

## Patients With Limited Health Literacy Ask Fewer Questions During Office Visits With Hand Surgeons

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### Abstract

**Background** In the midst of rapid expansion of medical knowledge and decision-support tools intended to benefit diverse patients, patients with limited health literacy (the ability to obtain, process, and understand information and services to make health decisions) will benefit from asking questions and engaging actively in their own care. But little

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Each author certifies that his or her institution approved the human protocol for this investigation, that all investigations were conducted in conformity with ethical principles of research, and that informed consent for participation in the study was obtained.

This work was performed at Massachusetts General Hospital, Boston, MA, USA.

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is known regarding the relationship between health literacy and question-asking behavior during outpatient office visits.

**Questions/purposes** (1) Do patients with lower levels of health literacy ask fewer questions in general, and as stratified by types of questions? (2) What other patient characteristics are associated with the number of questions asked? (3) How often do surgeons prompt patients to ask questions during an office visit?

**Methods** We audio-recorded office visits of 84 patients visiting one of three orthopaedic hand surgeons for the first time. Patient questions were counted and coded using an adaptation of the Roter Interaction Analysis System in 11 categories: (1) therapeutic regimen; (2) medical condition; (3) lifestyle; (4) requests for services or medications; (5) psychosocial/feelings; (6) nonmedical/procedural; (7) asks for understanding; (8) asks for reassurance; (9) paraphrase/checks for understanding; (10) bid for repetition; and (11) personal remarks/social conversation. Directly after the visit, patients completed the Newest Vital Sign (NVS) health literacy test, a sociodemographic survey (including age, sex, race, work status, marital status, insurance status), and three Patient-Reported Outcomes Measurement Information System-based questionnaires: Upper-Extremity Function, Pain Interference, and Depression. The NVS scores were divided into limited (0–3) and adequate (4–6) health literacy as done by the tool's creators. We also assessed whether the surgeons prompted patients to ask questions during the encounter.

**Results** Patients with limited health literacy asked fewer questions than patients with adequate health literacy ( $5 \pm 4$  versus  $9 \pm 7$ ; mean difference,  $-4$ ; 95% CI,  $-7$  to  $-1$ ;  $p = 0.002$ ). More specifically, patients with limited health literacy asked fewer questions regarding medical-care issues such as their therapeutic regimen ( $1 \pm 2$  versus  $3 \pm 4$ ;

mean difference,  $-2$ ; 95% CI,  $-4$  to  $-1$ ];  $p < 0.001$ ) and condition ( $2 \pm 2$  versus  $3 \pm 3$ ; mean difference,  $-1$ ; 95% CI,  $-3$  to  $0$ ;  $p = 0.022$ ). Nonwhite patients asked fewer questions than did white patients ( $5 \pm 4$  versus  $9 \pm 7$ ; mean difference,  $-4$ ; 95% CI,  $-7$  to  $0$ ;  $p = 0.032$ ). No other patient characteristics were associated with the number of questions asked. Surgeons only occasionally (29%; 24/84) asked patients if they had questions during the encounter, but when they did, most patients (79%; 19/24) asked questions.

**Conclusions** Limited health literacy is a barrier to effective patient engagement in hand surgery care. In the increasingly tangled health-information environment, it is important to actively involve patients with limited health literacy in the decision-making process by encouraging question-asking, particularly in practice settings where most decisions are preference-sensitive. Instead of assuming that patients understand what they are told, orthopaedic surgeons may take “universal precautions” by assuming that patients do not understand unless proved otherwise.

**Level of Evidence** Level II, therapeutic study.

## Introduction

Limited health literacy is increasingly recognized as a contributor to health disparities and ineffective patient care [11]. Approximately one-third of patients seeing a hand surgeon have limited ability to obtain, process, understand, and communicate about information to make health decisions [24]. These patients arguably stand to benefit the most from detailed health education and counseling. However, they have shorter office visits [25], perhaps because of insufficient engagement. Asking questions during the medical encounter is essential to actively engage in one’s health care, a concept known as patient activation (defined as the knowledge, skills, ability, and willingness to manage one’s health care) [1, 2, 14]. Highly activated patients are more likely to participate in decision-making and have better health outcomes and care experiences at lower costs [10, 14, 15].

