How Well Do Doctors Know their Patients? Factors Affecting Physician Understanding of Patients' Health Beliefs

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BACKGROUND: An important feature of patient-centered care is physician understanding of their patients' health beliefs and values.

OBJECTIVE: Determine physicians' awareness of patients' health beliefs as well as communication, relationship, and demographic factors associated with better physician understanding of patients' illness perspectives.

DESIGN: Cross-sectional, observational study.

RESEARCH PARTICIPANTS: A convenience sample of 207 patients and 29 primary care physicians from 10 outpatient clinics.

APPROACH AND MEASURES: After their consultation, patients and physicians independently completed the CONNECT instrument, a measure that assesses beliefs about the degree to which the patient's condition has a biological cause, is the patient's fault, is one the patient can control, has meaning for the patient, can be treated with natural remedies, and patient preferences for a partnership with the physician. Physicians completed the measure again on how they thought the patient responded. Active patient participation (frequency of questions, concerns, acts of assertiveness) was coded from audio-recordings of the consultations. Physicians' answers for how they thought the patient responded to the health belief measure were compared to their patients' actual responses. Degree of physician understanding of patients' health beliefs was computed as the absolute difference between patients' health beliefs and physicians' perception of patients' health beliefs.

KEY RESULTS: Physicians' perceptions of their patients' health beliefs differed significantly ($P < 0.001$) from patients' actual beliefs. Physicians also thought patients' beliefs were more aligned with their own. Physicians had a better understanding of the degree to which patients believed their health conditions had personal meaning ($p = 0.001$), would benefit from natural remedies ($p = 0.049$), were conditions the patient could control ($p = 0.001$), and wanted a partnership with the doctor ($p = 0.014$) when patients more often asked

questions, expressed concerns, and stated their opinions. Physicians were poorer judges of patients' beliefs when patients were African-American (desire for partnership) ($p = 0.013$), Hispanic (meaning) ($p = 0.075$), or of a different race (sense of control) ($p = 0.024$).

CONCLUSIONS: Physicians were not good judges of patient's health beliefs, but had a substantially better understanding when patients more actively participated in the consultation. Strategies for increasing physicians' awareness of patients' health beliefs include preconsultation assessment of patients' beliefs, implementing culturally appropriate patient activation programs, and greater use of partnership-building to encourage active patient participation.

KEY WORDS: physician-patient relationship; racial concordance; patient-centered communication; patient participation; disparities.

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INTRODUCTION

Physician understanding of their patients' health beliefs, values, and preferences is a fundamental feature of patient-centered care.^{1,2} Such an understanding is important for several reasons. First, a key, empirically supported tenet of health behavior theories is that a patient's beliefs about health (e.g., cause of disease, controllability of a condition, value of different remedies) predict health behaviors such as medication adherence, utilization of health care services, and lifestyle decisions.^{3–5} A better awareness of a patient's health beliefs could help physicians identify gaps between their own and the patient's understanding of his or her health situation⁶ and lead to treatments decisions better suited to the patient's expectations and needs.⁷ Second, physicians' skill at hearing and understanding patients' perspectives is also a key component of empathy,^{8,9} the expression of which contributes to perceptions of higher quality care and more effective communication.^{10,11} Finally, some research has shown that patient satisfaction, commitment to treatment, and perceived outcomes of care are higher when physician and patient achieve a shared understanding on issues such as the patient's role in decision-making, the meaning of diagnostic information, and the treatment plan.^{12–16}

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Current evidence indicates that physicians often have a poor understanding of their patients' perspectives with respect to patients' preferences for involvement in decision-making,¹⁷ desire for information,¹⁸ perceived health status,¹⁹ interest in life-sustaining treatments,²⁰ beliefs about treatment effectiveness and prognosis,²¹ level of health literacy,²² and emotional states.^{23,24} Because perceptions of patients can influence physicians' communication and decision-making^{25,26} and because physicians often have limited awareness of their patients' perspectives, research is needed to explicate factors that contribute to better physician understanding of what patients believe and value.

To address this gap in the literature, we first examined the degree of concordance between physicians' perceptions of their patients' health beliefs and patients' own reports of those beliefs using the recently developed and validated CONNECT instrument.²⁷ This measure assesses various domains of a clinician's or patient's beliefs about the cause, nature, meaning, and management of the patient's health condition as well as the patient's preference for a partnership with the doctor.

