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Potentially Preventable Use of Emergency Services: The Role of Low Health literacy

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Abstract

Background—Limited health literacy is a barrier to understanding health information and has been identified as a risk factor for overuse of the emergency department (ED). **The association** of health literacy with access to primary care services in patients presenting to the ED has not been fully explored.

Objective—To examine the relationship between health literacy, access to primary care and reasons for ED use among adults presenting for emergency care.

Methods—Structured interviews that included health literacy assessment were performed with 492 ED patients at one Southern academic medical center. Unadjusted and multivariable logistic regression models assessed the relationship between health literacy and 1) access to a personal physician, 2) doctor office visits, 3) ED visits, 4) hospitalizations, and 5) potentially preventable **hospital** admissions.

Results—After adjusting for sociodemographic and health status, those with limited health literacy reported fewer doctor office visits (OR=0.6, 95% CI=0.4-1.0), greater ED use (OR=1.6, 95% CI 1.0-2.4) and had more potentially preventable **hospital** admissions (OR=1.7, 95% CI=1.0-2.7) than those with adequate health literacy. After further controlling for insurance and employment status, fewer doctor office visits remained significantly associated with patient health

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literacy. (OR=0.5, 95% CI=0.3-0.9). Patients with limited health literacy reported a preference for emergency care, as the services were perceived as better.

Conclusions—Among ED patients, limited health literacy was independently associated with fewer doctor office visits and a preference for emergency care. Policies to reduce ED use should consider steps to limit barriers and improve attitudes towards primary care services.

Keywords

Emergency Department; Primary Care; Health literacy, Access to Care

Introduction

The Emergency Department (ED) represents an important point of entry to medical care for patients with acute but routine illness, especially those with limited health literacy, minorities and the poor.[1-3] Use of the ED for primary care treatable conditions is not optimal since access to timely and effective primary care is linked to better healthcare outcomes and reductions in costly ED visits and hospital admissions.[4-8] Socioeconomic factors have appropriately been implicated as root causes of non-emergent ED use and hospitalization for primary care treatable conditions. However these factors do not fully explain underuse of primary care services in patients presenting for emergency care.[4,9,10]

Health literacy, the capacity to obtain, process and understand health information and services needed to make appropriate healthcare decisions,[11] has not been well explored as a potential target for improving use of primary care services in ED patients. Policies to reduce ED use through financial penalties of patients or facilities for overuse of emergency services assume that patients are able obtain primary care elsewhere.[12] This study, examines the relationship between health literacy and use of primary care and other health services among ED patients. Because efforts to help patients access primary care services require improved understanding of why they decide to initiate care in the ED, patient-reported reasons for ED use were also investigated.

Methods

Study Design and Setting

An observational, cross-sectional study design of adults ≥18 years of age presenting to an ED at an academic medical center in an urban community of 250,000 in the southeastern U.S. between June-August, 2010 was used. The ED treats 75,000 patients annually and serves a diverse population (38% African American) with a range of payer sources (40% public, 36% private and 24% uninsured).

Selection of Participants

In the ED waiting room, 518 adults were approached by a trained research assistant (RA) who administered a structured interview. Patients were eligible for participation if they spoke English and provided informed consent. Exclusion criteria included severely impaired vision; hearing problems; being in police custody; or being too ill to participate. Patients were approached based on time, day and mode of arrival of the general ED population, with every sixth patient approached at time points evenly distributed throughout eight-hour intervals. Participation was voluntary and the study was approved by the University of Florida Institutional Review Board. Four hundred ninety two participants completed the study (response rate=95%).

Measures

Measures were obtained from structured interview, health literacy assessment and electronic medical record (EMR) review.