Patients with limited health literacy might not feel empowered to speak up or ask questions; they might be self-conscious, embarrassed, or deferential. Data regarding the relationship between health literacy and question-asking behavior are sparse and confined to the primary care setting [17]. Katz et al. [17] reported that patients with lower levels of health literacy tend to ask fewer questions regarding aspects of medical care, but that study was limited in size and generalizability because most patients were black women. Asking questions and engaging in shared decision-making are important to limit the potential

for misdiagnosis of patient preferences [28], particularly in hand surgery, where even with traumatic injuries (like distal biceps rupture, clavicle fracture, and distal radius fracture), treatment is discretionary, directed primarily at quality of life, and therefore is highly preference-sensitive.

Therefore, we asked: (1) Do patients with lower levels of health literacy ask fewer questions in general and as stratified by types of questions? (2) What other patient characteristics are associated with the number of questions asked? (3) How often do surgeons prompt patients to ask questions during an office visit?

## Patients and Methods

After institutional review board approval, 85 consecutive patients visiting the offices of three orthopaedic hand surgeons for the first time were invited to participate in this cross-sectional, qualitative and quantitative study. Inclusion criteria were age 18 years or older and fluency in English. Enrollment took place between November 2015 and March 2016. One (1.2%) patient declined participation, leaving 84 patients in the sample.

A research assistant (BTVH) not involved in patient care audio-recorded all visits using an encrypted device and [25]. The research assistant explained that audio recording was designed to evaluate physician-patient communication, but patients were not told the specific study aims so as not to influence behavior. Although the physicians were aware of the existence of this study, the interaction was not scripted and they were unaware of which patients were being enrolled in the study.

Two independent and blinded researchers (MEM, BTVH) listened to the audio recordings of the visits to count the number of patient questions and code them using an adaptation [17] of the Roter Interaction Analysis System [35], a widely used method to study physician-patient communication, until the reviewers reached a 90% agreement level. In this system, coding is done directly from audio recordings without transcription. As described by Katz and colleagues [17], questions were coded into 11 categories to maximize the usefulness and practicality of the Roter Interaction Analysis System for coding patient questions: (1) therapeutic regimen; (2) medical condition; (3) lifestyle; (4) requests for services or medications; (5) psychosocial/feelings; (6) nonmedical/procedural; (7) asks for understanding; (8) asks for reassurance; (9) paraphrase/checks for understanding; (10) bid for repetition; and (11) personal remarks/social conversation. We also defined a combined medical composite category representing information-seeking regarding key medical-care issues, which encompassed the first four categories [17]. The recordings also were reviewed to determine whether surgeons asked

patients if they had questions at any point during the encounter.

Directly after the visit, patients completed a sociodemographic survey (including age, sex, race, work status, marital status), the Newest Vital Sign (NVS) health literacy test [39], and three Patient-Reported Outcomes Measurement Information System-based (PROMIS) computerized adaptive questionnaires: Upper-Extremity Function [12], Pain Interference [3], and Depression [33]. The NVS health literacy test is based on a nutrition label from an ice cream container, and the overall score ranges from 0 to 6. We divided the resulting NVS scores into limited (0–3) and adequate (4–6) health literacy using the same threshold as in the original NVS study [39] and two recent studies [24, 25]. An NVS score less than 4 has a sensitivity of 100% and a specificity of 64% for predicting limited health literacy (Test of Functional Health Literacy in Adults [TOFHLA] score < 75) [39]. We included the PROMIS Upper-Extremity Function, Pain Interference, and Depression questionnaires because greater disability, maladaptive coping strategies, and symptoms of depression might plausibly affect question-asking behavior. All questionnaires were completed using a laptop computer, except for the NVS test, which was administered orally in accordance with its guidelines [39]. We also reviewed medical records to collect data regarding primary health insurance and diagnosis (traumatic versus nontraumatic).

### Statistical Analysis

An a priori power analysis indicated that a minimum sample size of 84 patients would provide 80% statistical power ( $\alpha = 0.05$ ) to detect a medium correlation of 0.30 between health literacy and the number of patient questions [17].

Continuous data were presented in terms of the mean and the SD. Categorical data were reported with frequencies and percentages.

To evaluate the association between health literacy and the number of patient questions, we used independent samples t-tests to compare the overall and category-specific number of questions asked by patients with adequate and limited health literacy. We also used Pearson correlation coefficients ( $r$ ) to determine the relationship between the number of patient questions and health literacy on a continuum.

The relationship between other patient characteristics and the total number of questions asked during the encounter was examined using Pearson correlation coefficients for continuous variables, independent samples t-tests for dichotomous variables, and ANOVA for categorical variables. Statistical significance was set at a probability less than 0.05.

