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E-HEALTH AND THE INTERNET:

FACTORS THAT INFLUENCE DOCTORS'

MEDIATION BEHAVIORS WITH PATIENTS

by

ERIN ROBINSON

Under the Direction of Yuki Fujioka

ABSTRACT

The Internet's popularity as a health resource (also referred to as *e-health)* for patients is impacting the doctor-patient relationship and health care overall. Many patients now tend to look on the Internet for the information they seek in order to avoid the hassle of going to the doctor. It is important to investigate how the doctors themselves feel about this impact and see what factors influence their behaviors toward patients with regards to e-health. This study used mediation behavior theory and the theory of reasoned action to assess the relationship between doctors' beliefs/attitudes and their subjective norms about e-health and their mediation behavior toward patients. Results revealed that many factors, including perceived benefits of the effects of e-health, perceived concerns about possible negative effects, evaluations, positive experiences

with patients and social norms indeed affect the type of mediation behavior doctors perform with patients when discussing e-health.

INDEX WORDS: Doctors, Physicians, Internet, Patients, Research, Health, Mediation, Theory of Reasoned Action

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ERIN ROBINSON

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Erin Robinson

2008

E-HEALTH AND THE INTERNET:

FACTORS THAT INFLUENCE DOCTORS'

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December 2008

DEDICATION

This thesis is dedicated to doctors, their patients and those who work and do research in the health care area. I hope this study brings a better understanding of the way technology is impacting dynamics of the doctor-patient relationship.

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CHAPTER 1

Introduction

The Internet is a popular resource for health information, not only among the general public, but also among physicians. Currently, it is estimated that 73.6 percent of individuals in North America are Internet users ("Internet World Stats" 2008). Health topics are frequently-searched items, with websites like www.WebMD.com offering everything from diagnoses to information about medications. Additionally, doctors use the Internet for everything from accessing journals (Bennett et al., 2004; Bennett et al., 2005; Casebeer et al., 2002) to obtaining information for patients (Bennett et al., 2004; Bennett et al., 2005; Casebeer et al., 2002). The Internet's popularity as a health resource does not seem to be slowing down. A 2007 Harris Poll survey revealed that from 2005 to 2007 the number of people who have ever gone online to search for health information has increased noticeably, from 53 percent to 71 percent (Harris Poll 2007).

Past research shows that patients often bring information from health Internet resources to consultations with their physicians (Broom, 2005; Casebeer et al., 2002; Gerber & Eiser, 2001; Schwartz et al., 2006). Reflecting the rapid growth of the health Internet, the term *e-health* has emerged to indicate the use of the Internet as a health resource ("HIMSS SIG," 2003, p. 12). (A more detailed description and brief history will be given in Chapter 2.)

Studies show that some doctors accept their patients' use (Gerber & Eiser, 2001) whereas others are more troubled by it (Anderson, Rainey & Eysenbach, 2003; Broom, 2005). While many studies report that doctors either like or dislike patient use of e-health, few studies have examined how doctors deal with patients who use e-health. It is important to study doctors' responses to patients' use of e-health because research shows there is some concern on the part

of the doctors about the quality of e-health information and its possible effects on people who are not medical experts. Some doctors are concerned about patients getting the wrong information from e-health (Gerber & Eiser 2001). They are also skeptical of the quality of information (Dickerson et al., 2004; Gerber & Eiser, 2001; Lewis & Behana, 2001) and believe easy navigation is essential when patients use e-health sites (Eysenbach & Köhler, 2001; Gerber & Eiser, 2001).

Ayantunde, Welch, and Parsons (2007) state patients tend to rate the quality of health information on e-health higher than health care professionals. In many cases patients and the general public do not take into consideration who makes or sponsors a health website (Henwood et al., 2003), meaning they also do not really contemplate if the information is credible. Due to the lack of regulation, patients may be at a heightened risk of becoming victims of "official looking" web pages that lack peer review (Cotten & Gupta, 2004). Research indicate that doctors often receive e-health-related questions from their patients (Broom, 2005; Gerber & Eiser, 2001; Henwood, Wyatt, Hart & Smith, 2003; Malone, Mathes, Dooley & White, 2005; Schwartz et al., 2006), where they might validate (endorse or denounce) certain information and sites by actively discussing e-health with patients. These discussions about e-health, in which we may assume that doctors will be dispensing advice to patients about whether or not to use e-health or perhaps suggesting the best way to use it, are referred to as *mediation*. The term used in this situation first appeared in studies about parental mediation, a theoretical construct that has been examined in the context of parents mediating their children's media use. (A more detailed explanation will be given in Chapter 2.)

