I Found It On the Internet…: The *WebMD* Phenomenon & the Patient-Provider Relationship

By

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ABSTRACT

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Over the past few decades, the Internet has become a popular channel through which patients can seek health information. Even a decade ago, 73 million American adults admitted to being "health information seekers." It is well known that effective communication and a strong relationship between patients and providers result in higher patient satisfaction and better outcomes; but patients are often dissatisfied. The increasing public availability of health information online is adding yet another dimension to the patient-provider relationship that neither party is fully equipped to handle. Using nationally representative HINTS data from 2003, 2005, 2007 and 2011, this study evaluates Internet health information seeking behavior (IHISB) as a cause, rather than a consequence, of patient satisfaction with the patient-provider relationship, monitoring its effects in general and over time. Binary logistic regressions showed that an increase in IHISB over time improved decision-making, information-flow and trust; and IHISB, in general, negatively affected perceptions of the clarity of providers' explanations and patient satisfaction with duration of the encounter, but did not affect reliability and coping. Ultimately, I hope to suggest more targeted health communication interventions to better prepare and unite patients, providers and policymakers as the techno-health-revolution progresses.

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CHAPTER 1: INTRODUCTION AND LITERATURE REVIEW

Introduction

Communication is, arguably, one of the most critical ingredients in the relationship between patients and healthcare providers. Various studies have shown that when patients perceive their provider as being a good listener, being respectful and encouraging mutual participation in the decision-making process, overall patient and provider satisfaction, as well as psychological and mental health, are improved (Ha, Anat and Longnecker 2010). An increasingly patient-centered approach to healthcare advocates a more active, participatory role for patients and their families and calls for a greater emphasis on patient-provider communication (Katz and Hawley 2013). At the same time, various studies document that many patients feel they receive less information and involvement in their care than is desired. As a result, they feel inadequately informed about their diagnosis, the rationale behind their treatment plan, and the associated risks and benefits of this plan (Janz *et al.* 2004; Lerman *et al.* 1993; Liang *et al.* 2002). Consequently, patients are turning to other sources to gather, clarify and interpret information, including the media (e.g., the Internet, television, health magazines), and family and friends.

Over the past few decades, even before the innovation of the smart phone, the World Wide Web has become a common channel for patient health information seeking; smart phones have only enhanced access, providing another means, besides desktops and laptops, through which individuals can access the Internet. Even a decade ago, the Pew Internet and American Life Project national survey (2002) reported that “73 million American adults have gone online searching for health information” (Broom 2002:325; Fox and Rainie 2002). The reality that these “health information seekers” comprise almost a quarter of our population emphasizes just how much technology is becoming intertwined into our everyday lives. Clearly, we must continue to remain cognizant of the Internet’s growing influence on our society and culture.

Much research has explored patient-provider communication, but “despite over 40 years of research, we still do not know enough to adequately explain how a changing health care landscape is transforming the communicative dynamics of medical consultations” (Street in press 2003:63). Given the complexity of the patient-provider relationship—regarding roles, styles, expectations and values, and the context in which the relationship is established—which itself occurs within a complex, defragmented, transforming healthcare system, “‘there is no single characterization that can properly do justice to [it]” (Thomasma 1983 qtd. in Rakatansky 2001). Despite the increasing advocacy for a shared decision making (SDM) approach to medical care, little is actually known about how best to incorporate patients’ widely varying preferences for involvement in the decision-making process, and “clinicians are not adequately trained to facilitate SDM, especially eliciting patient values and preferences” (Katz and Hawley 2013)

Further exacerbating this issue is the increasing public availability of health information on the Internet on websites like *WebMD* and *Healthline*. The development of such websites is adding yet another complicated dimension to the patient-provider interaction and physicians are not well-equipped to handle this. Thus, as we continue to grapple with designing innovative approaches to provider and patient communication skills and “patient consumerism,” becoming more knowledgeable about the transformative influence of publicly available health information online is essential.

While many studies explore the effects that health information seeking on the Internet is having on the patient-provider relationship, the majority are qualitative or limited in scope. Thus, the goal of this thesis is to add to the existing body of literature by taking a quantitative analytical approach toward understanding patterns and variations in Internet health seeking behavior and its effect on patient satisfaction with the patient-provider relationship. What provokes patients to turn to the Internet for health information? How common is this, compared to use of other media? Are certain groups at a greater disadvantage when it comes to accessing this information and getting responses from their providers? In what ways is Internet behavior influencing patients' decision to see a physician: Are they going unnecessarily, when it is too late, or not going at all? In addition, if and when they do seek the advice of a physician, how are they choosing to present the information they find online: Are they withholding information, asking for clarification and/or arguing with the professional? Although existing studies already attempt to answers these questions, more support is needed. Further evidence is necessary to better understand how Internet use is transforming the roles of patients and providers in the medical encounter, as well as the definition of the medical encounter itself.

The rest of this chapter will turn to existing literature to examine what we already know about the frequency of looking up health information online, reasons for turning to the Internet for information, the accessibility of this information avenue, and the effects of this phenomenon on the medical encounter. Ultimately, through quantitative analysis, I will attempt to explain how health information seeking on the Internet is affecting the patient-provider relationship, and whether and how this has changed over time.

To understand this phenomenon it is illustrative to, first, examine the importance of the doctor-patient interaction, the evolution of different models of communication in the medical encounter and known patient-provider interaction issues. Similarly, in order to understand the implications of the Internet, it is illustrative to examine the reasons why patients are turning to health information websites and to examine, more closely, the effects it has had on the patient-provider relationship—from the perspective of both patients and physicians.

The Doctor-Patient Relationship & Communication in the Medical Encounter

As Hall, Roter and Rand (1981) wrote, "'Medicine is an art whose magic and creative ability have long been recognized as residing in the interpersonal aspects of patient-physician relationship'" (qtd. In Ha, Anat and Longnecker 2010:38). It is well understood that patient-provider communication plays a vital role in laying the foundation for quality healthcare delivery (Ha, Anat, Longnecker 2010; Verlinde *et al.* 2012). In order to provide the most competent care possible, it is important to be aware of the different communication approaches required for different patient demographics, and of the inequalities in quality of and access to healthcare.

Evolution of the Doctor-Patient Relationship

The doctor-patient relationship has evolved over time. It is dependent upon the medical scenario and "the social scene." As Kaba and Sooriakumaran (2007) explain, "The doctor's and patient's ability for self-reflection and communication as well as any technical skills are embodied within this 'medical situation'. The 'social scene' refers to the socio-political and intellectual-scientific climate at the time" (58). Through an historical analysis of changes in the medical profession and healthcare delivery over time, Szasz and Hollender (1956) have delineated three basic models of the doctor-patient relationship: doctor-centered (active-passivity); guidance-co-operation (an ill patient seeks a doctor's help and is, thus, willing to cooperate, thereby placing the doctor in a position of power); and patient-centered (mutual participation) (Kaba and Sooriakumaran 2007). All three models are inherently based not only on the evolution of the medical profession and its rise to sovereignty, but also on the evolving definitions of health and illness over time.

In the 1700s “the symptom was illness” (Kaba and Sooriakumaran 2007:59). The medical profession was not yet legitimized, science and medical techniques appeared to be more harmful than helpful, and doctors were merely likened to apothecaries. Doctors believed that it was more important to treat an individual’s needs and experience of illness, than it was to treat the symptoms causing their discomfort. Thus, a symptoms-based model of illness prevailed during this time that was representative of patient dominance (Kaba and Sooriakumaran 2007).

Fast-forwarding a century later, achieving professional legitimacy and dominance arose from urbanization when people were surrounded by less of their family members and, consequently, had a greater need for non-family members to care for them. In conjunction with this, several other factors were critical to the creation of the omnipotent, autonomous physician-figure that dominated most of the 20th century, including: the elimination of competitors by the establishment of the AMA in 1850, improvements in medical education and the growth of hospitals after the 1910 Flexner Report, mechanisms of standardization and legitimation, and financial changes that occurred in the early-to-mid-1900s (Barr 2007). With the growth of hospitals and advances in biomedical knowledge and technology, came the growth of the biomedical model of illness and the passive patient. This new biomedical model of illness viewed the body as a machine and perceived disease as something wrong or broken that needed to be fixed. In this model, the patient was viewed as a problem in need of repair and the physician was the mechanic with the tools to do so. This illness model resulted in medical paternalism: patients became dependent on their doctor who possessed all of the clinical and anatomical knowledge to make a diagnosis and fix them (Barr 2007; Kaba and Sooriakumaran 2007).

Prior to the last two decades, medical paternalism was the predominant healthcare delivery model. It was defined by compliant advice-seekers (patients), and the technically knowledgeable and skilled ‘wizards’ (doctors) who, because of their training and expertise, were awarded the power to make decisions. Medical paternalism is rooted in the Hippocratic principles of *beneficence* and *primum non nocere* (not to hurt). These guiding principles ensure that “the doctor’s role involved acting in the patient’s best medical interests, with doctors regarding a ‘good patient’ as one who submissively accepted the passive role” (Kaba and Sooriakumaran 2007:59). Despite having underlying good intentions, the paternalistic model clearly created and reinforced an “asymmetrical or imbalanced interaction between doctor and patient,” and has, therefore, been challenged over the last few decades (Kaba and Sooriakumaran 2007:57).

An Important Transition: Patient-Centered Care

Over the past 20 years, strong advocacy has emerged for a more patient-centered approach to medical care, encouraging greater patient autonomy and active participation, and a more equitable balance of power in decision-making. It has “been described as one where ‘the physician tries to enter the patient’s world, to see the illness through the patient’s eyes’” (Kaba and Sooriakumaran 2007:57). Patient-centered care shifts the focus away from providers and a strictly disease, or biomedical, context, toward patients and their “individual characteristics, perspectives, values, and context,” which are integrated into their care (Feldman 2011:5). Although several definitions of patient-centered care exist, Moira Stewart “eloquently” outlined six defining characteristics, guided by two key principles “promotion of patient involvement and individualization of care”:

> (1) exploring the patient’s disease and illness experience; (2) understanding the whole person; (3) finding common ground; (4) incorporating prevention and

> health promotion; (5) enhancing the provider-patient relationship; (6) being realistic (Feldman 2011:5).

Especially as of late, in response to the changes being incurred with the implementation of the Affordable Care Act, many papers have been written on patient-centered care and a concept known as shared decision making (SDM). Feldman (2011) clarifies the distinction between the two:

> Shared decision making, the manifestation of patient-centered communication, grounds the clinical encounter in evidence while bringing the patient to the center of the decision making process. Through the process of shared decision making, providers and patients make medical decisions jointly by examining the current medical knowledge, reviewing options, outcomes and risk, and exploring patients' beliefs and perspective. […] A distinct shift from a paternalism, both provider and patient take on new roles in patient-centered-decision making (5).

Since shared decision making is really just the process through which patient-centered care is accomplished, I have chosen to hone in on it; moreover, it is the real-time process that has been affected by "patient activation" and Internet health information seeking—concepts that will be discussed in more detail later on in this chapter.

Shared Decision Making (SDM)

Historically, medical paternalism designated physicians as 'agents of healthcare' and the sole decision makers. However, various organizational, political-legal and economic forces have challenged this traditional approach to healthcare decision making. For example, "The tradition of medical decision making based on professional paternalism does not deal well with the complex trade-offs created by modern technology" (The Dartmouth Institute for Health Policy and Clinical Practice 2007). "In response to this rebellion against both paternalism and third party [payers, insurance companies and health maintenance organizations] intrusion into medical decision making," a different patient-physician relationship is being proposed (The Dartmouth

Institute for Health Policy and Clinical Practice 2007). This model, called shared decision-making, serves as the bridge that links evidence-based medicine with patient-centered care.

Shared decision making (SDM) is grounded in the fundamental elements of the patient-physician relationship. Following Hippocratic tradition, the AMA’s original *Code of Ethics* (1847), and revised versions, endorsed an ethic emphasizing conduct over character, as it “was premised on the understanding that the very nature of the physician’s responsibility consisted of caring for the sick and that this was a responsibility owed by all physicians to all patients” (Rakatansky 2001). Further, physicians were obligated to hold their ethical responsibility “above considerations of personal advancement” (Rakatansky 2001). Physicians must be advocates for their patients and are to abide by six key patient rights:

> 1. Patients have the right to fully discuss all information, risks, benefits and costs regarding treatments; physicians should guide their patients toward the “optimal course of action,” according to their patients’ best interest and values; patients are warranted access to copies of their personal health records, “to have their questions answered, to be advised of potential conflicts of interest that their physicians might have, and to receive independent professional opinions.” 2. Patients have the right to “accept or refuse any recommended medical treatment. 3. The patient has the right to courtesy, respect, dignity, responsiveness, and timely attention to his or her needs. 4. The patient has the right to confidentiality. […] 5. The patient has the right to continuity of health care. [… and] 6. The patient has a basic right to have available adequate health care” (AMA 1990).

The current vision of a SDM model is very much the same, taking a three-step decision making approach to obey these rights: “information exchange, deliberation, and consensus building” (Feldman 2011:11). SDM encourages collaboration between patients and providers in determining a treatment plan, while taking the risks and benefits of different options into consideration. It addresses the need to fully inform patients and account for their personal values and preferences, as well as the needs to do so in a respectful and timely manner while preserving confidentiality (Rakatansky 2001; The Dartmouth Institute for Health Policy and Clinical Practice 2007). In this way, the AMA’s goals have come to life; evidence-based medicine and individualized, value-based care have been combined into one equation whose sum is patient empowerment and "patient activation." Through this model, patients are encouraged to ask questions and to be at the forefront of their treatment plan, but are given a preference as to the degree to which they would like to be involved in the decision making process. This is in stark contrast to the previously dominant paternalistic model, which gave patients little or no power.

Why This Transition Occurred

Officially coined as a term in 1969 by British psychoanalyst Enid Balint, patient-centered care, or a SDM approach, came to be applied in American medical practice due to a multitude of contributing factors. While physicians were highly trusted by the public during the 'golden age of medicine,' post-World War II, this trust started to rapidly decline in the late 1960s; between 1966 and 1981, public trust in physicians decreased from 72% to 37%, and continued to decline through 1998 (Timmermans and Oh 2010). Today, managed care and government programs control prices for medical services, which has transformed medicine into more of a lucrative business—'Big Medicine.' As a result of "the increased bureaucratization of medical care, the rise of defensive medicine and malpractice legislation, the thalidomide scandal and reports of medical experimentation, and the implementation of informed consent laws, suspicion grew about physicians acting in patients' best interests" (Timmermans and Oh 2010:S98). Charles *et al.* (1997) argues that informed consent as a legally and ethically enforced patient right, "seems to imply at least a minimum of shared decision-making in the form of patient consent to treatment prior to any intervention" (681). In this way, SDM provides "a mechanism to decrease the informational and power asymmetry between doctors and patients by increasing patients' information, sense of autonomy and/or control over treatment decisions that affect their well-being" (Charles *et al.*1997:682). Therefore, it makes sense that this approach also has its roots in the social and consumer rights movements of the 1960s and 1970s, when the general public was demanding more rights and freedoms. Mirroring the goals of the anti-establishment movements that occurred during this time, patient participation in decision-making personified “autonomy, control” and challenge to “the authority of physicians as the patient-physician relationship shifted away from a paternalistic relationship toward a client-provider one” (Timmermans and Oh 2010:S98).

The entire SDM concept was likely developed from a combination of psychology’s therapeutic model and a mutual participation model, which was proposed in the early 1960s as a patient backlash against the establishment of medicine. A rise of psychology in the late 19th century led to the rise of the therapeutic model, which viewed patients holistically and encouraged them to be active participants in the medical consultation. This early therapeutic model laid the foundation for the mutual participation model that “ultimately led to the creation of patient-centered medicine. […] ‘The patient was not simply an object but a person, needing enlightenment and reassurance’” (Crichton-Miller 1932 qtd. in Kaba and Sooriakumaran 2007:59). A century later, in 1964, Michael Balint proposed the model for mutual participation. It describes a relationship in which “the doctor does not confess to know exactly what is best for the patient [… and] the interaction between [doctor and patient] is based on having equal power, mutual independence, and equal satisfaction” (Kaba and Sooriakumaran 2000:60). By giving patients more responsibility to take care of themselves and become more informed, this approach encourages more of a partnership between patients and their physicians. Consequently, “the doctor’s satisfaction cannot be derived from power nor can it stem from the control over someone else, but rather from the unique service he provides to humanity” (Kaba and Sooriakumaran 2007:60-61). This is the type of model currently being advocated.

Finally, over the last few decades, medical practice has endured much change in response to advances in medical technology, an aging population and changes in our healthcare delivery system. Due to advances in medicine, people are living much longer. Associated with this, there has been a dramatic shift away from acute care and a biomedical model of illness toward a greater focus on preventive care, chronic illness management and a more holistic, biopsychosocial approach to treatment. For patients with chronic disease sickness is not a temporary state needing a 'quick fix;' as the term "chronic" implies, the illness is long-term and becomes part of their identity, and medical care is directed more on treating the whole patient, not just their disease. The patient-provider relationship is long-term, as these patients require consistent monitoring, clinic visits and medication and lifestyle adjustments. As Charles *et al.* (1997) explains, "This process is likely to work best if both patients and physicians have a role in managing the illness and medication regiments" (682).

What's Really Going On in the Exam Room: Issues Related to Communication

Patients' and physicians' perceptions have become an increasingly important focus of quality improvement research, since patient satisfaction is often used as an indicator of the quality and success of medical care. "Patient satisfaction has been linked to patient involvement in medical decision-making, personalization of medical care, attention to patients' feelings and psychosocial concerns, patient-centered vs. doctor-centered care, and adequacy of information offered to patients by physicians" (Han, Collie, Koopman *et al.* 2005). Today, patients are considered medical consumers who are actively learning, engaging and, in some cases, resisting medical authority. Communication in the exam room is more of a two-way street than it was in the past and physicians are not the only ones creating barriers to building a good rapport. All of this is highly influenced by social factors that shape the production, dissemination and use of knowledge, which are also shaped by our personal characteristics (Ha *et al.* 2010).

Miscommunication, Discord & Patient Satisfaction

Patients’ perceptions of communication are highly dependent upon demographics and other individual characteristics. Communication in the medical encounter is typically defined in terms of: verbal communication (including task-focused spoken discussion and socio-emotional, or affective, behavior); non-verbal communication; patient-centered behavior; communicative styles of patients; and coping styles. Studies often assess communication efficacy among chronic illness patients—especially cancer patients—since the doctor-patient relationship is long-term. Across the board, miscommunication, difficulty understanding one’s prognosis, difficulty voicing concerns and expectations, and discouragement from asking questions are among the greatest problems patients report in the doctor-patient relationship (Ha *et al.* 2010).