We also assessed whether the surgeons invited patients to ask questions during the encounter, and whether that prompted patients to ask questions.

### Patient Characteristics

The 84 patients comprising our study population included 49 (58%) men and 35 women with a mean (SD) age of 51 (16) years (Table 1). Most patients were white (81%; 68/84) and employed (67%; 56/84). Sixty-three percent (53/84) had private insurance, whereas 37% (31/84) had government-funded insurance (Medicare, 24%; 20/84; Medicaid, 13%; 11/84). More than two-thirds of office visits were related to nontraumatic conditions (69%; 58/84).

**Table 1.** Characteristics of the study population (n = 84)

Parameter	Value
Age (years), mean $\pm$ SD	51 $\pm$ 16
Sex, number (%)	
Female	35 (42)
Male	49 (58)
Race/ethnicity, number (%)	
White	68 (81)
Nonwhite	16 (19)
Insurance status, number (%)	
Medicare	20 (24)
Medicaid	11 (13)
Private	53 (63)
Working status, number (%)	
Working	56 (67)
Retired	17 (20)
Disabled	11 (13)
Marital status, number (%)	
Unmarried	40 (48)
Married	44 (52)
Diagnosis, number (%)	
Nontraumatic	58 (69)
Traumatic	26 (31)
Health literacy, number (%)	
Limited (NVS score $\leq$ 3)	22 (26)
Adequate (NVS score 4–6)	62 (74)
PROMIS instruments, mean $\pm$ SD	
Pain Interference	59 $\pm$ 8.6
Upper Extremity Function	36 $\pm$ 9.5
Depression	48 $\pm$ 9.1

NVS = Newest Vital Sign; PROMIS = Patient-Reported Outcomes Measurement Information System.

**Table 2.** Distribution of patient questions overall and by health literacy level

Questions	All patients	Health literacy			p Value
		Limited	Adequate	Mean difference (95% CI)	
Total questions asked, mean ± SD	7.8 ± 6.5	4.9 ± 3.7	8.8 ± 7.0	−3.9 (−7.0 to −0.78)	0.002
Category, mean ± SD					
Therapeutic regimen	2.6 ± 3.3	1.0 ± 1.5	3.2 ± 3.6	−2.2 (−3.8 to −0.62)	< 0.001
Medical condition	2.7 ± 2.9	1.7 ± 2.0	3.1 ± 3.1	−1.4 (−2.8 to 0.010)	0.022
Lifestyle	0.13 ± 0.43	0.18 ± 0.50	0.11 ± 0.41	0.070 (−0.15 to 0.29)	0.53
Requests for services or medications	0.17 ± 0.43	0.14 ± 0.35	0.18 ± 0.46	−0.040 (−0.25 to 0.17)	0.71
Psychosocial/feelings	0.10 ± 0.33	0.050 ± 0.21	0.11 ± 0.37	−0.060 (−0.23 to 0.11)	0.42
Nonmedical/procedural	0.94 ± 1.7	0.73 ± 1.1	1.0 ± 1.9	−0.27 (−0.99 to 0.45)	0.50
Asks for understanding	0.020 ± 0.15	0	0.030 ± 0.18	−0.030 (−0.11 to 0.047)	0.40
Asks for reassurance	0.26 ± 0.56	0.14 ± 0.35	0.31 ± 0.62	−0.17 (−0.45 to 0.11)	0.23
Paraphrase/checks for understanding	0.52 ± 0.81	0.55 ± 0.60	0.52 ± 0.88	0.030 (−0.37 to 0.43)	0.89
Bid for repetition	0.13 ± 0.37	0.23 ± 0.43	0.10 ± 0.35	0.13 (−0.054 to 0.31)	0.16
Personal remarks/social conversation	0.18 ± 0.42	0.18 ± 0.50	0.18 ± 0.39	0 (−0.21 to 0.21)	0.97
Medical composite*	5.5 ± 5.0	3.0 ± 2.9	6.4 ± 5.3	−3.4 (−5.8 to −1.0)	< 0.001

\* Includes therapeutic regimen, medical condition, lifestyle, and requests for services or medications.

