifically groups with stable (37.4%), declining (53.8%), and strongly declining (8.8%) trajectories, with the last one reaching the threshold for cognitive impairment (Figure 1). Socioeconomic status, specifically living in rural areas during childhood and no schooling or primary education, as well as self-identified race was systematically different between the groups (Table 1). Moreover, respondents in the stable trajectory were more likely to report living in urban areas, more than primary education, to be white, to earn more than four times the minimum wage/month, to practice manual work, craft or artistic activity at least once a week, and less likely to have had stroke or be widowed. On the other hand, those in the strongly declining trajectory were more likely to be black or mixed and smoke at baseline.

Conclusion: Our findings suggest substantial potential for modification of risk of cognitive decline even in lower educated older individuals at risk for cognitive impairment. Risk factors related to self-identified race/ethnicity and socioeconomic status suggest systematic inequalities in brain health potential, with risk for later-life cognitive impairment. Sample attrition suggests conservative estimates of the magnitude of the risk factors for cognitive decline. Health and social policies should address inequalities to improve later-life cognitive function of at-risk individuals.

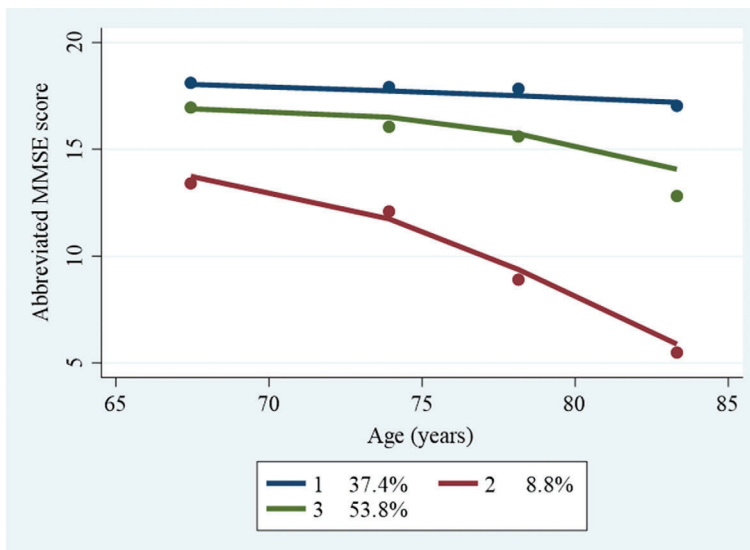


Figure 1. Trajectories of cognitive change among 354 Brazilian elderly individuals across 15 years of follow-up in the SABE study; 1 – stable, 2 – strongly declining, 3 – declining.

Table 1. Demographic characteristics for the three trajectories groups.

%	Stable trajectory (n= 125)	Strongly Declining trajectory (n= 31)	Declining trajectory (n= 198)	χ^2 (2) or F (2,351)
Age – M (SD)	67.4 (0.53)	66.9 (1.07)	67.5 (0.42)	0.89
Women	66.4	77.4	70.7	0.45
<i>Self-identified race</i>				
White	84	35.5	64.7	< .001
Mixed	9.6	41.94	19.4	
Black	1.6	19.4	5.1	
Other	4.8	3.2	5.1	
<i>Socioeconomic status</i>				
<i>Education</i>				
No schooling	0.8	38.7	24.2	< .001
Primary schooling	60.8	61.3	75.3	
More than primary schooling	38.4	0	0.51	
House ownership (yes)	89.6	93.6	85.4	0.30
<i>Number of wages</i>				
1-2 wages	13.7	60.9	28.4	
2-3 wages	19.6	4.4	22.3	
3-4 wages	5.9	17.4	8.1	
wages > 4	46.1	17.4	30.4	
Not lived in rural areas during childhood	60	16.1	22.2	< .001
<i>Cardiovascular risk factors</i>				
No hypertension	48.8	41.9	50.8	0.65
No diabetes	87.2	77.42	81.44	0.27
No heart disease	84.8	83.9	89.3	0.40
No stroke	98.4	87.1	94.5	0.02
<i>BMI</i>				
<18.5	0.9	3.3	1.1	0.76
18.5 – 24.9	30.8	40	33.3	
25 – 29.9	41.9	40	38.1	
≥ 30	26.5	16.7	27.5	
<i>Alcohol consumption</i>				
No	56.8	77.4	70.2	0.08
At least 1 time per week	26.4	22.6	20.2	
2-6 times per week	11.2	0	6.1	
Everyday	5.6	0	3.5	
<i>Smoking</i>				
Never	68.0	54.8	65.2	0.13
Smoked before	27.2	25.8	25.8	
Currently Smoker	4.8	19.4	9.1	
<i>Physical activity</i>				
No	60.8	67.7	71.7	0.12
<i>Artistic activities</i>				
No	48.0	70.9	74.8	< .001
<i>Economic situation before age of 15 years</i>				