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Patients With Mental Health Needs Are Engaged In Asking Questions, But Physicians' Responses Vary

Ming Tai-Seale,

Senior investigator in the Department of Health Policy Research at the Palo Alto Medical Foundation Research Institute, in California

Patricia K. Foo, and

Medical doctor candidate and doctoral candidate in economics at Stanford University, in California

Cheryl D. Stults

Research associate at the Palo Alto Medical Foundation Research Institute

Abstract

Increased patient engagement is of particular interest regarding patients with mental health needs, given the high burden of mental illness in the United States and the potential for greater patient engagement to improve health outcomes. Little is known about the extent to which these patients ask questions of their physicians; how physicians respond; and what the relationship is between patients' questions and visit outcomes. We conducted in-depth mixed-method analyses of 322 audio recordings of primary care visits by people with mental health needs. We found that patients asked many questions—a median of fifteen per visit—but that they were more likely to ask about biomedical topics, such as diabetes, than about mental health topics. Patients received highly varied responses from physicians. Our findings suggest that efforts aimed at improving patient engagement should move beyond simply encouraging patients to ask questions. The goal should also be to support physicians in recognizing patients' concerns and providing the most responsive answers, as well as promoting strong relationships to undergird communication among all members of the care team.

Asking questions when visiting physicians has been seen as a way for patients to engage physicians and get more out of their encounters with them.^{1,2} Joining in the chorus of recommendations from patient advocates² and the popular news media,^{3,4} the Agency for Healthcare Research and Quality launched a campaign in 2011 titled “Questions Are the Answer,” which encourages patients to ask a specific set of questions during their health care encounters.⁵

How this movement toward greater patient engagement affects people with mental illnesses is of particular interest. Primary care physicians see and treat more than half of all cases of mental illness in the United States, putting them on the front lines of helping patients with mental health needs.⁶ However, because of the nature of their illnesses, patients with mental illnesses may be less motivated than other patients to engage in their care and less willing to ask questions.

The success of a strategy aimed at getting patients to ask questions of their primary care practitioners depends on the extent to which patients with mental health needs ask questions and receive helpful answers. In previous studies, an increased number of patients' questions have been associated with physicians' providing more information,^{7,8} higher patient satisfaction,⁹ higher patient ratings of quality of care,¹⁰ less patient anxiety and depression,⁹ improved health outcomes,¹⁰ and better patient adherence to treatment recommendations.⁹

These studies, however, were done mainly in specialty care settings, such as cancer and geriatrics. Little is known about whether patients with mental health needs ask questions in routine primary care. Similarly, little is known about how primary care physicians respond to patients' questions pertaining to mental illness.¹¹ What is known is that in at least one study from an academic primary care group practice at an urban ambulatory care clinic, primary care physicians expressed concern that their clinical skills and practice environment were inadequate to fully address the needs of patients with mental illnesses.¹²

The combination of patients' mental health status and physicians' unease in communication about mental illness may contribute to the documented underdiagnosis and under treatment of patients with mental illnesses in primary care.^{11,13} Knowing how patients with mental illnesses do or do not question their physicians and how those physicians respond is important information for those crafting policies to improve the quality of primary care, especially considering that about half of the care for common mental disorders is delivered in primary care settings.¹³

This article extends previous research on patient engagement. Our study involved a detailed analysis of all questions asked by 322 patients identified as having a potential need for mental health services. Building upon conceptual thinking and the literature,^{11,14,15} we address the following research questions: What factors influence whether patients with mental health needs ask questions? How do primary care physicians respond to these questions? What are the relationships between patient questions and the duration of the visit or the patient-perceived quality of physician communication?

Study Data And Methods

DATA SOURCE

Data came from an integrated delivery system in the Detroit, Michigan, area. Subjects were those enrolled in an observational study of discussion of preventive health issues during periodic health exams.¹⁶ A research assistant observed and recorded the visits during 2007–09. Clinician-participants were practicing family or general internal medicine physicians.

