



Division of
General
Internal Medicine

Department
of Medicine

Health Literacy is Associated with Asthma Beliefs Among Older, Inner-City Adults

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Background—Asthma Epidemiology

Asthma common among older adults

- Prevalence: 4% to 9%

Mortality/morbidity higher in the elderly

- 14x higher asthma mortality than adults 18-34y (54% of deaths)
- 2x higher hospital admission rates

Background—Asthma Control

Asthma morbidity and mortality avoidable

- Good self-management is critical
- Medication adherence, avoidance of triggers, self-monitoring of symptoms

Background—Barriers to Self-Management

Asthma beliefs

- Suboptimal (inaccurate) beliefs common
- More common among older adults
- Poorer self-management and asthma outcomes
- Example
 - No symptoms-no asthma, 53%
 - 1/3 less adherent
 - 3x more common among adults ≥ 65 y

Background—Barriers to Self-Management

Health literacy (HL)

- Degree to which individuals can obtain, process, understand information for health decisions

HL → poorer disease self-management and outcomes

Research Objective

Examine the relationship between health literacy and asthma disease and medication beliefs.

Hypothesis:

Low health literacy is associated with sub-optimal asthma beliefs.

Theoretical Construct

Common Sense Model of Self-Regulation (CSM)

- *Identity*: wheezing or cough indicating disease activity
- *Timeline*: asthma as an acute or chronic disease
 - No Symptoms-No Asthma
- *Consequences*: effect of steroid medications on asthma control
- *Control*: curability of asthma
- *Cause*: role of inflammation and mediating effects of steroids

Health literacy

- Provides opportunity for factual information to mitigate beliefs

Methods—Setting and Subjects

General medicine practice, tertiary care hospital, East Harlem, NYC

Inclusion

- Age ≥ 50 years
- Chart documented asthma
- English and Spanish speakers

Exclusions

- Other chronic pulmonary diseases (e.g., emphysema)
- Dementia

Recruitment

- Convenience sample, recruited and interviewed in waiting area

Methods—Outcome Measures

Asthma illness beliefs

- Brief-Illness Perceptions Questionnaire (B-IPQ)
- 9-item assessment, based on CSM
- Adapted for asthma
- Items examined individually

Asthma medication beliefs

- Role of steroid medications

Methods—Secondary Outcome Measures

Asthma controller medication use

- Inhaled corticosteroids (ICS) and oral leukotriene inhibitors (LTI)

Asthma-related health services

- Emergency department visits, hospitalizations (past 12 months)

Methods—Independent Variables

Health literacy

- Short Test of Functional Health Literacy in Adults (S-TOFHLA)
 - Prose passages (English or Spanish)
 - Modified Cloze procedure (36 items)
 - Timed (7 minutes)
 - Scoring: Inadequate (0-16), Marginal (17-22), Adequate (23-36)
 - Inadequate: struggle with basic medical information

Methods—Independent Variables

Other variables

- Asthma control questionnaire (asthma symptoms)
- Socio-demographics and health status