These are not new issues. Three decades ago, Strull, Lo and Charles (1984) studied hypertensive outpatients’ level of preference for shared decision-making and the degree to which their physicians were able to accurately judge their preference. They found physicians to be poor judges of their patients’ needs for treatment-related information and discussion; physicians were more than twice as likely to underestimate patients’ desire to participate in decision making than they were to overestimate them. Discord between patient preference and perception of the approach toward decision-making as well as difficulty communicating with medical providers tend to be sources of dissatisfaction, distress, anger, anxiety and difficulty coping for patients—particularly those with cancer. Lerman *et al.* (1993) studied breast cancer patients’ perceptions of medical interactions, coping styles and psychological distress. They found that the top interactional problems reported by these patients were difficulty asking questions of and expressing feelings to their providers, and even when the physician did offer information and explanations, many patients had difficulty understanding. Janz *et al.* (2004) found notable discrepancies between patient and physician concordance about decisional role when examining patient preferences for involvement in breast cancer treatment decision-making. They found that higher education level was significantly associated with patient desire to take on an active role in the treatment decision, and female patients who perceived playing a more active role in decision-making had higher levels of satisfaction. From this, it is evident that in order to increase patient satisfaction, which is positively associated with active involvement in decision-making, physicians need to directly ask patients their role preferences rather than trying to passively discern behavioral cues. Murray *et al.* (2007) also found discord "between patients' preferred style of clinical decision-making and the style they usually experienced" when investigating how social class influenced patient preferences and their actual experience in the clinical encounter (189). They found that higher socioeconomic status and continuity of care (i.e., having a regular doctor) were positively associated with a preference for shared decision making and a greater likelihood of experiencing one's preferred tactic. On the other hand, patients of a lower socioeconomic status were more likely to report not receiving enough information from their physicians to make the "right" decision (Murray *et al.* 2007). Recognizing the reality, significance and persistence of these issues is especially important since level of intrigue in becoming more educated about one's condition is not necessarily indicative of a patient's desire to be actively involved in decision-making.

Gerber and Eiser (2001) note that patients who are interested in becoming more knowledgeable are not always interested in the medical decision-making process. Studies of patient-physician relationships support that, patients demonstrating a high degree of interest in becoming educated about their condition and treatment options are highly variable in their actual preference for "actual participation" in decision-making. In a number of cases, patients often prefer to delegate the decision-making responsibility to their physician (Arora and McHorney 2000; Gerber and Eiser 2001).

Communication Inequities Associated with Age & SES

Inequities in quality of and access to healthcare are well-documented. The relationship between patient and provider helps establish the foundation for healthcare delivery, and, thus, problems within the relationship further exacerbate those inequities. Various studies have repeatedly demonstrated the importance of physicians' communication skills in healthcare quality, patient satisfaction and compliance, and efficacy of care (Verlinde *et al.* 2012).

A multitude of studies also show that a positive correlation exists among a patient's age and social gradient and level of information giving―both from physician to patient, and patient to physician (Verlinde *et al.* 2012). The communicative styles of physicians and their level of information giving often stem from a patient's age and/or social gradient. Liang *et al.* (2002) examined communication between physicians and older women, ages 67 and up, and the effects on cancer treatment decision-making and patient satisfaction. Their results demonstrated that patients 80 years of age and older often receive less information about treatment options, are less likely to report being given a choice of treatment, are less likely to perceive that their surgeons initiated communication and are less likely to initiate communication themselves and, as a result, report lower levels of satisfaction. DeVoe, Wallace and Fryer (2009) also assessed discrepancies between age and perceptions of healthcare communication to consider variations among a broader age category. When controlling for all sociodemographic and socioeconomic factors, they found that patients between ages 18 and 24 are more likely to report being dissatisfied with their physicians' abilities to explain things, spend enough time with them and listen to them. DeVoe, Wallace and Fryer (2009) did note that this age group tends to have lower income and are less likely to be insured, which supports that these variables are also important for predicting quality of patient-provider communication and caregiving.

Lower patient satisfaction and access to quality medical care among low-income individuals and the underinsured are well-studied. Variations in how physicians allocate time during the consultation have been reported for patients of higher and lower socioeconomic statuses. Typically, social class is defined in terms of income level and/or education level (Verlinde *et al.* 2012:2). Patients with less education have reported that more time during the consultation is dedicated to the physical exam and nutritional counseling, rather than to answering questions, assessing comprehension of information—which is significant because less educated and poorer patients are more likely to have difficulty understanding physicians' explanations—and collaborating, and "less screening tests [are] provided to them" (Verlinde *et al.* 2012:8). Although seemingly contradictory, these patients report similar levels of overall satisfaction with their medical care even though they are also less likely to have their expectations met. In contrast, patients of higher-class status report receiving more overall communication and more information from their physicians. Patients with at least some level of college education tend to be more affective in expression, curious and assertive, which results in the receipt of more information from physicians (Verlinde *et al.* 2012). In other words, it seems to be the case that more educated patients are more apt to receive more health and diagnostic-related information than less educated patients.

Further research in this area has revealed that more educated patients are not only more communicative and assertive, but they are also more likely to ask more questions and voluntarily give information. Looking at the interaction of race, income level, education and age and the amount of time physicians spend on certain "categories" of communication, Siminoff *et al.*

(2006) further expanded on this. They found that that patients' willingness to volunteer information, even when not elicited by a question, and physicians' tendency to ask patients questions were more common when patients had more than a high school education and had a medium or higher income. Interestingly, though, within these consultations, there was little discussion about patients' feelings and coping with their diagnosis, but more interpersonal relationship-building did occur with white, more educated and more affluent patients, as was expected (Siminoff *et al.* 2006). Additionally, more "biomedical talk" was given to these patients which, for ethnic minorities and less educated, older and lower socioeconomic class patients, could potentially result in a less satisfactory decision-making process (Siminoff *et al.* 2006; Verlinde *et al.* 2012). Clearly, such data validates the inference that physicians are likely to give these patients more information and more guidance because they are inspired to give more to patients who are interested in receiving more and participating more, and who are likely to understand more and are able to pay more (Verlinde *et al.* 2012).

Exposing Health Literacy Issues

Considering that communication problems between low income populations and their providers, as well as access to fewer resources and less information, have been well-documented, it is important to acknowledge another troubling issue: health literacy, which is also associated with satisfaction and health outcomes. According to the AMA, health literacy is a "'constellation of skills, including the ability to perform basic reading and numerical tasks required to function in the health care environment'" (qtd. in Safeer and Keenan 2005). Contrary to common assumption, health literacy is not just an issue for the lower class. Most healthcare materials are written at a tenth-grade level and while this is sufficient for most adults, who can read at an eighth-grade level or higher, 20% of the population can barely read at a fifth-grade level. Additionally, older patients suffer because their reading and comprehension abilities deteriorate with the cognitive decline and vision and hearing loss associated with aging (Safeer and Keenan 2005).

Health literacy is a significant issue because health illiterate patients often struggle to access and use our healthcare system. More specifically, they may struggle to complete forms and may be ashamed to ask for help and clarification, complain that they had trouble understanding test results because their physician did not simplify the “medical jargon” enough, be noncompliant with medications, adhere poorly to recommended interventions and delay decision-making. In order to improve patient satisfaction and health, physicians need to provide patients with easy-to-use and comprehensible information and make a concerted effort to reinforce or further clarify information discussed during the visit. As will be discussed later on, a new form of health literacy is becoming a concern: “technoliteracy.” That is, one’s ability to discern health information on the Internet is intensifying the issue. In conjunction with the other issues discussed, we now need to consider that some patients are also less likely to have full-time access to information on the Web, exacerbating the existing social gradient. This suggests a need to hone in on this techno-aspect of the social gradient as it relates to doctor-patient communication.

SDM Revisited: Which Patients Are More Likely to Be On Board?

As medicine continues to grapple with the idea that every person’s biochemistry is slightly difference, it is important for all of us to acknowledge and accept that approaches to communication and decision making are highly individual and variable—especially when it comes to our health. Research has shown that there are many patients who desire to become educated about their health and want to actively participate, and others who prefer a provider-directed approach to their healthcare (Verlinde *et al.* 2012). Hence, the practicality of SDM is, of course, dependent upon a number of factors, including sociodemograhics and the clinical scenario.

When researching chronic illness patients’ preferences for medical decision-making, Arora and McHorney (2000) found that patients who are younger, more education and healthier and have an active coping style prefer more active participation. Similar to other studies, they also reported that women are more likely to be active medical decision-makers, which is consistent with their being more active in seeking care, asking more questions during visits and having more partnership-building with physicians than men (Cooper-Patrick *et al.* 1999; Arora and McHorney 2000; Levinson *et al.* 2005). McKinstry (2000), who observed patients’ preference for shared decision making based on educational (social class) level, found that social class, age, situation and physician consultation style—mutual participation or authoritative—were correlated with patients’ preference for a particular decision-making approach. Patients who prefer a shared decision making style are typically in their 20s to 40s and as people get much older, their desire to participate decreases (Frosch and Kaplan 1999; McKinstry 2000). Street *et al.* (2005) found that active communicators had at least some level of college education; but, while these patients were likely to ask more questions and be more assertive in the interaction, they did not openly express their concerns more often than patients without a college-level education. Levinson *et al.* (2005) assessed public preferences for participation in clinical decision-making in order to understand how demographics and health status influence style preference, contributing further to previous findings by factoring in how race/ethnicity is intertwined with all of this. They found that Whites are much more likely than African-Americans and Hispanics to prefer a mutual participation style, and patients with a better health status are much more likely to be actively involved. With regard to race, both Cooper-

Patrick *et al.* (1999) and Levinson *et al*. (2005) propose that physician behaviors—acting more dominant with minorities—may play a role, since Levinson *et al.* (2005) found a consistent preference pattern among minorities even after controlling for socioeconomic status and education.

Recognizing that decision-making style in the medical encounter is multi-faceted, Alexander Kon (2010) proposed a "'shared decision making continuum'" consisting of five styles or approaches: "patient or agent driven, physician recommendation, equal partners, informed non dissent, and physician driven" (qtd. in Feldman 2005:8). Providers should take the time to assess how a patient wants to be involved, and patients should be honest and clear with their providers. Establishing this type of dynamic is becoming more and more critical as technological advances not only present us with a wider array of treatment options, but also as they begin to have a more integral role in communication and our everyday lives.

The e-Health Phenomenon & a "New" Doctor-Patient Relationship

The integration of information technology into our healthcare system is "reshaping" the organization and distribution of medical care and the doctor-patient dynamic (Anderson, Rainey and Eysenbach 2003). Outside of the exam room, with just the press of a button, patients have access to the epidemiological world almost anywhere they go, using their Web browser. "Today, the Internet facilitates crucial components of healthcare delivery including: consumer education; disease management; clinical decision supports; physician/consumer communication; and administrative efficiencies" (Ball and Lillis 2001:3). On websites, in chat rooms, in free online access to health journals and on smart phone apps, patients are able to find information about symptoms, treatment options, risk factors, disease prevention, medications and their providers.

Unlimited, “anonymous” access to health information entices patients to ‘take the bull by the horns’ and look things up.

The Internet is particularly alluring because it “far surpasses other media in its ability to be ‘consumer centric’” and to meet patients’ needs and desires in a timely manner (Anderson, Rainey and Eysenbach 2003:68). The web-information-network crosses domestic and international borders and integrates “different modes of communication and forms of content” (Anderson, Rainey and Eysenbach 2003:67). The availability of a vast amount of health-related information on the World Wide Web has contributed to the shift in the focus of medical care from cure to prevention, and to the emergence of a new type of patient-consumer: the Internet-informed patient (Anderson, Rainey and Eysenbach 2003). For all of these reasons, the Internet is an extremely important place to analyze the “new” doctor-patient relationship (Anderson, Rainey and Eysenbach 2003).

The Internet

A relatively recent phenomenon, dating back to the 1960s and 1970s, the Internet has been described as a “new source of power [derived] not [from] money in the hands of a few but information in the hands of many” (Ball and Lillis 2001:1). By definition, the Internet is an “electronic network that links people and information through computers and other digital devices to allow for person-to-person communication, and allows for information retrieval” (Anderson, Rainey and Eysenbach 2003:68). It has been referred to as “A modern-day Guttenberg press,” since “Just as literacy became both an instrument of freedom and a necessity for those who could finally access books, computer literacy has become an imperative for those who wish to take part in this new information age” (Ball and Lillis 2001:1). It was not until the mid-to-late 1990s that lay people were able to search specifically for healthcare information with such ease; the “World Wide Web” has made this dramatically easier. A variety of vehicles exist on it through which individuals can access information, including “websites, listservs, online support groups, chat rooms, instant messaging, and email” (Cotten and Gupta 2004:1797). Patients, caregivers and loved ones can access information from all over the world, via millions of web pages, enabling them “to become more active collaborators in their own health” (Stevenson, Kerr, Murray and Nazareth 2007:1). Through telemedicine, patients can consult with real physicians through messaging and live-feed webcams. Online support communities are among the top sources that consumers and members of their social network report using to find health information online (Cotten and Gupta 2004).

A large proportion of Americans are utilizing the Internet to search specifically for health and medical information. Seventy four percent of US Internet users in 1999 “searched for online health and medical information,” a 43% increase from 1998 (Ball and Lillis 2001:3). More than 100 million Americans in 2002 will have sought information, including health information, online to help them make medical decisions, “an increase of 13 million from the previous year” (Forkner-Dunn 2003). The Pew Internet & American Life Project’s (2013) most recent report found that 85% of U.S. adults use the Internet and within this group, 72% reported looking up health information online within the past year (Fox 2013). It would be interesting to see specifically how online health information seeking patterns have changed over the past two decades in terms of what and for whom individuals are looking things up, when and how often, and the reported consequences.

With the advent of mobile Internet and smartphones, finding information about any topic has become even easier—all you have to do is reach into your pocket or purse. We now literally have the world at our fingertips. Like 77% of online health seekers do, you can click on your browser and type your questions into Google, Bing or Yahoo, or you can log onto a specialty site like *WebMD* like another 13% do (Fox 2013). If you have a smartphone, you can download a *WebMD* or *Medscape* app, in addition to countless other variations of "Symptoms Checker" apps. As of 2013, 91% of adults in the U.S. own a cell phone, and 56% own a smartphone (Fox 2013). Breaking this down further, "31% of cell phone owners, and 52% of smartphone owners, have used their phone to look up health or medical information" and "19% of smartphone owners have downloaded an app specifically to track or manage health" (Fox 2013). Mobile Internet access is an extraordinary extension of the e-Health phenomenon with the potential to mollify many issues of access to healthcare services, health information and a computer. The Pew Research Center (2013) notes that younger people, Latinos and African-Americans are much more likely to have mobile Internet access than other groups, and these two racial/ethnic minority groups are among those who struggle with issues of access to health care and health information (Fox 2013).

Obviously patients are still seeing their doctors, but this now seems to come after much more deliberation than was seen in the past. Rearranging your schedule to book an appointment seems to come after seeing whether the Internet 'crystal ball' tells you that you should consider consulting your physician. So the questions become: who are these Internet health information seekers, what exactly are they looking up, and why?

Patients & the 'WWW': Who, Why & What

Health information seeking has been defined as searching for information to "help 'reduce uncertainty regarding health status' and 'construct a social and personal (cognitive) sense of health'" (Tardy and Hale 1998 qtd. in Cotten and Gupta 2004:1796). Likelihood and frequency differ by demographic data. Age, education, income and health status are the most dominant of the predictor variables correlated to greater likelihood of seeking health information online (Cotten and Gupta 2004). Compared to offline health information seekers, online seekers are significantly younger (mean age 40 vs. 52), more educated individuals, who earn higher incomes and who consider themselves to be happier; individuals with more long-term illnesses are also more likely to be online health seekers (Cotten and Gupta 2004). In terms of income, 42% of individuals looking up health information earn more than $50,000 per year, compared to 30% who earn between $30,000 and $49,000 per year and 17% who earn less than $30,000 per year (Brodie *et al.* 2000). Additionally, Blacks are the less likely to use online health information compared to Whites and other races/ethnicities—19% versus 34% and 47%, respectively (Brodie *et al.* 2000). Interestingly, Cotten and Gupta (2004) found that both online and offline health information seeking patients mentioned utilizing their healthcare professionals more often than other sources for health information, even though they still relied on additional health resources (Cotten and Gupta 2004). It would be interesting to see whether social inequalities are correlated to the sources being used and whether age remains a key predictor of patients using the Internet, and how this is transforming the patient-provider relationship.

The impetus for patients' online health information seeking behavior is an historical struggle for patients to easily obtain information about health problems and treatment options from their physicians (Anderson, Eysenbach and Rainey 2003). Stemming from the desire to have more control over one's own health, patient consumerism has "become a thriving movement in the healthcare system" (Ball and Lillis 2001:2). This movement has been "Powered by regulatory changes like the Patient's Bill of Rights, by societal changes like increasing technoliteracy and self-reliance, and by the Internet's reinvention of the way information is accessed and managed" (Ball and Lillis 2001:2). As sociologists, we understand that there is never just one simple reason behind a macro-level, or even a micro-level, trend. Deductive reasoning leads us to presume that there must be other structural, institutional and personal forces at play underlying these information-acquiring issues and Internet health seeking behavior. From previous sections that discussed the shifts in our approach to healthcare decision making and explored communication in the medical encounter, we have already come to understand what we are dealing with at the foundational level. By forging a connection between these two discussions, we can deduce the impetus behind the impetus.

The motivation to search for health information on the Internet arises from a number of rationales. While physicians have traditionally been the primary source of all health information and while the patient-provider relationship has historically exhibited a power imbalance, the Internet presents an opportunity to rectify this by providing multiple channels through which patients can become more informed, which in theory should level the scale. Part of this stems from frustration and dissatisfaction with physicians' lack of time. In 1998, a survey reported that 77% of U.S. adults concurred that "'doctors spend less time with the patients now than 10-15 years ago'; 65% feel that 'Most doctors are hurried'; and 47% are 'not satisfied with duration of doctor's visit'" (Reents and Miller 1998 qtd. in Anderson *et al.* 2003:70). Insufficient consultation time results in misunderstandings and confusion, which exacerbate patient dissatisfaction and noncompliance (Anderson *et al.* 2003). A more recent article from *NPR*, entitled "What's Up, Doc? When Your Doctor Rushes Like The Road Runner," reported that "3 out of 5 patients think their doctors are rushing through exams. That's nearly the exact same number as three decades ago" (Varney 2012). This latter finding is particularly interesting and suggests that there must be additional factors contributing to patients seeking health information on the Internet. For example, the freedom to readily access online health resources in a comfortable and "anonymous" environment, whenever and wherever, relatively inexpensively, is particularly appealing. Patients can ask difficult and/or embarrassing questions on Internet webpages, chat rooms, blogs and support groups, without having to worry about being judged by or bombarding their physicians (Hardey 1999; Iverson *et al.* 2008). Having this independence gives "patients greater control over the rate at which they learn new medical information, reducing the sense of 'information overload' that has traditionally stymied patient-physician encounters" (qtd. from Iverson *et al.* 2008; Hardey 1999). Numerous online support communities exist for patients suffering from similar medical conditions, providing "a strong, highly accessible base of support for individuals with health challenges. Such support is especially beneficial for those who are homebound as a result of debilitating illness" (qtd. from Iverson *et al.* 2008; Hardey 1999).