The sample consisted of 322 patients from the preventive health discussion study¹⁶ who met any of the following broad criteria for mental health needs that have been used in previous research:¹⁷ filled a prescription for or were prescribed a psychotropic medication in the twelve months before the observed visit; had a mental health diagnosis code in their electronic health record or visited a behavioral health center in the twelve months before the visit; or had a cumulative score of ≥ 2 on the two-question Patient Health Questionnaire that inquires about the frequency of depressed mood and anhedonia, an inability to experience

pleasure from usually enjoyable activities, over the past two weeks.¹⁸ Each question is scored from 0 (“not at all”) to 3 (“nearly every day”). Patients who had a mental health discussion as noted by the observing research assistant were also included.

Institutional Review Boards of the integrated health service delivery system and Palo Alto Medical Foundation approved the study.

METHODS

Recruitment of subjects for the larger observational study of preventive health issues has been described elsewhere in greater detail.¹⁶ Briefly, the patient participation rate was 50 percent, whereas the physician participation rate was 47 percent, resulting in a sample of 500 visits, from which the 322 visits in this study were obtained.¹⁶ Enrollment and selection information is provided in the online Appendix.¹⁹

A postvisit survey made use of a twenty-item Relational Communication Scale, an instrument designed to measure the verbal and nonverbal communication between two individuals, which was used in this case to assess patients’ perceptions of physicians’ relational communication.²⁰ Factor analysis identified two factors with excellent reliability.¹⁶

The first factor was related to openness. It included the following perceptions of physicians by their patients: My doctor was interested in talking to me; was sincere; wanted me to trust him or her; was willing to listen to me; was open to my ideas; and was honest in communicating with me.

The second factor related to composure and included the following: My doctor seemed nervous in my presence; created a sense of distance between us; felt very tense talking to me; and acted bored by our conversation. These four items were reverse-coded, so that higher values of the factor indicate better perceived composure.

All recordings were transcribed and analyzed using a method described elsewhere.¹⁵ Briefly, five trained research associates (“raters”) coded the audio recordings and transcripts for content, communication behaviors, and time spent on each topic.

Scores from different raters were compared using intraclass correlations for numerical variables and percentage agreement for categorical variables. Intraclass correlations between raters and within the same rater ranged from 0.78 to 0.99.

Qualitative analysis was carried out using the software Atlas.ti. Each visit was first coded for its content by topics.^{15,21} A *topic* was defined as an issue that required a response from the other person and had at least two complete exchanges between patient and physician.

Topics were categorized into these eight major areas: biomedical, such as diabetes; health behavior, such as diet; mental health, such as depression; psychosocial, such as family relationships; physician-patient relationship, such as the patient praising the physician; agenda setting/summarizing, such as setting the agenda of the visit and reviewing the issues as the visit progresses; closing, such as ending the visit; and other, such as small talk about

the weather.¹⁵ An example of an observed biomedical question is, “What about bone density?,” whereas an example of an observed mental health question is, “I want a happy pill. Is there such a thing?”

A topic could have multiple “instances” if that topic was discussed several times during the visit. The length of time spent on each topic was defined as the cumulative amount of time spent on all instances of the topic.¹⁵

A patient “question” was identified by vocal intonation from the audio recording. Each topic of conversation was coded for whether it included a patient question. Also coded was the extent to which the physician solicited the patient’s questions for each topic on a three-point scale, being described in specific behavioral terms with the midpoint (that is, 3) and two endpoints (that is, 1, 5) ranging from 1 if the physician made no attempt to solicit questions and ignored unsolicited questions to 5 if the physician openly encouraged and asked for questions.²²

Furthermore, we measured the extent to which the physician informed the patient using a five-point scale, ranging from 1 if the physician did not offer reasons for what a patient was being asked to do to 5 if the physician provided reasons with repeated reference to the patient’s understanding of the subject of their discussion.²³

Lastly, all patient questions and physician responses (or nonresponses) that occurred within mental health topics were qualitatively analyzed for emergent themes.

ANALYSIS

Multivariate models used generalized estimating equations, which accounted for clustering. The dependent variables at the topic level included whether the patient asked a question during a topic, logarithm of physician conversation time per topic, and quality of information given to the patient.

At the visit level, the dependent variables were logarithm of visit length and patient-reported physician relational communication regarding openness and composure. We discuss these findings, presented in the relevant exhibits, in greater detail below.