This study will look at how doctors mediate patients' e-health use. It will assess the relationship between doctors' attitudes and beliefs about e-health and their behavior toward

patients' use of it. More specifically, it will examine how doctors' beliefs about e-health, including perceived benefits and negative influences of e-health, quality of e-health information and past interaction with their patients using e-health, would be related to doctors' engagement of mediation behavior. The current study will also look at how perceived peer endorsement about mediation behaviors would be associated with doctors' mediation behavior.

CHAPTER 2

Review of Literature

Brief History of the Internet as a Health Resource

The term *e-health*, first used in 1999, refers to the use of the Internet as a health resource and everything related to computers and medicine - health services and information available via the Internet, (Eysenbach 2001) ranging from finding information to ordering medications online (Fox 2004). E-health has inevitable impacts, both negative and positive, on the doctor-patient relationship. The effect on these relationships has already begun to affect health care overall, as many patients now tend to look to e-health for the information they seek to avoid the hassle of going to the doctor. This change sits well with many physicians (Chew, Grant & Tote, 2004); for a few it is a disappointment (Broom, 2005).

To better understand the influence of e-health on the general public, it is important to look at who uses it, what they look for, and why they use it. In the context of this research, e-health as accessed by a consumer includes health sites that diagnose, such as www.WebMD.com, sites that provide information on health-related topics including diet, fitness, insurance, drugs, brand-name prescription drugs, and specific diseases.

There is no one specific definition of e-health, but the Healthcare Information and Management Systems Society (HIMSS) created an e-health special interest group and came up with a definition they feel encompasses all aspects of e-health. “[E-health is] the application of the Internet and other related technologies in the healthcare industry to improve the access, efficiency, effectiveness and quality of clinical and business processes utilized by healthcare organizations, practitioners, patients and consumers to improve the health status of patients” (“HIMSS SIG,” 2003).

The exact beginning of e-health is hard to pinpoint, as little or no literature exists on what was the first e-health or medical website. The reason for this could be that when people starting relying on the Internet for health information, they probably used search engines rather than specific websites. The number of people searching the Internet for health information was approximately 7.8 million in 1996, 23.3 million in 1999 and almost 100 million in 2001 (Bass et al., 2006). The most recent nationwide estimate of the number of people going online to search for health information is 160 million (Harris Poll 2007). Consumers say they mostly visit health information portals, government agencies, and nonprofit organizations when researching health information, meaning these consumers are getting their information from fairly credible sources (Bansil et al., 2006).

Professional organizations realized the potential of e-health as a health resource about the same time as the general public. The National Library of Medicine (NLM) developed a computer-based search interface, which was designed to make it easier for health professionals, patients and consumers to find information online. This interface, called the Grateful Med, was a software package introduced in 1986 that has since been enhanced in the NLM's effort to improve user access. In 1996, NLM released the Internet Grateful Med (IGM), an Internet-accessible version of the Grateful Med search software. Coupled with the rise in use of microcomputers, IGM added to the rise in use of e-health as a health search resource for medical professionals (Wood, Wallingford & Siegel, 1997).

Since the World Wide Web's development in the United States (Im & Chee, 2001) in the early 1990s, it has spread rapidly (Estabrooks, O'Leary, Ricker, & Humphrey, 2003). At the beginning of 1996, approximately six to ten million people were using the Internet (Im & Chee, 2001), and in 1996 and 1997 it emerged as a health resource. Countless sites offered information

sources ranging from articles to books, pamphlets, medical news, advertisements, discussion groups, educational programs, promotional material, online ordering of products and services, and the list continues (Rees, 1998). Tyson (2000) states that about 18 million adults used e-health in 1998. Currently, a Google search on the term “health website” yields over 69,500,000 results. A search on the term “medical website” yields 25,300,000 results.