We also predicted that physicians' understanding of patients' health beliefs would be related to several factors. First, we expect physicians will have a better understanding of their patient's health beliefs when patients more actively participate in their consultations. Patients who ask questions, express their worries, and state preferences and opinions are interjecting their views into the consultation, thus providing physicians explicit information on their beliefs, needs, and concerns.^{28,29} Second, from a relationship development perspective, we expect physicians who have seen a patient on more occasions will have better knowledge of that patient's beliefs than of a patient with whom doctor has had few or no previous visits. While this proposition has not been studied in medical encounters, there is some evidence that longer relational histories are associated with patients' willingness to talk about psychosocial concerns, particularly those of a sensitive nature.³⁰ Finally, cultural differences between physicians and patients may affect how well physicians understand their patients.³¹ Although little research has addressed this issue, some evidence is suggestive. Several studies have found that patients reported more positive consultations when the physician was of the same race or ethnicity.³²⁻³⁴ In some settings, Caucasian physicians have reported less favorable impressions and poorer communication with African-American patients,^{26,35} which in turn can contribute to misperception and lower trust.^{26,36,37}

METHODS

Research Participants

Physicians and patients were recruited from ten primary care clinics in the Houston, Texas area. These included public (Department of Veterans Affairs and county based) and private practice clinics. In September 2002, flyers were sent to local physicians inviting them to one of several luncheons to discuss

a research project on physician-patient communication. Physicians were invited to participate either at the luncheon or by phone if the physician expressed an interest in participating but could not attend the luncheon. A total of 29 physicians (all at the attending level or in practice) agreed to participate. Thirteen were affiliated with the VA, 9 practiced at public, community-based clinics, and 7 were from private practice, all of whom saw patients by appointment. For each of these doctors, one patient per half-day clinic was recruited by project personnel who approached potential participants as they arrived for their visits. Patients were eligible to participate if they spoke English and were over 18 years of age. The targeted number of patients recruited per physician was seven to ten, which would produce a sample size sufficient for regression analyses given an expected ten predictor variables. The patient recruitment period was from October 2002 through August 2003. The study received IRB approval from the Baylor College of Medicine and the VA review boards. Informed consent was obtained for all patients and physicians.

Prior to the consultation, patients completed a questionnaire that asked for demographic information, the primary reason for their visit, and how many times they had previously seen this doctor. The patient then had his or her consultation, which was audio-recorded. After the visit, patients completed the CONNECT instrument, which assessed their beliefs about the primary health issue for that visit. After the visit, the physician completed two versions of the CONNECT instrument, one assessing his or her own beliefs about the patient's health condition and the other what he or she thought the patient's health beliefs were.

The CONNECT Instrument

The 19-item CONNECT instrument²⁷ assesses 6 domains of an individual's perceptions about a particular health condition—the degree to which (1) the patient's health condition has a biological cause (cause-bio), (2) the patient is responsible for the condition (fault), (3) the patient can control the condition (control), (4) the condition can be treated by non-biomedical ('natural' or integrative) treatments (natural), (5) the condition has significant meaning for the patient (meaning), and (6) the patient prefers a partnership with the physician in managing the condition (partnership). The CONNECT instrument is theoretically grounded in Kleinman's³⁸ seminal work on patients' 'explanatory models' and Leventhal's³⁹ research on physician and patient 'illness representations.' The CONNECT instrument is scored by summing the respondent's responses on 6-point Likert scales to the items comprising a particular CONNECT domain (e.g., control, meaning, etc.) and then standardizing scores to a 100-point scale.

Active Patient Participation Measure

Active patient participation consisted of three types of patient communication—asking questions, acts of assertiveness (offering opinions, stating beliefs and preferences, making a request), and expressing concerns (worries, fears, negative feelings). These behaviors are considered 'active' because they

explicitly place the patient's perspective into the conversation and they can influence the physician's behavior, perceptions, and treatment decisions.^{26,37,40,41} Two undergraduate students, who were blind to the purpose of the study, were trained to code the interactions using the Active Patient Participation Coding scheme, a previously validated observational method of coding the three above elements of patient communication.²⁹ Coders first listened to audio-recordings and, when hearing a behavior of interest, placed the behavior into the appropriate category of active participation. An overall active participation score was computed by summing the total number of questions, acts of assertiveness, and concerns expressed per patient per interaction. Reliability was established by having both coders code a subset of 15 consultations independently of one another. Reliability (intraclass correlation) for the active patient participation composite index was 0.83. The remaining consultations were divided between the two coders who coded them independently.

Data Analysis

To determine how well physicians understood patients' health beliefs, t-tests were used to determine if patients' actual beliefs differed significantly from physicians' perceptions of patients' beliefs for each CONNECT domain. We also examined whether physicians tended to think patients' beliefs were comparable to their own beliefs about the patient's health condition by examining the relationship between the physician's own responses to the CONNECT instrument and the physician's perceptions of the patient's beliefs.