Guided by previous literature,^{2,11,14} we established the following independent variables for the topic-level analyses: a numerical rating of the quality of how well the physician solicited patient questions;²² the number of instances of a topic initiated by the patient;¹⁵ the number of instances of the topic;¹⁵ and whether the patient brought a list of questions or topics to discuss.²

Covariates included topic characteristics; patient’s education, sex, and race; two-item Patient Health Questionnaire score; whether the patient had had an anxiety attack in the past month; whether the physician’s specialty was family medicine or internal medicine; and the physician’s sex and race. All statistical analyses were performed using the statistical software Stata.

LIMITATIONS

This study had several limitations. A potential bias was that it included only older and insured patients, which limits generalizability. Furthermore, we did not code “inviting a question” or “responding to a question” explicitly. Nor did we differentiate how the length and nature of questions (for example, short clarifying versus complex advice seeking) might have affected physicians’ responses.

An additional limitation is the heterogeneity in the type and severity of patients’ mental health needs. For example, patients who met the inclusion criteria only because the research assistant observed a mental health discussion may have had different mental health needs than patients with a documented record of antidepressant use. We performed sensitivity analyses by excluding those patients and found our results to be unchanged, with the exception of increased *p* values for results on the factor scales, largely the result of smaller sample size.

Study Results

The patient sample of adults (*N* = 322) was 65 percent white and 35 percent male, with a mean age of fifty-nine years (Exhibit 1). Twelve percent of patients brought a list of issues.

Among the fifty-nine physicians in the sample, 44 percent were men, 47 percent were white, 71 percent were in internal medicine, and 29 percent were in family medicine. Visits lasted an average of twenty-eight minutes. The average topic was discussed for one minute (median 0.6 minutes), of which physicians talked for 0.7 minutes (median 0.4 minutes) and patients, 0.4 minutes (median 0.2). The average topic had 1.7 recurrences (data not shown).

PATIENTS’ QUESTION-ASKING BEHAVIOR

Ninety-nine percent of the patients asked at least one question during their visit. The mean and median numbers of questions during a visit were eighteen and fifteen, respectively (interquartile range: 8–24) (Exhibit 1). The maximum number of patient questions in a visit was ninety-eight.

Patients asked questions early and throughout the visit. The median patient asked a first question 1.4 minutes into the visit. Patients asked questions with approximately equal frequency throughout the visit (data not shown).

Whether a patient asked a question during a particular topic was associated with patient demographics, the content of the topic, and the dynamics of the patient-physician conversation (Exhibit 2). Male patients and patients with less than a high school diploma were significantly less likely than female or better-educated patients to ask questions. Patients’ race, age, and measures of mental health were not significant predictors; neither was bringing a list.

Patients were more likely to ask a question on a biomedical topic than on mental health, health behavior, or psychosocial topics. Patients were also more likely to ask questions when the topic included a discussion about a medication.

Furthermore, questions about medications ($n = 60$) qualitatively corresponded to those suggested by the Agency for Healthcare Research and Quality's "Questions Are the Answer" campaign. The majority of these ($n = 45$) focused on medication side effects; some ($n = 13$) focused on medication alternatives, including different medications or other forms of treatment; and a few ($n = 2$) focused on medication interactions (data not shown).

Lastly, topics with multiple instances were significantly more likely than others to have a patient question. The number of patient-initiated instances was also a significant predictor of patient questions (Exhibit 2).

PHYSICIAN BEHAVIOR

Topics for which a physician scored highly (that is, 5 on a 1–5 scale) on soliciting patient questions²² were significantly more likely to result in a patient's question (Exhibit 2) than topics for which physicians scored poorly (that is, 1 on a 1–5 scale) on soliciting patient questions.

To assess whether patients' questions elicited more information from physicians, we examined whether topics in which a patient raised a question were associated with more physician time spent on the topic. Results showed that physicians spent 65.1 percent more time (0.4 minutes) on topics in which the patient had asked a question than on topics in which the patient had not asked a question (Exhibit 2). Physicians also scored 0.4 points higher on the quality of the explanations they provided to patients regarding what the patient was asked to do for topics in which the patient had asked a question than they did for topics in which the patient had not asked a question.