In 1998, it seems that medical and health officials noticed the booming popularity of the e-health field and wanted to guide it in the right direction to maximize its potential as a health resource. In 1999 the *Journal of Medical Internet Research* was introduced and the first e-health “Developers’ Summit” was hosted by the e-health Institute, a nonprofit organization that uses new technologies like e-health to improve health (e-health Institute 2004). Many health-related websites disappeared in 2000 during the “Y2K scare,” but, overall, in the past decade, e-health has seen unparalleled growth in terms of its access to health information (Ahern, 2007), heavily influencing the decision-making process in people’s own health care (Anderson et al., 2003; Flynn, 2005).

The study of e-health continues to progress. In 2002, The Robert Wood Johnson Foundation (RWJF) implemented the Health e-Technologies Initiative, a five-year national program examining the efficiency of interactive e-health applications, including the Internet. The goal was to promote e-health evaluation research to see if the applications improved the outcomes for patients and consumers. At the beginning of the Initiative, a call for proposals based on any e-health research was put out. Eighteen proposals were awarded a total of $4.8 million in funds. In 2004 a call for proposals based on integrating e-health was put out. Six of these proposals were awarded a total of $2.45 million. The results of the projects showed that interest in e-health has increased heavily over the last few years. Using the synonym “behavioral

informatics," Ahern (2007) found that e-health articles on this topic increased from approximately 839 articles in 1984 to 3145 articles in 2004.

Because of the strong influence of e-health in the medical world, it is important to examine who is using it in a medical context and why. Health care providers, as well as the general public, all fit under the umbrella of medical e-health users, but their uses differ in some ways. First examined will be medical professionals' use of e-health for information.

E-health Use among Medical Professionals

Since e-health's emergence, it has grown in use among physicians and will continue to grow. Frequently-cited instances for physicians' e-health use include the following: (a) access to journals (Bennett et al., 2004; Bennett et al., 2005; Casebeer et al., 2002); (b) searches for information on clinical protocols (Chew et al., 2004); (c) consultations with other specialists and colleagues (Bennett et al., 2004; Chew et al., 2004); and (d) searches for information related to specific patient problems (Bennett et al., 2004; Bennett et al., 2005; Casebeer et al., 2002).

The rate of physicians' e-health use ranges from a few times a month to several times a day. Still, some studies report that physicians rarely or never go online for clinical information, including searching for patient-based information (Bennett et al., 2004; Casebeer et al., 2002). However, this does not apply to most physicians as their e-health use is becoming more frequent and will continue to grow. Research shows time spent online for health information is increasing. Average time spent using e-health when accessing clinical information (as self-reported by physicians) doubled from 4.4 times a month in 2001 to 8.6 times a month in 2003. Physicians ranked web sites as more important and journals and continuing medical education (CME) meetings as less important. This may be why their e-health use doubled in a two-year time span. In the study, many physicians reported using e-health for literature searching (71.5 percent),

which shows physicians benefit, at least in terms of availability, from being able to access this information online. Additionally, a main reason for family physicians' office use of e-health is their high rate of interaction with patients, as they often search for information to benefit their patients. In a random sample survey of 3,347 physicians conducted by Bennett, et al. (2004) it was revealed that family physicians have used e-health to solve specific patient problems related to diagnosis, management, patient education materials such as brochures on medications and diseases, and guideline summaries. The survey also showed specialists' use of e-health, in contrast to family physicians' use, is driven by the need to access online journals and up-to-the-minute research on a specific topic. Casebeer et al. (2002) administered a survey by facsimile to a random sampling of 2,200 U.S. office-based physicians of all specialties, including family practice, internal medicine, OB/GYN and cardiologists. The survey showed specialists as more likely to be e-health users than primary care physicians. This could be due to the fact that specialists are required to keep up-to-date with the latest research from online journals and need access to this information more frequently than primary care physicians need access to patient-related information. Additionally, patient consultations take up much of family physicians' time so they do not have the same amount of time in which to search e-health that specialists do (Chew et al., 2004). Casebeer et al. (2004) found medical specialists more likely to be users of e-health than surgical specialists.

E-health Use among General Public

In the context of this research, "general public" is defined as a person who is not currently under the care of a physician due to an illness. Surveys show the average e-health seeker to be female, younger, well-educated with a college degree (Bansil, Keenan, Zlot, & Gilliland, 2006; Cotton & Gupta, 2004; Dickerson et al., 2004), European-American (Dickerson

et al., 2004), and has a higher income (Cotten & Gupta 2004; Dickerson et al., 2004). Baker, Wagner, Singer, and Bundorf (2003) and Cotten and Gupta (2004) also found that less healthy people were more likely to search for health information online.

