

Does Oral Health Predict Cognitive Decline among Older Adults? From the Health and Retirement Study

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Background

Oral health is an important component of health. Poor oral health has been shown to be an indicator of lower quality of life,¹ and has also been shown to be associated with multiple health conditions, such as diabetes,² heart disease,³ and depression.⁴

Increasing evidence from longitudinal studies have shown some level of associations between oral health and cognitive outcomes.⁵ However, previous studies were limited in:

- (1) Most of them used binary measures of cognitive function by "with/without dementia", instead of examining the change of cognitive function over time;
- (2) Previous studies often examined one oral health outcome, such as periodontitis, or tooth loss;
- (3) There is racial disparities in oral health,⁶ and the rate of decline in cognitive function may differ across different groups.⁷ However, there was a lack of understanding of the potential differences in the associations between oral health and cognitive decline over time across racial groups.

Aims

1. To examine the associations between oral health and cognitive decline over time among non-Hispanic white older adults;
2. To examine the associations between oral health and cognitive decline over time among the African American older adults;
3. To compare and contrast the racial differences in the associations between oral health and cognitive decline over time.

Methods and Materials

The sample included older adults aged 65 years and above in the Health and Retirement study who (1) were enrolled in the 2008 wave; (2) were followed up in 2010 and 2012 waves; and (3) completed both cognitive measure and the 2008 oral health module.

Oral health: Three indicators: edentulism (yes/no), overall mouth conditions (range: 1-5), and self-rated oral health (range: 1-5).

Cognitive function: was measured by the HRS/AHEAD cognitive battery in each wave.

Control variables: sociodemographic (gender, marital status), socioeconomic (education, household income), and health factors (depression, number of medical conditions, number of physical difficulties).

Weighted descriptive and growth curve analyses (age model) were performed.