To examine whether communication, relationship, and demographic variables were related to the degree of physician understanding of patients' health beliefs, the absolute difference between the patient's score on a particular domain and the physician's score for how he or she thought the patient responded on that domain served as dependent measures in linear, multivariable regression models that included the following as a priori predictors: the patient's race (African-American, Hispanic, Caucasian), age, gender, and education (high school or less vs. some college or more); the physician's race (African-American, Asian, Caucasian), gender, and age; racial concordance, gender concordance, how many previous visits the patient had with the doctor; and the number of active patient participation behaviors during the interaction. All analyses controlled for patients nested within physicians.

RESULTS

At the close of the enrollment period, 269 patients agreed to participate and have their consultations audio-recorded; however, audiotape data from 55 patients were missing or incomplete due to equipment malfunction or recording errors. In addition, 7 patients had incomplete data on self-report measures, leaving the final sample at 207. Patient and physician characteristics are presented in Table 1. The

Table 1. Characteristics of Physicians and Patients

Characteristic	Physician sample	Patient sample
	(N=29)	(N=207)
Mean age in years (SD)	40 (8.1)	55.7 (14.7)
Range	29–57	19–84
Ethnicity	41% Asian 28% African American	39% African American 11% Hispanic
Percent female	31% White 40%	50% White 39%
Education	NA	13.8% High school or less 29.5% High School 35.5% Some college 21.7% College degree plus
Active patient participation		
Mean (SD)	NA	9.11 (7.13)
Median		8
Range		0–41
Patient reported number of previous visits	NA	20% None 21% 1–2 visits 13% 3–5 visits 46% 6 or more visits

patient and physician samples were diverse with respect to age, gender, and ethnicity. Fifty-eight percent of the physician-patient pairs were gender concordant, and 32% were race concordant.

Physician Understanding of Patients' Health Beliefs

Across all health domains, there were significant differences between patients' health beliefs and physicians' perceptions of patients' health beliefs (Table 2). However, on four of six domains, physicians generally thought patients' beliefs were similar to their own. Moreover, in the two domains where physicians thought the patient's health beliefs differed from their own, their perceptions were in the opposite direction of the patient's belief (Table 2). For example, compared to their own views, physicians thought that patients believed there was more a biological cause to their health condition and believed they had less control over the condition. In actuality, patients believed there was less of a biological cause and that they were more in control than what physicians believed. With the exception of the extent to which the patient's condition was due to a biological cause, physicians underestimated patients' beliefs about being at fault, the meaning of the disease, the value of natural treatments, having control, and wanting a partnership with the doctor (Table 2).

Factors Predicting Physician Understanding of Patients' Health Beliefs

While we found no significant predictors of physician understanding of the 'cause biological' and 'patient at fault' domains of patients' health beliefs, several variables did predict better understanding across the other domains. Those that were

Table 2. Differences Between Patients' Health Beliefs and Physician Perceptions of Patients' Beliefs (n=207)

Domain ^a	A	B	C	Difference	Difference
	Physician model	Physician belief about patient model	Patient model	A vs. B (P-value) ^c	B vs. C (P-value) ^d
Cause-biological	71.4 ^b	74.4	67.4	0.059	0.009
Patient at fault	49.1	49.1	55.0	ns	<0.001
Patient has control over condition	78.4	75.8	82.8	0.018	<0.001
Meaning to the patient	71.0	72.1	79.6	ns	<0.001
Benefit from natural treatments	50.7	50.8	56.7	ns	<0.001
Patient wants partnership with doctor	82.5	81.3	89.7	ns	<0.001

^aScores for health domain beliefs were standardized to a 100-point scale

^bThese are means scores for each health domain

^cThis difference represents physicians' perceptions of patients' beliefs, relative to the physicians' own beliefs

^dThis differences represents physicians' perceptions of patients' beliefs relative to the patients' actual beliefs

statistically significant or approached significance are reported in Table 3. By far the most consistent predictor of physician understanding was active patient participation. The more patients asked questions, expressed concerns, and stated preferences and opinions, the closer the match between the patient's self-reported beliefs and the physician's understanding of the patient's beliefs with respect to the meaning of the condition, the patient's ability to control the condition, the

value of natural remedies, and the patient's desire for a partnership with the doctor.