Methods—Analyses

Multivariable analyses

❖ Asthma beliefs = inadequate HL + age + sex + race

Results—Patient Characteristics

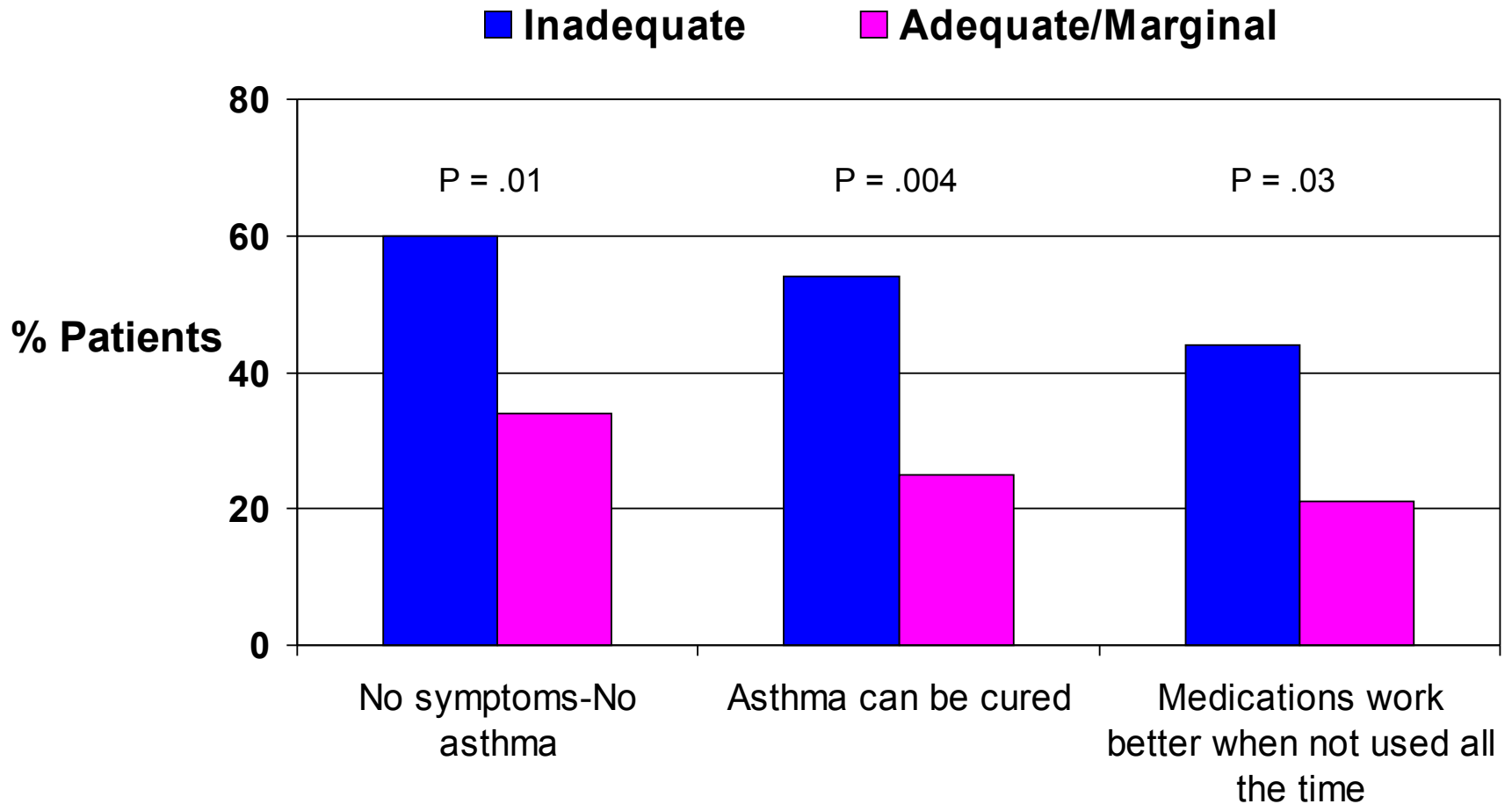
	n = 100
<i>Age, mean years (sd)</i>	61 (8)
Female	81
Non-Hispanic black	32
Non-Hispanic white	6
Hispanic	62
English proficiency, v. poor	28
Education, \leq 8 th grade	23
General health, poor-fair	61
# Chronic diseases, \geq 6	22

Results—Asthma Beliefs

CSM		Total Sample
Domain	Belief	(n=100)
<i>Timeline</i>	No symptoms-no asthma	43
<i>Control</i>	Asthma can be cured	35
<i>Consequences</i>	Medications work better when not used all the time	24

CSM, Common Sense Model of Self-Regulation

Results—Health Literacy & Asthma Beliefs



Results—Health Literacy & Asthma Beliefs

Association with Inadequate Health Literacy

CSM

Domain	Asthma Belief	Adjusted OR (95% CI)	P
<i>Timeline</i>	No symptoms-no asthma	2.5 (1.0-6.1)	.05
<i>Control</i>	Asthma can be cured	3.3 (1.3-8.3)	.01
<i>Consequences</i>	Medications work better when not used all the time	3.8 (1.3-11)	.02

