Health Literacy and Perceived Control in Patients with Diabetes

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Control of Diabetes
Do clinicians and patients determine control differently?

- Clinicians: hemoglobin A1c (HbA1c) < 7.0%
  - » Many patients poorly controlled by this measure (47%)
  - » Patients often do not recall or understand the meaning of their HbA1c

- How do patients determine control?

Casagrande et al, Diabetes Care, 2013
Do et al, Amer J Ophthalmology, 2006
Harwell et al, Diabetes Educator, 2002

Health Literacy and Perceived Control

- Studies evaluating the effect of health literacy on HbA1c have been mixed

- The effect of health literacy on accurate perceptions of control is unknown

- To improve control we need to understand factors that impact patients' perceptions of their own control
  - » Health literacy may be one such factor

Study Objectives

- Identify factors associated with perceived good control in patients with persistently poorly controlled diabetes
    - » Health Literacy
    - » Self-efficacy
    - » Depression
    - » Self-care

Factors of Interest

Measure	Instrument	Range
Health Literacy	Rapid Estimate of Adult Literacy in Medicine (REALM)	0-66
Self-Efficacy	Perceived Confidence in Diabetes Scale	0-7
Depression	Patient Health Questionnaire 2 (PHQ-2)	0-8
Self-Care	Summary of Diabetes Self-Care Activities Measure	0-70

Other measures evaluated were barriers to medication adherence, diabetes support received, confidence in taking diabetes medication, and diabetes distress

Determining Perceived Control

- "How well do you think you are managing to control your diabetes?"
  - » 5-point Likert scale from "Not very well" to "Very well"
  - » Responses dichotomized into well/very well versus all others
- Analysis: bivariate and multivariable logistic regression

Aalto and Uutela, Int J Behavioral Med, 1997

Recruitment and Data Collection

- Five University of Pennsylvania Health System primary care practices

- Persistent poor control

  » Last two HbA1c measurements in the electronic medical record >8.0%

- Survey and lab data were obtained during an in person interview and baseline lab draw

Results

- 280 diabetic patients with persistently poor control
- 88% African American
- 70% women
- REALM
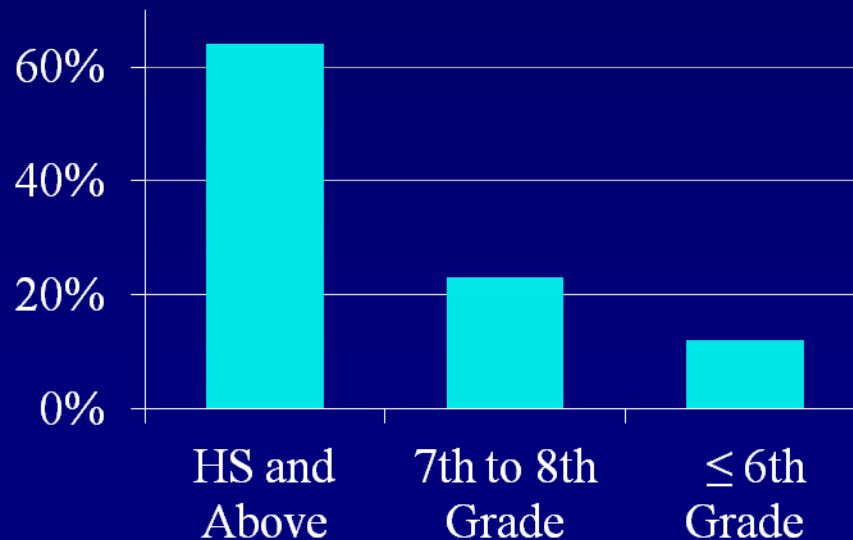
Many poorly controlled participants reported well/very well control