The patient's race or physician-patient racial concordance was related to understanding in three of the domains (Table 3). Specifically, compared to their understanding of Caucasian patients' beliefs, physicians had poorer understanding of African-American patients' preferences for a partnership and, marginally ($p < 0.08$), of the meaning of the condition for Hispanic patients. Physicians had a better understanding of patients' beliefs about control over the condition when the physician and patient were of the same race. Although male physicians' perceptions of patients' preferences for a partnership and sense of control over the condition were more consistent with patients' beliefs than were the perceptions of female physicians, it is difficult to draw conclusions given the small sample of physicians ($n=29$). Physicians had a poorer understanding of college educated patients' sense of control and partnership preferences than they did of patients with high school educations or less. The number of previous visits the patient had with the doctor was not related to physician understanding of patients' health beliefs.

Table 3. Factors^a Affecting Physician Understanding of Patients' Health Beliefs (n=207)

Health domain	Confidence interval			P value
	Estimate ^b	Lower	Upper	
Meaning to the patient				
Active patient participation	-0.49	-0.78	-0.20	0.001
Patient race = Hispanic (ref = white)	6.27	-0.63	13.2	0.075
Patient age	-0.16	-0.30	-0.02	0.024
Patient wants partnership with doctor				
Active patient participation	-0.23	-0.42	-0.05	0.014
Patient race = African-American (ref = white)	3.51	0.75	6.28	0.013
Patient education (ref = high school or less)	3.05	0.71	5.39	0.011
Doctor gender = female (ref = male)	4.79	-0.05	9.64	0.053
Benefit from natural remedies				
Active patient participation	-0.30	-0.59	-0.00	0.049
Patient has control over condition				
Active patient participation	-0.42	-0.66	-0.18	0.001
Racial concordance (ref = racial non-concordant)	-5.13	-9.57	-0.69	0.024
Patient education (ref = high school or less)	5.64	2.47	8.82	0.001
Doctor gender = female (ref = male)	4.78	1.02	8.55	0.013

^aPredictor variables that did not reach statistical significance in any model included physician race, physician age, patient gender, gender concordance, and number of previous visits the patient had with the doctor

^bNegative coefficients indicate less difference between patients' models and physicians' beliefs about patients' models, thus greater understanding. For example, for patients' beliefs about control, physicians had a better understanding of these beliefs when patients were more active participants, racially concordant, and had lower education level

DISCUSSION

Physicians with a more accurate understanding of their patients' health beliefs should be better positioned to reconcile differences between their own and their patient's illness perceptions and propose treatments more suited to the patient's unique needs and personal circumstances.^{1,42} While some studies have examined differences between physicians' and patients' perspectives on health and health care,^{12,19,20,43,44} very few studies have examined how well physicians understand their patients' health beliefs and what factors contribute to a better understanding. Using the CONNECT instrument,²⁷ which assesses six domains of patients' and physicians' illness representations, this study investigated patient, physician, relationship, and communication factors that predicted how well physicians understood their patients' health beliefs. Several findings are noteworthy and have important implications for clinical practice and future research.

First, physicians had a relatively poor understanding of their patients' health beliefs. Specifically, physicians generally underestimated the degree to which patients perceived meaning in their conditions, believed they were at fault, saw value in natural remedies, had a sense of control over the condition, and preferred being a partner in their care. In addition, on four of the six domains (fault, meaning, value of natural remedies, and desire for a partnership), physicians thought the patients' beliefs were not significantly different from their own beliefs, thus assuming a shared understanding when in fact this was not the case. These findings are consistent with other studies indicating that physicians perceive the quality of their interactions with patients differently than do patients,^{23,45-47} tend to underestimate patients' desire for information¹⁸ and shared decision-making,⁴⁸ and misjudge patients' literacy levels.^{22,49} Our study makes an important contribution to this body of work by now demonstrating similar patterns of misunderstanding about not just the outcome of the medical encounter, but also about the nature of the health condition being addressed. Shared understanding between physician and patient is not only a critically important foundation for informed decision-making,⁵⁰ it is arguably a pathway for optimizing patient trust, adherence, and disease outcomes.^{1,51}

While much of the literature describing the importance of developing a shared understanding situates such activities in the context of either cross-cultural encounters⁵² or health problems of extraordinary significance (such as end of life decision making),²⁰ our findings suggest that physicians may misperceive how their patients understand relatively common medical issues, such as blood pressure control. Our findings point to the need for physicians and patients to develop a shared understanding in these routine everyday encounters prior to decision making, as widely espoused in the chronic care model of illness management.⁵³

A second important finding in this study is that physicians had a better understanding of patients' health beliefs following those encounters in which patients more frequently asked questions, expressed concerns, and stated preferences and opinions. While other studies have linked patient involvement to a number of post-consultation outcomes,⁵⁴⁻⁵⁸ our findings demonstrate that active patient participation also helps physicians become more aware of their patients' health beliefs. Such understanding forms the foundation for formulating therapeutic plans that patients are more likely to follow, since such plans take into account the patient's perspective on how the illness works and what therapies are feasible, given their unique circumstances.³⁸