Health literacy—The REALM is a health word recognition test which is the most widely used instrument in health literacy research.[13,14] REALM scores are highly correlated with standardized reading tests and The Test of Functional Literacy Skills.[14,15] Raw REALM scores can be converted into reading grade levels (<61, below ninth grade reading level, an indicator of limited health literacy) and (≥61, ninth grade reading level or above, an indicator of adequate health literacy).[12, 15]

Patient-Level Control Variables—The Andersen Behavioral Model of Health Services Use[16] suggests that health services access and use is based on *predisposing*, *enabling*, and *need factors*.[16] *Predisposing Factors* (age, gender, race) *and Enabling Factors* (employment and health insurance (public, private, uninsured) were obtained through structured interview and EMR. Race was dichotomized as White and African American/Other because only 9 patients who self-identified as a race other than White or African American had limited health literacy. *Need Factors* included three measures: 1) Self-rated health (Excellent/Very Good, Good, Fair/Poor); 2) Self-reported number of **chronic** conditions; and 3) triage severity (Emergency Severity Index (ESI), categorized as high acuity (ESI=1-2) and less urgent (ESI=3-5) from the EMR.[17]

Outcome Variables—Self-reported health services access and use in the six months before the ED visit were assessed using **4** items from the 2009 Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey.[18] These included having a personal physician (response options, yes-no), number of doctor's office/clinic visits, and ED visits (**collected as a 6-level categorical variable with** responses dichotomized into none or ≥1) **and** receiving care as soon as it was needed (responses dichotomized into never or sometimes/usually/always).[19,20] Potentially preventable **hospital** admissions for a primary care treatable condition were assessed by applying AHRQ technical and SAS statistical software to flag ambulatory care sensitive condition diagnosis codes in EMR discharge data in the two years prior to study entry.[21]

Reasons for ED Use were assessed with the Emergency Medicine Patients' Access to Healthcare (EMPATH) tool.[22] The instrument captures possible reasons for obtaining care in an ED using a dichotomous (yes-no) response.[22]

Analysis

Between-health literacy group differences in predisposing, enabling, and need factors were assessed using chi-square tests. The influence of health literacy on health services access and use was examined in sequential, cumulative models controlling for these factors. Unadjusted logistic regression models examined health literacy alone followed by multivariable models including predisposing and need factors and fully adjusted models including predisposing, enabling and need factors. Comparing odds ratios (ORs) for health services access and use between sequential steps allowed an assessment of how the effect of health literacy on outcomes changed with adjustment for these variables. Results are presented as unadjusted and adjusted ORs with 95% confidence intervals (CI).

Health literacy group differences in reasons for ED use were tested with chi-square analyses. All statistical analyses were performed using Stata 10.0.[23]

Results

In the study population, mean participant age was 41 (± 17) years, **38% were of African American or other race**, 62% White, 45% male and 34% had limited health literacy. Patients with limited health literacy were significantly more likely to be of African American **or other race**, male, and have public or no insurance (Table 1). There were no significant health literacy group differences in triage severity or admission on the day of the interview (data not shown). Most patients (75%) had less urgent ED visits (ESI 3-5) and overall health services use in this population was high (Table 2).

Health literacy and Health Services Use

In unadjusted analysis, patients with limited health literacy were significantly more likely than those with adequate health literacy to report ≥1 ED visits in the previous six months (OR=1.51, 95% CI=1.03-2.20) (Table 2). Patients with limited health literacy were as likely as those with adequate health literacy to report having a personal physician but were significantly more likely to report never being able to obtain care from a doctor's office/ clinic as soon as they felt care was needed (OR=1.70, 95%CI=1.09-2.66).

When adjusted for predisposing and need factors, patients with limited compared to adequate health literacy reported significantly greater ED use (OR=1.57, 95%CI=1.02-2.43), were more likely to have had a potentially preventable admission (OR=1.65, 95%CI=1.00-2.73), and had significantly fewer doctor office/clinic visits in the previous six months (OR=0.60, 95%CI=0.36-0.98). In the fully adjusted analysis including predisposing, enabling (employment and insurance status) and need factors, only the effect of health literacy on fewer doctor office/clinic visits remained significant (OR=0.55, 95%CI=0.32-0.93). Adjustment for enabling factors attenuated the relation between health literacy and number of ED visits, potentially preventable hospital admissions, and obtaining care as soon as needed (Table 2) although the direction of effects remained consistent.

Health literacy and Reasons for ED Use

The majority of patients (89%) believed their condition was an emergency on the day of the interview, believed the ED was the right place to go for treatment (92%) and were worried about their condition (93%) (Table 3). Patients with limited health literacy were significantly more likely than patients with adequate health literacy to report they always receive care in the ED (60% versus 40%, $p<0.001$), receive better care in the ED (67% versus 58%, $p<0.05$) and like the ED environment (38% versus 19%, $p<0.001$).