We also qualitatively explored physicians' responses to patients' questions within mental health topics, resulting in four emergent themes. First, straightforward patient questions about particular names of psychotropic medications received prompt and concise answers. In providing short responses, however, physicians missed opportunities to explore underlying patient concerns and to inform patients about their mental illness and treatment options.

Second, questions about side effects of psychotropic medications or potential for dependence were answered with varied clarity. For example, when one patient asked, "Do you stay on it [an antidepressant] for the rest of your life?," the patient's physician extensively described the multiple treatment modalities that complemented medications and often led to their successful termination. A similar question posed by another patient to a different physician received a vague answer that addressed neither the underlying causes of the patient's mood disorder nor the patient's wish for alternative treatment.

Third, open-ended and emotion-laden questions received more varied responses. One patient used a question to hint at concerns about the stigma of going to a mental health clinic, to which the physician responded, "I never thought about it that way." In another visit the patient stated, "And I want a happy pill. [laughs] Is there such a thing?" The physician could have dismissed this cue as a joke but instead took the cue and thoroughly investigated the patient's mood using a battery of structured questions. The investigation concluded with a depression diagnosis, a prescription of an antidepressant, and a follow-up visit to check her

response to treatment. This physician's immediate and thorough response to this patient's joke-like question allowed a full investigation of her mood and saved the patient from having to bring up the same question later on in the visit or having to remain untreated, had the physician failed to respond.

Fourth, multitasking was associated with having fragmented conversations. Some patients raised mental health questions during the physical exam or while the physician was typing. In these instances, the physician responded briefly, then resumed the ongoing task, prompting some patients to reinitiate the mental health discussion later.

ASSOCIATION BETWEEN PATIENT QUESTIONS AND VISIT OUTCOMES

Each additional patient question was associated with visit durations that were 0.5 percent (six seconds) longer (Model D in Exhibit 3). In contrast, each increase in the average number of instances per topic was associated with visits that were 12.5 percent (3.5 minutes) longer.

Patients who brought a list of topics also had visits that were 3.2 minutes longer than the visits of those who did not bring a list. Men's visits were 2.2 minutes shorter than women's visits. Compared to white physicians, physicians from other races or ethnicities, primarily (62 percent) Asian Americans, had visits that were 3.6 minutes shorter.

Patients who asked more questions rated their physicians as doing worse in openness and composure (Model E in Exhibit 3). Patients who brought a list also rated openness lower. Men gave higher composure ratings than women. Physicians of other race or ethnicity received higher ratings on openness than white physicians. Patients who had had an anxiety attack rated their physicians significantly lower on composure than patients who had not had an anxiety attack recently.

Discussion

To the best of our knowledge, ours is one of the first studies to investigate by topic the interactions between primary care physicians and people with mental health needs. This approach to examining patient engagement distills complex and dynamic interactions into sequential topics unfolding over time, wherein patients ask questions, physicians respond, and vice versa.

Patients in our sample asked many questions. They asked questions early and often, particularly when encouraged by their physicians and regardless of whether they reported symptoms of depression and anxiety. Nevertheless, they were more likely to ask questions on biomedical than on mental health topics.

They were also more likely to ask questions on topics that recurred multiple times than on topics that occurred once or twice, which suggests that they may have been using questions to redirect conversation toward a previously unresolved topic. Such tactics are important for increasing comprehension, but they also can fragment the flow of conversation and potentially increase cognitive effort for both patients and physicians.

Furthermore, we found that visits in which topics were split into multiple instances were significantly longer than visits in which topics were discussed with fewer interruptions.

Our findings suggest that patients with mental health needs are engaged in their health care, as measured by questions. For example, we found that female and better-educated patients already asked the majority of questions about medications suggested by the Agency for Healthcare Research and Quality. These results were consistent with prior literature.^{7,24} Therefore, this patient population is no different from one broadly selected, without considering their mental health status, in their propensity to ask questions.^{25,26}

For example, James Galliher and colleagues conducted an “Ask Me 3” intervention with 834 patients and found that 92 percent of them asked questions in their visits. They found no difference between the intervention and control groups in their propensity to ask questions.²⁵ Marra Katz and colleagues found, in a study of fifty-seven low-literacy inner-city patients, that patients asked an average of twelve questions per visit.²⁶

The collective findings from these two studies and our study may suggest that patients today—even those with mental health needs—are comfortable asking questions in their visits. Therefore, generic encouragement to ask questions may do little to move the needle on patient engagement.