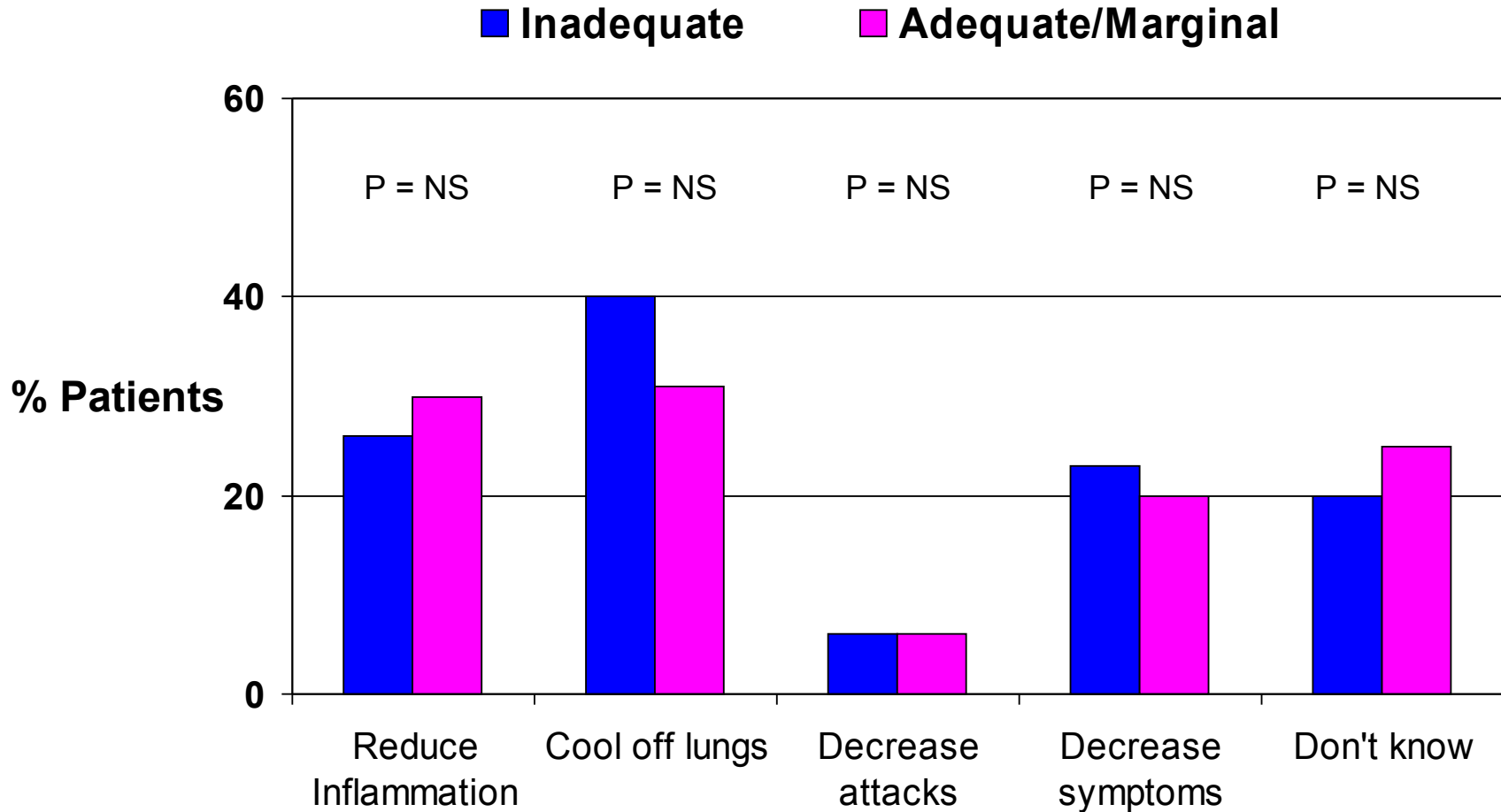
CSM, Common Sense Model of Self-Regulation

Results—Asthma Steroid Medication Beliefs

CSM		Total Sample
Domain	Beliefs About What Steroids Do	(n=100)
	Steroids reduce airway inflammation	28
	Steroids cool off the lungs	34
<i>Cause</i>	Steroids decrease number of attacks	6
	Steroids decrease symptoms	21
	Don't know	23

