ORIGINAL RESEARCH   CME

Health Literacy and the Quality of Physician-Patient Communication During Hospitalization

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BACKGROUND: Overall, poor physician-patient communication is related to post-discharge adverse events and readmission. We analyzed patients' ratings of the quality of physician-patient communication during hospitalization and how this varies by health literacy.

METHODS: Medical patients were interviewed during their hospitalization to assess personal characteristics and health literacy. After discharge, patients completed by telephone the 27-item Interpersonal Processes of Care in Diverse Populations Questionnaire (IPC). Using the IPC, patients rated the clarity and quality of physicians' communication during the hospitalization along the following 8 domains: General clarity, Responsiveness to patient concerns, Explanation of patients' problems, Explanation of processes of care, Explanation of self-care after discharge, Empowerment, Decision making, and Consideration of patients' desire and ability to comply with recommendations.

RESULTS: A total of 84 patients completed both the in-hospital and telephone interviews. Subjects had a mean age of 55, and 44% had inadequate health literacy. Overall, patients gave the poorest ratings to communication that related to Consideration of patients' desire and ability to comply with recommendations. Patients with inadequate health literacy gave significantly worse ratings on the domains of General clarity, Responsiveness to patient concerns, and Explanation of processes of care ($P < 0.05$ for each). In multivariable analyses, the relationship with General clarity did not persist.

CONCLUSIONS: Physicians received relatively poor ratings on their Consideration of patients' desire and ability to comply with recommendations. Patients with inadequate health literacy experienced lower quality and clarity of hospital communication along multiple domains. More attention to effective health communication is warranted in the hospital setting. *Journal of Hospital Medicine* **2010;5:269–275.** © *2010 Society of Hospital Medicine.*

KEYWORDS: communication, health literacy, transitions of care.

It is well established that patients have difficulty understanding written health materials,[1] medical terminology,[2,3] and other aspects of provider-patient communication.[4,5] Such difficulties in communication can be magnified at transitions of care like hospital discharge.[6] Patients often receive a large amount of information in a short period of time at discharge, and this information may be delivered in a way that is not straightforward or standardized.[7,8] When asked, patients commonly report a poor understanding of important self-care instructions such as how to take medications upon returning home.[9,10] One study even showed that more than half of patients did not recall anyone providing instructions about how they should care for themselves after hospitalization.[11] Poor medication management after hospital discharge contributes to adverse events,[12–15] inadequate disease control,[16] and in the setting of cardiovascular disease, higher mortality.[17,18] Most adverse events after hospital discharge could be prevented or ameliorated through relatively simple means, including better communication among patients and providers.[6,14–16,19–21] Greater attention to communication and care transitions could also reduce the number of unplanned rehospitalizations in the United States.[22]

Patients' health literacy is an important factor in effective health communication, yet little research has examined the role of health literacy in care transitions. Health literacy is defined as the extent to which an individual is able to "obtain, process and understand basic health information

and services needed to make appropriate health decisions."[23,24] Low health literacy is a prevalent problem in the United States, affecting approximately 40% of adults.[25] Research has shown that low health literacy is associated with low self-efficacy[26] and less interaction in physician-patient encounters,[27] which in combination with physicians' use of complex medical language,[28] may contribute to poor physician-patient communication. Patients with low health literacy also have greater difficulty understanding prescription drug labels,[29] limited knowledge of disease self-management skills,[30] a higher incidence of hospitalization,[31] and higher mortality rates.[32–34]

In order to elucidate the relationship between patient-provider communication and health literacy in the hospital setting, we analyzed patients' ratings of their communication experience during their hospitalization. We report patients' perceptions of the clarity of communication and how this may vary by level of health literacy and other important patient characteristics.