Our findings that patients who asked more questions perceived their physicians’ communication to be worse suggest room for improvement in training and supporting primary care physicians. The finding that physicians’ responses to mental health questions were varied in quality offers a possible reason for this perception on the part of patients.

Previous studies have found that some physicians experience discomfort with discussing mental health or with having patients who ask many questions, which could be associated with these quality variations.^{12,13}

For example, in an intervention designed to encourage minority patients with mental disorders to ask questions,¹ patients reported that when they asked questions, some physicians became frustrated because they did not have answers. Those patients, in turn, felt discouraged. A sole focus on activating patients could unintentionally intensify patients’ fears of being seen as “difficult”²⁷ and could introduce friction in the patient-physician relationship.

Conclusion

Our central hypothesis was that patients who ask questions receive more physician services. The time analyses suggest that this may be true. Qualitative analysis of physicians’ responses and patient-reported quality of physician communication suggest a more complex story.

Efforts aimed at improving patient engagement should move beyond simply encouraging patients to ask questions. Rather, it may be more appropriate to adopt a broader view of

patient engagement as a set of reciprocal tasks by both patients and clinicians,²⁸ built upon strong relationships among patients, physicians,^{2,3} and the care team.¹³

When patients ask questions, a small time cost is incurred. But this cost is overshadowed by the much larger time cost of having fragmented conversations. If patient questions are indeed cues for additional exposition as our results suggest, physicians who are responsive to patients' questions may be able to reduce the frequency of fragmented conversations during patient encounters and, thus, shorten the overall length of time per patient visit.²⁹ The "And I want a happy pill" example described earlier illustrates an example of a physician's being responsive to a patient's cue and thus reducing the need for the patient to reintroduce the topic.

Organizational efforts to create a team-based care approach can shift the time cost of certain patient questions (such as those regarding where to go to get a lab test) to other clinic staff,³⁰ as has been previously suggested.^{11,31} The connection of this research to care teams is important and points to the need for future research to evaluate the patient engagement experience in an increasingly team-based treatment setting.

An additional crucial factor to consider is physicians' ability to respond to questions outside of their basic training in a composed manner that meets patients' needs, despite the stress of a busy practice environment. Traditional medical education might not have prepared all physicians to respond to the diversity of questions outside the biomedical arena. It is likely that physicians' frustration may be higher when they are asked about certain topics, such as anxiety,¹⁴ not just when the number of questions is high. Systematic approaches to support primary care physicians in responding to patients' mental health questions are potentially an important future direction for research.

A transformed patient-centered health care system that encourages patients to ask questions, supports physicians in providing the most responsive answers, and promotes communication in systems of care can take patient engagement to a new level that will be rewarding for both patients and physicians.

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Biographies

Ming Tai-Seale is a senior investigator at the Palo Alto Medical Foundation Research Institute.

In this month's *Health Affairs*, Ming Tai-Seale and coauthors report on their study of the degree to which patients with mental health needs ask questions of their primary care physicians, how those physicians respond, and what results occur. Analyzing audio recordings of more than 300 patient visits, they found that patients asked many questions, but these tended to be more about biomedical issues than about mental health issues. They also got back highly varied responses from the doctors, many of which weren't attuned to patients' real concerns or needs. The authors write that in addition to encouraging patients to ask questions, health systems should support physicians in communicating better and promoting strong relationships, to undergird communications among all members of care teams in order to meet patients' diverse needs.

Tai-Seale is a senior investigator in the Department of Health Policy Research at the Palo Alto Medical Foundation Research Institute, where she studies the economics of patient-

physician communication and patient-centered care for patients with multiple chronic conditions. She is also a member of the Asia Health Policy Forum and the Asia Health Policy Program at the Walter H. Shorenstein Asia-Pacific Research Center, Freeman Spogli Institute for International Studies, at Stanford University. In addition, she is an adjunct affiliate at the university's Center on Health Policy/Patient-Centered Outcomes Research.

Tai-Seale is a member of the project advisory committee for AcademyHealth's Research Insights series for policy makers and is an editorial board member of *Health Services Research*. She earned a master's degree in health administration from Emory University and a doctorate in health services research from the University of California, Los Angeles.

