Health Literacy, Numeracy and HIV Outcomes

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Background

- Poor health literacy and numeracy have been associated with higher viral loads, HIV knowledge deficits, and non-adherence to medications[1-3]
- Older adults and minorities have been found to be disproportionately affected by literacy deficits[4-6]
- Patients' ability to be more knowledgeable about their lab values and other health issues may enhance their engagement in care[7]

HALO Study
(Health Awareness in Literacy Outcomes)

Specific aims:

1. **Assess the relationship of health literacy and health numeracy to HIV lab values, patient recall of these values, and medication adherence.**
2. Assess the impact of cognition on health literacy and health numeracy as it relates to patient recall of most recent lab values and medication adherence.

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Methods

- Cross-sectional, descriptive design
- Convenience sample (*N* = 120) from 1917 Clinic
- Inclusion criteria:
  - HIV infected for at least 1 full year
  - Age 19 or above
  - Currently on HIV medication regimen
  - Those with cognitive impairments excluded
- Data analyzed using SPSS Version 20.0 for Windows.
  - Pearson's r
  - Stepwise multiple regression methods

Measures

Variable	Instrument	Cronbach's Alpha
Health literacy (HL)	Rapid Estimate of Adult Literacy in Medicine Revised (REALM-R; Bass et al., 2003) Newest Vital Sign (NVS; Weiss et al., 2005)	.86 .78
General numeracy	Expanded Numeracy Scale (Lipkus et al., 2001) Subjective Numeracy Scale (Fagerlin et al., 2007)	.82 .83
HIV HL HIV HN	Brief Estimate of Health Knowledge and Action – HIV Version subscale (BEHKA-HIV; Osborn et al., 2010); Investigator-developed items	.63
Medication adherence	BEHKA-HIV subscale (Osborn et al., 2010)	.60

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Investigator-Developed Items

CD4 Health Numeracy

"What is a normal CD4 count?"

a. Less than 200
b. 201 – 300
c. 301 – 499
d. 500 or more

VL Health Numeracy

"Which of the choices below would be the 'best' viral load in someone with HIV?"

a. 40 – 75
b. 500 – 1000
c. 1000 – 5000
d. 5000 or more

Variables (cont'd)

- HIV Laboratory Values
  - Serum CD4+ lymphocyte count
  - Serum viral load
- Example of patient recall item:

  "What was your most recent CD4 count?"

  a. 50 or less
  b. 51 – 200
  c. 201 – 499
  d. 500 or more

→ Level of concordance between patient recall & medical chart

Coded as follows:

- 0 – No agreement (2 or more response items between self-report and chart)
- 1 – Partial agreement (1 response item between self-report and chart)
- 2 – Full agreement (same response item in self-report and chart)

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Sample Characteristics (*N* = 120)

Variable	Number (%)	*M* (*SD*)	Range
Gender			
Male	79 (65.8%)		
Female	41 (34.2%)		
Ethnicity			
African American	86 (71.7%)		
Caucasian	31 (25.8%)		
Other	3 (2.5%)		
Annual Income			
< $10,000 per year	82 (68.3%)		
> $15,000 per year	38 (31.7%)		
Education			
< 12 years education	30 (25.0%)		
12 years/GED	25 (20.8%)		
Attended at least some college/ vocational school	65 (54.2%)		
Age (years)		43.45 (8.95)	22.89 – 66.34
Health Literacy			
REALM-R	120 (100%)	5.48 (2.69)	0 – 8
Adequate literacy	62 (51.67%)		
Poor literacy	58 (48.33%)		
NVS	120 (100%)	2.89 (1.94)	0 – 6
Adequate literacy	50 (41.67%)		
Possible limited literacy	37 (30.83%)		
High risk for poor literacy	33 (27.5%)		
Numeracy	120 (100%)	4.85 (2.82)	0 – 11
CD4 count	117 (97.5%)	589.7 (334.26)	38 – 1653
VL	117 (97.5%)	18,693.5 (95,993)	19 – 761,000
CD4 Agreement	117 (97.5%)	1.69 (.53)	0 – 2
No Agreement	4 (3.4%)		
Partial Agreement	28 (23.9%)		
Full Agreement	85 (72.6%)		
Viral load Agreement	117 (97.5%)	1.32 (.88)	0 – 2
No Agreement	32 (27.4%)		
Partial Agreement	16 (13.7%)		
Full Agreement	69 (59.0%)		

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Findings

- Health literacy associated with:
  - Higher CD4 count (REALM-R – $r = .21$, $p < .05$)
  - Accurate pt recall of CD4 (REALM-R – $r = .18$, $p < .05$)
  - Keeping clinic appointments (REALM – $r = .21$; NVS – $r = .22$, $p < .05$)
- Health numeracy associated with:
  - Keeping clinic appointments ($r = .22$, $p < .05$)
- General numeracy associated with:
  - Accurate pt recall of viral load ($r = .19$, $p < .05$)

- Neither health literacy or numeracy were significantly associated with medication adherence (based on BEHKA-HIV).