Methods

Setting and Participants

Patients admitted to the general medical wards at Grady Memorial Hospital were recruited for participation. Grady Memorial Hospital is a public, urban teaching hospital located in Atlanta, GA. It serves a primarily low income, African American population, many of whom lack health insurance. Approximately 30% to 50% of patients at this hospital have inadequate health literacy skills.[35]

The present study was conducted as preliminary research for a randomized controlled trial to improve post-discharge medication adherence among patients with acute coronary syndromes (ACS). The criteria for the present study mirrored those of the planned trial. Patients were eligible for the current study if they were admitted with suspected ACS and evidence of myocardial ischemia.[36] Exclusion criteria included lack of cooperation/refusal to participate, unintelligible speech (eg, dysarthria), lack of English fluency (determined subjectively by interviewer), delirium (determined by lack of orientation to person, place, and time), severe hearing impairment (determined subjectively by interviewer), visual acuity worse than 20/60 (per pocket vision screening card), acute psychotic illness (per admission history), police custody, age younger than 18 years, no regular telephone number, administration of all medications by a caregiver, and not taking prescription medications in the 6 months before admission.

Data Collection and Measures

Enrollment occurred between August 2005 and April 2006, after approval was obtained from both the Emory University Institutional Review Board (IRB) and Grady Research Oversight Committee. Interested and willing participants provided written informed consent and subsequently completed an interviewer-assisted questionnaire prior to

hospital discharge to collect information regarding demographics and cardiovascular risk factors. To ensure that answers were not confounded by participants' inability to read the questionnaire text, all questions were read to participants by study interviewers, with the exception of the health literacy assessment—the Rapid Estimate of Adult Literacy in Medicine (REALM).[37] The REALM classifies a patient's literacy according to the number of medical terms from a list that the patient pronounces correctly. It correlates highly with other assessments of literacy and health literacy.[38] Cognitive function was measured using the Mini-Mental State Examination (MMSE).[39]

Research staff contacted patients by telephone approximately 2 weeks after hospital discharge to complete a survey which included the Interpersonal Processes of Care in Diverse Populations Questionnaire (IPC).[40] The IPC is a validated, self-report questionnaire with high internal consistency reliability. It was developed and normalized among ethnically diverse populations of low socioeconomic status. Items on the IPC originally referred to communication during the last 6 months in the outpatient clinic; they were reworded to refer to the recent hospitalization only. The research assistant administered 8 of 12 domains of the IPC that were most pertinent to rating the quality and clarity of patient communication with hospital physicians.[41] Four other IPC domains that pertained to interpersonal style (eg, friendliness, emotional support) were not administered to minimize response burden. Each domain was comprised of 2 to 7 items, and responses were given on a 5-point Likert scale. The 8 domains and sample items were as follows: (1) General clarity (eg, "Did the doctors use medical words that you did not understand?"); (2) Elicitation of and responsiveness to patient problems, concerns, and expectations (eg, "Did the doctors listen carefully to what you had to say?"); (3) Explanations of condition, progress, and prognosis (eg, "Did the doctors make sure you understand your health problem?"); (4) Explanations of processes of care (eg, "Did the doctors explain why a test was being done?"); (5) Explanations of self-care (eg, "Did the doctors tell you what you could do to take care of yourself at home?"); (6) Empowerment (eg, "Did the doctors make you feel that following your treatment plan would make a difference in your health?"); (7) Decision-making: responsiveness to patient preferences regarding decisions (eg, "Did the doctors try to involve you or include you in decisions about your treatment?"); and (8) Consideration of patient's desire and ability to comply with recommendations (eg, "Did the doctors understand the kinds of problems you might have in doing the recommended treatment?").

Statistical Analysis

Patient characteristics were summarized using frequency, mean, and standard deviation measures. Nondichotomous measures were recategorized into dichotomous variables as follows: age (less than 55 years vs. 55 years or older), race

TABLE 1. Patient Characteristics (n = 84)

Characteristic	n (%)
Age	
<55 years	45 (54)
≥55 years	39 (46)
Gender	
Male	49 (58)
Female	35 (42)
Race	
Black	74 (88)
White or other	10 (12)
Marital status	
Married or living with someone	23 (27)
Living alone	61 (73)
Education	
Did not complete high school	32 (38)
High school graduate	52 (62)
Employment status	
Employed (full/part time)	18 (21)
Not employed	66 (79)
Mini-Mental State Exam	
Cognition impaired	42 (50)
Cognition not impaired	42 (50)
Health literacy	
Inadequate	37 (44)
Marginal or adequate	47 (56)

(black vs. white or other), marital status (married or living with someone vs. living alone), education (less than high school vs. high school graduate), employment status (employed full/part time vs. unemployed/retired), MMSE score (cognitively impaired [MMSE score ≤24] vs. no significant cognitive impairment [MMSE score >24]),[39] and health literacy score (inadequate [REALM score 0 to 44] vs. marginal or adequate [REALM score 45-66]).[38] Dichotomous variables were summarized using frequencies.