CSM, Common Sense Model of Self-Regulation

Results—Health Literacy & Medication Beliefs



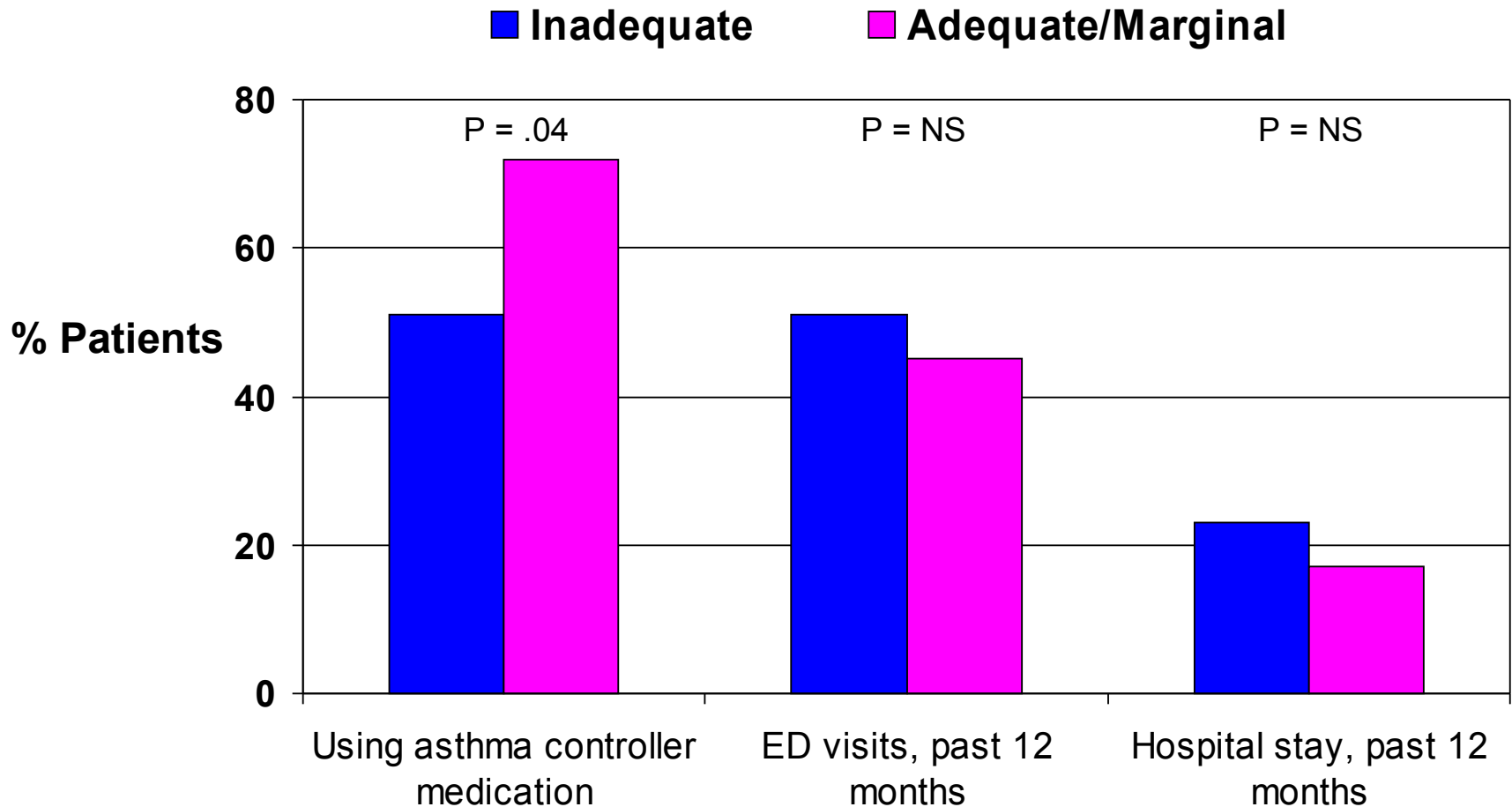
Results—Health Literacy & Medication Beliefs