One trend of consumers is that more and more people are getting high-speed broadband Internet access in their homes; another is there are more users with six or more years of Internet experience. Broadband users are more likely to use e-health instead of asking a physician their health inquiries. Fast results from searches and the ability to quickly navigate through the results mean consumers will continue to use e-health for health information searches. They can easily and quickly go online to become health information seekers, which Tardy and Hale (1998) define as searching for information that provides confidence in health status and creates a cognitive sense of health.

With the means to use e-health, the average consumer has created a new identity, one that Ferguson (1997) termed the "online self-helper." As mentioned previously, consumers are no longer restricted to asking a doctor or consulting a (perhaps outdated) health reference book. According to Gerber and Eiser (2001), by 2001 more than 52 million adults had searched for health information on the Internet, and in 2004 this number jumped to approximately seven million people a day (Schwartz et al., 2006). According to Fox (2005), the trends ensure that this number will grow.

Women's roles as caretakers in the household are one reason they are more likely to search for health information online (Bansil et al., 2006). This may be why, compared to men, they are more concerned with their health as well as family and friends' health. Younger consumers are more likely than older ones to be experienced Internet users and be familiar with how to conduct Internet searches (Bansil et al., 2006), so they may be more likely to turn to it for

answers to health inquiries. Bansil et al., (2006) conducted random-sample survey among 8432 participants. The study revealed that people with at least a college degree were 2.68 times as likely to search for health information online as people with a high-school degree or less. In a study done by Dickerson et al. (2004) education was the most dominant predictor of online search behavior. A reason for well-educated people being more likely to go online for health information may be their increased experience in Internet research due to the need to use it for school purposes.

Who searches for health information online varies as much as what they search for. Surveys show consumers mostly search for information on specific diseases or conditions (Cotten & Gupta, 2004; Fox, 2005). However, they also use the Internet for “a broad range” of health information (Malone et al., 2005). According to Fox (2005), in 2004, e-health users searched for the following: medical treatments and procedures (51 percent), diet and nutrition (51 percent), exercise and fitness (42 percent), prescription or over-the-counter drugs (40 percent), health insurance (31 percent), alternative medicines (30 percent), a particular doctor or hospital (28 percent); mental health issues (23 percent), experimental treatments or medicines (23 percent), environmental health hazards (18 percent), immunizations and vaccinations (16 percent), sexual health (11 percent), Medicare or Medicaid (11 percent), problems with drugs or alcohol (8 percent), and how to quit smoking (7 percent).

There are many reasons why e-health is a popular source for information research. Hopping online to find an answer to a health or medical inquiry has become second nature in today’s technologically-driven world. The general public is beginning to depend on e-health for most of their necessary health information (Fox, 2005). Basic informative needs are one major reason consumers go online for health information (Bansil et al., 2006; Cotten & Gupta, 2004;

Lewis & Behana, 2001; Umefjord, Petersson & Hamberg, 2003). Ease and convenience in finding the information is another reason e-health is so popular (Bansil et al., 2006; Cotten & Gupta, 2004; Umefjord et al., 2003) as well as the ability to find information that is easy to understand (Bansil et al., 2006). Medical jargon used in general health publications, pamphlets, and leaflets distributed to the public can be hard to understand and can sometimes be a one-way model of communication (Henwood et al., 2003). If patients see medical terms on a website they do not understand, they can easily search for another website that is easier for them to interpret.

E-health Use among Patients

"Patient" here is defined as someone under the care of a physician due to an illness or as someone who visits a doctor for a clinical consultation. Patients value the information they receive from e-health as much as, or almost as much as, information they receive from their doctors (Diaz, Griffith, Ng, Reinert, Friedmann, & Moulton, 2002; Dickerson, Boehmke, Ogle, & Brown, 2006; Gerber & Eiser, 2001; Lewis & Behana, 2001). Aside from its convenience, a reason for the popularity of e-health may be due to a lack of communication between doctors and patients. Some patients feel they cannot effectively communicate with their doctors; reasons for this include doctors may be seeing too many patients to spend enough time with each one to explain everything (Tyson, 2000) or doctors may not be open to suggestions from patients on decisions made (Diaz et al., 2002). Patients have high opinions of e-health because they feel more educated on certain topics and they feel a sense of empowerment they otherwise would not (Broom, 2001; Dickerson et al., 2006). Instead of the doctor holding all the knowledge, they feel as though they share some of it, too.