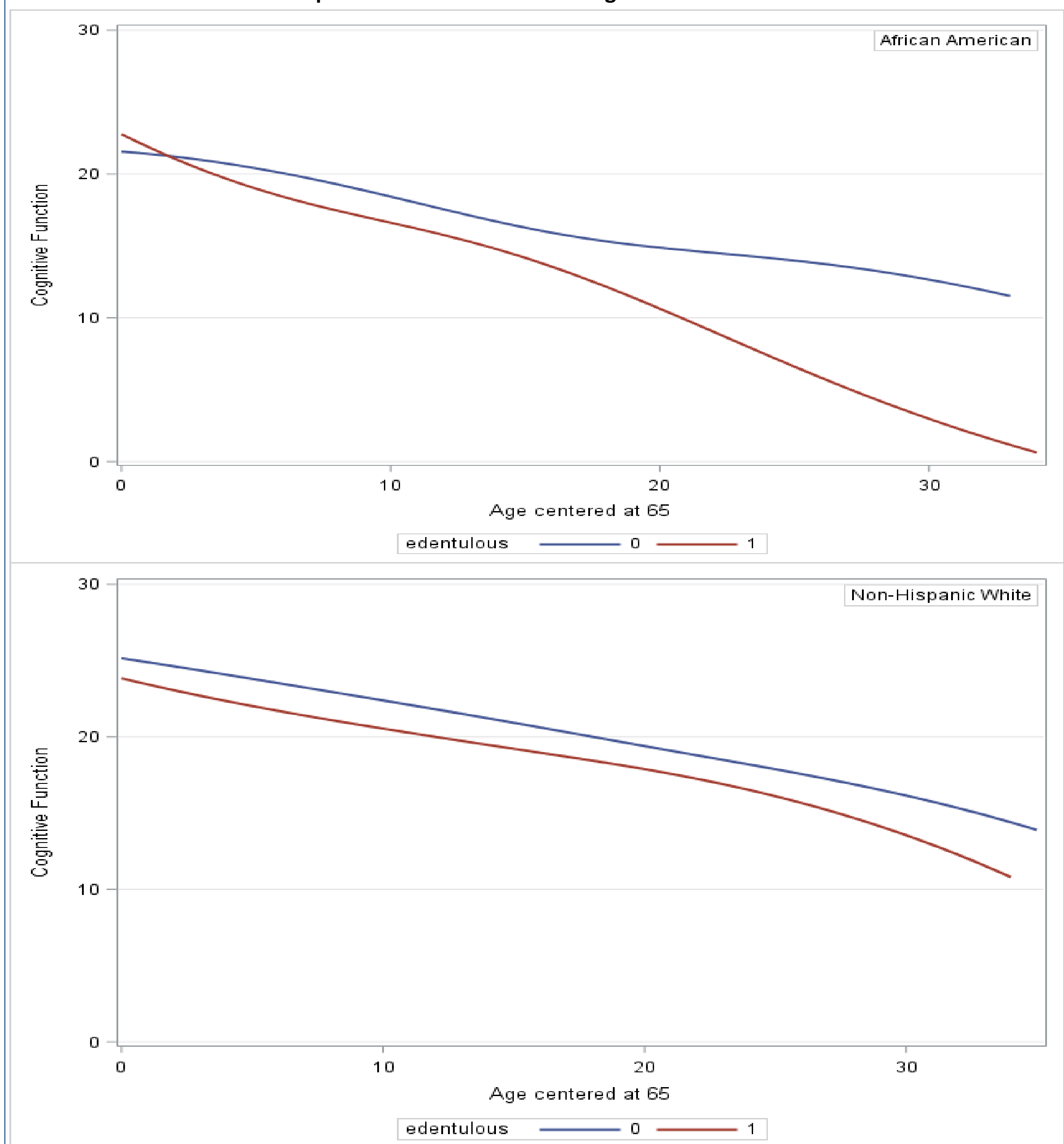
Table 1. Descriptive statistics

Variable name	All (Percentage)	White	Black	p
Sample Size	925	781(88.5)	110(7.8)	
wave				
2008	925	781	110	
2010	859	702	90	
2012	815	622	77	
Age at 2008	74.4(0.3)	74.42(0.30)	73.71(0.88)	
<75 (0)	499(54.4)	412	69	
75-85(1)	326(34.9)	285	26	
>85(2)	100(10.7)	84	15	
Gender				
Male (1)	387(42.6)	343	33	
Female(0)	538 (57.4)	438	77	
Overall mouth condition		1.65(0.03)	1.88(0.09)	0.01
Self-rated oral health		2.99(0.03)	2.68(0.12)	0.01
Poor(1)	74(7.5)	56	13	
Fair (2)	185(20.3)	145	30	
Good	382(41.8)	329	39	
Very good(4)	284(30.4)	251	28	0.01
Edentulous				
Yes(1)	203(20.3)	157	32	
No(0)	722(79.7)	624	78	0.03
Cognition				
2008 cognition	21.932(0.199)	22.46(0.20)	17.77(0.64)	0.0001
2010 Cognition	21.175(0.198)	21.47(0.20)	18.00(0.79)	0.0001
2012 cognition	20.870(0.248)	21.20(0.26)	17.46(0.91)	0.0001

Results

For edentulism condition, there were no significant difference in level of cognitive function at baseline between edentulous and non-edentulous older adults from either non-Hispanic White or African American population. African American older adults who were edentulous at age 65 had a faster rate of cognitive decline as they grew older ($\beta = -0.337$, $p < .05$), compared to those who were not edentulous at age 65. However, this faster decline rate was not seen in their white counterparts ($\beta = -0.024$, $p > .05$).

Chart 1. Predicted relationship between oral health and cognitive function over time



For overall mouth condition, non-Hispanic whites who had worse overall mouth condition at age 65 also had significantly worse cognitive function ($\beta = -0.889$, $p < .05$) compared to those who had better overall mouth condition at age 65. However, this difference was not found among African American older adults ($\beta = 0.522$, $p > .05$).

For self-rated oral health, there were no significant differences in neither level of baseline cognitive function nor the rate in cognitive decline, regardless of race ($p > .05$).

Discussion and Conclusion

This study suggests that community-dwelling African American older adults with worse oral health have faster deterioration of cognitive function over time.

Non-Hispanic white and African American older adults showed different patterns in the associations between oral health and cognitive function. This study provides a preliminary knowledge base that oral health can be a potential modifiable risk factor for cognitive decline.

This study highlights the importance of developing early intervention strategies to protect and promote oral health as for the purpose of decelerate cognitive decline, especially among African American population.

Limitations

1. Cognitive function data of 2014 is now available
2. Measure of oral health is self-reported

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