Scores for each individual IPC question ranged from 1 to 5 with lower scores indicating better communication, except for questions in the domain of general clarity where higher scores indicated better communication. Then, for each of the 8 domains, scores of the individual IPC questions within that domain were averaged.

Bivariate analyses were conducted for each of the 8 IPC domains, by level of health literacy and other relevant patient characteristics, using the independent samples *t*-test. Multivariable linear regression models were then constructed to examine the independent association of health literacy with each of the 8 IPC domains, while controlling for other patient characteristics that were also found to be associated with IPC domain scores. Bivariate analyses were also conducted for each of the 27 individual IPC items, to gain an understanding of which items might be driving the overall effect. A 2-sided $P < 0.05$ was considered statistically significant. All analyses were performed using SPSS 15 for Windows (SPSS, Chicago, IL).

Results

Patient Characteristics

A total of 109 eligible patients were approached, 100 agreed to participate and were enrolled in the hospital, and 84 of them completed the follow-up interview by telephone to comprise the sample for this study (Table 1). Most of the 84 participants were under the age of 55 (54%), male (58%), African American (88%), unemployed (79%), lived alone (73%), and had completed high school (62%). Age ranged from 24 to 80 years, REALM score ranged from 0 to 66, and MMSE ranged from 12 to 30. A large proportion (44%) had inadequate health literacy skills, and 50% had cognitive impairment. Patients with inadequate health literacy were more likely to have not finished high school and to suffer cognitive impairment, $P < 0.01$ for each comparison.

Hospital Communication Ratings by IPC Domains

Overall, patients' ratings of hospital communication were positive, with most IPC domain score means lying in the favorable half of the Likert scale (Table 2). The domains with the best communication ratings were responsiveness to patient concerns (mean = 1.68), explanations of condition and prognosis (mean = 1.75), and empowerment (mean 1.76). The domain of worst performance was consideration of patients' desire and ability to comply with recommendations (mean = 3.15).

In bivariate analyses that compared IPC domains by patients' level of health literacy, several differences emerged. Patients with inadequate health literacy skills gave significantly worse ratings to the quality of communication on the domains of general clarity (mean = 3.36 vs. 3.89 for patients with marginal or adequate health literacy, $P = 0.02$), Responsiveness to patient concerns (mean = 1.86 vs. 1.53, $P = 0.03$), and Explanations of processes of care (mean = 2.22 vs. 1.84, $P = 0.04$). On a fourth domain, Explanations of condition and prognosis, a nonsignificant trend was present (mean = 1.93 vs. 1.61, $P = 0.09$).

Fewer significant relationships were found between other patient characteristics and IPC domain scores. Patients who were age 55 or older provided worse ratings on explanations of self-care (mean = 2.74 vs. 2.05 for patients under the age of 55, $P = 0.003$). Lower ratings on the domain of general clarity, which indicated unclear communication, were found among patients who had not graduated from high school (mean = 3.31 vs. 3.88 for high school graduates, $P = 0.02$) or who had cognitive impairment (mean = 3.39 vs. 3.93 for patients without impaired cognition, $P = 0.01$). No significant differences were present by gender or race.

Based on these bivariate relationships, terms for inadequate health literacy, age ≥55, Cognitive impairment, and high school graduation were entered into multivariable models that predicted scores on each of the 8 IPC domains. Inadequate health literacy was independently associated with Responsiveness to patient concerns ($\beta = -0.512$, $P = 0.007$) and Explanations of processes of care ($\beta = -0.548$, $P = 0.023$); a nonsignificant trend was present for

TABLE 2. Interpersonal Processes of Care (IPC) Domains Overall and by Level of Health Literacy