## Results

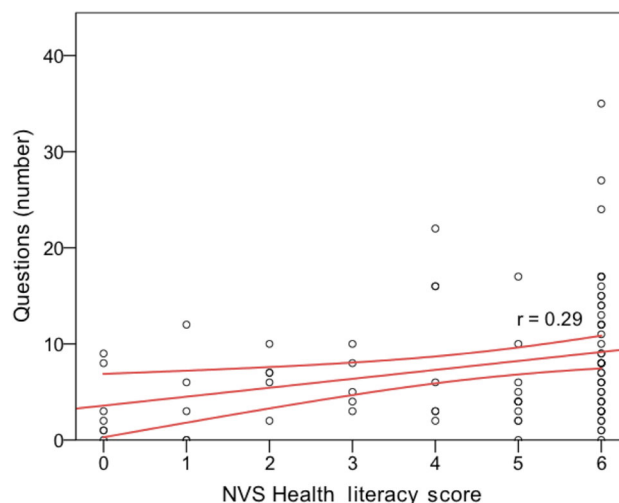
Patients with limited health literacy asked fewer questions than patients with adequate health literacy ( $5 \pm 4$  versus  $9 \pm 7$ ; mean difference,  $-4$ ; 95% CI,  $-7$  to  $-1$ ;  $p = 0.002$ ) (Table 2). More specifically, they asked fewer questions regarding medical-care issues such as their therapeutic regimen ( $1 \pm 2$  versus  $3 \pm 4$ ; mean difference,  $-2$ ; 95% CI,  $-4$  to  $-1$ ;  $p < 0.001$ ) and condition ( $2 \pm 2$  versus  $3 \pm 3$ ; mean difference,  $-1$ ; 95% CI,  $-3$  to  $0$ ;  $p = 0.022$ ). Health literacy, when evaluated on a continuum, correlated moderately with the total number of questions asked by patients during the visit ( $r = 0.29$ ,  $p < 0.001$ ) (Fig. 1).

Race was the only other patient characteristic associated with the number of questions asked during the encounter. Nonwhite patients asked fewer questions than did white patients ( $5 \pm 4$  versus  $9 \pm 7$ ; mean difference,  $-4$ ; 95% CI,  $-7$  to  $-0$ ;  $p = 0.032$ ).

When surgeons asked patients if they had questions during the encounter, most patients (79%; 19/24) asked questions. However, surgeons only occasionally (29%; 24/84) asked patients if they had questions.

## Discussion

In the midst of rapid expansion of medical knowledge and decision-support tools intended to benefit diverse patients, a substantial proportion may not understand this information well enough to ask questions and engage actively in their care [19]. Data regarding the relationship between



**Fig. 1** The correlation of health literacy (Newest Vital Sign [NVS] score) with the number of patient questions is shown.

health literacy and question-asking behavior are sparse and confined to the primary care setting [17]. We therefore sought to characterize the association of health literacy with the number and types of questions asked by patients during first-time hand surgery appointments. We also sought other patient characteristics associated with the number of questions asked during the encounter.

Our study was subject to several limitations that generate questions for future research. First, a larger sample size would have allowed us to assess the independent contribution of patient characteristics to question-asking behavior through the use of multivariable regression

modeling with limited risk of overfitting (fitting a model with too many degrees of freedom) and yielding biased estimates. The association of health literacy and race with question-asking behavior should not be interpreted as causal or direct. Health literacy and race may be associated with deference, disenfranchisement, mistrust, passivity, wealth, or other factors that influence the number of questions asked. Nevertheless, the observed associations can help direct the development of targeted strategies to facilitate patient-physician communication. Second, although audio recordings were coded using a validated adaptation of the Roter Interaction Analysis System [35], there is always a degree of subjectivity, which we attempted to minimize by training our coders. Third, patient and physician awareness of being audio-recorded may have caused them to subconsciously alter their behavior [38]. However, a previous study suggested audio recording has minimal effects on patient-physician communication [34]. Fourth, although we included patients presenting to different hand surgeons, this study was conducted at a single urban academic center serving predominantly white patients in the northeastern United States, and the results may lack generalizability [25]. Along these lines, the NVS health literacy test is not independent of the context and patient population in which it is used, and is unable to preclude potential confounders such as anxiety, perfectionism, loquaciousness, and controlling or suspicious personalities, on the one hand, and introversion, stoicism, or reticence, on the other. Consistent with the original NVS study [39], we defined limited health literacy as a score less than 4, which may overestimate the percentage of patients with limited health literacy. Fifth, we only considered first-time office visits so as to limit bias associated with heterogeneity of physician-patient familiarity. However, the association between health literacy and question-asking may change for followup and post-operative appointments. Sixth, our results might have been different had we enrolled patients presenting with a single condition or a group of similar conditions, but inclusion of patients with the usual spectrum of illnesses in our office also could be viewed as a strength. Seventh, we included only English-speaking patients. Given that language and cultural barriers often coexist with limited health literacy and may synergistically hinder the patient-physician interaction [37], the observed health literacy differences in question-asking might have been even more pronounced had we enrolled a more culturally and linguistically diverse patient population. Eighth, the study's primary focus on the number of questions asked during the medical encounter may lead to a simplistic conclusion regarding a complex phenomenon such as patient-physician communication. Additional larger studies on the more qualitative aspects of the patient-physician relationship are needed. Furthermore,