Perceived Control

39%

61%

■ Well/Very Well
■ Other
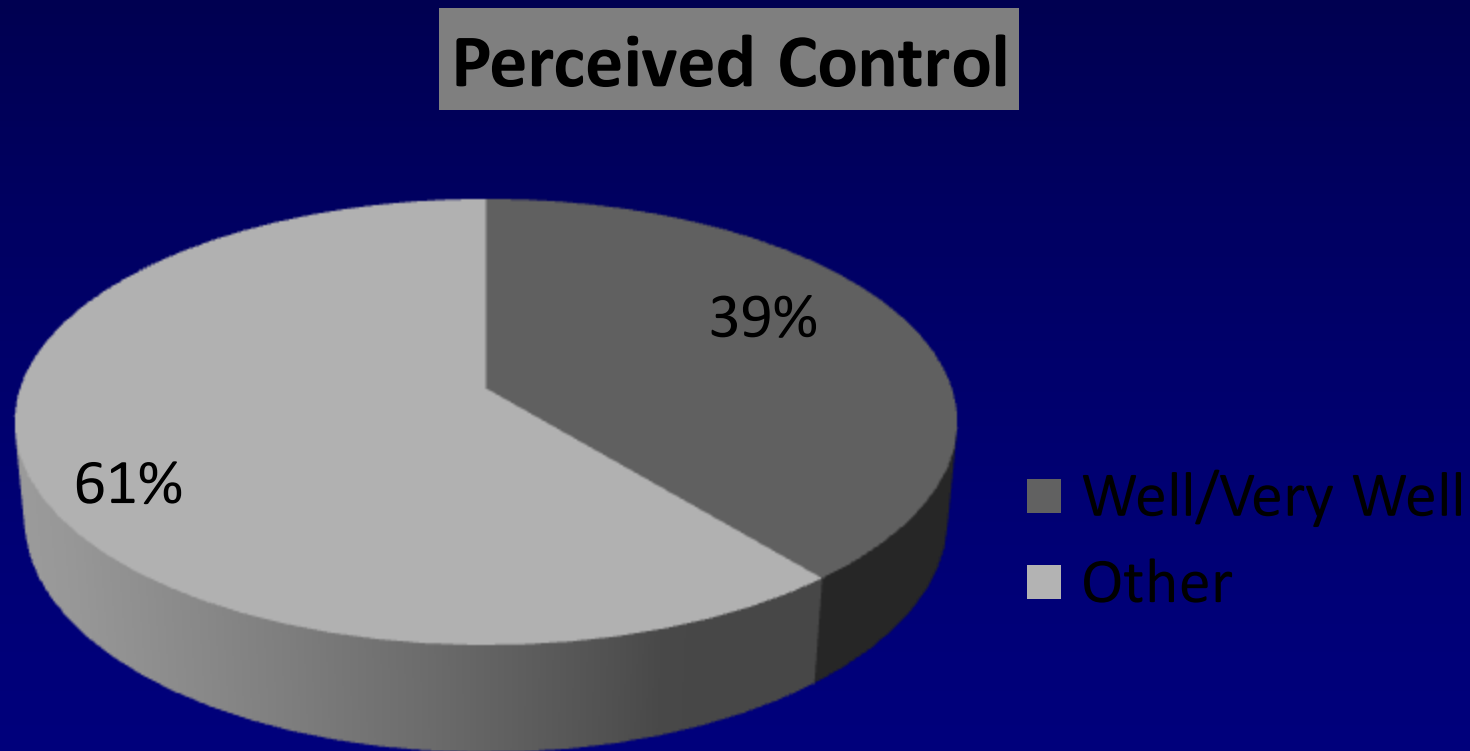
Factors Associated with Perceived Control
Bivariate Analysis

Variable	Well/V. Well Perceived Control	Other Perceived Control	X² or t	P-value
Health Literacy			22.90	<0.0001
HS and above	52 (29%)	128 (71%)		
7th-8th grade	36 (57%)	27 (43%)		
≤ 6th Grade	20 (61%)	13 (39%)		
Depression			3.15	0.08
<4	67 (44%)	87 (56%)		
≥4	41 (33%)	83 (67%)		
Self-Efficacy	5.39 (1.37)	4.37 (1.32)	30.58	<0.0001
Self-Care	42.74 (12.30)	34.72 (12.77)	22.67	<0.0001
HbA1c	9.10 (1.55)	9.88 (1.84)	11.94	0.0006

Factors Associated with Perceived Control
Multivariable Analysis

Variable	Odds Ratio	95% CI	P-Value
Health Literacy			
HS and above	1.0		
7th to 8th Grade	2.44	1.12, 5.32	0.025
≤6th Grade	4.51	1.48, 13.74	0.008
Depression	0.83	0.42, 1.66	0.598
Self-Efficacy	1.45	1.12, 1.89	0.005
Self-Care	1.03	1.00, 1.06	0.026
HbA1c	0.81	0.66, 0.99	0.037

Model also adjusts for: age, sex, race, education, insurance type, comorbidities, HbA1c, barriers to medication adherence, diabetes support received, confidence in taking diabetes medication and diabetes distress

Predictors of Perceived Good Control

- Patients with low health literacy more likely to inaccurately perceive they were in good control

- Patients appear to use other cues, in addition to HbA1c, to determine control
  - Self-care
  - Self efficacy

Implications

- Health care providers should consider health literacy when discussing HbA1c and control of diabetes

- Self-care activities may be misinterpreted as a more important indicator of control than HbA1c

- Providers must ensure that patients who perform diabetes self-care activities understand that this alone does not guarantee adequate control of their disease

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