Patients' use of e-health is very similar to the general public's use. Schwartz et al. (2006) surveyed 1289 participants regarding using e-health for health information. Sixty-five percent

reported access to the Internet and 74 percent of those participants reported using it to search health topics, including specific diseases, medications, nutrition, and illness prevention. A survey by Dickerson et al. (2004) found the most-mentioned reason for searching online for health information was to find out about a physical illness. Most of the participants (82.5 percent) used search engines such as www.google.com, one-third used general health-related websites like www.WebMD.com, and very few accessed a specific health website.

Patients' e-health use is further encouraged by the lack of a strong relationship between patients and physicians, which perhaps contributes to a lack of trust between them as well. One study shows patients search for information after a physician consultation (Dickerson et al., 2004). If physicians do not take the time to explain everything fully and their patients do not completely comprehend the information, it is understandable why they would feel the need for a second opinion (Umefjord et al., 2003) A problem with using health websites as a second opinion, however, is that patients may not be visiting their physicians when necessary, such as when they have serious health problems (Bansil et al., 2006). Furthermore, when in the company of their doctors, it is not likely patients will seek information like they would if they were at home using e-health (Cotten & Gupta, 2004).

Like consumers, patients' e-health use has to do with seeking information; however, patient use is closing information gaps (Dickerson et al., 2006), which refer to patients' lack of knowledge on health-related issues. These gaps stem from deteriorating physician-patient relationships. Patients feel that doctors are too busy to answer their questions. Umefjord et al. (2005) surveyed 1223 patients and discovered many of them felt the need for a second opinion after seeing a doctor who was too busy to answer questions. Many doctors make time to tell their patients basic information but do not take time to fully explain the details (Dickerson et al.,

2006), supporting Tyson's (2000) argument that there is a lack of attention to detail in the current doctor-patient relationship. Anderson et al. (2003) state that U.S. adults generally believe that doctors spend less time with patients than 10-15 years ago. Less time spent with patients means they may not have the opportunity to make sure they understand what the doctor is telling them, especially when, many times, information given from doctor to patient can be difficult to understand or hard to remember (Umefjord et al., 2003). Studies like this one show why the e-health is a popular resource.

Another reason for patient e-health use is that the Internet enables the general public to take a more active role in making decisions about their health through the use of social support and the ability to explore treatment options. Im and Chee (2001) state the importance of social support in that it helps prepare people for the difficult experiences they may go through with a new illness. Patients are better informed than in the past and thus play a different role in the decision-making process when it comes to their health (Gerber & Eiser, 2001). Unhealthy patients, meaning those with a chronic disease, especially feel the need to be better informed about their illnesses. In a study of e-health use among healthy patients *versus* chronic disease patients, Bansil et al.'s (2006) survey of 8432 participants found those patients with two or more diseases were more likely to search for online health information than those who reported having no chronic disease.

Convenience and anonymity (Umefjord et al., 2003) are reasons why patients, just as the general public, use e-health. As Cotten and Gupta (2004) state, "The Internet . . . allows users to ask awkward, sensitive, or detailed questions without the risk of facing judgement, scrutiny, or stigma" (p. 1797). Forkner-Dunn (2003) notes that patients want and expect quick, convenient and personalized health care. Ordering medications online or searching for information on a

physical condition without having to make a trip to the doctors' office is also very convenient for most patients. The comfort of anonymity comes into play for patients the same way it does for the general public – when patients have questions they are too embarrassed to ask, they can contact experts online under practically anonymous conditions (Anderson et al., 2003).

Dickerson et al.'s (2006) survey also found health sites, through online communities, provide emotional and social support and reassurance for cancer patients, which can be helpful for patients. The 20 female patients who participated in the survey accessed online discussion groups and searched for health information on Google to gain an understanding and get information about their specific types of cancer and to validate recommended treatments. They also got advice from others who had cancer or had it in the past and felt a "bond" was created among women who wanted to reach out and help each other. Patients felt reassured because they felt e-health offered the most current treatment protocols. They also confirmed information gained from health websites as well as treatment decisions with support networks (friends and family) that included someone with medical knowledge.