	IPC Domain	Total (n = 84), Mean (SD)	Patients with Inadequate Literacy (n = 37), Mean (SD)	Patients with Marginal or Adequate Literacy (n = 47), Mean (SD)	P Value
1	General clarity*	3.66 (1.00)	3.36 (1.14)	3.89 (0.74)	0.02
2	Responsiveness to patient concerns	1.68 (0.68)	1.86 (0.76)	1.53 (0.58)	0.03
3	Explanations of condition and prognosis	1.75 (0.87)	1.93 (0.99)	1.61 (0.74)	0.09
4	Explanations of processes of care	2.01 (0.86)	2.22 (0.96)	1.84 (0.74)	0.04
5	Explanations of self-care	2.37 (1.04)	2.42 (1.20)	2.33 (0.90)	0.71
6	Empowerment	1.76 (1.03)	1.85 (1.27)	1.69 (0.81)	0.51
7	Decision-making	2.34 (0.78)	2.34 (0.80)	2.34 (0.77)	1.00
8	Consideration of patients' desire and ability to comply with recommendations	3.15 (1.19)	3.24 (1.16)	3.07 (1.23)	0.54

Abbreviation: SD, standard deviation.

*The range for all scores is 1 to 5. On the domain of General clarity, higher scores indicate more favorable responses. On other domains, lower scores indicate more favorable responses.

consideration of patients' desire and ability to comply with recommendations ($\beta = -0.582$, $P = 0.09$). The association of age with explanations of self-care remained after adjustment for the other variables ($\beta = 0.705$, $P = 0.002$). None of the patient characteristics was independently associated with ratings of general clarity.

IPC Item Responses

Examination of responses on the individual IPC items revealed the specific areas of difficulty in communication as rated by patients (Table 3). In the domain of general clarity, patients with inadequate literacy provided poorer ratings on the item pertaining to use of medical terminology (mean = 2.92 vs. 3.68 for patients with marginal or adequate literacy, $P = 0.004$). Regarding Responsiveness to patient concerns, differences by literacy were present in the item that pertained to patients being given enough time to say what they thought was important (mean = 2.27 vs. 1.51, $P = 0.003$). On the domain of explanations of processes of care, the item rated differently by patients with inadequate literacy referred to feeling confused about their care because doctors did not explain things well (mean = 2.51 vs. 1.83, $P = 0.02$).

Discussion

We used a validated instrument, the IPC,[40] to examine patients' ratings of the quality and clarity of hospital-based communication. Overall, patients provided favorable ratings in many domains, including those pertaining to Responsiveness to patient concerns and Explanations of condition and prognosis. Clinicians' consideration of patients' desire and ability to comply with recommendations was rated least favorably overall. This represents an important area for improvement, particularly when considering the prevalence of nonadherence to medical therapy after hospital discharge, which may be as high as 50%.[9,42] Nonadherence after hospital

discharge contributes to avoidable emergency department visits,[43] hospital readmissions,[44] and higher mortality.[18,45] The results of this study suggest that hospital physicians should give greater consideration to patients' preferences and problems that they may have in following the treatment recommendations.[16] Future research will determine the extent to which this may enhance post-discharge adherence.

Another important finding is that patients with inadequate health literacy rated hospital-based communication less favorably than did patients with marginal or adequate literacy. In bivariate analyses, this effect was seen on several domains, including general clarity, Responsiveness to patient concerns, and explanations of processes of care. The latter 2 relationships persisted after adjustment for age, cognitive impairment, and educational attainment. To our knowledge, this is the first study which examines the effect of health literacy on patients' ratings of hospital-based communication.

The majority of the literature on health communication and health literacy focuses on the outpatient setting.[34,46] However, the quality and clarity of patient-provider communication in the hospital is also critically important. Ineffective communication in the hospital contributes to poor care transitions and post-discharge complications. Patients commonly leave the hospital with a poor understanding of what transpired (eg, diagnoses, treatment provided, major test results) and inadequate knowledge about the self-care activities that they must perform upon returning home (eg, medication management, physical activity, follow-up appointments).[9–11] Poor communication is often cited as the main underlying and remediable factor behind medical errors, adverse events, and the readmissions that commonly occur after hospital discharge.[6,16,20] The results of this study provide complementary evidence, showing that patients often feel they have experienced suboptimal communication in the hospital setting. These findings highlight an opportunity