Data from a MEDSTAT survey in 2000, which aimed to find out what patients are looking up on health-related websites, showed that disease-specific information was most commonly sought, and next was general and preventive health information (Ball and Lillis 2001:3). According to the Pew Research Center (2005), however, it is more likely that patients are looking up "routine health matters," related to diet and exercise, than more specific and complex conditions. This disparity could suggest that new patterns are emerging. Some patients look up information online prior to a consultation to decide whether it is necessary to go and "to explore whether symptoms were related to clinically meaningful diseases" (Sommerhalder *et al.* 2009:268). The overworked frequently do this because they are tired of wasting time and money on long waits for doctor's appointments and "grappling with inconvenient scheduling that robs them of works hours, and filling out duplicative forms" (Ball and Lillis 2001:2). A Pew Internet & American Life Project report (2000) showed that 41% of people surveyed "said that the Internet affected their decisions about going to a doctor, treating an illness, or questioning their doctor" (Forkner-Dunn 2003). Over two-thirds of patients claim that they "do not receive literature about their condition or their child's condition, and only one-third receive literature about their medications" (Ball and Lillis 2001:3). They compensate by educating themselves, most commonly, using Internet resources. Some patients go online after the consultation to clarify their diagnosis or a procedure. To better prepare for the future, they can look up performance level data on hospitals, doctors and medications and compare them before deciding what, who and which to use. Individuals also do Internet searches about a family member's or close friend's diagnosis in order to be able to be there for support (Ball and Lillis 2001).

Pros & Cons of Internet Health Information Seeking

As technology creeps its way into every aspect of our lives, it is changing the nature of relationships, communication and information-sharing. This "has important implications for health care: issues such as the quality of care, the validity and consistency of available information, and the effects on the doctor-patient relationship [are] major concerns" (Impicciatore *et al.* 1997:1875).

Patient empowerment and the Internet-informed patient

Eysenbach (2000) explains that the public availability of "interactive information" via the Internet:

> 'coincides *with the desires of most consumers to assume more responsibility for their health*…Information technology and consumerism are synergistic forces that promote an 'information age healthcare system' in which consumers can, ideally, *use information technology to gain access to information and control their own health care*, thereby utilizing resources more efficiently' (qtd. in Henwood, Wyatt, Hart and Smith 2003:593).

From this, two concepts can be extracted—patient empowerment and the Internet-informed patient. These can be further divided into two, interrelated parts: being empowered to access the information and get informed, and being informed and thus empowered to take ownership of your health, make lifestyle changes and actively participate in the clinical encounter.

Patient empowerment has been shown to be correlated “with better treatment outcomes and significantly higher levels of patient satisfaction” (Broom 2005:328). Across the board, studies support that looking up health information online bolsters patient confidence and encourages patients to be more active during the medical visit (Ball and Lillis 2001; Broom 2005). This is operationalized by an increase in the number and types of questions Internet-informed patients ask their providers to ensure their understanding, clarify contradictions between their own views and what the physician has presented, and make suggestions for “specific diagnoses, diagnostics or treatments” (Hardey 1999; Henwood *et al.* 2003; Broom 2005; Iverson, Howard and Penney 2008; Verlinde *et al.* 2012). Iverson, Howard and Penney (2008) found that in addition to increased participation (in the form of asking questions) in the medical encounter, looking up health information online also increased the likelihood of patient compliance with advice and resulted in self-directed dietary changes. In more than 50% of cases, health information acquired from the Internet changed the way patients thought about their health, inspiring behavioral and lifestyle changes. When assessing the impact of Internet use on health-related behaviors and the doctor-patient relationship, Iverson, Howard and Penney (2008) also found that health information obtained online increased Internet users’ interest in their own health and caused them to change their way of thinking. Behavioral changes included increased doctor’s visits, more active participation during the doctor’s visit, increased compliance, dietary changes, and increased use of alternative products. Some patients have also expressed that information sought online either before and/or after a visit to their doctor was reassuring and reduced confusion about their personal medical issues (Iverson, Howard and Penney 2008).

Despite the benefits of patient empowerment, the fact that some patients are formulating their health values, opinions and decisions off of information from the Internet is a cause of major concern among medical professionals (Forkner-Dunn 2003). As previously discussed, some patients attempt to use online information to find alternatives to their physician's advice, to forgo seeing their physician or to self-diagnose and self-treat, especially when they are unable to book an appointment. This is particularly disconcerting for healthcare providers whose patients are misinformed and argumentative, are turning into "cyberchondriacs," and are neglecting to seek or take their expert advice. Unfortunately, in the latter scenario, patients could end up harming themselves by following incorrect information found on the Internet, and when they finally do seek expert advice it is often too late. As it is, "Consumers demand a wide variety of choices of every service and product they require. [… But] e-health consumers tend to be more willing to explore 'alternative' care like acupuncture and nutritional supplements: in 1999, more people visited alternative care providers than visited their physician" (Ball and Lillis 2001:2). Having so much information available on the Web, some of which is irrelevant, incorrect or not 'proven' effective but well-advertised, in conjunction with rapid advances in biomedical technology, has forged unrealistic expectations of medicine.

Many physicians sympathize with patients' frustration with the '10-minute interview'—there is simply not enough time allotted for quality communication. But when Internet printouts, obstinate patients and irrational demands for certain tests or procedure are added into the mix, physicians fear that the time constraint dilemma will be exacerbated further. In addition, many physicians and health care administrators fear that Internet health seeking behavior could increase healthcare costs if it causes health services to be used inappropriately. As 'gatekeepers,' physicians have to sign off on certain tests and procedures before they can be done. A shocking reality is that "physicians appear to acquiesce to clinically-inappropriate requests generated by information from the Internet," fearing that refusing a patient's request may damage the doctor-patient relationship and/or time efficiency (Murray, Lee *et al.* 2003). This raises some important questions: If doctors are not giving patients their most honest medical advice, then who is supposed to take over this role? Where do we draw the line for meeting patients' requests, and what are we basing this off of?

Patient empowerment as a threat to the deprofessionalization of medicine

Hardey (1999) "suggested that by breaking down hierarchical models of information giving (i.e., doctor to patient), the Internet has contributed to clinicians' loss of control over medical knowledge or deprofessionalization, contributing to a decline in awe of and trust in doctors" (Broom 2005:358). Some physicians feel that patients who come into the consultation with multiple demands and questions and Internet printouts are burdensome and are challenging their authority. They may take it to mean that patients lack trust in their skills and knowledge, are paranoid about their health and are trying to show off their new-found technical knowledge, which may not even be relevant or correct. Feeling threatened, some physicians may react negatively toward Internet-informed and empowered patients. In fact, Fox and Rainie (2002) found that 13% of American Internet users "'got the cold shoulder' when presenting Internet material to their doctor" (qtd. in Broom 2005:328). According to Murray, Lee *et al.* (2003), physicians perceiving their patients as a potential threat to their authority "was a consistent predictor of a perceived deterioration in the physician-patient relationship" (Online).

Physicians are especially conflicted about how to react when a misinformed patient seeks clarification but ignores their expertise and tries to persuade them that the webpage author's incorrect, irrational interpretations of the health information are actually correct. Dealing with patients like this is very time consuming. When assessing physicians' perceptions of the Internet empowered patient, Murray, Lee *et al.* (2003) observed that 38% of US physicians "believed that the patient bringing in information made the visit less time efficient, particularly if the patient wanted something inappropriate, or the physician felt challenged" (Online). Academic physicians, in particular, are more likely to believe that Internet health information seeking encourages unnecessary office visits and are, therefore, more likely to react negatively toward Internet-informed patients, compared to hospitalists and private practice physicians (Kim and Kim 2009). Some completely refuse to discuss Internet- acquired information with their patients, in part, because they fear not getting reimbursed for time wasted doing so (Kim and Kim 2009; Sommerhalder *et al.* 2009).

While there is individual variation, a general consensus among doctors seems to be "that neither they nor the patient can cope with the amount of information patients are bringing into the medical consultation" (Broom 2005:328). Perceiving outspoken, Internet-informed patients as a challenge to their authority "was the most consistent predictor of a perceived deterioration in the physician-patient relationship, in the quality of health care, or health outcomes" among U.S. physicians (Murray, Lee *et al.* 2003:Online).

A theoretical argument for deprofessionalization

Weber's theory of rationality and Giddens' structuration theory arguably provide the best bases for understanding the "new" doctor-patient relationship and its intricate connection with technology, including the Internet. In order to provide a more comprehensive understanding of the Internet's transformative effect on the medical profession, I will be utilizing Ritzer's and Walczak's (1988) application of Weber's theory to medicine, and Hardey's (1999) analysis of Giddens' account of life in modern society, in *Modernity and Self-Identity* (1991), as they apply to "contemporary changes in and around the paradigmatic profession--physicians" (Ritzer and

Walzcak 1988:1). Before doing so, it is necessary to define professionalization and deprofessionalization.

A profession, or professional, is distinguished by his or her rigorous training, expertise and mastery of a specialized body of knowledge, “control over uncertainty and indeterminancy” and authority (Ritzer and Walczak 1988:5). For medicine, in particular, along with the power derived from being a legitimized profession, “[comes] a sense of the *fragility* of that power” (Ritzer and Walzcak 1988:6). To maintain their ‘wizardry powers,’ doctors must continually prove that they are deserving and capable of managing others’ well-being. If they abuse this power, their license to practice medicine can be revoked. As long as they successfully prove themselves, doctors remain the beholders of the ‘mystic’ healing powers and knowledge that others are not entirely privy to—hence, they are medical *professionals*. Deprofessionalization, then, is “associated with the demystification of medical expertise and increasing lay skepticism about the health professionals” (Hardey 1999:821). Presently, “demystification” through the democratization of this specialized knowledge via the Internet is posing a major threat to the dominance of the medical profession.

Weber’s theory of rationalization provides one effective forum for conceptualizing the deprofessionalization of medicine argument as it relates to patient empowerment and the Internet. While Weber defines rationality into four key types, the most pertinent ones for this analysis are formal rationality and substantive rationality. Formal rationality is characterized by efficiency, predictability, calculability and control, and proposes that individual choice and behavior depend on universal principles applied to everyone through laws, regulations and rules. According to substantive rationality, “the effort to find the most rational means to ends” is constructed by individuals’ socially constructed values (Ritzer and Walczak 1988:4). Ritzer and Walzcak (1988) argue that the intersection of formal and substantive rationality forms the foundation for this argument: “The spread of formal rationalization is tending to overwhelm substantive rationality and contributing to the deprofessionalization of physicians” (4). This is evident in the push toward patient-centered care; patients are being encouraged to be more informed and empowered in the clinical encounter, but the “most rational means to an end” (treatment) is not always reached because patients may be misinformed and have irrational points of view derived from the media (Ritzer and Walzcak 1988:4).

Applying Weber’s theory to American medicine, Ritzer and Walczak (1988) proposed that:

> physicians (and their substantive rationality) are being profoundly affected by the spread of formal rationality and that this is contributing to some degree of deprofessionalization. […] To the degree that physicians come to be characterized by formal rationality, they will be unable to continue to lay claim effectively to the distinctive title of professional (6-7).

“Technology as a component of advancing rationalization” is posing a threat to medical professional sovereignty, in addition to other threats attributed to structural changes in our healthcare system such as managed care and capitalism (Ritzer and Walczak 1988:12). Traditionally, physicians arrive at a diagnosis based on subjective and autonomous judgments made using their senses—touch, sound, sight. However, as robotics surgical techniques, EHRs, symptoms and medications checkers, and other computerized technologies begin to replace traditional, subjective and hands-on diagnostics and treatments, medicine is being routinized and demystified and, consequently, physicians’ authority is being threatened. Ritzer and Walczak (1988) argue that: “The patient is well aware that much of the work is being done by technologies and technicians and this serves to erode the authority of the physician in the eyes of the patient” (13). With the advent of tools like at-home pregnancy tests, blood pressure and glucose self-monitors and, now, *WebMD*-like websites and online symptoms-checkers, which give patients free, unlimited access to health information, patients can bypass or completely avoid seeing their physician. Using these technological innovations independent of their physicians, patients can be in charge of their health and well-being and can attempt to self-diagnose and self-treat. This democratization of medical knowledge threatens "the idea that professional physicians possess their own distinct body of general systematic knowledge" (Ritzer and Walczak 1988:12-13).

Giddens (1991) also provides a valuable addition to the deprofessionalization argument, rooted in the redefinition of patients as "consumers" in the 1970s and applied specifically to the unlimited amount of health-related information on the Internet. The premise of Giddens' (1991) argument, a major theme of the consumerism movement was "the need to provide clients with information" (Hardey 1999:821). Living "in an information-rich society" more or less forces us to deliberate every life plan, strategy and decision only after seeking information and advice "via a potentially confusing mass of competing and sometimes contradictory sources of information" (Hardey 1999:821). This is particularly evident when it comes to making health-related decisions and applies to individuals of all health statuses. As we already know, an important source of information is the Internet and online health seeking may result in patients "evaluating and at times challenging expert knowledge" (Hardey 1999:822). This reiterates and clarifies that there are really two challenges to medical dominance resulting from the growth of the Internet and they are interrelated: "exposing exotic medical knowledge to the public gaze" and "the presence of a wide range of information about and approaches to health" (Hardey 1999:822).

Medical autonomy is distinguished by "exclusive access to 'expert knowledge' and the ability to define areas of expertise and practice" (Hardey 1999:822), and the Internet poses a very possible threat to destroying this. Previously defined boundaries are being completely blurred. Since ancient times, the "medical paradigm" has promulgated that physicians make sure they give patients detailed information about treatments; living in a consumer-characterized society, patients welcome this and are using the Internet to reinforce this so they can be as informed as possible about their own, or a loved one's, health. Patients' increasing dependency on online health information, either to make decisions or clarify 'the doctor's orders,' "represents a challenge to previously hierarchical models of information giving" by enabling patients to be in control of the "usefulness and quality of the information they collect" (Hardey 1999:832). Giddens would, therefore, argue that this shift in control of the dissemination of information "is central to the deprofessionalization thesis and may be seen as a contribution to the decline in awe and trust in doctors" (Hardey 1999:832).

The underlying issue concerning this entire argument pertains to the quality of the health information on the Internet. According to Hardey (1999), the quality and validity debate illustrates how the Internet is necessitating that medical professionals "attempt to retain and redefine [the] boundaries" in the patient-provider relationship "around medical expertise" (Hardey 1999:823-828). Additionally, it urges that medical information online be more tightly regulated and suggests an additional role for providers to help patients interpret and verify this information.

Validity of information & "technoliteracy"

There are widely mutual concerns about the validity of the information circulating online and how to discriminate between correct and false information (Frosch and Kaplan 1999; Impicciatore *et al.* 1997; Fox and Rainie 2000; Henwood *et al.* 2003; Iverson, Howard and Penney 2008). Almost anyone can post information on a website and claim it to be true and, unfortunately, not all of this information is monitored for accuracy or quality (Fox and Rainie 2002). This issue has received much public attention over the past few years, especially in 2012 when Wikipedia voluntarily shut down for a day as a protest, surprisingly, against Internet piracy laws. For any type of website, including one providing health-related information, anyone with computer and graphic design skills and access to a computer can design a website that *appears* reliable, and users need only know of a convenient place to begin their Internet search that will link them to the "desired resource" (Hardey 1999:822-824). "The equity of presentation offered by the Internet dissolves the boundaries around areas of expertise upon which the professions derived much of their power" (Hardey 1999:826). In theory, this may be contributing to patients increasingly choosing to try alternative and herbal products because even though they lack the symbols of power and authority in the public eye, online webpages advertising them can be altered in such a way that *suggests* legitimacy (Hardey 1999).

Patients and providers have expressed widespread concern about the reliability of health information on the Internet (Fox and Rainie 2000). When assessing the accuracy of 41web page articles on home management of fever in children, Impicciatore *et al.* (1997) found many inconsistencies in the information provided. Of the 41 sites evaluated, only four "adhered closely to the main recommendations in the guidelines" (Impicciatore *et al.* 1997:1875). The greatest aberrations were in how to take a child's temperature and sponging procedures to reduce fever; twenty-six websites recommended taking rectal temperatures which is actually not highly advised by healthcare providers because of risks of injury and/or infection (Impicciatore *et al.* 1997). While this study was conducted at the rise of the Internet, the need to regulate publicly available healthcare information online is a persistent issue. Murray, White *et al.* (2003) conducted a study among patients of poor health status in order to determine their perceptions of how Internet health information is affecting the doctor-patient relationship; their findings supported that there is widespread concern about the reliability of Internet information, with 72% of respondents expressing high or moderate concern about this. Only one-third of respondents were comfortable with their ability to assess information for quality. In their report on *The Online Health Care Revolution: How the Web helps Americans take better care of themselves*, Fox and Rainie (2000) revealed that while the majority of online health seekers are concerned about the unreliability of health information online, more than three-quarters "found the information they wanted through an Internet search, rather than being directed by someone" (6), and only a little more than half of the respondents checked to see who was providing the information on the Web sites they were consulting. Henwood *et al.* (2003) and Iverson, Howard and Penney (2008) later noted that a major source of concern for physicians is when their patients fail to check or fail to remember the source of the information they retrieved online.

A related issue is that of media and health literacy skills, otherwise known as "technoliteracy." Ball and Lillis (2001) argue that, "Computer literacy has become an imperative for those who wish to take part in this new information age" (1). The plethora of information publicly available on the Internet may make patients "feel they know as much about a certain condition as a doctor does" but this is a fallacy (Broom 2005:329). Henwood *et al.* (2003) and Iverson, Howard and Penney (2008) both explain that many individuals lack the skills necessary to "comprehend and comparatively evaluate medical information and do not understand how or where to locate the most accurate information online" (706). "The medical profession anchors the problem of quality within a natural science model that is reinforced by the concept of evidence-based practice and the traditional role of the profession as a protector of the public interest" (Hardey 1999:829). This presents a prime opportunity for physicians to help shape policies promoting interventions that regulate Internet health information more scrupulously; even though some interventions do exist, they are not necessarily as effective as they could be. Additionally, if patients and physicians are willing to partner up, despite some of the aforementioned concerns, this could also improve the doctor-patient relationship.

Benefits perceived by physicians

It is important to recognize that doctors do not always perceive patients' use of the Internet as a threat. In some instances, they actually see it as a resource to promote partnership and enhance the medical encounter by encouraging both parties to "share the burden of responsibility for knowledge" (Gerber and Eiser 2001:e15). Some physicians argue that Internet-informed patients make the consultation easier and more efficient because the patient is already up to speed. They can discuss health-related issues on a more intricate level and can focus on a more important matter, the intervention (Sommerhalder *et al.* 2009). Informed patients may be viewed as more responsible and their inquiries may be considered an added benefit. Their knowledge and questions force physicians to keep up-to-date on new treatments and "to be more comprehensive in discussing available treatment options" (Frosch and Kaplan 1999:286). Sommerhalder *et al.* (2009) found that physicians who viewed the Internet as a valuable resource found it easier to come to clinically reasonable decisions with patients because researching prior to a consultation promoted shared decision making.