Patients use e-health because of its convenience and the fact that they can search for information anonymously (Umefjord et al., 2003). They feel more responsible in decision-making (Im & Chee, 2001) and feel a sense of empowerment (Broom, 2001; Dickerson et al., 2006) when they are armed with information from e-health. Unfortunately, another reason e-health is so popular is patients' feelings that communication between them and their doctors is not as strong as it could be (Tyson, 2000). These reasons for patients' uses differ from some of the reasons cited for doctors' uses, which include reading journals online (Bennett et al., 2004; Bennett et al., 2005; Casebeer et al., 2002), searching for clinical protocol information (Chew et al., 2004) and searching for information for patients (Bennett et al., 2004; Bennett et al., 2005;

Casebeer et al., 2002). The next section will discuss how doctors consider e-health as a health information source.

Doctors' Attitudes toward E-health

Perceived Benefits. Some physicians believe a benefit of e-health use is that discussion of patient searches can contribute to better communication in consultations, Casebeer et al. (2002) found. Schwartz et al. (2006) conducted a study and discovered 63 percent of physicians reported suggesting a specific health website to their patients. This shows that they think at least some e-health sites can be beneficial to patients, as long as they are visiting the right ones.

E-health use in general seems to be beneficial to people's overall health. In a study comparing online information seekers (people who use e-health in addition to doctors, pamphlets, etc.) with offline information seekers (people who do not use e-health), the online users were significantly more likely to have an overall good health record (Cotten & Gupta, 2004).

Perceived Concerns. Some physicians are concerned about patients accessing the wrong information for their health inquiries and are worried about how they will interpret the information they find (Gerber & Eiser 1). If patients use e-health to decide such things as what type of medicine to take or what kind of treatment to get, the effects could be disadvantageous, or, at the extreme, harmful or fatal.

Inaccurate information or the possibility of misunderstanding accurate information may cause some individuals to postpone necessary medical consultations or treatments (Dickerson et al., 2006) because they think there are better options than the conventional treatments (Broom, 2005). E-health may be used as an alternative to physicians, resulting in patients not going to them when they especially need to (Anderson et al., 2003). Luckily, very few cases of physical

harm due to e-health research exist (Crocco, Villasis-Keever, & Jadad, 2002). A study by Larner (2006) involving e-health use by a neurology outpatient population found no patient was physically harmed as a result of information accessed from e-health.

Strain on the physician-patient relationship due to e-health has been documented and is a concern of doctors about e-health. More and more patients use e-health before consultations, which has an increasingly strong impact on doctor-patient relationships (Gerber & Eiser, 2001). Studies show that physicians both disapprove and approve of these patients who are more informed and better able to assess the risks and benefits of medicines and treatment for themselves (Henwood et al., 2003).

Malone et al. (2005) found some primary care practitioners associated e-health use with patients' control issues and felt as though patients were using e-health to check up on the advice they received, which was unnerving to the physicians. Some disapprove because of the shift in control in the relationship. Now it is not just the doctor who has all the knowledge, as patients can go online and learn enough to at least ask questions they otherwise may not have thought of.

According to Gerber and Eiser (2001) some patients get a second opinion from e-health. This can promote a decline in trust in doctors (Broom, 2005; Dickerson et al., 2006). Schwartz et al. (2006) states some physicians feel challenged when a patient brings in information from e-health, which could lead to a breakdown of the relationship.

More literature exists describing doctors feeling threatened (Anderson et al., 2003; Broom, 2005), anxious and frustrated (Broom, 2005), and feeling concerned about patients crossing the line by bringing in too much information from e-health (Henwood et al., 2003). Physicians are not always open to discussing material brought in from e-health, which can

contribute to poor communication in clinical consultations (Schwartz et al., 2006; Broom, 2005), something that is already a problem and causes patients to go to e-health in the first place.

The changing patients' roles in the health decision-making process is a consequence of e-health use (Gerber & Eiser, 2001) that may be viewed as either a benefit or concern. Armed with information from e-health, patients are able to assume more responsibility in decision-making and be more active participants in it. E-health is a source of current health information for patients and the general public; they like that they can address their own health-related needs without having to go to the doctor (Anderson et al., 2003). On one hand, it is good for patients to feel more responsible and perhaps not as helpless in health care decisions. On the other hand, being more assertive has affected the dynamics of the physician-patient relationship, both negatively and positively. Therefore some physicians may view it as a benefit; some may be concerned about what they see as a negative effect.