Third, our study suggests that the patient's ethnicity also may be related to how well physicians understand their patients. Compared to the beliefs of Caucasian patients, physicians had a poorer understanding of African-American patients' preferences for a partnership and the meaning of the condition to Hispanic patients. Doctors also had a poorer understanding of patients' sense of control over health when the patient was of a different race. Other studies have shown that, even when taking into account racial differences in patient participation (minority status patients are often less participatory^{26,37,59,60}), minority patients experience less trust^{61,62}, and are sometimes perceived by clinicians more negatively.^{26,35,63} Taken as a whole, these results suggest that understanding the patient's perspective is more complex when physicians and patients come from different cultural and

ethnic backgrounds, and they underscore the need for skills training in narrative medicine, history building, and other forms of cultural competence.⁶⁴⁻⁶⁶

To what extent physician understanding of patients' health beliefs improves decision-making and the quality of care patients receive is an important area for future research as well as identifying the most efficient, effective means to provide information on patient's health beliefs to clinicians. For example, would physicians get a better of understanding of their patients' health beliefs if this information was gathered as a preconsultation assessment, was part of the medical history, or through longer visits that might allow patients more opportunities to be active participants?⁶⁷ Evidence to date also demonstrates that more active patient participation in the consultation can be increased with patient activation interventions that can be efficiently deployed prior to a patient's visit using various methods (e.g., coaching,^{56,68} printed material,^{69,70} interactive computer programs,^{71,72} and video^{73,74}).

Our results also have implications for professional development and medical education. Given the current primary care environment and its inherent time pressures, physicians do not have the luxury to pursue lengthy discussions of patients' views about multiple aspects of their medical histories. However, patients' histories often contain important pieces of contextual information that can lead to important insights about their perspectives,⁷⁵ and patients often reveal this information in the form of subtle verbal and nonverbal cues,⁷⁶ which physicians often miss.^{77,78} In ongoing work, we have been developing educational interventions to help physicians follow patients' cues and efficiently understand the significance and meaning of this information.⁷⁹ The protocols used in this study to measure understanding may be useful when evaluating such educational interventions.

This study has several limitations. First we did not examine whether the accuracy of physician understanding was related to post-consultation outcomes. This is an important goal for future research. Second, we cannot draw strict conclusions regarding causation because we did not get pre-consultation assessments of physicians' understanding of their patients' models. Third, while relatively balanced with respect to gender concordance, the study sample was not balanced with respect to racial concordance in that all Hispanic patients and all Asian physicians were in non-concordant interactions. Fourth, physicians in this study represented different types of practices (e.g., VA vs. hospital clinics) and experience levels, yet a sample of only 29 physicians was too small to determine whether these and other unidentified physician factors were related to their understanding of patients' health beliefs. Finally, although our analysis included several patient variables, others (e.g., health status) were not and may have contributed to unmeasured effects on physician understanding.

In conclusion, an important feature of patient-centered care is physician understanding of their patients' health beliefs and values. In one of the first investigations of its kind, this study quantified such understanding, revealed gaps in physician awareness of their patients' health beliefs and found that physicians understood patients better when patients were more participatory. Less understanding was to some degree also associated with patients' ethnicity. Future research should further explicate factors that contribute to better physician understanding of their patients and test interventions that target these processes.