SDM Revisited

Let us reconsider, once again, the feasibility of a shared decision making approach. The benefits of Internet-acquired information are challenging medicine in unprecedented ways. At the same time, these benefits are also facing opposition from a number of factors, including an individual's ability to access and understand information on the Internet, time pressures for decision-making and the receptiveness of healthcare providers (Broom 2005). Reconsider the scenario of a patient who comes into the doctor's office with reams of Internet printouts for interpretation and proceeds to argue with their physician over contradictions. When we also consider that patient-centered care encourages patients to be engaged and informed and ask their physicians questions, we are likely to scratch our heads. How are physicians supposed to handle a patient like this? What about a patient who comes in and demands certain treatments they read about online? Hardey (1999) assessed the ability of Internet-informed patients to negotiate with specialists and found that the majority of respondents felt uncomfortable sharing the information they found online with their specialists, who tended to be defensive, discouraging and hostile (Broom 2005). As a result, some patients withhold information found online from their physicians.

The general consensus is that physicians are experiencing yet another role change due to the introduction of health-related Internet information during consultations. They need to step up their game, not only with keeping up-do-date with new medical treatments, but also in their role as gatekeepers—particularly for primary care physicians. According to one physician interviewed by Sommerhalder *et al.* (2009), "'When the Internet came up, many thought that patients could handle it independently, and that there was no need for us doctors. But, the opposite was the case: Our advice is getting more and more necessary in relation to this vast amount of information'" (270). Consultations are necessary to help put the information in a more personal context and help patients achieve clarity and control. Adding to their 'checklist,' physicians might also need to be an online health information 'clarificationist', as well as a teacher and prescriber of credible medical websites. Considering that some already have enough trouble communicating and connecting with their patients as it is, are physicians equipped to do this?

For SDM to occur successfully requires both the willingness of patients to share their information and cooperate with their providers and the willingness of the providers to participate (Sommerhalder *et al.* 2009). But if doctors are already struggling with time restraints imposed by managed care, are complaining that the discussion of Internet information in the clinical encounter is having a negative effect on time efficiency, and are expected to help patients discern correct, appropriate online health information from those that are incorrect and inappropriate, where and how can these additional roles be squeezed in?

Conclusion

It is undeniable that doctor-patient communication is a multidimensional interaction that still has many ‘kinks’ that need to be ‘flattened out.’ While medical school and continuing medical education curricula have been modified to enhance physicians’ verbal and nonverbal communication skills, patients are still frustrated and, consequently, are turning to the Internet for health-related inquiries. The complexities of clinical practice are already demanding, but new tasks continue to be added to a physician’s to-do list and list of qualifications. Due to the growing prevalence of online health information seeking, physicians are now being encouraged to “prescribe” credible medical websites to their patients, and dissect and clarify this information for their patients, who are likely to bring it into the exam room. The availability and accessibility of health information on the Web is contributing to this. Previous studies shed light on the pros and cons that patients and physicians perceive the Internet medical community as having on the patient-physician dynamic. While this information may be beneficial in some ways, concerns about information validity, technoliteracy and conflicts arising in the exam room with misinformed patients, are adding to the existing tension in the clinical interaction.

Although many studies address the impact of Internet use on patients' disease experience and on the patient-provider relationship, most of them are either qualitative or limited in scope. Few, if any, quantitative studies consider Internet health information seeking as a cause to understand its impact on the patient-provider relationship, and whether it is possibly provoking role changes in an already changing healthcare landscape. Thus, in the following sections, I will quantitatively examine the extent to which health information seeking on the Internet by patients is affecting the patient-provider relationship, and, thus, contributing to role redefining and posing an increased threat to medical professional dominance. Doing so will provide numerical backing for this question, which is necessary to further emphasize the need to innovate current communication skills workshops and health literacy education for both patients, their families and providers, as they relate to the Internet. Ultimately, my goal is to provide further support to the growing body of literature in this subject-area and propose policy reforms to enhance both providers' and patients' communication skills when discussing online health information and ways society can better tackle "information overload."

The remainder of this thesis will continue to explore, from the patient perspective, how Internet health information seeking behavior impacts the patient-provider relationship, offering insight into particular areas that must be addressed in the future in order to continue improving communication and rapport in the medical encounter. In Chapter 2, I will be reviewing the variables and methods used to conduct the secondary data analysis. The results, presented in Chapter 3, will clarify the Internet's effect on the patient-provider relationship, highlighting some of the specific areas that communication interventions should be targeting. In the final chapter, I will interpret the results by re-evaluating what the literature has shown us and suggest potential education modules and roles for providers and patients that should be developed in the future as the techno-health-revolution progresses, alongside the push for a mutual decision-making approach to medical care. I will also provide direction for future research in this subject-area.

CHAPTER 2: METHODOLOGY

This research aims to build upon the existing, growing body of literature that has already demonstrated: 1) persistent sources and areas of miscommunication in the medical encounter, 2) the prevalence of Internet use in America, and 3) the current and future impacts of Internet use on the doctor-patient relationship. Previous studies have looked at the forms of and reasons for Internet health use, the differences between online health users and non-online health users, the outcomes of Internet health use on patient lifestyle and behavior, and the potential advantages and disadvantages of Internet health seeking on the doctor-patient relationship and the medical profession. However, this thesis, as an extension of previous research, is novel in that it aims to assess how Internet health information seeking behavior (IHISB) has affected the patient-provider relationship across time, quantitatively, using a large sample size. Additionally, it takes an interesting approach to current research in that it examines IHISB as a cause, rather than a consequence, of patient satisfaction with the patient-provider relationship.

Research Design

Data

In order to examine the effect of health-related Internet searches on the patient-provider relationship, I performed a cross-sectional, quantitative analysis of data acquired from the Health Information National Trends Survey (HINTS) in 2003, 2005, 2007 and 2011. HINTS is a nationally representative survey, with an oversampling of ethnic minority populations, that has been administered by the National Cancer Institute every few years since 2003 to gather information about how Americans find, use and understand health information, specifically as it relates to cancer. The questions asked provide baseline data about patterns in health information use and dissemination, patient perceptions and understanding, patient-provider communication, health services and utilization, and Internet use. Data collection is repeated routinely to monitor trends (Nelson *et al.* 2004:445). Doing repeated population surveys on a cyclical basis (repeated cross-sections) enables researchers "to track trends in the public's rapidly changing use of new communication technologies […] in terms of the public's knowledge, attitudes, and behaviors" (Nelson *et al*. 2004:443-444). HINTS data "was built upon extant models of health communication and behavior change" and is publicly available for researchers and practitioners to use, with the hope that the information it provides "will help further research in health communication and health promotion and provide useful information for programs, policies, and practices in a variety of settings" (Nelson *et al.* 2004:444). It is important to note that the years of HINTS survey data used in this thesis represent a trend study (repeated cross-sections) rather than a panel study, since the same group of respondents was not followed over time, nor were the same questions asked every cycle. This type of research highlights the results of the new survey as well as "trends in responses to a given survey item over time" (Rizzo *et al.* 2007:3). Since my ultimate goal was to identify trends over time, I compared questions that were asked in at least two of the cycles.

Data from four HINTS survey years were used: 2003, 2005, 2007 and 2011. Random samples were generated using a random-digit-dial (RDD) sample design (Rizzo *et al.* 2007:2). HINTS 1 (2003) data—collected from a total of 6,369 respondents between October 2002 and April 2003— and HINTS 2 (2005) data—collected from a total of 5,586 respondents between February 2005 and August 2005—were obtained from 30-minute telephone interviews (NCI 2013). HINTS 2007 data, which was collected from a total of 7,674 respondents between January 2008 and April 2008, used a dual mode design: one half of the sample was collected through a phone interview, while the other half completed pencil-and-paper questionnaires they received in the mail (NCI 2013). HINTS 4, Cycle 1 (2011) is the first of four mail-mode data collection cycles spanning three years. The “single-mode mail survey” utilized two methods of respondent selection: an “All Adult” method, in which two questionnaires were sent with each mailing and requested that all adults in the household complete the questionnaire, and a “Next Birthday” method, in which one questionnaire was sent with each mailing and requested that the adult with the next upcoming birthday complete the questionnaire (NCI 2013). The data was collected between October 2011 and February 2012 from a total of 3,959 respondents (NCI 2012). A high response rate was crucial for this research, as a high response rate yields greater confidence and more readily generalizable results. This was a significant benefit of utilizing secondary data obtained and published by a well-known government source.

Measures

The following descriptions of the different indicators of the patient-provider relationship were taken from survey questions asked by HINTS. The concept, or question, of the patient-provider relationship was indicated by different variables that, in HINTS, were categorized as assessing Patient-Provider Communication and Health Communication. My dependent variables, thus, assessed patient satisfaction by: level of involvement in treatment decision-making; the clarity of providers’ explanations of medical information; trust; duration of and/or quality of time spent in the medical encounter; the exchange of information measured, separately, by one’s ability to ask their provider questions, and one’s comprehension of and comfort with the next steps in their care; one’s ability to rely on their provider; and coping with uncertainty. It is important to note that each of these dependent variables was recoded into a dichotomy. Additionally, even though some of these questions were asked only in two or three of the HINTS cycles, they were still useful for drawing comparisons and indicating trends over time.

I chose the eight dependent variables defined above because, among the survey questions I had to choose from, they were most representative of previously identified “problem areas” in the patient-provider relationship. As discussed in the literature review (Chapter 1), patients have consistently expressed concerns about time, shared decision-making, their ability to understand their provider’s explanation of medical jargon, their comfort and willingness to discuss information with their providers, and their provider’s interest in discussing medical information retrieved from external sources, in the medical encounter. From the healthcare provider perspective, the medical profession, throughout history, has endured periods of total dominance and periods in which their authority has been threatened.

Overall, this data informs us and provides us with quantitative evidence for the effects of online health-information seeking on the patient-provider relationship, and how this differs over time. Ultimately, for each of the eight indicators of the patient-provider relationship, I proposed three models, each one controlling for age, race/ethnicity, gender, self-reported health status, educational level, insurance status and year; race/ethnicity was comprised of Black, Hispanic and Other races—which consisted of non-Hispanic American Indians or Alaska Natives, Native Hawaiians or other Pacific Islanders and Asians, and non-Hispanic Multi-racial individuals—where White served as a reference category. Each model was analyzed using binary logistic regressions. The first model served as a baseline to which comparisons were made. The second model, which included a variable measuring Internet health information seeking behavior (IHISB), was compared to the baseline model to see whether and how the Internet affected an indicator of the patient-provider relationship. For the third, and final, model, I created a set of interaction terms (IHISB*Year) that enabled me to evaluate whether and how Internet health seeking behavior differed across each year of interest, compared to the reference year, and how this affected each indicator of the patient-provider relationship being evaluated. This third model was compared to the first and second models to see if any patterns could be at least partly explained by temporal changes in health-related Internet use.

Quantitative analysis was extremely important and relevant to my research, since my goal was to add numeric validation to the growing body of literature in the areas of Internet health and the doctor-patient relationship. The analytical approach I took, comparing Internet use and Internet use by year to the baseline model for each indicator, allowed me to really understand and appreciate how the patient-provider relationship is being impacted by this phenomena, since some aspects are affected while others are not. Using this information, we can identify which aspects are positively, negatively or not at all affected so that we can take a more targeted approach toward health communication interventions.

Response Rate

In order to examine whether health-related Internet use had any effect on each of the indicators of the patient-provider relationship, I created a dichotomous variable, "internethealthseek," so that I could discriminate between Internet health seekers and both non-online health seekers and non-Internet users across all our years of interest. To do this, I had to combine survey questions that specified whether the respondent searched online for health information for themselves or some other person into one variable, which I proceeded to dichotomize so that whether you sought health information for yourself or for someone else or for both served to merely indicate that you did, in fact, seek health information online. Any missing data was included in the "no" response category. In total, across 2003, 2005, 2007 and 2011, 23,588 responses were obtained for whether individuals seek health information online. Table 1 shows the frequency of Internet use for health-related inquiries by year. As expected, Internet use, specifically for health-related inquiries, has continued to increase over the past decade, with the greatest spike appearing between 2005 and 2007.

Table 2.1. Internet Health Information Seeking Behavior by Year

	Year				Total
	2003	2005	2007	2011	
Did not use Internet to search for health information in the last year for self and/or other	3,748	3,195	2,123	679	9,745
%	58.8%	57.2%	27.7%	17.2%	41.3%
Used Internet to search for health information in the last year for self and/or other	2,621	2,391	5,551	3,280	13,843
%	41.2%	42.8%	72.3%	82.8%	58.7%
Total	6,369	5,586	7,674	3,959	23,588
%	100.0%	100.0%	100.0%	100.0%	100.0%

Data Analysis Strategy

Upon cleaning up the data and merging the accurate data files into one dataset, I used the Statistical Package for the Social Sciences (SPSS) to perform my analysis. Using this program, frequencies for each year were determined using cross tabulations, and binary logistic regressions were run. Cross tabulations provided the per year frequencies (response rate) of each selected indicator of the patient-provider relationship, in order to determine which responses were most popular among respondents across the years being compared. The chi-square (χ^2) value indicated the significance of the change in frequencies over time. In order to investigate the hypothesis that certain aspects of the patient-provider relationship will be impacted by Internet health information seeking behavior (IHISB) and that this may differ over time, three logistic regression models were run for each variable—a baseline model, a model demonstrating the significance and relevance of IHISB in predicting patient satisfaction, and a model measuring how much IHISB differs between years and the effect this has. Sociodemographic factors and self-reported health status, as well as health Internet use and health Internet use by year, served as independent variables, while indicators of the patient-provider relationship comprised the dependent variables. I used p-values to determine the level of statistical significance and relevance of certain independent variables in predicting the outcome, with $p=0.05$ being the cutoff for statistical significance. The beta-coefficients and odds ratios provided information about the strength of the relationship between the predictor and the dependent variable, as compared to the reference group. Any changes in these values were particularly important to analyze among the three models, since the goal was to understand how much variation could be explained by Internet health use and/or Internet health use by year. These quantitative assessments were "translated" into qualitative assessments to confirm what qualitative research has already demonstrated and to strengthen our insight into the *WebMD* phenomenon over time as it pertains to patient satisfaction with the patient-provider relationship.

Methodological Limitations

The limitations of this study pertain to the HINTS dataset used. HINTS questions only inquire about the patient-perspective, which hindered my ability to gain insight from the provider perspective. Investigating the provider perspective would have made more sense since many of the questions raised in the literature are aimed at gaining this insight, but few large-scale studies exist which offer this magnitude of quantitative data. Additionally, many of the survey questions were not consistently asked in every cycle and some of the questions were asked slightly different than previous years—for example, questions indicating whether or not you were an Internet health information seeker. Furthermore, because HINTS is a cross-sectional survey, I was unable to infer any direct causal relationships. However, I was still able to examine more general trends over time, which was useful for my analysis.

CHAPTER 3: QUANTITATIVE RESULTS

The objective of this thesis is to provide quantitative evidence regarding which areas of the patient-provider relationship, in particular, are being affected by Internet health-seeking behavior. To determine this, first, cross-tabulations were run for each dependent variable by year in order to determine the response rates and, second, three different binary logistic regressions were run for each dependent variable. The first regression served as the baseline model, merely to observe the influence of the sociodemographic, self-reported health status and year variables on the dependent variable. The second model included an indicator for Internet health information seeking behavior (IHISB) to determine the effect of Internet health use on the dependent variable. The third and final model included an interaction term for IHISB by year to assess the extent to which response rates for each predictor of the patient-provider relationship were affected not only by year and IHISB separately, but also by a combination of IHISB frequency within each year. Statistical significance was determined using a cut-off of p=0.05 for the t-test, and strength of the relationship was indicated by the values of the beta-coefficient (direction of the slope of the relationship) and the odds ratio. Ultimately, the results highlighted some of the key areas of the patient-provider relationship that are improved, negatively affected and unaffected by patients seeking health-related information online.

In order to better understand the measures and results at hand, it is necessary to discuss, more in-depth, the indicators of the patient-provider relationship and patient-provider communication that were used. The first section describes the indicator of Internet health use, the second section examines "forms" of Internet health use, and the final section includes cross-tabulations and binary logistic regressions of the different "consequences," or indicators of the patient-provider relationship, attributed to Internet health use over time.

Internet Health Information Seeking Behavior (IHISB):

Table 3.1. Internet Health Information Seeking Behavior by Year

	Year				Total
	2003	2005	2007	2011	
Did not use Internet to search for health information in the last year for self and/or other	3,748	3,195	2,123	679	9,745
%	58.8%	57.2%	27.7%	17.2%	41.3%
Used Internet to search for health information in the last year for self and/or other	2,621	2,391	5,551	3,280	13,843
%	41.2%	42.8%	72.3%	82.8%	58.7%
Total	6,369	5,586	7,674	3,959	23,588
%	100.0%	100.0%	100.0%	100.0%	100.0%

Pearson χ^2 =2931.793; p=0.000

In order to assess the impact that online health seeking behavior is having on the patient-provider relationship, it was necessary to establish an indicator of this behavior to be compared to the baseline. Because HINTS asked this question slightly differently across the four years being analyzed, it was necessary to combine their measures into one variable upon merging all of the data. The following questions were combined and dichotomized into the final indicator variable: “In the past 12 months, have you looked for health or medical information for yourself?” (2003, 2005, 2011); “In the past 12 months, have you looked for health or medical information for someone else?” (2003, 2005, 2011); “The most recent time you looked for information about health or medical topics, who was it for?” (2007, 2011). In the HINTS survey, the first two questions were asked only of people who used the Internet, while the latter was asked of people who looked for information about health or medical topics from any source. Ultimately, the indicator variable for IHISB was able to clearly distinguish Internet health information seekers from non-Internet health information seekers by measuring whether or not respondents ever used the Internet to search for health or medical information in the last year for themselves and/or others. As shown in Table 1, a total of 23,588 respondents answered this question across all four years being analyzed, 13,843 (58.7%) of whom responded that they had used the Internet to search for health information for themselves or someone else, while the remaining 9,745 (41.3%) had not. Looking at the column percentages for each year, there is a strong trend toward more people using the Internet for health-related purposes. In particular, there was a large spike in IHISB between 2005 and 2007, and a smaller but still large increase between 2007 and 2011. As expected, the majority of people are participating in this e-health culture.