Patricia K. Foo is a medical doctor candidate and doctoral candidate in economics at Stanford University.

Patricia Foo is both a medical doctor candidate and doctoral candidate in economics at Stanford University. She studies issues such as insurance plan design, provider incentives, insurer-provider networks, and optimal medical guidelines. She is also a research associate at the Palo Alto Medical Foundation Research Institute, where she studies patient-physician communication and mental health disparities.

Cheryl D. Stults is a research associate at the Palo Alto Medical Foundation Research Institute.

Cheryl Stults is a research associate at the Palo Alto Medical Foundation Research Institute. In this role she studies patient-physician interaction and patient-centered care. She earned a master's degree in sociology from Boston College and a doctorate in sociology from Brandeis University.

EXHIBIT 1**Characteristics Of The Sample Of Patients And Physicians, Study Of Patients' Questioning Doctors During Office Visits**

Variable	Number	Percent
PATIENT CHARACTERISTICS (N = 322)		
Age (mean years)	59	__a
Male	112	35
Race		
White or Caucasian	210	65
Black or African American	93	29
Other	19	6
Education		
Less than high school graduate or GED	14	4
High school graduate or GED	82	25
Some college	131	41
4-year college or more	95	30
PHQ2 score 3	42	13
Had an anxiety attack in past 4 weeks	24	7
Brought a list of topics	39	12
PHYSICIAN CHARACTERISTICS (N = 59)		
Age (mean years)	50	__a
Male	26	44
Race		
White or Caucasian	28	47
Black or African American	10	17
Other	21	36
Internal medicine (vs. family medicine)	42	71
VISIT CHARACTERISTICS (N = 322)		
Number of visits with at least 1 patient question	319	99
Number of patient questions during visit		
Mean (standard error)	18 (1)	__a
Median	15	__a
Range, minimum-maximum	0-98	__a
Visit length in minutes, mean (median)	28 (26)	__a
Number of topics, mean (median)	19 (19)	__a
TOPIC CHARACTERISTICS (N = 6,007)		
Patient asked a question	1,437	24

Variable	Number	Percent
Content		
Biomedical	3,746	62
Health behavior	657	11
Mental health	132	2
Psychosocial	699	12
Physician-patient relationship	87	1
Other	134	2
Closing	265	4
Agenda setting/summarizing	287	5
Number of instances, mean (median)	1.7 (1.0)	__ ^a
Number of patient-initiated instances, mean (median)	0.5 (0.0)	__ ^a
Discussed medication	1,381	23
Physician conversation time in minutes, mean (median)	0.7 (0.4)	__ ^a
Quality of information given to patient, mean (median)	2.7 (3.0)	__ ^a
Physician's degree of soliciting patient questions		
Low	296	25
Medium	829	70
High	52	4

SOURCE Authors' data and analysis. **NOTES** Number of patient questions per visit is conditional on asking at least one question during the visit ($n = 319$). PHQ2 is Patient Health Questionnaire-2 (see Note 18 in text). GED is general equivalency degree.

^aNot applicable.

EXHIBIT 2**Characteristics Associated With Patient Question Asking, Physician Conversation Time, And Information Quality At The Topic Level**