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REFERENCES

- Epstein RM, Street RL Jr. Patient-Centered Communication in Cancer Care: Promoting Healing and Reducing Suffering. NIH Publication No. 07-6225. Bethesda: National Cancer Institute; 2007.
- Epstein RM, Peters E. Beyond information: exploring patients' preferences. *JAMA*. 2009;302:195-7.
- Fishbein M, Cappella JN. The role of theory in developing effective health communications. *Journal of Communication*. 2006;56:S1-17.
- Godin G, Kok G. The theory of planned behavior: a review of its applications to health-related behaviors. *Am J Health Promot*. 1996;11:87-98.
- Janz NK, Becker MH. The Health Belief Model: a decade later. *Health Educ Q*. 1984;11:1-47.
- Collins DL, Street RL Jr. A dialogic model of conversations about risk: Coordinating perceptions and achieving quality decisions in cancer care. *Soc Sci Med*. 2009;68:1506-12.
- Elwyn G, Edwards A, Kinnersley P, Grol R. Shared decision making and the concept of equipoise: the competences of involving patients in healthcare choices. *Br J Gen Pract*. 2000;50:892-9.
- Hojat M, Gonnella JS, Nasca TJ, Mangione S, Vergare M, Magee M. Physician empathy: definition, components, measurement, and relationship to gender and specialty. *Am J Psychiatry*. 2002;159:1563-9.
- Mercer SW, McConnachie A, Maxwell M, Heaney D, Watt GC. Relevance and practical use of the Consultation and Relational Empathy (CARE) Measure in general practice. *Fam Pract*. 2005;22:328-34.
- Epstein RM, Hadee T, Carroll J, Meldrum SC, Lardner J, Shields CG. "Could this be something serious?" Reassurance, uncertainty, and empathy in response to patients' expressions of worry. *J Gen Intern Med*. 2007;22:1731-9.
- Zachariae R, Pedersen CG, Jensen AB, Ehrnrooth E, Rossen PB, von der Maase H. Association of perceived physician communication style with patient satisfaction, distress, cancer-related self-efficacy, and perceived control over the disease. *Br J Cancer*. 2003;88:658-65.
- Street RL Jr, Richardson MN, Cox V, Suarez-Almazor ME. (Mis) understanding in patient-health care provider communication about total knee replacement. *Arthritis Rheum*. 2009;61:100-7.
- Bruera E, Willey JS, Palmer JL, Rosales M. Treatment decisions for breast carcinoma: patient preferences and physician perceptions. *Cancer*. 2002;94:2076-80.
- Jackson JL. Communication about symptoms in primary care: impact on patient outcomes. *J Altern Complement Med*. 2005;11 Suppl 1:S51-6.
- Staiger TO, Jarvik JG, Deyo RA, Martin B, Braddock CH III. BRIEF REPORT: Patient-physician agreement as a predictor of outcomes in patients with back pain. *J Gen Intern Med*. 2005;20:935-7.
- Starfield B, Wray C, Hess K, Gross R, Birk PS, D'Lugoff BC. The influence of patient-practitioner agreement on outcome of care. *Am J Public Health*. 1981;71:127-31.
- Strull WM, Lo B, Charles G. Do patients want to participate in medical decision making? *JAMA*. 1984;252:2990-4.
- Willems S, De MS, Deveugele M, Derese A, De MJ. Socio-economic status of the patient and doctor-patient communication: does it make a difference? *Patient Educ Couns*. 2005;56:139-46.
- Suarez-Almazor ME, Conner-Spady B, Kendall CJ, Russell AS, Skeith K. Lack of congruence in the ratings of patients' health status by patients and their physicians. *Med Decis Making*. 2001;21:113-21.
- Teno JM, Hakim RB, Knaus WA, et al. Preferences for cardiopulmonary resuscitation: physician-patient agreement and hospital resource use. The SUPPORT Investigators. *J Gen Intern Med*. 1995;10:179-86.
- Guir CF, Mackillop WJ, Ginsburg AD, et al. Do doctors know when their patients don't? A survey of doctor-patient communication in lung cancer. *Lung Cancer*. 1997;18:1-20.
- Kelly PA, Haidet P. Physician overestimation of patient literacy: a potential source of health care disparities. *Patient Educ Couns*. 2007;66:119-22.