"Forms" of Internet Use: Patient Willingness & Provider Interest

While the majority of past and current research has investigated dissatisfaction with different aspects of the patient-provider relationship as motivations for IHISB, this study proposes that the interplay between Internet use, patients and providers is so complex that there is no correct, unidirectional way to analyze what is going on. Even though we have established that flaws in patient-provider communication may encourage patients to seek information online, we have also established that such behavior, itself, has a major impact on communication as well. Thus, in order to suggest how to proceed moving forward, it makes sense to explore the implications of Internet use on the patient-provider relationship with quantitative backing. Before doing so, two "forms" of Internet health seeking which have been described as critical elements of patient-provider communication need to be acknowledged: patient willingness to discuss online health information with providers, and perceived healthcare provider interest in discussing this information with patients.

Patient Willingness to Discuss Internet Health Information with their Provider

Table 3.2 Whether Patients Talk to their Healthcare Provider about Internet Health Information by Year

	Year			
	2005	2007	2011	Total
Did not talk to healthcare provider about health information found on the Internet %	1230 51.6%	3263 72.2%	2207 74.9%	6700 68.0%
Did talk to healthcare provider about health information found on the Internet %	1155 48.4%	1259 27.8%	741 25.1%	3155 32.0%
Total %	2385 100.0%	4522 100.0%	2948 100.0%	9855 100.0%

Pearson χ^2 =395.465; p=0.000

Patient willingness to discuss health-related information they looked up online was measured by asking: “In the past 12 months, have you talked to a doctor, nurse or other health professional about any kind of health information you have gotten from the Internet?” This question was asked in 2005, 2007 and 2011 only of participants who had used the Internet. I decided to incorporate this in my investigation because, as discussed in the literature review, many patients choose to withhold information from their physicians, even if it is just information they found online and are curious about. As seen in Table 3.3, across 2005, 2007 and 2011, when this question was asked, a total of 9,855 people responded, of whom 3155 (32.0%) agreed that they had discussed Internet health information with their healthcare provider in the past 12 months, compared to the remaining 6700 (68.0%) who did not. Based on the column percentages, representing the percentage of patient responses of Disagree or Agree, across the three corresponding years, it seems that patients are becoming less likely to openly share and discuss Internet health information with their healthcare providers. This is interesting since patients are purportedly trying to take on a more active role in the medical encounter. On the other hand, this type of information may not be shared because of the physician’s demeanor and attitude in the exam room, because the physician’s explanation validated what the patient “secretly” found online, because the patient is embarrassed or because the patient does not want to challenge their physician, among various other reasons.

Table 3.3. Logistic Regression of Patient Willingness to Talk to Providers: In the past 12 months, have you talked to a doctor, nurse or other health professional about any kind of health information you have gotten from the Internet?

	Model A		
	B	**p-value**	**O.R.**
Sociodemographic variables			
AGE			
18-34	reference		
35-49	0.186	**	1.204
50-64	0.129	--	1.138
65-74	-0.178	*	0.837
75+	-0.784	***	0.457
EDUCATION LEVEL			
some HS	reference		
HS grad	0.425	**	1.53
some college	0.877	***	2.403
college grad	1.127	***	3.085
GENDER			
Male	Reference		
Female	-0.126	**	0.882
SELF-REPORTED HEALTH STATUS			
Poor Health	reference		
Good Health	-0.213	**	0.808
INSURANCE STATUS			
Uninsured	reference		
Has HCCoverage	0.21	*	1.234
ETHNICITY			
HISPANIC	-0.196	*	0.822
BLACK	-0.171	*	0.842
OTHER Races	-0.055	--	0.842
Year			
2005	reference		
2007	-0.882	***	0.414
2011	-0.887	***	0.412
Constant	-0.972	***	0.378

N=9,549 (missing=14,039)
*p<0.05; **p<0.01; ***p<0.001

For this variable, it made sense to only examine the baseline model, since the question accounted for Internet use. This model tells us that age, education, gender, health and insurance status, race/ethnicity and year are all significant and relevant predictors of a patient's willingness to talk to their healthcare provider about health information obtained online. Interestingly, there appears to be a gap in age and type of response to this question; respondents ages 35-49 are 20.4% more likely than ages 18-34 to discuss Internet information with their physicians, but respondents 65 years of age and older, are 16.3% and 54.3% less likely, respectively, than 18-34 year olds to discuss Internet health information. The magnitude of unlikelihood for people 75+ to have such a discussion with their docs, compared to 18-34, might be representative of some critical generational differences in terms of, as discussed in depth in the lit review, the physician-dominant decision-making model they grew up with and even bringing up the fact that they may have searched for health info online could be seen as taboo to the 75+ because it's a threat to 'the omnipotent one.' The more educated you are, the more likely you are to discuss Internet health information with your physician, with college graduates being 3.085 times more likely than respondents with some or less than a high school education. Women are 11.8% less likely than men and those with good health are 19.2% less likely than those with fair or poor health to discuss Internet health information with their physicians. People with insurance, however, are 23.4% more likely than the uninsured to engage in such a discussion. Hispanics and Blacks are 17.8% and 15.8% less likely, respectively, than Whites to discuss health information from the Internet with their physicians. Additionally, respondents in 2007 and 2011 were 58.6% and 58.8% less likely, respectively, than in 2005 to always or usually discuss online health information with their physicians. This suggests that over time, people who got health information online were less likely to talk with their healthcare provider about it, which is contradictory to what might be expected. This last piece would be particularly interesting to continue to monitor over time to see how it changes as the push for mutual participation in medical decision-making continues to grow.

Healthcare Provider Interest in Discussing Internet Health Information

Table 3.4. Patient Perceptions of Provider Interest in Discussing Internet Information by Year

	Year			Total
	2005	2007	2011	
Disagreed that their healthcare provider expressed interest in hearing about Internet health information %	295 25.8%	313 25.2%	196 26.7%	804 25.8%
Agreed that their healthcare provider expressed interest in hearing about Internet health information %	849 74.2%	927 74.8%	538 73.3%	2314 74.2%
Total %	1144 100.0%	1240 100.0%	734 100.0%	3118 100.0%

Pearson χ^2 =0.514; p=0.773

I decided to incorporate this in my investigation because, as discussed in the literature review, many patients choose to withhold information from their physicians because they exude a “cold-shoulder” or burdened tone, dissuading the patient from sharing or asking questions, which could result in non-compliance. Healthcare provider interest was measured by asking respondents: “In the past 12 months, when you talked with a health care professional, how interested were they in hearing about the information you found-online?” This question was asked in 2005, 2007 and 2011 only of participants who had used the Internet. As seen in Table 3.4, across 2005, 2007 and 2011, when this question was asked, a total of 3,118 people responded, of whom 2314 (74.2%) agreed that their provider seemed interested in discussing health information found online with them, compared to the remaining 804 (25.8%) who disagreed. Based on the column percentages, representing the percentage of patient responses of Disagree or Agree, across the three corresponding years, it seems that providers have generally shown consistent interest in hearing about and discussing Internet health information with their patients; between 2005 and 2007, perceived provider interest increases by 0.6%, but decreases by 1.5% by 2011.

Table 3.5. Logistic Regression of Provider Interest: In the past 12 months, when you talked with a health care professional, how interested were they in hearing about the information you found-online?

	Model A		
	β	p-value	O.R.
Sociodemographic variables			
AGE			
18-34	reference		
35-49	0.185	--	1.203
50-64	0.188	--	1.207
65-74	0.183	--	1.201
75+	0.705	*	2.024
EDUCATION LEVEL			
some HS	reference		
HS grad	0.251	--	1.285
some college	0.346	--	1.414
college grad	0.344	--	1.411
GENDER			
Male	reference		
Female	0.137	--	1.147
SELF-REPORTED HEALTH STATUS			
Poor Health	reference		
Good Health	0.338	**	1.402
INSURANCE STATUS			
Uninsured	reference		
Has HCCoverage	0.108	--	1.114
ETHNICITY			
HISPANIC	-0.253	--	0.776
BLACK	0.314	--	1.369
OTHER Races	-0.164	--	0.849
Year			
2005	reference		
2007	-0.02	--	0.98
2011	-0.104	--	0.901
Constant	0.169	--	1.184

N=3,035 (missing=20,553)
*p<0.05; **p<0.01; ***p<0.001

Similar to the previous variable, it made sense to only examine the baseline, since the question accounted for Internet use. The baseline model (Model A) in Table 5 tells us that only age and self-reported health status are significant and relevant to healthcare providers seem very or somewhat interested in discussing online health information with their patients. If you are older than 75, you are 2.024 times more likely than someone 18-34 years old, and if you are healthy you are 40.2% more likely than someone with fair or poor health to perceive that your provider is interested in entertaining such a discussion. It can be inferred from this model that IHISB has no significant effect on patient-perceived provider interest.

"Consequences" of Internet Use: What Happens to the Patient-Provider Relationship When Patients Use the Internet?

A total of eight variables were used to indicate patient satisfaction with the patient-provider relationship, based on questions asked in the HINTS 2003, 2005, 2007 and/or 2011 surveys that were most representative of well-known issues. Assessment of which areas of the relationship have been positively, negatively and not at all affected by Internet use and time (year) was determined based on comparison to a baseline model that controlled only for sociodemographic factors, self-reported health status and year.

Decision-Making

Table 3.6. Patient Perceptions of Decision-Making Involvement in the Medical Encounter by Year

	Year			Total
	2003	2007	2011	
Disagreed that their healthcare provider involved them in decision-making	864	1147	557	2568
%	16.3%	17.2%	17.1%	16.9%
Agreed that their healthcare provider always/usually involved them in decision-making	4428	5528	2708	12664
%	83.7%	82.8%	82.9%	83.1%
Total	5292	6675	3265	15232
%	100.0%	100.0%	100.0%	100.0%

Pearson χ^2 =1.666; p=0.435

Decision-making was measured by patients’ responses to the following survey question: “In the past 12 months, how often did your doctors, nurses or other health care professionals involve you in decisions about your health care as much as you wanted?” This question was asked of all participants in the survey. As seen in Table 6, across 2003, 2007 and 2011, when this question was asked, a total of 15,232 people responded, of which 12,664 (83.1%) agreed that their healthcare provider always or usually involved them in medical decision-making, compared to the remaining 2,568 (16.9%) who disagreed. Based on the column percentages, representing the percentage of patient responses of Disagree or Agree, across the three corresponding years, it seems that patients were slightly more likely to disagree that their provider involves them in decision-making between 2003 and 2007, but since then their responses have remained relatively constant. Overall, from the cross-tabulations, it can be concluded that patient satisfaction with decision-making has not significantly changed over time.

Table 3.7. Logistic Regressions of Decision Making: How often did your doctors, nurses, or other health care professionals involve you in decisions about your health care as much as you wanted?

	Model A			**Model B**			**Model C**		
	B	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**
Sociodemographic variables									
AGE									
18-34	Reference			reference			reference		
35-49	0.191	**	1.21	0.191	**	1.21	0.187	**	1.206
50-64	0.393	***	1.481	0.395	***	1.484	0.386	***	1.472
65-74	0.399	***	1.491	0.404	***	1.498	0.397	***	1.487
75+	0.45	***	1.568	0.458	***	1.58	0.448	***	1.565
EDUCATION LEVEL									
some HS	Reference			reference			reference		
HS graduate	-0.03	--	0.971	-0.033	--	0.967	-0.026	--	0.974
some college	-0.011	--	0.989	-0.019	--	0.981	-0.013	--	0.987
college graduate	0.096	--	1.101	0.085	--	1.089	0.092	--	1.097
GENDER									
Male	Reference			reference			reference		
Female	-0.167	***	0.846	-0.165	***	0.847	-0.163	***	0.849
SELF-REPORTED HEALTH STATUS									
Poor Health	Reference			reference			reference		
Good Health	0.562	***	1.754	0.562	***	1.754	0.563	***	1.756
INSURANCE STATUS									
Uninsured	Reference			reference			reference		
Has HCCoverage	0.395	***	1.484	0.394	***	1.483	0.39	***	1.477
ETHNICITY									
HISPANIC	-0.423	***	0.655	-0.42	***	0.657	-0.421	***	0.656
BLACK	-0.219	**	0.803	-0.217	**	0.805	-0.218	**	0.804
OTHER Races	-0.271	**	0.763	-0.27	**	0.763	-0.271	**	0.763
Year									
2003	Reference			reference			reference		
2007	-0.413	**	0.866	-0.512	**	0.859	-0.307	***	0.736
2011	-0.154	*	0.857	-0.166	*	0.847	0.111	--	1.118
Internet health-seeking									
Internethealthseek				0.029	--	1.029	-0.326	*	0.722
Intuseyear(2003)							reference		
Intuseyear(2007)							0.289	--	1.335
Intuseyear(2011)							0.527	**	1.694
Constant	0.77	***	2.16	0.762	***	2.142	0.792	***	2.208

For n=14,580 (missing=9,008)
*p<0.05; **p<0.01; ***p<0.001

The above table provides the results of the binary logistic regressions run for the indicator of patient satisfaction with involvement in medical decision-making. The baseline model (Model A) in Table 7 tells us that age, gender, self-reported health status, insurance status, race and year are significant and relevant to patients being always or usually involved in treatment decision-making by their physicians. As you get older, you are more likely to feel satisfied with how much your physician involves you in the decision-making process. Women are 15.4% less likely than men to agree that their physicians involve them in decision-making. Hispanics, Blacks and other races are 34.5%, 19.7% and 23.7% less likely, respectively, than Whites to feel satisfied with their involvement in decision-making. Those in good health are more likely than those with fair or poor health, and those with health insurance are more likely than the uninsured, to agree that their physicians involve them in decision-making. People in 2007 were 13.4% less likely than in 2003 to agree, while in 2011 they were 14.3% less likely than in 2003 to agree.

Model B incorporates the indicator of Internet health information seeking behavior (IHISB) to determine how using the Internet affects patient satisfaction regarding level of involvement in medical decision-making, when all other factors are controlled for. As is shown in Model B of Table 7, adding in our indicator of IHISB did not have a statistically significant effect, suggesting that whether individuals seek health information on the Internet is not, itself, an adequate predictor of satisfaction with level of involvement in treatment decision-making. Notably, the beta-coefficients for 2007 and 2011 did become slightly more negative in this model.

In Model C, the year-IHISB interaction term is added to determine whether Internet use over time can account for trends in patient attitudes regarding their involvement in decision-making in the medical encounter, when all other factors including Internet use are controlled for.

As is shown by the year-IHISB interaction terms in Model C, using the Internet in 2011 appeared to be significant and relevant to agreeing that one's physician always or usually involved them in the decision-making process. If you were an online health information seeker in 2011, you were 69.4% more likely than a health information seeker in 2003 to agree that your physician always or usually involved you in treatment decision-making. Additionally, year and Internet health seeking, separately, were affected by the interaction term in Model C. The slope for 2007 was more negative than in the previous models, such that now in 2007 you were 26.4% less likely than in 2003 to respond that your physician always/usually involved you in decision-making—a 12% increase from Model B. In Model C, 2011 is no longer statistically significant, but IHISB is, with online health information seekers being 27.8% less likely than non-online health information seekers to respond that their physicians always or usually involved them in treatment decision-making. Further, in Model C, 2007 remains and IHISB becomes statistically significant even though the interaction term is not statistically significant, and 2011 becomes insignificant and the interaction term for 2011 is significant. All of this suggests that the effect of using the Internet for health information is stronger in 2011 than 2003, even more so than in 2007 compared to 2003.

Provider Clarity

Table 3.8. Patient Perceptions of How Often Your Healthcare Provider Explained Things Clearly by Year

	Year		Total
	2003	2011	
Disagreed that their healthcare provider explained health information clearly	625	306	931
%	11.7%	9.4%	10.8%
Agreed that their healthcare provider always/usually explained health information clearly	4705	2959	7664
%	88.3%	90.6%	89.2%
Total	5330	3265	8595
%	100.0%	100.0%	100.0%

Pearson χ^2 =11.616; p=0.001

Whether patients feel that their healthcare provider clearly and effectively explains things to them was measured by responses to the following survey question, asked of all survey participants in 2003 and 2011: “In the past 12 months, how often did you healthcare professional explain things in a way you could understand?” As seen in Table 8, a total of 8,595 respondents answered this question, 7,664 (89.2%) of whom agreed that their doctor, nurse or other healthcare professional always or usually explained health information to them clearly, while the remaining 931 (10.8%) disagreed. Based on the column percentages, it can be concluded that, generally speaking, as time progresses more people are satisfied with their providers’ efforts to clearly and comprehensibly explain medical information to them.

Table 3.9. Logistic Regressions of Provider Clarity: How often did your doctors, nurses, or other health care professionals explain things in a way you could understand?

	Model A			Model B			Model C		
Sociodemographic variables	**β**	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**
AGE									
18-34	reference			reference			reference		
35-49	-0.046	--	0.955	-0.048	--	0.953	-0.045	--	0.956
50-64	0.053	--	1.055	0.044	--	1.045	0.054	--	1.056
65-74	0.001	--	1.001	-0.015	--	0.985	0.001	--	1.001
75+	0.072	--	1.074	0.048	--	1.05	0.056	--	1.058
EDUCATION LEVEL									
some HS	reference			reference			reference		
HS grad	0.154	--	1.166	0.161	--	1.175	0.17	--	1.185
some college	0.351	**	1.421	0.369	**	1.447	0.376	**	1.457
college grad	0.487	***	1.627	0.511	***	1.666	0.519	***	1.68
GENDER									
Male	reference			reference			reference		
Female	-0.116	--	0.89	-0.119	--	0.888	-0.123	--	0.884
SELF-REPORTED HEALTH STATUS									
Poor Health	reference			reference			reference		
Good Health	0.84	***	2.316	0.84	***	2.317	0.839	***	2.314
INSURANCE STATUS									
Uninsured	reference			reference			reference		
Has HCCoverage	0.423	***	1.526	0.427	***	1.532	0.415	***	2.314
ETHNICITY									
HISPANIC	-0.653	***	0.521	-0.661	***	0.517	-0.655	***	0.519
BLACK	-0.214	*	0.807	-0.219	*	0.803	-0.218	*	0.804
OTHER Races	-0.155	--	0.856	-0.157	--	0.854	-0.159	--	0.853
Year									
2003	reference			reference			reference		
2011	0.141	--	1.152	0.169	--	1.184	0.467	**	1.595
Internet health-seeking behavior									
Internethealthseek				-0.062	--	0.94	-0.375	*	0.687
Intuseyear(2003)							reference		
Intuseyear(2011)							0.401	--	1.493
Constant	0.963	***	2.619	0.981	***	2.667	0.945	***	2.574

N=8,267 (missing=15,321)
*p<0.05; **p<0.01; ***p<0.001

The baseline model (Model A) tells us that education, self-reported health status, insurance status and race/ethnicity are significant and relevant to patients being always or usually satisfied with their physician's ability to clearly explain health or medical information in a way they could understand. The more educated and healthier you are, the more likely you are to feel satisfied with your physician's ability to explain medical jargon to you. Those with health insurance are 52.6% more likely than the uninsured to agree that their physician explains things clearly to them. Hispanics and Blacks are 47.9% and 19.3% less likely, respectively, than Whites to feel that their physician adequately explains things to them.

