A Path Analysis of Patient and Social-Level Factors on Health Literacy and Retention in Care Among African Americans Living with HIV

Ashley N. Anderson, PhD, RN[1]; Regine Haardörfer, PhD[2]; Marcia Holstad, PhD, FNP-BC, FAANP, FAAN[1]; Minh Ly T. Nguyen, MD, MPH[3]; Drenna Waldrop-Valverde, PhD[1]

[1] Emory University Nell Hodgson Woodruff School of Nursing, Atlanta GA; [2] Rollins School of Public Health, Emory University, Atlanta, GA; [3] Division of Infectious Diseases, School of Medicine, Emory University, Atlanta, GA

Background

Although African Americans comprise only 12% of the United States population, African Americans represent the greatest proportion of persons diagnosed and living with HIV among all racial and ethnic groups.

Retention in care refers to whether an individual attends regularly scheduled HIV appointments. Compared to White and Hispanic/Latino populations, retention in care among African Americans is five and two percent lower, respectively.

Poor retention in care is a contributor to the morbidity and mortality of HIV among African Americans and is one of the most significant predictors of antiretroviral treatment failure, elevated HIV viral load, and decreased CD4 T-cell count.

Preliminary evidence suggests that health literacy—the ability to access process and use health information—may contribute to disparities in health outcomes among African Americans living with HIV. Health literacy is 20% lower among African American adults than White adults.

Evidence is emerging regarding causal pathways linking health literacy to health outcomes among disparate populations, but no studies have examined these pathways for retention in care among racially disparate persons living with HIV.

This research adapted Paasche-Orlow and Wolf's health literacy model to inform relationships among health literacy, retention in care, HIV clinical outcomes, and sociodemographic indicators of health literacy.[1]

Purpose

The purpose of this study is to utilize an adapted health literacy model to evaluate the effect of health literacy on retention in care and its subsequent effect on racial disparities and HIV clinical outcomes.

Methods

Procedures
This study is ancillary to a non-experimental longitudinal parent study involving 699 participants. Participants were recruited from four outpatient HIV clinics in metro-Atlanta, Georgia from 2012 to 2015. This study collected retention in care and HIV viral load data 24-months post baseline from electronic medical records.

Main Variables of Interest

Short Test of Functional Health Literacy (S-TOFHLA)[2]

- 2 prose passages measure reading comprehension and includes 36 items.
- 4 numeracy items measure ability to understand and work with numbers.
- Scored as cumulative percent correct for both portions.

Visit Adherence[3]

$$\frac{\text{Kept HIV Appointments}}{\text{Scheduled HIV Appointments}} \times 100\%$$

All outpatient appointments with an HIV primary care provider who has prescribing authority.

100% visit adherence vs. < 100% visit adherence

Insurance used as a proxy for socioeconomic status (SES)—"not low SES" = private/commercial insurance or self pay; "low SES" = Ryan White; "very low SES" = Medicare/Medicaid. Cognitive function calculated as a T-score for the Hopkins Verbal Learning Test Revised and the Color Trails Test 1 and 2. Viral suppression defined as HIV-1 RNA <2.3 $\log_{10}$ (200 copies/mL).

Statistical Analysis
We removed participants from the data set if they had no scheduled HIV appointments during the 24-month post baseline period, were missing HIV viral load data, or had a total number of scheduled appointments that was 3 standard deviations above the mean (outliers). We performed multiple imputation for variables with missing data and conducted path analysis using theta parameterization. The path analysis controlled for the effect of age, sex, and sexual orientation on S-TOFHLA and for the effect of age on viral load.

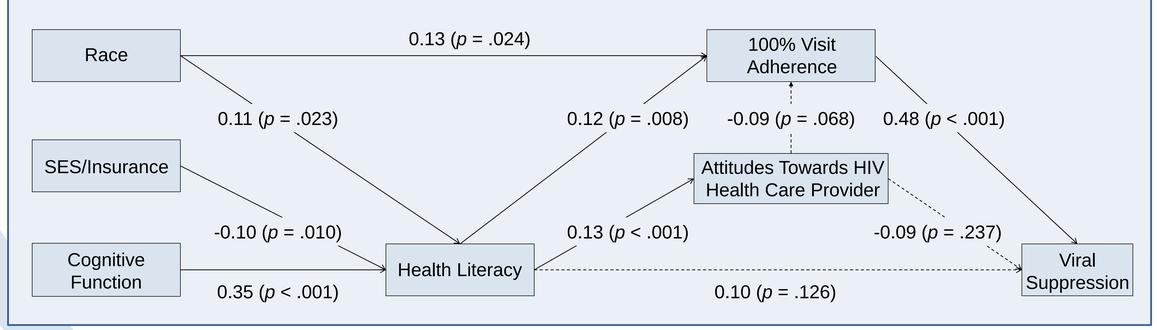
Results

Participant Demographics (N = 620)

African American	61%	Identify Male	70%	Very Low SES	45%
<100% Visit Adherence	62%	Viral Suppression	93%	Age (years)	48 ± 10
S-TOFHLA	91 ± 12	Attitudes Towards HIV Health Care Provider	87 ± 13	Cognitive Function	41 ± 8

Path Analysis of Patient and Social-Level Factors on Health Literacy and Retention in Care *(Standardized beta coefficients presented)*

The model demonstrated good fit to the data, as indicated by the following goodness-of-fit indices: RMSEA = 0.006, SRMR = 0.038, CFI = 0.996, TLI = 0.995.



Coding for categorical variables are as follows: race is 0 = African American, 1 = Non-African American; visit adherence is 0 = <100% visit adherence, 1 = 100% visit adherence; viral load is 0 = not suppressed, 1 = suppressed; SES/Insurance is 0 = not low SES, 1 = low SES, 2 = very low SES

Results Continued

Non-African Americans had greater health literacy.

Greater health literacy led to 100% visit adherence, which was subsequently associated with viral suppression.

Socioeconomic status and cognitive function directly influenced health literacy, which then influenced 100% visit adherence and patient provider interactions.

The model explained 20.0% of variance in health literacy, 37.8% of variance in viral load, 4.1% of variance in visit adherence, and 1.6% of variance in attitudes towards the HIV health care provider.

Conclusions & Implications

Health literacy mediates the relationship between race and retention in care, as well as the effect of race and sociodemographic predictors on patient-provider interactions.

Findings suggest causal pathways between retention in care and health literacy for racially disparate HIV populations.

Implications include the need to provide individualized, patient-centered educational health resources and retention in care interventions that address patient health literacy.

Acknowledgements

This study was supported by F31NR017580, R01 MH092284, P30NR014134, T32NR012715, and the Center for AIDS Research at Emory University (P30AI050409).

References

1. Paasche-Orlow, M. K., & Wolf, M. S. (2007). The causal pathways linking health literacy to health outcomes. American Journal of Health Behavior, 31(1), S19-26.
2. Baker, D. W., Williams, M. V., Parker, R. M., Gazmararian, J. A., & Nurss, J. (1999). Development of a brief test to measure functional health literacy. Patient Education and Counseling, 38(1), 33-42.
3. Mugavero, M. J., Westfall, A. O., Zinski, A., Davila, J., Drainoni, M. L., Gardner, L. I., . . . Giordano, T. P. (2012). Measuring retention in HIV care: The elusive gold standard. Journal of Acquired Immune Deficiency Syndromes, 61(5), 574-580.