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A Qualitative Study on Health Numeracy and Patient–Provider Communication of Laboratory Numbers in Older African Americans with HIV

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Examples of statements requiring health numeracy ability
Statements requiring basic health numeracy skills: • Take 1 pill 2 times a day • Follow-up with your health care provider on Thursday at 1 pm
Statements requiring computational health numeracy skills: • How many grams of dietary fiber are in one serving of oatmeal? • Your co-pay for a clinic visit is $20; your copay for an emergency room visit is $40
Statements requiring analytical health numeracy skills: • Take 1 nitroglycerin tablet for a systolic blood pressure > 160 mmHg • Your viral load is <50 copies/mL (reference <50 is undetectable)
Statements requiring statistical health numeracy skills: • Based on genetics and lifestyle factors, you have a 15% chance of developing the condition • You must be at least 95% adherent to your ART medication for it to be highly effective

MOBILE Study
(Managing Health Outcomes by Interventions in Literacy Effectiveness)

Specific aims:

1. To determine patient preferences for the design of a health literacy-based intervention to promote antihypertensive medication adherence in older African Americans with HIV.
2. To design the protocol based on patient preferences.
3. To evaluate the protocol versus standard of care and estimate intervention effect size for a larger RO1 application.

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Methods

- Qualitative, descriptive design
- Five focus groups (6 – 8 participants each)
- Recruited from HIV clinic in Birmingham Metro area
- Inclusion/Exclusion Criteria
  - Self-identify as African American/Black
  - Age $\geq$ 50
  - HIV diagnosis for $\geq$ 1 year
  - Currently prescribed antihypertensive medication
  - Those with cognitive impairments and neurological conditions were excluded

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Sample Characteristics (*N* = 36)

Demographic variable	
Mean Age	59.4 (range 53-64)
Gender	
Male	16 (44.4%)
Female	20 (55.5%)
Educational Level	
<12 years	8 (22.2%)
12 years/GED	10 (27.8%)
Attended some college	18 (50%)
Employment status	
Unemployed	13 (36.1%)
Employed	1 (2.8%)
Retired	2 (5.6%)
Disability	20 (55.6%)
Household income	
$0-$4,999	13 (36.1%)
$5,000-$9,999	10 (27.8%)
$10,000-$19,999	12 (33.3%)
$20,000-$29,999	1 (2.8%)
Years since HIV diagnosis	
≥5 years	4 (11.2%)
≥10 years	31 (86.1%)
Years since hypertension diagnosis	
≥5 years	10 (27.8%)
≥10 years	16 (44.4%)