TABLE 3. Interpersonal Processes of Care (IPC) Items Overall and by Level of Health Literacy

IPC Items	Overall (n = 84), Mean (SD)	Inadequate Literacy (n = 37), Mean (SD)	Marginal or Adequate Literacy (n = 47), Mean (SD)	P Value
General clarity*				
1. Did the doctors use medical words you did not understand?	3.35 (1.14)	2.92 (1.40)	3.68 (0.73)	0.004
2. Did you have trouble understanding your doctors because they spoke too fast?	3.98 (1.06)	3.81 (1.13)	4.11 (1.01)	0.21
Responsiveness to patient concerns				
3. Did the doctors give you enough time to say what you thought was important?	1.85 (1.14)	2.27 (1.28)	1.51 (0.88)	0.003
4. Did the doctors listen carefully to what you had to say?	1.62 (0.88)	1.76 (1.04)	1.51 (0.72)	0.22
5. Did the doctors ignore what you told them?	1.70 (0.92)	1.81 (1.09)	1.62 (0.77)	0.38
6. Did the doctors take your concerns seriously?	1.55 (0.92)	1.65 (0.98)	1.47 (0.88)	0.38
Explanations of condition and prognosis				
7. Did the doctors give you enough information about your health problems?	1.88 (1.11)	2.11 (1.27)	1.70 (0.95)	0.11
8. Did the doctors make sure you understand your health problems?	1.62 (0.88)	1.76 (0.98)	1.51 (0.78)	0.22
Explanations of processes of care				
9. Did the doctors explain why a test was being done?	1.70 (1.10)	1.89 (1.24)	1.55 (0.95)	0.16
10. Did the doctors explain how the test was done?	2.20 (1.35)	2.27 (1.39)	2.15 (1.34)	0.69
11. Did the doctors tell you what they were doing as they examined you?	1.99 (1.20)	2.22 (1.34)	1.81 (1.06)	0.13
12. Did you feel confused about what was going on with your medical care because doctors did not explain things well?	2.13 (1.23)	2.51 (1.47)	1.83 (0.92)	0.02
Explanations of self-care				
13. Did the doctors tell you what you could do to take care of yourself at home?	1.67 (1.09)	1.81 (1.29)	1.55 (0.90)	0.31
14. Did the doctors tell you how to pay attention to your symptoms and when to call the doctor?	2.01 (1.38)	2.19 (1.60)	1.87 (1.17)	0.32
15. Did the doctors clearly explain how to take the medicine (that is when, how much and for how long)?	1.88 (1.36)	2.00 (1.53)	1.79 (1.22)	0.48
16. Did the doctors go over all the medicines you are taking?	2.39 (1.55)	2.51 (1.74)	2.30 (1.40)	0.54
17. Did the doctors give you written instruction about how to take the medicine (other than what was on the container)?	3.29 (1.70)	3.05 (1.75)	3.48 (1.66)	0.26
18. Did the doctors tell you the reason for taking each medicine?	2.05 (1.43)	2.24 (1.64)	1.89 (1.24)	0.29
19. Did the doctors tell you about side effects you might get from your medicine?	3.32 (1.64)	3.11 (1.73)	3.49 (1.56)	0.29
Empowerment				
20. Did doctors make you feel that following your treatment plan would make a difference in your health?	1.75 (1.07)	1.89 (1.27)	1.64 (0.90)	0.31
21. Did the doctors make you feel that your everyday activities such as your diet and lifestyle would make a difference in your health?	1.77 (1.21)	1.81 (1.41)	1.74 (1.03)	0.81
Decision-making				
22. Did the doctors try to involve you or include you in decisions about your treatment?	2.43 (1.55)	2.30 (1.49)	2.53 (1.60)	0.49
23. Did the doctors ask how you felt about different treatments?	3.08 (1.58)	2.89 (1.66)	3.23 (1.51)	0.33
24. Did the doctors make decision without taking your preferences and opinions into account?	2.23 (1.35)	2.34 (1.55)	2.15 (1.20)	0.54
25. Did you feel pressured by doctors in the hospital to have a treatment you were not sure you wanted?	1.60 (0.97)	1.81 (1.18)	1.43 (0.74)	0.09
Consideration of patients' desire and ability to comply with recommendations				
26. Did the doctors ask if you might have any problems actually doing the recommended treatment (for example taking the medication correctly)?	3.82 (1.47)	4.08 (1.40)	3.62 (1.51)	0.15
27. Did the doctors understand the kinds of problems you might have in doing the recommended treatment?	2.43 (1.44)	2.26 (1.52)	2.57 (1.38)	0.34

Abbreviation: SD, standard deviation.