As shown in Model B of Table 9, adding in our indicator of IHISB did not have a statistically significant effect, suggesting that whether individuals seek health information on the Internet is not, itself, a sufficient predictor of satisfaction with physician ability to clearly explain things. Notably, the beta-coefficients for respondents with some college education or a college diploma and for respondents with health insurance became slightly more positive in this model, while the beta-coefficients for Hispanic and Black became slightly more negative.

In Model C, however, while the interaction term year-IHISB itself was not statistically significant, year and IHISB became statistically significant. In 2011 respondents were 59.5% more likely than in 2003, and Internet health information seekers were 31.3% less likely than non-Internet health information seekers to respond that their physician always or usually clearly explained things to them. The fact that in this model year and IHISB became statistically significant, but the interaction term was not, suggests that using the Internet in 2011 did not affect responses about their physician's explanatory abilities, but did in the reference year (2003). Also notable, the beta-coefficients for some college, college graduate and Hispanic become slightly more positive, while the beta-coefficient for having health insurance gets smaller.

Trust

Table 3.10. Trust in Health or Medical Information from Physician by Year

	Year			Total
	2005	2007	2011	
Do not trust health or medical information from doctor or other healthcare professional	417	408	230	1055
%	7.5%	5.4%	5.9%	6.2%
Trust health or medical information from doctor or other healthcare professional	5136	7203	3686	16025
%	92.5%	94.6%	94.1%	93.8%
Total	5553	7611	3916	17080
%	100.0%	100.0%	100.0%	100.0%

Pearson χ^2 =26.387; p=0.000

How much respondents seem to trust health or medical information received from their physician was indicated by their response to the following survey question, asked of all participants in 2005, 2007 and 2011: “In general, how much would you trust information about health or medical topics from a doctor or other health care professional?” The importance of considering such a question is that, despite the fact that patients may search for information from other sources including the Internet, at the end of the day patients still place high validity and trust in their physicians. According to Table 10, a total of 17,080 people responded to this question, 16,025 (93.8%) of whom had a lot or some trust in health or medical information from their providers, compared to the remaining 1,055 (6.2%) who had little or no trust. In general, patients appear to be more trusting of medical information from their providers today than they may have been 7-10 years ago; however, there seems to be an interesting spike in increased trust between 2005 and 2007, but this decreases by 2011.

Table 3.11. Logistic Regressions of Trust: In general, how much would you trust information about health or medical topics from a doctor or other health care professional?

	Model A			Model B			Model C		
	β	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**
Sociodemographic variables									
AGE									
18-34	reference			reference			reference		
35-49	-0.193	--	0.825	-0.185	--	0.831	-0.177	--	0.838
50-64	-0.221	*	0.802	-0.193	--	0.825	-0.178	--	0.837
65-74	-0.447	***	0.639	-0.383	**	0.682	-0.355	**	0.701
75+	-0.635	***	0.53	-0.531	***	0.588	-0.505	***	0.603
EDUCATION LEVEL									
some HS	reference			reference			reference		
HS grad	0.379	***	1.461	0.337	***	1.4	0.34	***	1.405
some college	0.601	***	1.824	0.488	***	1.629	0.49	***	1.632
college grad	1.038	***	2.824	0.884	***	2.42	0.885	***	2.422
GENDER									
Male	reference			reference			reference		
Female	-0.257	***	0.773	-0.227	***	0.797	-0.233	***	0.792
SELF-REPORTED HEALTH STATUS									
Poor Health	reference			reference			reference		
Good Health	0.45	***	1.568	0.444	***	1.56	0.435	***	1.545
INSURANCE STATUS									
Uninsured	reference			reference			reference		
Has HCCoverage	0.543	***	1.72	0.517	***	1.678	0.506	***	1.659
ETHNICITY									
HISPANIC	-0.425	***	0.654	-0.38	***	0.684	-0.372	***	0.689
BLACK	-0.331	**	0.718	-0.305	**	0.737	-0.305	**	0.737
OTHER Races	-0.527	***	0.59	-0.506	***	0.603	-0.502	***	0.605
Year									
2005	reference			reference			reference		
2007	0.331	***	1.393	0.205	*	1.227	0.328	**	1.388
2011	0.204	*	1.227	0.0034	--	1.034	0.417	*	1.518
Internet health-seeking behavior									
Internethealthseek				0.397	***	1.487	-0.004	--	0.996
Intuseyear(2005)							reference		
Intuseyear(2007)							0.736	***	2.087
Intuseyear(2011)							0.331	--	1.393
Constant	1.74	***	5.698	1.675	***	5.242	1.576	***	4.834

N=16,262 (missing=7,326)
*p<0.05; **p<0.01; ***p<0.001

The baseline model (Model A) tells us that age, education, gender, health status, insurance status, race/ethnicity, and year (all of the controls) are significant and relevant to whether patients always or usually trust medical information obtained from their healthcare providers. Once you reach 50 years of age, the older you get, the less likely you are to trust health or medical information from your provider. However, the more educated you are the more likely you are to trust health information from your healthcare provider. If you are a woman, you are 22.7% less likely than a man, and if you are Hispanic, Black or Other you are 34.6%, 28.2% or 41% less likely, respectively, than a White person to respond that you always or usually trust information from your healthcare provider. Those in good health are 56.8% more likely than those with fair or poor health, and those with health insurance are 72% more likely than the uninsured to agree that they trust their provider as a health information source. Respondents in 2007 were 39.3% more likely than in 2005, and respondents in 2011 were 22.7% more likely than in 2005 to agree. This is interesting, as it demonstrates that there is an apparent spike in trust in 2007 which decays in 2011.

As shown in Model B of Table 11, adding in the indicator of IHISB is a significant and relevant predictor of patient trust in their physicians, such that Internet health information seekers are 48.7% more likely than non-Internet health information seekers to trust health information from their providers. Interestingly, in this model, 2011 is no longer significant suggesting that the reason more people were satisfied in 2011 than in 2005 is that more of them were using the Internet. The beta-coefficient decreases for 2007, suggesting that maybe part of the higher trust in 2007 compared to 2005 could be attributed to higher Internet use. The beta-coefficients for education, self-reported health status and insurance also decrease, while the beta-coefficients for gender, Hispanic, Black and Other get more positive. Interestingly, while the beta-coefficients for 65-74 and 75+ years of age become more positive, the 50-64 years age category becomes insignificant, suggesting that the reason this demographic trusted information from their healthcare providers less than people ages 18-34 can be attributed to greater Internet use among these respondents.

When the interaction term, year-IHISB, is added into Model C, Internet use in 2007 appeared to be significant and relevant to trusting health information from one's healthcare provider. Internet health information seekers in 2007 are 2.087 times more likely than an Internet health information seeker in 2005 to trust health information received from their provider. However, the interaction term does not contribute to the model in 2011; this suggests that the higher amount of trust in 2011, compared to 2005, cannot necessarily be explained by IHISB, whereas IHISB can at least partly explain this trend in 2007. Additionally, year and IHISB, separately, were affected by the interaction term in Model C. The slope for 2007 became more positive than in Model B, but was comparable to the value in Model A, such that in this model respondents in 2007 were 38.8% more likely than in 2003 to agree that they always or usually trusted health information from their provider. The fact that 2007 its interaction term are significant suggests that trust in healthcare information from providers was especially high in 2007, particularly among respondents who used the Internet. Additionally, 2011 became statistically significant again in this model, while IHISB became insignificant. The combination of these changes that occurred between Models B and C suggests that Internet use does not have an effect in the comparison year (2005) but does in the interaction years, 2007 and, in particular, 2011. Because 2011 went from being significant in A to insignificant in B to significant again in C, when we controlled for year-Internet use, we can conclude that it's not the year that was different but rather the Internet use, which was greater than in 2003 and caused the greater trust in 2011. Also notable, the beta-coefficients for age, Hispanic and Other become less negative and for education and 2007 become more positive, while the beta-coefficient for gender becomes more negative and for self-reported health status and insurance status decrease (become less positive).

The fact that among all three models women were more than 75% less likely than men to trust information from their physicians could be explained, at least partly, by the fact that women tend to feel that their physicians, especially male physicians, blame their emotions and symptoms on their hormones and psychosis. The consistency of Hispanics, Blacks or Other respondents to be more than 60% less likely than Whites to trust health information from their providers could be understood by the fact that ethnic minorities place a strong emphasis on family ties and trust and are likely to, for example, only see a physician who knows their family or was recommended by a family or friend; it would be interesting to see which other sources these racial/ethnic categories trust health information from more—particularly, the Internet compared to their healthcare provider.

Time

Table 3.12. Whether HealthCare Provider Spends Enough Time by Year

	Year		Total
	2003	2011	
Healthcare provider does NOT spend enough time	987	688	1675
%	18.5%	21.2%	19.5%
Healthcare provider always/usually spends enough time	4338	2561	6899
%	81.5%	78.8%	80.5%
Total	5325	3249	8574
%	100.0%	100.0%	100.0%

Pearson χ^2 =8.950; p=0.003

Whether respondents feel their healthcare provider spends enough time with them was gauged by asking the following question of all participants in the 2003 and 2011 surveys: “In the past 12 months, how often did you doctors, nurses or other healthcare professionals spend enough time with you?” Such a question was crucial to incorporate as a measure of patient satisfaction with the patient-provider relationship since, as the literature has debated and as many of us have personally experienced, patients often complain that their providers do not spend enough time with them or that the consultation feels rushed. As shown in Table 12, a total of 8.574 respondents answered this question, 6,899 (80.5%) of whom agreed that their healthcare provider always or usually spent enough time with them, while the remaining 1,675 (19.5%) disagreed. It appears that as time progresses, patients are less satisfied with the amount of time their physicians spend with them, indicated by the 2.7% decline in positive responses to the question between 2003 and 2011.This corresponds to what the literature has pointed out (Anderson *et al.* 2003).

Table 3.13. Logistic Regressions of Time: How often did your doctors, nurses, or other health care professionals spend enough time with you?

	Model A			Model B			Model C		
	β	p-value	O.R.	β	p-value	O.R.	β	p-value	O.R.
Sociodemographic variables									
AGE									
18-34	reference			reference			reference		
35-49	0.196	*	1.217	0.19	*	1.209	0.192	*	1.211
50-64	0.456	***	1.578	0.431	***	1.54	0.436	***	1.547
65-74	0.671	***	1.956	0.625	***	1.868	0.632	***	1.881
75+	0.767	***	2.152	0.698	***	2.009	0.699	***	2.013
EDUCATION LEVEL									
some HS	reference			reference			reference		
HS grad	-0.003	--	0.997	0.02	--	1.021	0.025	--	1.025
some college	-0.053	--	0.948	0.004	--	1.004	0.009	--	1.009
college grad	-0.048	--	0.953	0.026	--	1.206	0.031	--	1.032
GENDER									
Male	reference			reference			reference		
Female	-0.088	--	0.916	-0.097	--	0.908	-0.099	--	0.906
SELF-REPORTED HEALTH STATUS									
Poor Health	reference			reference			reference		
Good Health	0.47	***	1.6	0.472	***	1.603	0.471	***	1.601
INSURANCE STATUS									
Uninsured	reference			Reference			reference		
Has HCCoverage	0.358	***	1.431	0.369	***	1.447	0.363	***	1.438
ETHNICITY									
HISPANIC	-0.325	***	0.723	-0.348	***	0.706	-0.345	***	0.708
BLACK	-0.14	--	0.87	-0.154	--	0.857	-0.157	--	0.857
OTHER Races	-0.121	--	0.886	-0.129	--	0.879	-0.13	--	0.878
Year									
2003	reference			Reference			reference		
2011	-0.306	***	0.737	-0.228	***	0.796	-0.084	--	0.92
Internet health-seeking behavior									
Internethealthseek				-0.195	**	0.823	-0.338	*	0.713
Intuseyear(2003)							reference		
Intuseyear(2011)							0.185	--	1.204
Constant	0.651	***	1.918	0.711	***	2.036	0.69	***	1.994

N=8,248 (missing=15,340)
*p<0.05; **p<0.01; ***p<0.001

The baseline model (Model A) tells us that age, self-reported health status, insurance status, being Hispanic and year are significant and relevant to patients being always or usually satisfied with the amount of time their physician spends with them. The older you are, the more satisfied you are with the amount of time your physician spends with you. Respondents with good health were 60% more likely than those in fair or poor health to agree, and respondents with health insurance with 43.1% more likely than the uninsured to agree. Hispanics were 27.7% less likely than Whites to agree that their physician always or usually spent enough time with them, and respondents in 2011 were 26.3% less likely to agree than respondents in 2003. This last finding, in particular, makes sense considering that previous studies support that as time has progressed, patients have grown more dissatisfied with the amount of time allotted for the medical encounter—thanks to HMOs and management cutting down to get doctors to see as many patients as possible (ideally, 20-25 patients per day).

However, as shown in Model B in Table 13, IHISB is a significant and relevant predictor of patient satisfaction with the amount of time physician spends, such that Internet health information seekers are 17.7% less likely than non-Internet health information seekers to agree that their physician always or usually spends enough time with them. In Model B, the beta-coefficients for all age categories become less positive; for health and insurance statuses become more positive; for Hispanic becomes more negative; and for 2011 becomes a lot less negative, such that respondents in 2011 were now only 20.4% less likely than in 2003 to agree that their physician spent an adequate amount of time with them, further suggesting that greater frequency of Internet use in 2011 than in 2003 can account for this difference.

In Model C, year-IHISB is not a significant predictor for level of satisfaction with physician time spent and, in this model, year is no longer significant. However, IHISB, itself, remains significant and has a beta-coefficient that is three times more negative than it was in Model B, such that Internet health information seekers in this model are now 28.7% less likely than non-Internet health information seekers to feel satisfied with the amount of time their provider spends with them. The fact that year becomes insignificant, while IHISB remains significant, and the interaction term does not become significant in Model C, suggests that it was the year, not the intensified Internet health seeking, that was different; that is, the reason respondents were less satisfied had more to do with the year during which they responded, and less to do with how frequently they were using ‘surfing the Web.’ The effect of Internet health seeking was independent of the year and had its own separate impact on the dependent variable.

Ability to Ask All Questions

Table 3.14. Satisfaction with Ability to Ask Provider All Health-Related Questions by Year

	Year		Total
	2007	2011	
Healthcare provider does NOT let them ask all health-related questions they have	883	403	1286
%	13.1%	12.3%	12.9%
Healthcare provider always/usually does let them ask all health-related questions they have	5841	2872	8713
%	86.9%	87.7%	87.1%
Total	6724	3275	9999
%	100.0%	100.0%	100.0%

Pearson χ^2 =1.343; p=0.246

Another adequate measure of patient satisfaction, particularly regarding the communication aspect of the patient-provider relationship, pertains to whether patients feel they are able to ask as many questions as possible during the medical encounter. This was measured by asking the following question of all respondents in 2007 and 2011: “During the past 12 months, how often did doctors, nurses, or other health professionals give you the chance to ask all the health-related questions you had?” As seen in Table 14, a total of 9,999 respondents answered this survey question, 8,713 (87.1%) of whom agreed that their provider always or usually lets them ask questions, while the remaining 1,286 (12.9%) disagreed. Based on the response rates, it appears that patient response rate has remained relatively constant over time. The fact that the frequency of patients who agree their provider lets them asks questions only increases by 1% between 2007 and 2011, suggests that the push for SDM may not be the primary reason for patients’ positive responses to this question.

Table 3.15. Logistic Regressions of Asking Questions: How often did doctors, nurses, or other health professionals give you the chance to ask all the health-related questions you had?

	Model A			Model B			Model C		
	β	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**
Sociodemographic variables									
AGE									
18-34	reference			reference			reference		
35-49	0.206	*	1.229	0.199	*	1.22	0.196	--	1.216
50-64	0.299	**	1.349	0.299	**	1.348	0.293	**	1.34
65-74	0.363	**	1.437	0.378	***	1.459	0.375	***	1.455
75+	0.476	***	1.609	0.512	***	1.669	0.504	***	1.656
EDUCATION LEVEL									
some HS	reference			reference			reference		
HS grad	0.301	**	1.352	0.271	*	1.311	0.285	*	1.329
some college	0.288	*	1.334	0.217	--	1.242	0.228	*	1.256
college grad	0.289	*	1.335	0.201	--	1.223	0.215	--	1.24
GENDER									
Male	reference			reference			reference		
Female	-0.164	*	0.849	-0.143	*	0.866	-0.143	*	0.867
SELF-REPORTED HEALTH STATUS									
Poor Health	reference			reference			reference		
Good Health	0.574	***	1.775	0.575	***	1.776	0.575	***	1.776
INSURANCE STATUS									
Uninsured	reference			reference			reference		
Has HCCoverage	0.541	***	1.718	0.54	***	1.717	0.531	***	1.7
ETHNICITY									
HISPANIC	-0.36	***	0.698	-0.338	***	0.713	-0.337	***	0.714
BLACK	-0.211	*	0.809	-0.199	*	0.819	-0.201	*	0.818
OTHER Races	-0.526	***	0.591	-0.515	***	0.598	-0.517	***	0.596
Year									
2007	reference			reference			reference		
2011	0.051	--	1.052	0.027	--	1.027	0.426	**	1.531
Internet health-seeking behavior									
Internethealthseek				0.244	0.002	1.276	-0.134	--	0.875
Intuseyear(2007)							reference		
Intuseyear(2011)							0.491	**	1.635
Constant	0.616	***	1.852	0.48	**	1.616	0.4	*	1.491

N=9,543 (missing=14,045)
*p<0.05; **p<0.01; ***p<0.001

The baseline model (Model A) tells us that age, education level, gender, self-reported health status, insurance status and race/ethnicity are significant and relevant for predicting whether respondents feel that their healthcare provider lets them ask all of the health-related questions they have during the medical encounter. The older and more educated you are, the more likely you are to agree that you were able to ask your provider all of the questions you had. Women are 15.1% less likely than men to agree, while people in good health are 77.5% more likely than those with fair or poor health to agree and those with health insurance are 71.8% more likely than the uninsured to agree. Hispanics, Blacks and Other non-White races are 30.2%, 19.1% and 40.9%% less likely, respectively, than Whites to feel satisfied with their ability to ask their provider all of the health-related questions they have during the medical encounter.

When the indicator of IHISB is added into Model B, it is statistically significant, such that Internet health information seekers are 27.6% more likely than non-Internet health information seekers to agree that their provider lets them ask all of the health-related questions they have. In this model, however, the some college and college graduate education levels become insignificant, and the slope for high school graduate is reduced, such that compared to people with some or less than a high school education, high school graduates are 31.1% more likely to agree in Model B; in Model A, however, high school graduates were 35.2% more likely than people with some or less than a high school education to agree. Additionally, the slopes for gender, Hispanic, Black and Other non-White races become less negative when IHISB is included in the model. This model predicts that women are 13.4% less likely than men, and Hispanics, Blacks and Other non-White races are 28.7%, 18.1% and 40.2% less likely, respectively, than Whites to feel that their healthcare provider lets them ask all of the health-related questions they have.