	Model A: Patient asked question during topic (odds ratio) (<i>n</i> = 6,007)	Model B: Change in physician conversation time per topic (<i>n</i> = 6,007)		Model C: Quality of information given to patient (<i>n</i> = 2,662)
		Percent	Minutes	
COMMUNICATION MEASURES				
Patient asked a question	— ^{<i>a</i>}	65.1 ^{***}	0.4	0.4 ^{***}
Physician solicit score				
Medium (3)	1.1	19.9 ^{***}	0.1	0.6 ^{***}
High (5)	4.6 ^{***}	61.8 ^{***}	0.4	1.3 ^{***}
Irrelevant for topic	0.6 ^{***}	1.6	0.01	0.3 ^{***}
No. of instances of the topic	1.3 ^{***}	47.9 ^{***}	0.3	0.1 ^{***}
No. of instances initiated by patient	1.5 ^{***}	−19.9 ^{***}	−0.1	−0.1 ^{**}
TOPIC CHARACTERISTICS				
Discussed medication	1.6 ^{***}	19.6 ^{***}	0.1	0.1 ^{***}
Health behavior topic	0.6 ^{***}	−12.3 ^{***}	−0.1	0.2 ^{***}
Mental health topic	0.5 ^{***}	−25.5 ^{***}	−0.2	−0.1
Psychosocial topic	0.2 ^{***}	−32.4 ^{***}	−0.2	0.2
Physician-patient relationship	0.7	13.0	0.1	−1.1 ^{***}
Other topic	0.3 ^{***}	−14.4	−0.1	— ^{<i>b</i>}
Closing topic	0.9	19.9 ^{***}	0.1	−0.4 ^{**}
Agenda setting/summarizing	0.3 ^{***}	−32.5 ^{***}	−0.2	0.5 ^{***}
PATIENT CHARACTERISTICS				
Brought a list of topics	1.2	10.4	0.1	0.05
Less than high school or GED	0.6 ^{**}	15.9	0.1	−0.1
High school or GED	0.9	−3.2	−0.02	−0.1
Some college	0.8	3.5	0.02	−0.03
Male	0.8 ^{**}	6.0	0.04	−0.01
Had anxiety attack in past 4 weeks	0.9	5.9	0.04	−0.03
PHYSICIAN CHARACTERISTICS				
Family medicine specialty	1.1	27.3 ^{***}	0.2	0.1
African American	0.7	13.9	0.1	−0.1
Other race/ethnicity	1.0	6.9	0.05	−0.02

SOURCE Authors' analysis. **NOTES** All models are topic-level multivariate generalized estimating equations with robust standard errors and exchangeable correlation structure. Model A uses a logit link function; Models B and C use identity link functions. Model C is reported in units of dependent variable, which is measured on a 1–5 scale, as described in the Methods section. This dependent variable applied to only 2,662 topics.

The right column of Model B reports the association between a one-unit increase in the independent variable on the duration of physician conversation time per topic. All models also controlled for patient's age, patient's race, patient's Patient Health Questionnaire-2 (PHQ2) score, and sex of physician (coefficients not significant and not shown). The comparison groups include biomedical topics for topic content area, patients with a four-year college degree or more for education, internal medicine for physician specialty, female for sex, and white for race. GED is general equivalency degree.

^aVariable not included because it is the dependent variable in Model A.

^bNot relevant. "Other" topics are small talk that was not evaluated for the quality of information given by the physician.

**
 $p < 0.05$

 $p < 0.01$

EXHIBIT 3

Relationship Between Patient Questions And Visit Length And Patient-Reported Perception Of Physician's Relational Communication

	Model D: Change in visit length (<i>n</i> = 322)		Model E: Relational communication (<i>n</i> = 310)	
	Percent	Minutes	Openness	Composure
COMMUNICATION MEASURES				
No. of patient questions in visit	0.5 ***	0.1	−0.01 ^a	−0.01 **
Average no. of instances per topic	12.5 **	3.5	−0.2	0.4
No. of topics	3.4 ***	0.9	−0.01	−0.01
PATIENT CHARACTERISTICS				
Brought a list of topics	11.5 ***	3.2	−0.2 **	−0.1
Male	−8.0 **	−2.2	0.2	0.4 **
Had anxiety attack in past 4 weeks	4.1	1.1	−0.3	−0.3 **
PHYSICIAN CHARACTERISTICS				
Family medicine specialty	9.6	2.7	0.1	−0.2
African American	−2.5	−0.7	0.2	−0.1
Other race/ethnicity	−13.0 **	−3.6	0.3 **	−0.02

SOURCE Author's analysis. **NOTES** Both models are visit-level analyses. The right column of Model D reports the effect of a one-unit increase in the independent variable on the duration of overall visit in minutes. All models also controlled for patient's age, patient's race, patient's education, patient's Personal Health Questionnaire-2 (PHQ2) score, and sex of physician (coefficients not significant and not shown). The comparison groups include internal medicine for physician specialty, female for sex, and white for race. The sample size is smaller in Model E because of missing survey responses for twelve patients.

^a $p = 0.11$.

** $p < 0.05$

*** $p < 0.01$