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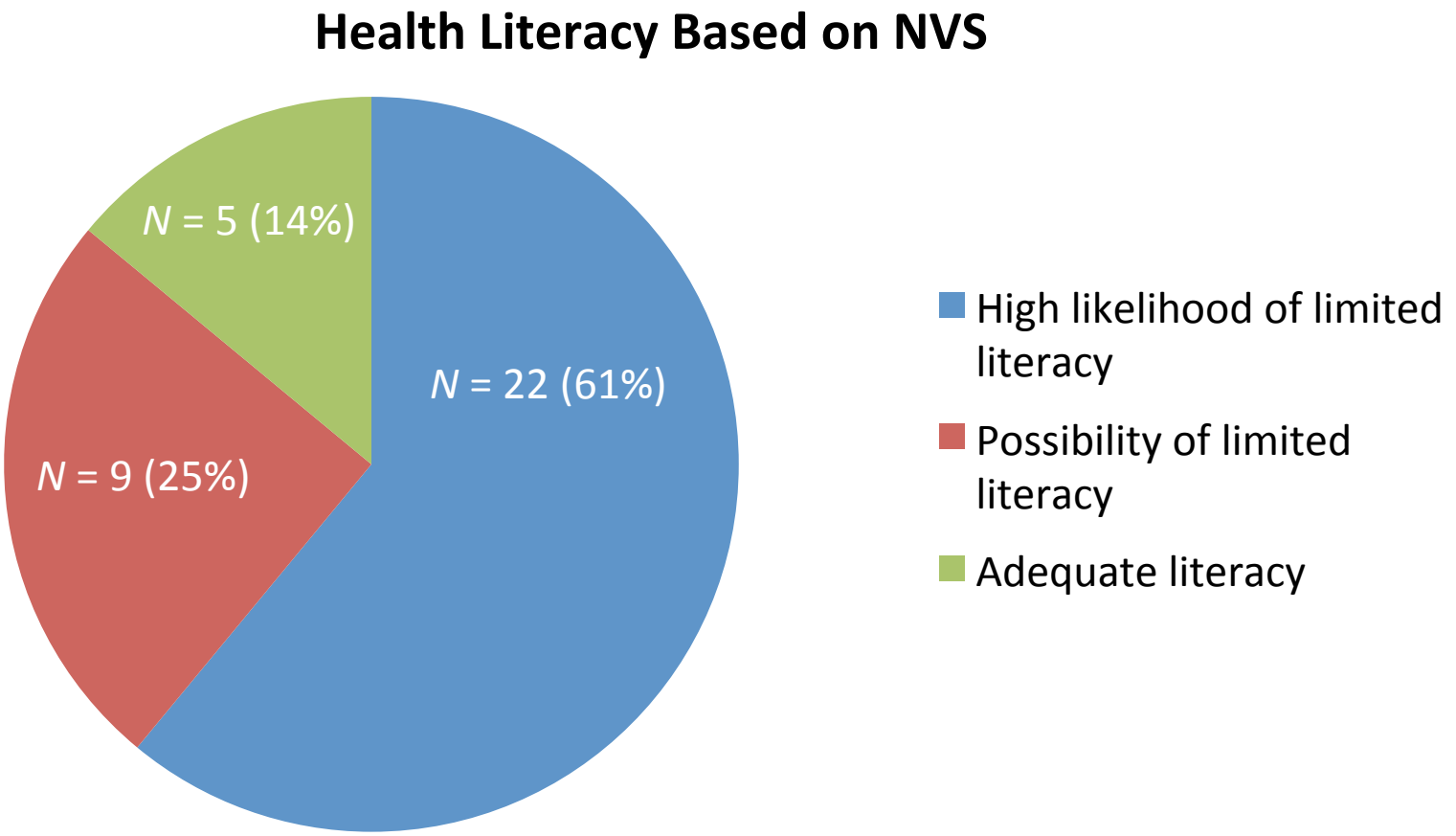
Results



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Major Themes

- Tailor program to individual and psychosocial needs
- Communicate often and assess understanding
- Verbal communication over technology
- Monitor adherence progress and provide feedback in simple terms

Selected FG Audio Clip

"Well, see, I was takin' blood pressure pills for a long time. I didn't even know I was takin' blood pressure until a lady said, "You took your blood pressure pills?" I said, "What blood pressure pills?" It was just shaped like a little football. I was just takin' it cuz they said take it and I didn't know what it was. I had been takin' it for two years. Didn't even know I was taking blood pressure pills."

Male, FG #2

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RCT Pilot

UAB 1917 Clinic (*N* = 36)

Health Literacy/Peer-based Intervention

- 2 x/weekly peer phone contact
- Adherence/HL needs assessment
- "WISE" suggestions
- Record progress

Hypothesis

H1: Participants in intervention arm will have 10% or higher antihypertensive medication adherence compared to the standard of care group.

Study Population

- Older AA w/HIV & HTN dxs
  - Uncontrolled HTN at two visits over past year
- Two arms (intervention and standard of care group) – 50% female

Measures

- Baseline; 6 week and 12 week follow-ups
- Recorded in RedCap
  - Beliefs about Medications Questionnaire[10]
  - Medication Adherence Scale[11]
  - **Brief Health Literacy Screen[12]**
  - Centers for Epidemiological Studies – Depression[13]
  - **Short Test of Functional Health Literacy in Adults[14]**
  - UCLA Loneliness Scale[15]
  - Patient Activation Measure[16]
  - Patient Health Engagement Scale[17]
  - Perceived Stress Scale[18]
  - Social Provisions Scale[19]
- Outcome measures:
  - MEMs Caps
  - Unannounced pill counts
  - BP, HR, CD4, VL, clinic appt. adherence

Recruitment Pool **528**

Out of 92 contacts **39** eligible

Completed baseline N = **36**

18 - I | **18 - C**

20 F; 16 M
Mean age 57.4
Range (50-73)

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MOBILE II Protocol

Conclusions/Implications for Practice

- Hypertension and adherence remain important risk factors for mortality in people living with HIV
- Stronger evidence for the development and use of interventions to mitigate the effects of **low health literacy** and improve adherence and management of antihypertensive medications, particularly among older adults and African Americans, are needed immediately.

QUESTIONS/COMMENTS?

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