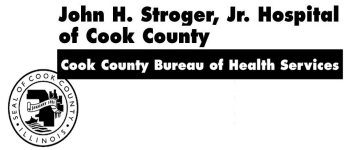


# Associations of income and education with asthma symptoms and quality of life in an urban adults cohort

Sadowski LS<sup>1</sup>, Evans AT<sup>1</sup>, Shalowitz MU<sup>2</sup>, Shannon JJ<sup>1</sup>, and Weiss KB<sup>2</sup>.

<sup>1</sup>John H. Stroger, Jr. Hospital of Cook County; <sup>2</sup>Northwestern University Feinberg School of Medicine



## Abstract

**Rationale:** Asthma morbidity is highly concentrated in urban poor populations. We sought to characterize the relationship between two facets of socioeconomic status, education and household income, and asthma status.

**Methods:** Adults were identified as family members from a population-based proportional sample that screened 32,858 households with children attending Chicago elementary schools. Eligibility for adults included: 1) age 18-40 yrs; 2) diagnosis of asthma and using asthma medications at least 8 weeks during preceding year; and 3) fluent in English. Predictor variables collected at a baseline face-to-face interview included self-reported education, annual household income (<15K, 15-30K, 30-50K, >50K), asthma symptoms (days and nights with symptoms in preceding 14 days) and asthma quality of life (QOL, Mini Asthma Quality of Life Questionnaire).

**Results:** Our sample of 353 adults was predominantly women (78%) with a mean age of 30.9 yrs (SD 6.1). Self-reported race-ethnicity was African-American (52%), Hispanic (28%), Caucasian and Asian (15%), and mixed (4%). Most graduated high school (83%), and were employed (62%). Nearly half reported a household income <\$30,000 (47%). In the prior 14 days, subjects had an average of 5 (SD 5) symptom days and 3 (SD 4) symptom nights. For each drop in income category, there was an increase of approximately 1 symptom day or night (p=0.019) and a drop in QOL score of approximately 0.4 (p<0.001). Education <high school degree was independently associated with a drop in QOL scores of >0.5 (p<0.001), but not with asthma symptoms.

**Conclusions:** We demonstrate a relationship between socioeconomic status and asthma outcomes. Factors mediating this relationship need to be explored to reduce asthma morbidity.

## Methods

Setting and Design:

- Population based, cross-sectional survey
- Population proportionate sampling of Chicago schools to identify children and adult household members with asthma
- Face to face interviews

Eligibility:

- Age: 18-40 years, English language
- Physician-diagnosed asthma requiring MDI use >8 weeks (past 12 m)
- Agree to periodic interviews over 2 years

Measurements:

Predictors:

- Education: <HS graduate, HS graduate, >HS graduate
- Health Literacy: 66-item REALM score — # words correctly pronounced
- Asthma knowledge: 11 item knowledge test — # correct
- Income: pre-tax household income: <\$15K, \$15-30K, \$30-50K, >\$50K

Outcomes:

- Asthma-related Quality of Life: Juniper's 15 item scale, mean score 1-7
- Asthma Symptom Frequency: sum of # days and nights with asthma symptoms in prior 14 days (range: 0-28)

## Results for 353 young adults with asthma

Predictors and Outcomes	Values	Results
Health Literacy		
Knowledge		
Asthma Symptoms		
Asthma Quality of Life		

Independent Predictors of Asthma Quality of Life and Symptom Frequency in Multivariate Models

Predictor	Quality of Life coefficient	Symptom frequency coefficient
Income	- .8 (p<.01)	3 (p<.01)
Education	- .8 (p<.01)	3 (p=.07)
Health Literacy	NS	NS
Knowledge	NS	NS
Model R <sup>2</sup>	.15	.07

## Background

- Income – known predictor of health disparities and adverse health outcomes
- Education – correlated with income, yet independent of health disparities
- Low literacy – associated with poor asthma knowledge and poor use of MDI

## Objectives

In a diverse urban young adult population, determine if:

1. education and income are associated with asthma symptoms and quality of life;
2. literacy, independent of education, is associated with asthma morbidity;
3. asthma knowledge, independent of education, is associated with asthma morbidity.

## Results: Sample Characteristics of 353 adults

	N (%)		N (%)
Female	276 (78)	Current Smoker	113 (32)
Age: median (range)	32 (18-41)	Atopy: RAST+ to dust or roach	181 (51)
Race/Eth:African-American	184 (52)	FEV <sub>1</sub> % predicted, pre-bronchodilator	
Hispanic	99 (28)	< 80%	107 (30)
Other	54 (12)	≥ 80%	207 (59)
Education: <High School	60 (17)	Severity:	
High School graduate	236 (67)	Hospitalized with asthma, past 12 m	46 (13)
College Graduate	56 (16)	Emergency room visit, asthma, past 12m	143 (41)
Household Annual Income: <\$15K	86 (24)	Use of inhaled corticosteroids	178 (50)
\$15-\$30K	84 (24)		
\$30-\$50K	64 (18)		
>\$50K	97 (28)		

## Conclusions

In our predominantly African-American, young, urban adult community sample:

1. Lower income and lower education were independently associated with lower quality of life and higher symptom burden.
2. Literacy and asthma knowledge were **not** associated with asthma morbidity after adjusting for education and income.

Chicago Initiative to Raise Health Equity (CHIRAH)

**Funding:** NHLBI 1 U01 HL072496-03