Discussion

Effective health maintenance requires an understanding of health information and access to continuity and follow up care.[7,8,11,24] To our knowledge, this is the first study to demonstrate differences in access to care in a doctor's office between adults presenting to the ED with limited compared to adequate health literacy. In unadjusted analysis, patients with limited health literacy were just as likely to have a personal doctor as those with higher health literacy skills. Yet those with limited health literacy were more likely to encounter barriers to care in the doctor's office as soon as they felt care was needed and to have had at least one ED visit in the previous six months.

Sequential adjustment for predisposing, need and enabling variables allowed for an assessment of how the relation between health literacy and health services access and use is impacted by these factors. Controlling for predisposing and need, patients with limited, compared to adequate health literacy remained as likely to have a personal doctor, **but more**

likely to have fewer doctor office visits, and more ED visits in the previous six months. Those with limited health literacy were also more likely to have had a potentially preventable hospital admission for a primary care treatable condition. Controlling for employment and insurance status, only the relation between health literacy and fewer doctor office visits remained significant. Although one might have expected the relationship between literacy and fewer doctor office visits to also be largely explained by employment and insurance status, adjustment for these factors had little effect. These results suggest that limited health literacy represents a barrier to care in the doctor's office, independent of other, well-recognized socioeconomic factors.

Patients' perspectives on reasons for ED use are needed to identify why patients choose to initiate care in the ED and which patients may accept or resist primary care alternatives to emergency care.[25] Patients with limited health literacy were more likely to report they received all healthcare in the ED, perceived better care in the ED, and liked the ED environment. Patients with limited health literacy may prefer the ED as a point of entry to the healthcare system because they find the ED easier or more convenient to access than primary care services[4,9,10] or may perceive the ED as a source of advanced high-quality care.[26] These results suggest that ED patients with limited health literacy may require clear communication on why primary care is beneficial to them and support in navigating the healthcare system to access timely primary care services. Models in which clinics reserve space for same day appointments improve access to primary care[27] and patients leaving the ED with scheduled appointments are more compliant with primary care follow-up.[28]

This study has several limitations. The study was conducted at a single institution and may not be generalizable to the broader US ED population. However, all EDs serve patients with a range of health literacy skills and the underlying relation between health literacy and healthcare access and use should be broadly applicable. Further, the study was powered to detect significant health literacy group differences in access to primary care services. A larger sample size may have detected significant differences in other healthcare services in fully adjusted models. Finally, the association between health literacy and health services access and use is based on patient self-report and thus, subject to recall and social desirability bias.[29]

Despite limitations, the results of this study have important implications for healthcare policy and research. Strategies to address costs associated with non-urgent ED use include policies to limit patients' access to non-urgent emergency services,[30,31] requiring on-site payment from patients whose presenting conditions are deemed non-emergent, and reducing Medicaid reimbursements for emergency care for pre-defined conditions.[32] Limiting access to emergency services without improving access to timely primary care services or uncovering the reasons patients with limited health literacy prefer the ED for care is unlikely to change these health service use patterns.

In summary, this study demonstrates that limited health literacy in the ED population is independently associated with barriers to accessing primary care services in a doctor's office. The results also suggest that interventions to improve access to care in the ED population must extend beyond identifying a personal doctor or providing insurance and include defining and modifying the barriers to timely primary care services experienced by those with limited health literacy.