In Model C, however, IHISB becomes statistically insignificant (p=0.408), while year and the interaction term become significant and relevant predictors of whether patients feel that their provider lets them ask all of the questions they have. Respondents in 2011 were 53.1% more likely than in 2007 to agree that their provider let them ask all health-related questions and, more specifically, Internet health information seekers in 2011 were 63.5% more likely than Internet health information seekers in 2007 to agree that their provider always or usually let them ask all questions. This variation in the significance of year, IHISB and the year-IHISB interaction term in predicting whether respondents feel more or less satisfied with the extent to which their provider let them ask questions suggests that Internet health seeking behavior was a stronger predictor of this in 2011 than in 2007. Also notable in this model, the 35-49 age category becomes insignificant and college graduate remains insignificant, but the slope of high school graduate gets bigger and some college becomes significant again; that is, high school graduates are 32.9% more likely than people with some or less than a high school education, and people with some college education are 25.6% more likely than people with some or less than a high school education, to feel satisfied with their ability to ask their provider all of the health-related questions they have during the consultation.

Adequately Informed About the "Next Steps"

Table 3.16. Healthcare Provider Makes Sure Patient Knows Necessary Next Steps by Year

	Year		Total
	2007	2011	
Disagrees that provider makes sure he/she understands the next steps	766	352	1118
%	11.4%	10.8%	11.2%
Agrees that provider makes sure he/she understands the next steps	5933	2918	8851
%	88.6%	89.2%	88.8%
Total	6699	3270	9969
%	100.0%	100.0%	100.0%

Pearson χ^2 =0.991; p=0.320

Whether providers have been making sure their patients understand the next steps in their medical care was measured by asking all respondents in 2007 and 2011 the following question: “During the past 12 months, how often did your doctors, nurses or other health professionals make sure you understood the things you needed to do to take care of your health?” Of the 9,969 total respondents who answered this question, 8,851 (88.8%) agreed that their provider always or usually makes sure they understand what they need to do regarding their health, while the remaining 1,118 (11.2%) disagreed. Based on patients’ response rates, providers have been consistently doing a good job of making explicitly clear what the next steps are, since between 2007 and 2011 there was only an increase of 0.6% of respondents who agreed.

Table 3.17. Logistic Regressions of Next Steps: How often did your doctors, nurses, or other health professionals make sure you understood the things you needed to do to take care of your health?

	Model A			Model B			Model C		
	β	p-value	O.R.	β	p-value	O.R.	β	p-value	O.R.
Sociodemographic variables									
AGE									
18-34	reference			reference			reference		
35-49	0.104	--	1.11	0.102	--	1.108	0.1	--	1.105
50-64	0.278	**	1.32	0.277	**	1.319	0.273	**	1.314
65-74	0.498	***	1.645	0.501	***	1.65	0.499	***	1.648
75+	0.59	***	1.805	0.6	***	1.822	0.593	***	1.81
EDUCATION LEVEL									
some HS	reference			reference			reference		
HS grad	-0.115	--	0.891	-0.124	--	0.884	-0.112	--	0.894
some college	-0.022	--	0.979	-0.041	--	0.96	-0.031	--	0.969
college grad	0.003	--	1.003	-0.02	--	0.98	-0.009	--	0.991
GENDER									
Male	reference			reference			reference		
Female	-0.102	--	0.903	-0.096	--	0.908	-0.096	--	0.909
SELF-REPORTED HEALTH STATUS									
Poor Health	reference			reference			reference		
Good Health	0.659	***	1.933	0.659	***	1.933	0.658	***	1.932
INSURANCE STATUS									
Uninsured	reference			reference			reference		
Has HCCoverage	0.272	*	1.312	0.271	*	1.311	0.262	*	1.3
ETHNICITY									
HISPANIC	-0.404	***	0.668	-0.398	***	0.672	-0.397	***	0.673
BLACK	-0.099	--	0.906	-0.096	--	0.909	-0.097	--	0.908
OTHER Races	-0.086	--	0.917	-0.083	--	0.92	-0.085	--	0.919
Year									
2007	reference			reference			reference		
2011	0.09	--	1.094	0.083	--	1.087	0.435	*	1.545
Internet health-seeking behavior									
Internethealthseek				0.065	--	1.067	-0.264	--	0.768
Intuseyear(2007)							reference		
Intuseyear(2011)							0.421	*	1.523
Constant	1.157	***	3.18	1.121	***	3.068	1.054	***	2.868

N=9,524 (missing=14,064)
*p<0.05; **p<0.01; ***p<0.001

As seen in the baseline model (Model A), age, health and insurance status and race/ethnicity are significant and relevant for predicting whether respondents feel that their healthcare provider makes sure they understand what they need to do to take care of themselves. The older you are, the more likely you are to agree that your provider makes it clear to you what the next steps are in your care. Those in good health are 93.3% more likely than those with fair or poor health, and those with healthcare coverage are 31.2% more likely than the uninsured to agree that their provider always or usually makes sure they know how to take care of their own health. Hispanics, however, are 33.2% less likely than non-Hispanic Whites to feel that their provider adequately informs them.

When the indicator of IHISB is added into Model B, it is not a significant and relevant predictor of whether patients feel their provider makes sure they understand the next steps in the health care. Interestingly, though, the beta-coefficients for 65-74 and 75+ year olds and Hispanics became more positive, such that 65-74 year olds and 75+ year olds were 65% and 82.2% more likely, respectively, than 18-34 year olds to agree that their provider made sure they understood how to take care of their health, while Hispanics were now only 32.8% less likely than non-Hispanic Whites to agree. Additionally, the beta-coefficients for the 50-64 year old age category and insurance status decreased very slightly, such that 50-64 years olds were 31.9% more likely than 18-34 year olds and the insured were 31.1% more likely than the uninsured to agree.

However, when the interaction term year-IHISB is incorporated into Model C, year (2011) and the interaction term become statistically significant and relevant predictors of whether patients feel that their healthcare provider makes sure they understand what they need to do to take care of their health, while IHISB remains insignificant. Respondents in 2011 were

54.5% more likely than in 2007 to agree that their provider always or usually makes sure they know what the necessary next steps are regarding their health and, more specifically, Internet health information seekers in 2011 were 52.3% more likely than Internet health information seekers in 2007 to agree that their provider always or usually makes sure they understand how to proceed with their health care. This suggests an increase in Internet use over time, but not Internet use alone, was a stronger predictor of this in 2011 than in 2007.

Can Rely on Healthcare Provider

Table 3.18. Can Rely on Healthcare provider to Take Care of Healthcare Needs by Year

	Year		Total
	2007	2011	
Cannot rely on provider to take care for health needs	891	413	1304
%	13.3%	12.6%	13.0%
Can always/usually rely on provider to take care of health needs	5829	2876	8705
%	86.7%	87.4%	87.0%
Total	6720	3289	10009
%	100.0%	100.0%	100.0%

Pearson χ^2 =0.960; p=0.327

Perceptions about how much patients feel they can rely on their healthcare provider to take care of them was measured by asking all respondents participating in the 2007 and 2011 HINTS surveys, “In the past 12 months, how often did you feel you could rely on your doctors, nurses, or other health care professionals to take care of your health care needs?” As shown in Table 18, of the 10,009 total respondents who answered this question, 8,705 (87.0%) agreed that they could rely on their provider to take care of them, while the remaining 1,304 (13.0%) respondents disagreed. Between 2007 and 2011 patients have been pretty consistent regarding the extent to which they report they can rely on their providers to take care of their health needs.

Table 3.19. Logistic Regressions of Ability to Rely on Provider: How often did you feel you could rely on your doctors, nurses, or other health care professionals to take care of your health care needs?

	Model A			**Model B**			**Model C**		
	β	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**
Sociodemographic variables									
AGE									
18-34	reference			reference			reference		
35-49	0.057	--	1.059	0.057	--	1.058	0.056	--	1.058
50-64	0.39	***	1.476	0.389	***	1.476	0.389	***	1.475
65-74	0.659	***	1.934	0.66	***	1.935	0.66	***	1.934
75+	0.705	***	2.024	0.707	***	2.028	0.706	***	2.025
EDUCATION LEVEL									
some HS	reference			reference			reference		
HS grad	0.167	--	1.182	0.166	--	1.18	0.167	--	1.182
some college	0.095	--	1.1	0.092	--	1.096	0.093	--	1.098
college grad	0.127	--	1.135	0.122	--	1.13	0.124	--	1.132
GENDER									
Male	reference			reference			reference		
Female	0.011	--	1.011	0.012	--	1.012	0.012	--	1.012
SELF-REPORTED HEALTH STATUS									
Poor Health	reference			reference			reference		
Good Health	0.713	***	2.04	0.713	***	2.04	0.713	***	2.04
INSURANCE STATUS									
Uninsured	reference			reference			reference		
Has HCCoverage	0.584	***	1.792	0.583	***	1.792	0.582	***	1.79
ETHNICITY									
HISPANIC	-0.389	***	0.678	-0.388	***	0.679	-0.387	***	0.679
BLACK	-0.297	**	0.743	-0.296	**	0.744	-0.297	**	0.743
OTHER Races	-0.268	*	0.765	-0.267	*	0.766	-0.267	*	0.765
Year									
2007	reference			reference			reference		
2011	0.067	--	1.069	0.066	--	1.068	0.12	--	1.128
Internet health-seeking behavior									
Internethealthseek				0.012	--	1.012	-0.038	--	0.963
Intuseyear(2007)							reference		
Intuseyear(2011)							0.065	--	1.067
Constant	0.470	**	1.599	0.463	**	1.588	0.451	**	1.570

N=9,560 (missing=14,028)
*p<0.05; **p<0.01; ***p<0.001

The baseline model (Model A) tells us that age, health and insurance status and race/ethnicity are significant and relevant predictors of whether patients feel they can rely on their healthcare provider to take care of their health needs. As you get older, you are much more likely to feel confident in your provider's ability to care for you. Healthy people are 2.04 times more likely than those with fair or poor health, and people with healthcare coverage are 79.2% more likely than the uninsured to also agree that they can rely on their provider to take care of them. Hispanics, Blacks and Other non-White races are 32.2%, 25.7% and 23.5% less likely, respectively, than Whites to respond that they can always or usually rely on their healthcare provider to take care of their health needs. This may be, in part, related to the fact that ethnic minorities place high trust, faith and reliance within their inner social networks which, more often include close relatives and friends than healthcare practitioners.

When the indicator of IHISB is added to Model B, it does not appear to be a significant predictor of patient reliance upon their provider, and little to no changes are observed among the other control variables, except within the 75+ years old age category whose beta-coefficient increases slightly, such that if people 75 years of age and older are 2.028 times more likely than 18-34 year olds to feel they can rely on their healthcare providers to care for them. A similar, unchanged pattern is apparent when the interaction term is included in Model C, in which neither year nor IHISB nor the interaction term becomes statistically significant.

Coping with Uncertainty

Table 3.20. Healthcare Provider Helps Cope with Uncertainty by Year

	Year		Total
	2007	2011	
Disagrees that provider helps cope with uncertainty	1580	784	2364
%	24.3%	24.2%	24.3%
Agrees that provider always/usually helps cope with uncertainty	4918	2458	7376
%	75.7%	75.8%	75.7%
Total	6498	3242	9740
%	100.0%	100.0%	100.0%

Pearson χ^2 =0.021; p=0.886

The final indicator of patient satisfaction with the patient-provider relationship utilized in this study was asked of all respondents in 2007 and 2011 to gauge whether providers offer emotional support to their patients: “In the past 12 months, how often did doctors, nurses, or other health professionals help you deal with feelings of uncertainty about your health or health care?” A total of 9,740 people responded to this question, 7,376 (75.7%) of whom agreed that their providers always or usually help them manage their uncertainty, while the remaining 2,364 (24.3%) disagreed. Between 2007 and 2011 there appears to be little to no change in patient responses. This would be an interesting variable to continue monitoring over time, especially since coping with uncertainty is a cited motivation for patients to use the Internet, such as to participate in online support groups.

Table 3.21. Logistic Regressions of Coping with Uncertainty: How often did your doctors, nurses, or other health care professionals help you deal with feelings of uncertainty about your health or health care?

	Model A			Model B			Model C		
	B	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**	**β**	**p-value**	**O.R.**
Sociodemographic variables									
AGE									
18-34	reference			reference			reference		
35-49	0.234	**	1.264	0.232	**	1.261	0.231	**	1.26
50-64	0.272	***	1.313	0.271	***	1.311	0.269	***	1.309
65-74	0.447	***	1.564	0.451	***	1.569	0.45	***	1.568
75+	0.559	***	1.749	0.57	***	1.769	0.568	***	1.764
EDUCATION LEVEL									
some HS	reference			reference			reference		
HS grad	-0.058	--	0.944	-0.067	--	0.935	-0.062	--	0.94
some college	-0.233	*	0.792	-0.254	*	0.775	-0.25	*	0.779
college grad	-0.31	**	0.733	-0.336	***	0.715	-0.331	***	0.718
GENDER									
Male	reference			reference			reference		
Female	-0.155	**	0.856	-0.15	**	0.861	-0.149	**	0.861
SELF-REPORTED HEALTH STATUS									
Poor Health	reference			reference			reference		
Good Health	0.589	***	1.803	0.589	***	1.803	0.59	***	1.803
INSURANCE STATUS									
Uninsured	reference			reference			reference		
Has HCCoverage	0.241	**	1.272	0.24	**	1.271	0.236	**	1.266
ETHNICITY									
HISPANIC	-0.124	--	0.883	-0.118	--	0.889	-0.117	--	0.889
BLACK	0.039	--	1.04	0.043	--	1.044	0.042	--	1.043
OTHER Races	-0.154	--	0.857	-0.15	--	0.861	-0.151	--	0.86
Year									
2007	reference			reference			reference		
2011	0.004	--	1.004	-0.002	--	0.998	0.155	--	1
Internet health-seeking behavior									
Internethealthseek				0.074	--	1.077	-0.068	--	0.934
Intuseyear(2007)							reference		
Intuseyear(2011)							0.188	--	1.207
Constant	0.441	***	1.554	0.399	**	1.490	0.364	**	1.439

N=9,306 (missing=14,282)
*p<0.05; **p<0.01; ***p<0.001

The baseline model (Model A) tells us that age, education level, gender and health and insurance status are significant and relevant predictors of whether patients agree or disagree that their healthcare provider helps them cope with their feelings of uncertainty about their health. The older you are, the more likely you are to agree that your provider always or usually helps you cope with feelings of uncertainty, with 65-74 and 75+ year olds being 56.4% and 74.9%, respectively, more likely than 18-34 year olds to agree; this could have to do with stage of life and the aging process. People in good health and people with healthcare coverage are 80.3% and 27.2% more likely, respectively, than people in poor or fair health and the uninsured to agree. However, the more educated you are, the less likely you are to agree, such that people with some college education or people who have received a college diploma are 20.8% and 26.7% less likely, respectively, than people with some or less than a high school education to respond that their healthcare provider addresses their feelings of uncertainty about their health.

In Model B, when the indicator for IHISB is added, it is not statistically significant. However, it is notable that in this model, the beta-coefficients for the 35-49 and 50-64 age categories and insurance status decrease and for education become more negative, while for 65-74, 75+ and gender the beta-coefficients become more positive; no change in the slope occurs for self-reported health status.

When the interaction term for year-IHISB is incorporated into Model C, year, IHISB and the interaction term all remain statistically insignificant. Additionally, little variation is seen in the slopes of the other control variables, except for healthcare coverage and age, which decrease slightly in value, and for education and gender, which become slightly less negative.

Conclusion

Ultimately, this data supports my hypothesis, showing substantively important effects of increased Internet health information seeking behavior (IHISB) in some areas of the patient-provider relationship but not others. To reiterate the important findings, analysis of the results of the binary logistic regressions showed that patient satisfaction with decision-making, trust and the exchange of information have been improved by an increase in IHISB over time, while, in general, satisfaction with clarity of physicians' explanations and the duration of the medical consultation have been negatively affected. Reliability and coping were unaffected. The patterns across the dependent variables will be interpreted in the next chapter.

CHAPTER 4: DICUSSION & CONCLUSIONS

Further analysis of the current models for the patient-physician relationship may reveal that new, emerging trends are taking place. Efficiency, patient satisfaction, and clinical encounter time may vary when Internet-acquired information is considered in decision-making. […]Additional focus must be placed on studies that include the impact of electronically obtained knowledge on the patient-physician relationship (Gerber and Eiser 2001).

This chapter reviews the results presented in Chapter 3 and analyzes the deeper meaning behind the data to clarify how the patient-provider relationship has been affected by Internet health information seeking, in general and over time. It proposes the implications of this moving forward—for providers and medical educators, patients, and insurance companies and policymakers. It concludes with some of the methodological limitations of this study and suggestions for future research.

Summary of the Research Question

Treating Internet health seeking as a cause rather than a consequence, the purpose of this study was to determine how seeking health information on the Internet is affecting the patient-provider relationship. According to the existing literature, and collective personal experience, this relationship is significant because the patient-provider relationship and the Internet are very complicated and because technology is now creeping its way into the medical arena in an unprecedented way. Patients now have copious amounts of health-related information, literally, at their fingertips. They can "*WebMD*" their symptoms and self-diagnose, which may result in too few or too many visits to the doctor; they can research medications, treatments, healthcare providers and online support groups, and present this information to their provider seeking clarification, rebuttal or affirmation; or they may withhold this information completely. Towards the end of Chapter 1, I had proposed a few critical questions that I hoped to answer based on the results of this trend study. I asked that we reconsider the scenario of a patient who brings Internet printouts to their doctor's visit and who proceeds to argue with their doctor over contradictions. How is this physician, and physicians in general, supposed to handle a patient like this? This is a challenging, but critical question that requires a multifaceted solution—one that can be modified over time as the patient-provider relationship and the Internet's role continue to transform.

The causes and consequences of this intricate relationship are not black-and-white. Although many researchers have assumed that miscommunication between providers and patients is causal to Internet use, I argued that this may not be the case. Yes, many patients look up information on the Internet after the consultation, but many also use it beforehand, to educate and prepare themselves to make informed decisions. This alone suggests that this is a grey area and that correlation does not necessarily mean causation. Therefore, I sought to identify the correlations and patterns that exist between Internet health information seeking behavior (IHISB) and the patient-provider relationship from the patient perspective. The results ultimately showed that an increase in IHISB over time helps improve patients' perceptions of decision-making involvement and information exchange in the medical encounter, and trust in their providers. However, it worsens their perceptions of physician clarity and encounter time.

Summary and Analysis of the Results

Areas Improved by Internet Use: Decision-Making, Trust & Information Exchange

In general, trust of healthcare providers and patient satisfaction with level of involvement in decision-making and overall communication during the medical encounter increased, in part, because of increased Internet use over time.