*On the domain of general clarity, higher scores indicate more favorable responses. On other domains, lower scores indicate more favorable responses.

for improvement in care transitions and patient safety, particularly among patients with inadequate health literacy.

In outpatient research that utilized the IPC, Schillinger et al.[41] found that patients with inadequate functional health literacy reported significantly worse communication on the domains of general clarity, explanations of processes of care, and Explanations of condition and prognosis. Subsequent analyses by Sudore et al.[47] demonstrated that patients with inadequate or marginal health literacy more often reported that physicians did not give them enough time to say what they thought was important, did not explain processes of care well, and did not ask about problems in following the recommended treatment (Table 3, IPC items 3, 12, and 26, respectively). Our findings were very

similar. These relatively consistent results across studies and populations strengthen the conclusion that patients with inadequate health literacy feel their physicians do not communicate as effectively in these areas.

Importantly, the differences in patient responses by literacy category were driven by a few IPC items. These items pertained to physicians' use of medical terminology, the amount of time they gave patients to express their concerns, and how well they explained the patients' medical care. Training physicians to improve their communication skills in these specific areas may improve their ability to communicate effectively with patients who have limited literacy skills. Indeed, published recommendations on how to improve the clarity of verbal communication emphasize just a few major areas, including limiting the amount of medical terminology used, effectively encouraging patients to ask questions and express their concerns, and asking patients to teach-back key points to make sure the physician has provided adequate explanation.[48–51] The present study provides some evidence for those recommendations, which for the most part, have been based on clinical experience and expert opinion.

There remains a need for professional education about health literacy and techniques to improve communication with patients who may have limited literacy skills. Many experts advocate clear verbal communication with all patients, so-called "Universal Precautions."[52] Although 10 years have passed since the American Medical Association (AMA) called for more work in this area,[53] few curricula have been described in the literature.[48,54–56] The extent to which health literacy curricula have been implemented in medical schools and other professional schools is unknown. The impact of such training on the communication skills of health care providers and patient outcomes is also unclear.

The strengths of this study include a relatively good response rate and use of a validated measure to grade the quality of physician-patient communication. This measure, the IPC, has been used previously in the context of health literacy.[41] Nevertheless, certain limitations should be acknowledged. First, the study was performed at a single teaching hospital, where patients had a high prevalence of inadequate health literacy. The findings may not generalize to other institutions that serve a different patient population or to nonacademic programs. Second, communication was assessed by patient report, rather than by recording patient-provider discussions for rating by independent observers. While patient report is inherently more subjective, patients' own perceptions about the effectiveness of health communication are arguably more important than those of independent raters, and thus, the data source may not represent a true limitation. Third, patient responses were obtained approximately 2 weeks after hospital discharge, and accordingly, they are subject to recall bias, which may be greater among those with cognitive impairment. Finally, patients were directed to rate the communication of the overall group of physicians who took care of them in the hospital.

Given the academic setting, patients typically received care from a team that included medical students, interns, a resident, and an attending physician. We were not able to determine whether patients' ratings were influenced by a specific member of the team, nor how ratings may have been influenced by certain characteristics of that team member (eg, year of training, prior communication skills training, race or gender concordance, etc).

In summary, by surveying patients soon after an acute care hospitalization, we determined that certain areas held room for improvement, such as consideration of patients' desire and ability to comply with treatment recommendations. Patients with inadequate health literacy reported lower quality physician-patient communication on several domains. They expressed particular concern about physicians' use of medical terminology, not getting enough time to express their concerns, and not receiving clear enough explanations about the medical care. Efforts are needed to improve physicians' communication skills in these areas. Such training should be evaluated to determine if it has a beneficial effect on physician communication skills and patient outcomes.

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