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Table 1

Characteristics of participants by health literacy level (N=492)

	Overall (N=492) %	Adequate (N=324) %	Limited (N=168) %	p-value
PREDISPOSING				
Age				0.440
18-29	35	37	32	
30-49	35	33	37	
50-86	30	29	32	
Gender				0.007
Male	45	**41**	**54**	
Female	55	**59**	**46**	
African American/Other				<0.001
Yes	28	**19**	**45**	
No	72	**81**	**55**	
NEED				
Self-Rated Health				0.139
Excellent or Very Good	37	39	32	
Good	27	27	25	
Fair or Poor	36	33	42	
Chronic Conditions Count *				0.704
0 Conditions	31	31	32	
1-2 Conditions	37	36	39	
3 or More Conditions	32	33	29	
Emergency Severity Index **				0.731
High Acuity	25	25	26	
Less Urgent	75	75	74	
ENABLING				
Employment Status				0.610
Yes	59	58	61	
No	41	42	39	
Health Insurance Status				<0.001
Public	34	**28**	**43**	
Private	29	**35**	**19**	
Uninsured	37	**37**	**38**	

*The following 12 chronic conditions were measured in this count: heart attack, cancer, angina, diabetes, congestive heart failure, arthritis, stroke, depression, high blood pressure, atrial fibrillation, chronic obstructive pulmonary disease, any other

**Categorized as High Acuity (ESI=1, 2) or Less Urgent (ESI=3, 4, 5)

†Bolded values indicate significant differences between a given characteristic and health literacy level ($p<0.05$)

Table 2

Relationship between limited and adequate health literacy and healthcare access and use (N=492)[*†]

		Unadjusted			Adjusted for Predisposing & Need Factors			Adjusted for Predisposing, Need, & Enabling Factors		
	Percent in Sample (N)	Odds Ratio	Adjusted 95% CI	p-value	Odds Ratio	Adjusted 95% CI	p-value	Odds Ratio	Adjusted 95% CI	p-value
Healthcare Access and Use										
Hospital										
ED Visit in Previous 6 Months	51 (247)	**1.51**	**(1.03, 2.20)**	**0.03**	**1.57**	**(1.02, 2.43)**	**0.04**	1.40	(0.90, 2.20)	0.14
Hospital Admission for Ambulatory Care Sensitive Condition (ACSC) in Previous 2 Years	38 (185)	1.40	(0.96, 2.05)	0.08	**1.65**	**(1.00, 2.73)**	**0.05**	1.62	(0.96, 2.73)	0.07
Primary Care Services										
Had Personal Physician	56 (275)	0.81	(0.55, 1.17)	0.26	0.99	(0.63, 1.55)	0.98	1.06	(0.66, 1.68)	0.81
Doctor Office/Clinic Visits in Previous 6 Months	72 (341)	0.68	(0.45, 1.03)	0.07	**0.60**	**(0.36, 0.98)**	**0.04**	0.55	**(0.32, 0.93)**	**0.03**
Never Able to Go to Doctor's Office or Clinic as Soon as Needed in Previous 6 Months	21 (102)	**1.70**	**(1.09, 2.66)**	**0.01**	1.60	(0.95, 2.67)	0.07	1.53	(0.90, 2.59)	0.12

[*] Analyses adjusted for the following factors: *Predisposing*: age, gender, race; *Need*: self-rated health, chronic condition count; *Enabling:* employment status, insurance status

[†] Bold values indicated significance of $p \leq 0.05$.

Table 3

Proportions of patients who report each reason for emergency department use overall and by health literacy level (N=492)*

	N	Overall %	Adequate %	Limited %	p-value
Reasons For ED Visit					
Emergency	439	89	89	90	0.52
Right Place to Go	455	92	92	93	0.82
Worried	459	93	93	95	0.39
Too Much Pain	357	73	70	77	0.13
Too Sick or Injured	255	52	50	55	0.35
Don't Like Usual	63	13	13	13	0.89
Medical Records are at ED	203	41	38	47	0.06
Better Care at the ED	300	61	**58**	**67**	**0.04**
Always Get Care in ED	232	47	**40**	**60**	**<0.001**
Like Environment of the ED	124	25	**19**	**38**	**<0.001**
No Insurance	102	21	22	18	0.37
Financial	110	22	21	26	0.21
MD Refused Insurance	15	3	3	3	0.95
One Stop	312	63	62	65	0.49
No Appointment Necessary	224	45	45	46	0.92
Closest or Easiest Place	266	54	55	52	0.46
No Place to Go	269	55	55	54	0.87
Only Place Open	130	26	27	25	0.61
Language	161	33	33	33	0.996
Family or Friends	156	32	34	27	0.09

*Bold values indicated significance between adequate and limited health literacy, $p < 0.05$.