- Hall JA, Stein TS, Roter DL, Rieser N. Inaccuracies in physicians' perceptions of their patients. *Med Care*. 1999;37:1164-8.
- Butow PN, Brown RF, Cogar S, Tattersall MH, Dunn SM. Oncologists' reactions to cancer patients' verbal cues. *Psychooncology*. 2002;11:47-58.
- Hall JA, Horgan TG, Stein TS, Roter DL. Liking in the physician-patient relationship. *Patient Educ Couns*. 2002;48:69-77.
- Street RL Jr, Gordon H, Haidet P. Physicians' communication and perceptions of patients: Is it how they look, how they talk, or is it just the doctor? *Soc Sci Med*. 2007;65:586-98.
- Haidet P, O'Malley KJ, Sharf BF, Gladney AP, Greisinger AJ, Street RL Jr. Characterizing explanatory models of illness in healthcare: development and validation of the CONNECT instrument. *Patient Educ Couns*. 2008;73:232-9.
- Street RL Jr. Active patients as powerful communicators. In: Robinson WP, Giles H, eds. *The new handbook of language and social psychology*. New York: John Wiley & Sons; 2001:541-60.
- Street RL Jr, Millay B. Analyzing patient participation in medical encounters. *Health Communication*. 2001;13(1):61-73.
- Street RL Jr, Cauthen D, Buchwald E, Wiprud R. Patients' predispositions to discuss health issues affecting quality of life. *Fam Med*. 1995;27:663-70.
- Rothschild SK. Cross-cultural issues in primary care medicine. *Dis Mon*. 1998;44:293-319.
- Cooper-Patrick L, Gallo JJ, Gonzales JJ, et al. Race, gender, and partnership in the patient-physician relationship. *JAMA*. 1999;282:583-9.
- Cooper LA, Roter DL, Johnson RL, Ford DE, Steinwachs DM, Powe NR. Patient-centered communication, ratings of care, and concordance of patient and physician race. *Annals of Internal Medicine*. 2003;139:907-15.
- Garcia JA, Paterniti DA, Romano PS, Kravitz RL. Patient preferences for physician characteristics in university-based primary care clinics. *Ethn Dis*. 2003;13:259-67.
- van Ryn M, Burke J. The effect of patient race and socio-economic status on physicians' perceptions of patients. *Soc Sci Med*. 2000;50:813-28.
- Beach MC, Roter DL, Wang NY, Duggan PS, Cooper LA. Are physicians' attitudes of respect accurately perceived by patients and associated with more positive communication behaviors? *Patient Educ Couns*. 2006;62:347-54.
- Gordon HS, Street RL Jr, Sharf BF, Soucek J. Racial differences in doctors' information-giving and patients' participation. *Cancer*. 2006;107:1313-20.
- Kleinman A. Patients and healers in the context of culture. Berkeley: University of California Press; 1980.
- Leventhal H, Diefenbach MA, Leventhal EA. Illness cognition: using common sense to understand treatment adherence and affect cognition interactions. *Cognitive Therapy and Research*. 1992;16:143-63.
- Cegala DJ, Street RL Jr, Clinch CR. The impact of patient participation on physicians' information provision during a primary care medical interview. *Health Commun*. 2007;21:177-85.
- Krupat E, Irish JT, Kasten LE, et al. Patient assertiveness and physician decision-making among older breast cancer patients. *Soc Sci Med*. 1999;49:449-57.
- Epstein RM, Franks P, Fiscella K, et al. Measuring patient-centered communication in patient-physician consultations: Theoretical and practical issues. *Soc Sci Med*. 2005;61:1516-28.
- Martin E, Russell D, Goodwin S, Chapman R, North M, Sheridan P. Why patients consult and what happens when they do. *BMJ*. 1991;303:289-92.
- Heisler M, Vijan S, Anderson RM, Ubel PA, Bernstein SJ, Hofer TP. When do patients and their physicians agree on diabetes treatment goals and strategies, and what difference does it make? *J Gen Intern Med*. 2003;18:893-902.
- Cegala DJ, Gade C, Lenzmeier BS, McClure L. Physicians' and patients' perceptions of patients' communication competence in a primary care medical interview. *Health Commun*. 2004;16:289-304.