Evaluations of e-health. Doctors' evaluations of e-health as a health resource varies when comparing their own use of it to patient use. Casebeer, Bennett, Kristofco, Carillo, and Centor (2002) asked physicians specifically about their use of e-health for medical information, and just over a third said it was very helpful; almost half said it was occasionally helpful. In a survey conducted by Bennett, Casebeer, Kristofco and Collins (2005), over half of family physicians felt confident that e-health provided appropriate quality medical information; only 14 percent were not at all confident. Seventy-three percent believed e-health was useful to physicians. Chew et al. (2004) found a majority of physicians believed e-health use had advantages such as convenience and being up-to-date, was easy to use, had observable benefits, and wanted to learn how it could help them at work.

Physicians are also concerned and skeptical about the quality of health information online (Dickerson et al., 2004; Gerber & Eiser, 2001; Lewis & Behana, 2001) and believe credibility of a site is more important than easy searching or 24-hour access (Casebeer et al., 2002). With the high e-health use of patients and consumers, doctors must advise which sites are most credible; in this way they can also be more confident that information found by patients is correct.

According to studies that have evaluated e-health sites, a few factors help ensure that the website is credible. For one thing, websites endorsed by government agencies and professional organizations (Schwartz et al., 2006) increase the trustworthiness of the site (Eysenbach & Köhler, 2001). Sites ending in ".com" or running advertisements on the page show that more effort may be going into marketing a product or attracting marketing partners (Bansil et al., 2006), rather than making sure site visitors obtain accurate information.

Eysenbach, Powell, Kuss and Sa (2002) conducted a review of empirical studies assessing the quality of health information for consumers; the review helped the researchers establish a framework for how the quality of health websites had been evaluated. The study reviewed 79 studies that evaluated a total of 5941 health web sites that reported 408 evaluation results and 86 quality criteria. They identified the most frequently used criteria as accuracy, completeness, readability, design, disclosures and references provided.

The researchers describe *accuracy* as the degree to which the e-health information agrees with the generally accepted medical practice. The authors noted that several of the studies they evaluated used different methods to evaluate *completeness*, which includes comprehensiveness, coverage and scope. Most evaluations that the researchers reviewed simply reported the web sites that mentioned specific elements; others used the Soot score, which appraises completeness by measuring the coverage of certain topics with each topic weighted differently. The

researchers note the difficulty of measuring the validity of completeness from the perspective of users and public health researchers. On one hand, a web site's attempt to be complete in health topics may have too much information and may be overwhelming to users. On the other hand, a web site that covers only one topic in depth may be considered incomplete by evaluators even though it fully covers that topic. Users often search across multiple websites to find the information they are looking for so it most likely would not matter if one web site they visited did not have all the necessary information. The researchers suggest evaluating whether the site covers the topics it claims to (Eysenbach et al., 2002).

Readability formulas were used in eleven studies reviewed by the researchers. The formulas used the length and complexity of words to measure sites' reading levels. Limitations of readability formulas are that they do not fully assess the comprehension level of web sites because they do not take into account explanation of medical jargon or writing style, including the tone of the writing and its attitude toward the audience.

Disclosures and *references provided* were other frequently-cited evaluation criteria in Eysenbach et al.'s (2002) study. The most frequently evaluated disclosures were authorship, ownership, sponsorship and advertising. Thirty studies evaluated whether a web site provided references.

Overall, the researchers' review of the evaluations revealed that 55 of the studies found quality to be a problem on health websites. Seventeen studies had neutral evaluations and seven had more positive conclusions. The researchers noted the difficulty of assessing a health web site's quality. One problem is it is hard to measure an e-health user's chance of coming across a website of poor quality because this risk is a function of the proportion of poor quality web sites on the web and the inability of the user to recognize its poor quality and thus avoid it. Studies

usually report risk but not the inability of the user; therefore it is impossible to evaluate the proportion of poor quality on the web. Also, because methods of assessment vary widely among evaluation studies, operational definitions of quality criteria are needed. (Eysenbach et al., 2002).