while increased question-asking is associated with more-effective patient engagement, its relation to patient satisfaction remains unclear and the subject of further research. The growing realization that patient satisfaction with the hand surgeon is determined primarily by physician empathy rather than to visit duration [23, 31] might indirectly indicate that the number of questions asked during the encounter plays a limited role in patient satisfaction. Finally, because of the limited number of surgeons in our study, we were unable to examine physician characteristics influencing patient question-asking behavior.

Consistent with a study in primary care [17], patients with limited health literacy undergoing hand surgery asked fewer questions regarding medical-care issues, including therapeutic regimen and condition. Their visits also were considerably shorter. Our findings suggest that health literacy is a relevant determinant of patient engagement in hand surgery and underscore the importance of strategies to augment patient activation among patients with limited health literacy [9]. Patient engagement is a broader concept that combines patient activation with interventions designed to increase activation and promote positive patient behavior, such as obtaining preventive care [9]. On the basis of available evidence in other settings of healthcare delivery [13, 16, 20, 22, 26, 27, 29, 32, 36, 40, 41], it is likely that patients with low health literacy presenting to a hand surgeon are at greater risk for poor treatment adherence, suboptimal outcomes, and misuse of resources; future studies should confirm these assumptions in this patient population. To the extent that asking more questions yields more information for patients, the observed difference in question-asking may reveal a source of health-literacy disparities in access to health information. To enhance patient-centered communication and engagement in care, we speculate that hand surgeons might consider scripting and practicing clear, concise explanations for common conditions, pausing between sentences for questions and inquiring about quizzical looks (such as "Does that fit what you were thinking?"). Patients who ask few or no questions may be deferring to authority or ashamed to admit that they do not understand. There is some evidence that patients with limited health literacy often hide the problem from family and may avoid seeking care as a result of embarrassment [4, 30], although more research on the stigma associated with low health literacy is needed [21]. Instead of assuming that patients understand what they are told, physicians may take "universal precautions" by assuming that patients do not understand unless proven otherwise [19]. Alternatively, patients who ask fewer questions may have simpler problems that are more efficiently addressed or they may prefer being less involved in decision-making. However, patients who are less comfortable voicing their concerns and feel less involved in decision-making also might ask fewer

questions. Although one might anticipate that patients with the highest levels of health literacy would find their illness relatively easy to understand and ask few or no questions during the visit, we observed that they asked the most questions.

We also observed racial differences in question-asking behavior with nonwhite patients asking fewer questions during the encounter. This is in agreement with a study in the outpatient oncology office setting [6]. Given the notion that nonwhite patients report greater mistrust of physicians and experience less social power than whites [8], they may hold traditional role expectations that eschew active involvement in the encounter [2].

Surgeons only occasionally asked patients if they had questions during the encounter. However, the fact that when they did, most patients asked questions highlights the importance of encouraging question-asking. Simple interventions such as the Ask Me 3 might facilitate patient-physician communication [7]. The Ask Me 3 approach encourages patients to ask three questions at every visit with a physician: (1) “What is my main problem?” (2) “What do I need to do (about the problem)?” (3) “Why is it important for me to do this?” [7]. From the physicians’ perspective, simply asking, “What are your questions?” instead of, “Do you have any questions?” may eliminate embarrassment and give patients the message that questions are expected. More personalized or intensive previsit interventions, such as having patients list their questions before seeing the physician or having a previsit session with a health coach, also might help [5, 18].

Limited health literacy constitutes a barrier to effective patient engagement in hand surgery care. In the increasingly tangled health information environment, it is important to actively involve patients with limited health literacy in the decision-making process by encouraging question-asking, particularly in practice settings where most decisions are preference-sensitive. Instead of assuming that patients understand what they are told, orthopaedic surgeons may take “universal precautions” by assuming that patients do not understand unless proven otherwise.

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