46. **Ogden J, Fuks K, Gardner M, et al.** Doctors expressions of uncertainty and patient confidence. *Patient Educ Couns.* 2002;48:171-6.
47. **Rohrbaugh M, Rogers JC.** What did the doctor do? When physicians and patients disagree. *Arch Fam Med.* 1994;3:125-8.
48. **Bruera E, Sweeney C, Calder K, Palmer L, Benisch-Tolley S.** Patient preferences versus physician perceptions of treatment decisions in cancer care. *Journal of Clinical Oncology.* 2001; 2883-2885.
49. **Kenny DA, Veldhuijzen W, Weijden TV, et al.** Interpersonal perception in the context of doctor-patient relationships: A dyadic analysis of doctor-patient communication. *Soc Sci Med.* 2010;70:763-8.
50. **Braddock CH, Edwards KA, Hasenberg NM, Laidley TL, Levinson W.** Informed decision making in outpatient practice: time to get back to basics. *JAMA.* 1999;282:2313-20.
51. **Street RL Jr, Makoul G, Arora NK, Epstein RM.** How does communication heal? Pathways linking clinician-patient communication to health outcomes. *Patient Educ Couns.* 2009;74:295-301.
52. **Carrillo JE, Green AR, Betancourt JR.** Cross-cultural primary care: a patient-based approach. *Ann Intern Med.* 1999;130:829-34.
53. **Wagner EH, Glasgow RE, Davis C, et al.** Quality improvement in chronic illness care: a collaborative approach. *Jt Comm J Qual Improv.* 2001;27:63-80.
54. **Ong LM, de Haes JC, Hoos AM, Lammes FB.** Doctor-patient communication: a review of the literature. *Soc Sci Med.* 1995;40:903-18.
55. **Stewart MA.** Effective physician-patient communication and health outcomes: a review. *CMAJ.* 1995;152:1423-33.
56. **Kaplan SH, Greenfield S, Ware JE Jr.** Assessing the effects of physician-patient interactions on the outcomes of chronic disease. *Med Care.* 1989;27:S110-27.
57. **Ward MM, Sundaramurthy S, Lotstein D, Bush TM, Neuwelt CM, Street RL Jr.** Participatory patient-physician communication and morbidity in patients with systemic lupus erythematosus. *Arthritis Rheum.* 2003;49:810-8.
58. **Williams GC, McGregor HA, Zeldman A, Freedman ZR, Deci EL.** Testing a self-determination theory process model for promoting glycemic control through diabetes self-management. *Health Psychol.* 2004;23:58-66.
59. **Street RL, Gordon HS.** Companion participation in cancer consultations. *Psychooncology.* 2008;17:244-51.
60. **Siminoff LA, Graham GC, Gordon NH.** Cancer communication patterns and the influence of patient characteristics: Disparities in information-giving and affective behaviors. *Patient Educ Couns.* 2006;62:355-60.
61. **Gordon HS, Street RL Jr, Sharf BF, Kelly PA, Soucek J.** Racial differences in trust and lung cancer patients' perceptions of physician communication. *J Clin Oncol.* 2006;24:904-9.
62. **Collins TC, Clark JA, Petersen LA, Kressin NR.** Racial differences in how patients perceive physician communication regarding cardiac testing. *Med Care.* 2002;40:127-34.
63. **Green AR, Carney DR, Pallin DJ, et al.** Implicit bias among physicians and its prediction of thrombolysis decisions for black and white patients. *J Gen Intern Med.* 2007;22:1231-8.
64. **Teal CR, Street RL.** Critical elements of culturally competent communication in the medical encounter: A review and model. *Soc Sci Med.* 2009;68:533-43.
65. **Charon R.** Narrative and medicine. *N Engl J Med.* 2004;350:862-4.
66. **Haidet P, Paterniti DA.** "Building" a history rather than "taking" one: a perspective on information sharing during the medical interview. *Arch Intern Med.* 2003;163:1134-40.
67. **Street RL Jr, Gordon HS.** The clinical context and patient participation in post-diagnostic consultations. *Patient Educ Couns.* 2006;64:217-24.
68. **Street RL, Jr., Slee C, Kalauokalani DK, Dean DE, Tancredi DJ, Kravitz RL.** Improving physician-patient communication about cancer pain with a tailored education-coaching intervention. *Patient Educ Couns.* 2009.
69. **Cegala DJ, Post DM, McClure L.** The effects of patient communication skills training on the discourse of older patients during a primary care interview. *J Am Geriatr Soc.* 2001;49:1505-11.
70. **Clayton JM, Butow PN, Tattersall MH, et al.** Randomized controlled trial of a prompt list to help advanced cancer patients and their caregivers to ask questions about prognosis and end-of-life care. *J Clin Oncol.* 2007;25:715-23.
71. **Kim SP, Knight SJ, Tomori C, et al.** Health literacy and shared decision making for prostate cancer patients with low socioeconomic status. *Cancer Invest.* 2001;19:684-91.
72. **Street RL Jr, Voigt B, Geyer C Jr, Manning T, Swanson GP.** Increasing patient involvement in choosing treatment for early breast cancer. *Cancer.* 1995;76:2275-85.
73. **Anderson LA, DeVellis BM, DeVellis RF.** Effects of modeling on patient communication, satisfaction, and knowledge. *Med Care.* 1987;25:1044-56.
74. **Montgomery AA, Fahey T, Peters TJ.** A factorial randomised controlled trial of decision analysis and an information video plus leaflet for newly diagnosed hypertensive patients. *Br J Gen Pract.* 2003;53:446-53.
75. **Weiner SJ.** Contextualizing medical decisions to individualize care: lessons from the qualitative sciences. *J Gen Intern Med.* 2004;19:281-5.
76. **Lang F, Floyd MR, Beine KL.** Clues to patients' explanations and concerns about their illnesses. A call for active listening. *Arch Fam Med.* 2000;9:222-7.
77. **Levinson W, Gorawara-Bhat R, Lamb J.** A study of patient clues and physician responses in primary care and surgical settings. *JAMA.* 2000;284:1021-7.
78. **Weiner SJ, Schwartz A, Yudkowsky R, et al.** Evaluating physician performance at individualizing care: a pilot study tracking contextual errors in medical decision making. *Med Decis Making.* 2007;27:726-34.
79. **Thompson BM, Teal CR, Scott SM, Manning SN, Greenfield E, Shada R, Haidet P.** Following the clues: Teaching medical students to explore patients' contexts. *Patient Educ.Couns.* 2010, in press.