Title: Regional Disparities in Educational Attainment and Its Impact on Cognitive Health in Western and Eastern Africa

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Background

Education is a crucial social determinant of health, influencing opportunities, socioeconomic status, and health outcomes. Regional disparities in educational attainment and their effects on cognitive health are especially notable in low- and middle-income countries (LMICs), where access to education and healthcare varies widely. This study explores the role of education in health disparities, focusing on two distinct African regions—Western and Eastern Africa—using data from the U19 DAWN Study.

Methods

This cross-sectional study analyzed data from Western Africa (n=756) and Eastern Africa (n=689). Variables included early-life learning disability, special education participation, educational attainment (None, Elementary, High School, College, Graduate/Professional), and cognitive health diagnoses (Non-Cognitively Impaired, MCI, AD, Dementia, Other or No Diagnosis). A Wilcoxon rank sum test assessed differences in educational attainment between cognitive diagnostic groups. Logistic regression with a logit link function examined the relationship between years of education and the likelihood of a primary diagnosis of Alzheimer's Disease or Dementia.

Results

In the Eastern region sample, the Wilcoxon rank sum test revealed a significant difference in education levels between individuals with and without a cognitive health diagnosis (W=68233, p<0.001). Logistic regression showed that education was a significant predictor of diagnosis ($\beta=-0.04891$, SE=0.01641, z=-2.980, p=0.00288). Higher education levels were associated with lower odds of a cognitive health diagnosis. The model fit was reasonable, with a residual deviance of 927.65 and an AIC of 931.65.

In the Western region sample, the Wilcoxon rank sum test also showed a significant difference in education levels between individuals with and without a cognitive health diagnosis (W=81364, p=0.02669). Logistic regression confirmed that years of education significantly predicted

diagnosis status (β=−0.02640, SE=0.01076, z=−2.454, p=0.0141), with higher education linked to lower odds of being diagnosed with a cognitive health diagnosis. The model fit was adequate, with a residual deviance of 1060.2 and an AIC of 1064.2.

Conclusion
These findings emphasize the protective role of education against cognitive decline in both regions.