		Association with Inadequate HL	
CSM Domain	Steroid Medication Beliefs	Adjusted OR (95% CI)	P
	Steroids reduce airway inflammation	1.0 (0.4-2.9)	NS
	Steroids cool off the lungs	2.0 (0.8-5.5)	NS
<i>Cause</i>	Steroids decrease # of attacks	0.8 (0.1-5.3)	NS
	Steroids decrease symptoms	1.1 (0.4-3.1)	NS
	Don't know	0.6 (0.2-1.7)	NS

CSM, Common Sense Model of Self-Regulation

NS, not significant

Results—Health Literacy & Asthma Outcomes



Conclusions

Inadequate health literacy associated with suboptimal asthma beliefs

- No symptoms-No asthma
- Asthma can be cured
- Asthma meds work better when not used all the time

Inadequate health literacy not associated with:

- Beliefs about effects of steroid medications

Limitations

Pilot study

- Small sample size
- Cross-sectional
- Convenience sample

Implications

Beliefs based on experience

Medical messages: traditionally abstract information

To promote effective self-management:

- Provide low literacy messages
- Understand patients' health experiences
- Reframe health beliefs

Additional research needed

- Examine pathways linking health literacy and disease outcomes
- Objective measures of med adherence, disease outcomes

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Additional Slides

Results—Characteristics by Health Literacy

	Health Literacy			P
	Total	Inadequate	Adequate or Marginal	
	100	35	65	
Age, <i>mean (sd)</i>	61 (8)	64 (8)	60 (8)	.008
Female	81	83	80	NS
Black	32	23	37	NS
Latino	32	74	55	
English proficiency, v. poor	28	51	15	<.001
Education, \leq 8 th grade	23	46	6	<.001
General health, poor-fair	61	77	52	.02
# Chronic diseases, \geq 6	22	17	25	NS

Results—Asthma Self-Care and Control

	Total	Health Literacy		P
		Inadequate	Adequate or Marginal	
Self-Management and Control				
Asthma Medication Adherence Score, <i>mean (sd)</i> [†]	3.8 (0.8)	3.6 (0.8)	3.9 (0.7)	.17 [§]
Poor asthma medication adherence [†]	73	83	68	.10
Asthma Control Questionnaire Score, <i>mean (sd)</i> [‡]	3.1 (1.5)	3.0 (1.4)	3.3 (1.5)	.19 [§]
Poor asthma control	86	89	84	.57
Frequent use of short-acting beta- agonist	43	49	41	.74

[†]MARS, Medication Adherence Rating Scale, measured in subset prescribed an asthma controller medication (n=64); higher values → better adherence.

[‡]Higher values → worse asthma control.

Results—Health Literacy & Asthma Beliefs

CSM Domain	Belief	Health Literacy		P
		Inadequate	Adequate or Marginal	
<i>Timeline</i>	No symptoms-no asthma	60	34	.01
<i>Control</i>	Asthma can be cured	54	25	.004
<i>Consequences</i>	Medications work better when not used all the time	44	21	.03

Results—Health Literacy & Asthma Beliefs

Asthma-Related Health Care Use	Total	Health Literacy		P
		Inadequate	Adequate/ Marginal	
Prescribed asthma controller medication	65	51	72	.04
ED visits, past 12 months	47	51	45	NS
Hospital stay, past 12 months	19	23	17	NS

No Symptoms-No Asthma Belief Question

Do you think asthma is something you have all the time or only when you're having symptoms?

- ❖ *I have it all the time*
- ❖ *Most of the time*
- ❖ *Some of the time*
- ❖ *Only when I have symptoms*

Other Asthma Belief Questions

If you use [NAME CONTROLLER MED] all the time they do not work as well.

Strongly disagree; Disagree; Uncertain; Agree; Strongly agree

Do you expect the doctor to cure you of your asthma?

Definitely; Probably; Possibly; No

Medication Belief Question

People have different ideas about how steroids actually work in the body to treat asthma. What do you think they do?

- ❖ *Don't know, don't remember.*
- ❖ *Reduce airway inflammation / irritation*
- ❖ *Cool off / calm the lungs*
- ❖ *Decrease the number / frequency of attacks*
- ❖ *Decrease symptoms*
- ❖ *Other*