According to the results, increased trust between 2005 and 2007 can be attributed to greater Internet use for health-related purposes during that time; however, by 2011, Internet use appeared to have no significant effect on how much patients trusted their providers. It would be interesting to know why the effect of IHISB essentially disappears by 2011 and whether this effect has re-appeared since then or remained insignificant. Additionally, the degree to which patients felt their providers let them ask questions and explained how to take care of their own health increased very slightly over time, part of which can also be attributed to greater Internet use. The impact of Internet use on decision-making was particularly interesting because while IHISB appeared to reduce patient satisfaction with involvement in the decision-making process at first, by 2011 it had the opposite effect—it seems to have empowered patients to participate in decision-making. Which side of the patient-provider relationship, then, has actually been changed by increased online health seeking over time? Have patients modified their approach to the medical encounter? Or have providers adjusted their attitudes to make themselves more amenable to a mutual participation decision-making style?

The bivariate cross-tabulations and logistic regressions for patient willingness to talk about Internet health information and provider interest in discussing it shed a bit of light on this debate, but should continue to be evaluated in the future. Over time, Internet health seekers are becoming significantly less likely to discuss Internet health information with their healthcare providers. A little more than 48% of respondents in 2005 talked to their providers about Internet information, compared to 27.8% in 2007 and 25.1% in 2011. This is interesting considering patients are purportedly trying to take on a more active role in the medical encounter. On the other hand, patients may withhold this information if the physician’s demeanor and attitude in the encounter are antagonistic, if their explanation validates what the patient “secretly” found online or if the patient is embarrassed or does not want to challenge their physician, among other reasons. The results for perceived provider interest did not necessarily provide support for the latter argument, however. In 2005 and 2007, 74-75% respondents agreed that their providers were interested, and by 2011 only 73.3% agreed, an insignificant change. What else, then, could account for the increase in patients withholding Internet health information? One possibility is physician medical specialty; Kim and Kim (2009) found that academic physicians are more likely to believe that Internet use leads to unnecessary office visits and are, therefore, more likely to react negatively toward online health seeking patients, compared to hospitalists and private practice physicians. Non-verbal cues and personality types should also be considered in the future, since they were not specified or accounted for in this study.

Both sides can be argued based on what we already know. But the extent to which one side is being affected more than the other, or whether it is 50:50, and the role of IHISB in this partition has yet to be determined. To assess this in the future, one could operationalize patient versus provider approaches to the medical encounter, similar to how researchers have in the past: the patient approach could be measured by how many and what types of questions patients ask, which will express their level of expressed versus actual involvement in decision-making and in taking control of their health; the provider approach can be measured by the types of questions providers ask, their demeanor during the encounter and their reactions to questions posed by their patients, which will measure attitude and level of interest; patients should be asked whether they search for health-related information online.

Areas Negatively Affected by Internet Use: Explanation Clarity & Encounter Time

Decreased satisfaction with providers' ability to explain things clearly and the time they spend with their patients can be partly attributed to increased Internet use in 2003; but by 2011 the extent to which Internet health seeking had an effect was reduced. Opposite of the effect in the reference year (2003), this could suggest that respondents in 2011 were more satisfied with their provider's ability to explain health information clearly, regardless of whether they used the Internet. Drawing on an argument presented in the literature review, could it be that by 2011 patients trusted and understood their providers more than the Internet, or that by 2011 patients made their providers validate and clarify Internet information for them more frequently, resulting in increased satisfaction with and trust of the information from their providers? It would be interesting to know if either of these is the case. Year, however, appeared to have had more of an effect than Internet use did on provider clarity, suggesting that the causality may actually be reversed. This was expected since it is more reasonable that dissatisfaction with your provider's explanations drove you to use the Internet than it is that your satisfaction was a result of using the Internet. That is, it is more practical that because you do not understand, you refer to the Internet for clarification after the consultation.

Contrary to what I expected, only Internet users expressed a significantly negative difference with regard to the time their providers spend with them. I expected that Internet information seeking patients might be more likely to agree that their provider spends enough time with them based on physicians' opinions—making for a flawed hypothesis. Many physicians and some patients have reported that appointment time is often shorter and more efficient when patients look things up online because Internet-informed patients are more up-to-speed on the basics. This allows physicians to structure consultation time around "more important" topics, like the intervention. Other physicians argue that consultation time is wasted by obstinate Internet-informed patients who bicker with them (Murray *et al.* 2003). Patients may feel similarly especially if their physician seems impatient.

That being said, whether your physician spends enough time with you might be another instance in which the causality is reversed. It could very well be that you turn to the Internet because your provider is not spending enough *quality* time with you. This should continue to be monitored over time for significant changes, from both patients' and providers' perspectives, especially in managed care organizations where there is a strong push for the “10-minute consultation.”

Areas Unaffected by Internet Use: Reliability & Coping with Uncertainty

Unsurprisingly, these indicators of the strength of the patient-provider relationship were unaffected by IHISB and did not significantly change over time affected. It is very likely that the causality is reversed for both. It is much more likely that patients look up alternative treatment options or other providers if they cannot rely on their physician, than it is that Internet use improves patients’ ability to depend on their provider to take care of all of their health needs. It is also much more practical that patients turn to online support groups and blogs to help them cope with uncertainty because their physicians do not, than it is that participation in an online support group has any impact on the extent to which their provider offers them emotional support.

What’s Next?: Implications & Suggestions for Providers, Policymakers & Patients

Within the past decade or so, many academic and nonacademic institutions have started “to train health care providers to critically evaluate Internet material available to patients. However, the un-preparedness of [physicians] to undertake the contextualization and interpretation of such information indicates the limited effectiveness of current efforts” (Ahmad *et al.* 2006:e22). Continued efforts from all constituents are needed to identify strategies to become better Internet consumers and harness the benefits of the Internet as a resource to continue to improve communication. In light of this, “several possible avenues of improvement” exist (Ahmad *et al*. 2006:e22).

Providers & Medical Educators

As indicated by the results of this thesis, we have seen a somewhat ironic twist of fate pertaining to the *WebMD* phenomenon and the patient-provider relationship: there is a general and significant trend toward increasing Internet health information seeking behavior (IHISB) with less patients sharing Internet health information with their providers, but an increase in trust and patient satisfaction with decision-making. As Ahmad *et al.* (2006) and Bylund *et al.* (2007) explain, patients who search the Internet prior to the medical consultation consider the consultation important because it helps them better synthesize the information, especially when their provider is willing to evaluate and contextualize the information. Many complain that the information on the Internet is not presented in a patient-oriented manner and is contradictory or too complicated to comprehend and that, as a result, they suffer from information overload. This strongly suggests that a new role for physicians as "partners," who adapt Internet information to a personal context, is essential. For this to be accomplished, current training programs, curriculum and the *way* medical students are taught need to be modified.

Many providers are unaware that the Internet-informed patient is an emerging norm and the need for them to interpret and contextualize this information is becoming a 'necessary evil.' Even before the Internet became as popular as it is today, Bader and Braude (1998) pointed out that some people assume that any information on the Internet "must be accurate and correct. Needless to say, this is a potentially dangerous assumption" (409); because this dilemma is unlikely to diminish, it is increasingly important for both physicians and consumers "to know what is available on the Web, who is putting it there, and for whom the information is intended" (Bader and Braude 1998:409). Increasing providers' awareness and acceptance of "the Internet-generated 'reverse' information asymmetry" through formal and informal educational initiatives will assuage their apprehension and perceived threat to their expertise so that they no longer "'panic'" "'as soon as that list comes out'" (Ahmad *et al.* 2006:e22). As a result, they might be more open to partnership and to embracing their roles as "clarificationists" and "contextualizers."

Many physicians are beginning to realize "that if they are unwilling or unable to meet their patients' growing need for online health information and advice, their patients will be forced to go elsewhere--and there are plenty of places for them to go" (Ferguson 2000:113). Therefore, providers also need to be educated about patients' perceptions of Internet information. For example, providers should be aware that younger, chronically ill patients are more likely to look up health information online and be eager to talk about it, and patients who feel overwhelmed by Internet information struggle to make informed decisions. Additionally, Bylund *et al.* (2007) found that almost 50% of patients use "hidden strategies," such as not explicitly referring to the Internet or a website, to introduce outside health information during the consultation. Using this knowledge, providers can encourage patients to be more open about sharing online health information and inspire more action to be taken to solidify a list of credible websites, making all parties better consumers of medical information and strengthening their alliance.

To prepare physicians to address this alternative information avenue (the Internet), medical educators and healthcare administrators should "establish patient management guidelines for physicians seeing patients with internet health information" (Gerber and Eiser 2001:e15). Part of these guidelines should encourage physicians to write "Internet prescriptions," or heath website recommendations, to facilitate clarification and contextualization and to combat Internet-generated misinformation (Gerber and Eiser 2001). The need for this is evidenced by the fact that misinformation can lead to detrimental unanticipated consequences. "Prescribed" websites might increase patient trust in the information and encourage patients who find additional websites to give the physician-referred site more preference. To encourage patients to use their recommendations, physicians should be more amenable to suggesting websites and could try “link[ing] their own Web sites to various known Web sites that provide quality content” (Gerber and Eiser 2001:e15). When developing these guidelines, it should be considered that “Whereas it is difficult to teach ‘evidence-based medicine’ to the layperson, it is more feasible to discuss articles with patients using related concepts that physicians have learned” (Ahmad *et al.* 2006:e22). People have different learning styles and backgrounds and guidelines should be sensitive to the diverse needs of patients (Ahmad *et al.* 2006). If Internet “prescribing” gets incorporated into everyday practice, or at least upon request by the patient, it will require that physicians “know where high caliber information is located in cyberspace rather than merely know what the specific information is itself” (Gerber and Eiser 2001:e15). This information could be provided to them by insurance companies and medical specialty organizations like the American Pediatric Society (Gerber and Eiser 2001).

For this to work effectively, a few additional steps need to be taken. Health administrators should stress a team approach to more effectively address patients’ needs and Internet-related misinformation, confusion and distress, which has the potential to make the consultation more time-efficient. For example, nurse practitioners, nutritionists and other allied health professions can routinely educate patients about lifestyle changes and managing chronic illness. Human Resources can help patients resolve issues pertaining to Internet health information and can hold informal seminars to reinforce guidelines patients can use to find reputable websites and to teach them how to navigate recommended government meta-sites (Ahmad *et al.* 2006). Getting physicians on board might require tangible incentives. Insurance companies could consider developing a billing code to reimburse physicians for writing Internet prescriptions and clarifying Internet information for patients during the consultation. Other possibilities could target “professional ‘pride,’” giving recognition in the form of CME (continuing medical education) credit in information technology, certificates or monetary bonuses. These types of incentives should target older healthcare providers who graduated before information technology was incorporated into their training, since might be less likely to be aware and more likely to be rigid to change (Ahmad *et al.* 2006).

“Academic physicians and educators can [also] take an active role in the quickly changing information landscape” by advocating training in ‘Internet competency,’ more commonly referred to as medical informatics, to teach medical students and practicing physicians “how to critically evaluate materials available to the patient or consumer hungry for health and medical information” and how to communicate with Internet-informed patients (Bader and Braude 1998:410). The University of Vermont was one of the first medical schools to implement a “vertical curriculum” in medical informatics in 1992, recognizing that “Among other changes in the health care environment, computer technology and the field of medical informatics were becoming fully entrenched” (McGowan *et al.* 1998:457). The program helps students strengthen their skills in identifying and acquiring pertinent information from appropriate sources in filtering information for quality, applicability and specificity (McGowan *et al.* 1998). Many other institutions and accreditation groups have followed in their footsteps (Bader and Braude 1998). It is essential that clinical faculty be cognizant of information technology and its use among patients. Because it is inevitable that medical students and residents “will emulate the information-seeking and patient-communication habits of their mentors as much as they will their bedside manner[, …] information-seeking skills needs to become an integral part of clinical encounter skills” (Bader and Braude 1998:410). Doing so will ensure that future healthcare providers are more competent and capable of handling Internet-informed patients. Even 20 years ago, an analysis of “the benefits of increasing the amount of health information available to patients," including more informed decision-making, increased "participation in health maintenance" and decreased (unnecessary) health resource utilization, suggested that the World Wide Web could provide a unique delivery system for doing this (Bader and Braude 1998:410). As Bader and Braude concluded in 1998, which still stands true today, "it is clear that, without driving lessons, our students will not be able to successfully navigate the road" (410).

Policymakers and Insurance Companies

Although it seems more can be done on the provider side, the solution to this predicament is multifaceted. It also solicits that the government and insurance companies monitor the quality of medical content online and develop patient-focused interventions.

Information regulation

It is difficult to determine "whether a site is run by licensed experts providing validated resource information, unlicensed physician-consultants selling their services, or charlatans hawking their books and alternative therapies" (Bader and Braude 1998:409). And while "credible information resources posted by well-known physicians, associations, and health sciences centers" do exist, they can be difficult to find (Bader and Braude 1998:409). The government has already begun to address this problem by developing databases with consolidated lists of reliable resources. For example, *healthfinder.gov* is a "meta-site" developed by the U.S. Department of Health and Human Services that provides a list of credible, up-to-date websites created by government agencies, nonprofits and support groups (Bader and Braude 1998; Gerber and Eiser 2001). MEDLINE*plus,* which was developed by the National Library of Medicine, is available to the general public to help individuals find quality, up-to-date health information on over 900 topics; the site provides various types of health-related web resources

(U.S. National Library of Medicine 2012). Although these websites exist, and this is a good start, the government cannot feasibly monitor the quality of all medical content on all websites because there are just too many. In the short-term, the government needs to promote awareness of extensive databases like MEDLINEplus, and enhance laws to ensure patient privacy and confidentiality, persistent issues that have recently received a lot of publicity because hospitals and medical practices are being required to use electronic medical records.

Developing and maintaining a regulatory system could, however, be designated to a group like the World Wide Web Consortium (WWWC), which is the main international standards organization for the WWW. In the 1990s, the WWWC developed a set of technical standards called "PICS"—platform for Internet content selection—"that enable[d] people to distribute electronic descriptions or ratings of digital works across the Internet in a computer readable platform" (Eysenbach and Diepgen 1998:1498). PICS was originally created to protect children from offensive material by labeling who the content might be appropriate for--similar to movie and video game ratings; PICS has since been superseded by POWDER—Protocol for Web Description Resources (W3C 2009). Building upon this, Eysenbach and Diepgen (1998) proposed that a similar screening platform be used "to provide 'context,' and evaluative categories such as 'source rating'" for medical websites so that patients can potentially find more suitable information and be better able to discern between valid and invalid information (1498). In addition to this, I believe a screening system needs to be developed to screen for accuracy, validity and usefulness, mirroring the "advanced search" option present on search engines such as Google.

Patient-focused interventions

We have already established that one of the biggest problems for laypeople is discerning between quality and quackery. Similar to getting a second or third opinion from providers, then, how are patients supposed to adjudicate between the opinions of different medical websites? Insurance companies would be best suited to develop a website "yellow pages" for providers and patients to make this easier. With this, it will be important to consider that variations in access to and comprehension levels of the population exist, to ensure that the resources provided are helpful to all demographics.

If patients are also being encouraged to be better communicators and undertake a more active role in 'driving the boat' towards better health, it would be beneficial to teach them how to ask questions, thereby increasing their confidence and willingness to engage in complicated discussions. For example, one approach to improving communication is to bolster patients' skills in asking questions and expressing their concerns. This could be accomplished by offering pre-visit 'coaching' sessions "designed to increase information seeking and address patients' perceived barriers to communication" (Lerman *et al.* 1993:2618). The P.A.C.E. framework (Presenting, Asking, Checking, Expressing), developed by Dr. Don Cegala at Ohio State University, is an established patient education system designed to improve communication with physicians, with the aim of enhancing patient adherence and comfort communicating with providers through training (Diefenbach *et al*. 2009:2-3). It has been incorporated into various communication skills training workshops hosted for patients, such as one designed by the Division of Health Care Communication in the College of Health Discipline at the University of British Columbia with Kitsilano-Fairview Mental Health (Kline and Saunder 2005). Patients who received this intervention were more assertive in directing communication, elicited more information from providers, reported fewer physical and functional limitations, and had improved health outcomes (Lerman *et al.* 1993). Insurance companies, HMOs and ACOs could apply this framework to create workshops that teach patients and providers how to initiate discussion of Internet information and implement them in hospitals and healthcare groups, who would be incentivized to host the workshops.

Limitations

The limitations of this study pertain to the dataset used. Because I used secondary data, there were certain things I was unable to investigate because I was limited by the data. HINTS only provided data from the patient perspective. Considering that many questions raised in the literature are aimed at gaining more information about the physician side, it would have been wise to do so. Additionally, the survey questions were not consistently asked in each data collection year. Because of this, I was limited in my ability to infer as much as I would have liked to about causal directions and patterns among the variables.

Future Research

This study could be expanded upon in several ways in the future. Since there is a lack of quantitative research on physicians' perceptions, future research is needed that will elicit and quantitatively measure physicians' attitudes toward Internet health information in large-scale studies. This research should also evaluate some of the barriers posed by physicians and management to implement information technology into practice, such as the hesitation to encourage discussion of medical website information. Trends between Internet use and the patient-provider relationship over time should continue to be monitored. Researchers should also consider assessing whether physician-directed communication skills interventions that have been effective in this past are effective when applied to the discussion of Internet health information in the medical consultation. Doing so will help identify more specific tactics that can be used to foster mutual participation in decision-making and encourage patient-provider discussion of Internet health information in the future.

Although not measured in this study but discussed in Chapter 1 is how patients of different cultural, socioeconomic and educational backgrounds use computers and the Internet for information, and the effect this has on their relationships with their healthcare providers. Lower literacy skills are associated with worse health, in part, due to a lack of comprehension of information and a lack of access to medical and educational resources (Gerber and Eiser 2001; Safeer and Keenan 2005). People with poor literacy skills are also less likely to use the Internet to search for medical information (Gerber and Eiser 2001). All of this often negatively affects their relationship with their healthcare provider, resulting in dissatisfaction and worse health outcomes. As Safeer and Keenan (2005) point out, however, health literacy is not just an issue for people from lower socioeconomic backgrounds. At least 20% of the adult population can read at a fifth-grade level, while most healthcare materials are written at a tenth-grade level. In addition, the elderly may have lower health literacy attributed to cognitive decline and vision and hearing loss which result from aging. Therefore, additional efforts should be developed to help all demographics with lower health literacy skills. One prototype that has been developed is an adaptive technology kiosk with touch-screen input and audio output. If clinics and providers' offices have these kiosks available, then patients who are motivated to learn can do so "independent of their literacy or education level" (Gerber and Eiser 2001:e15). The kiosk's associated costs, complexity of use and potential for misinformation, as well as its potential effects on the patient-provider relationship, still need to be studied further (Gerber and Eiser 2001). Part of this study should assess variations in access to healthcare and health education materials and the Internet in different geographic regions to identify areas where implementing this tool might be more advantageous.

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