The variability in assessing health web sites is evident in other research. Easy navigation on a health website is important to physicians, both when they search e-health (Casebeer et al., 2002) and when their patients search (Eysenbach & Köhler, 2002; Gerber & Eiser, 2001). Another important factor, similar to the readability factor mentioned above, is understandability. According to Bansil et al. (2006), two factors that would promote e-health as an information resource are the ability to easily find health information which is understandable and easy to use. Therefore, websites should present information written at a seventh- or eighth-grade reading level so that most e-health users will be able to understand it. The current study will ask surveyed physicians to evaluate e-health web sites based on these criteria.

Past Experiences with Patients. Doctors' beliefs and attitudes toward e-health may also depend on their personal experience when discussing it with patients. Broom (2005) found that a significant amount of people often bring information from e-health into medical consultations to aid in decision-making. Gerber and Eiser (2001) report a study in which 1276 physicians were surveyed and it was found that 3 out of 4 doctors had patients bring information to them from e-health. Most physicians (about 75 percent) found this act to be unobtrusive but some looked at it as a positive challenge; others (less than 25 percent) believed it had a negative effect.

Physicians' past experiences with patients and e-health may influence their future experiences. Doctors who have had unpleasant experiences, such as those who feel challenged by patients who bring health information from e-health into the consultation (Schwartz et al., 2006), may always associate e-health with negative patient relationships. They may correlate it

not only with feeling threatened, but also with longer consultations due to having to answer more questions from the patient, having to take more time to explain e-health information and having to correct misinformed patients.

Physicians who have had pleasant experiences likewise may always associate e-health with favorable experiences. Gerber and Eiser's (2001) survey found that 75 percent of physicians found patients bringing in information from e-health to be unobtrusive. It could be that they like dealing with more informed patients in their consultations because they do not have to take as much time to explain information or do not have to answer as many questions.

Peer Influence

Besides personal beliefs discussed above, it is possible that doctors' behavior may also be influenced by social factors, such as their fellow physicians. For example, past research reported doctors' peers influence what drugs they prescribe to their patients. To identify factors that influence prescribing decisions among Turkish physicians, a study had 156 doctors surveyed and 75 percent reported being affected by department heads and colleagues in the same specialty when deciding which drugs to prescribe to patients (Kisa, 2006). A study by Gallan (2005) also reveals peer influence to be highly influential on doctors' drug prescription decisions.

Based on this information, we can propose the idea that discussion with peers may influence the way doctors deal with e-health issues. A doctor's colleagues' opinions may affect how he deals with patients' use of e-health as well as how he handles e-health-related questions from patients. If a doctor is aware that his colleagues are continually discussing e-health with patients, as well as fielding e-health questions from them, he may be more likely to do so also.

Conclusion

As the literature review has shown, e-health is heavily used in a health context by health care providers, the general public, and patients. Physicians tend to catch up on the latest research or seek out patient-specific information. Patients' and the general public's health searches consist of similar material, with patients often seeking social support.

Some physicians believe a benefit of e-health is that it creates better communication with patients. There are some concerns on the part of the physician, however, including one about the shift of power in the physician-patient relationship. Evaluations of e-health show that the best health websites are those sponsored by government agencies and health care organizations; these sites should also be easy to navigate and understand.

Consequences of e-health use for health information show it is a catalyst in changing patients' roles in the decision-making process since they now have more knowledge than patients of yesterday. Some physicians are uneasy about this change but many accept e-health's role in health and the boost of confidence it is giving many patients when dealing with treatment decisions and talking with their doctors, as shown in the research about doctors' past experiences (Gerber & Eiser, 2001). Additionally, research about the fact that doctors discuss prescriptions with peers (Gallan, 2005; Kisa, 2006) suggests that they might also discuss e-health and patients.

The goal of this research is to examine how often doctors discuss e-health with patients and what factors may influence doctors' engagement in such behavior. As reviewed above, these factors may include both doctors' personal beliefs and attitudes toward e-health and social influence via interactions with other doctors. The following sections will discuss theoretical framework, parental mediation and the theory of reasoned action (TRA), on which this research is based.

Theory of Reasoned Action

The theory of reasoned action (TRA) (Fishbein, 1967) assumes that a person's behavior is determined by his/her intention to perform a specific behavior. Behavioral intention is influenced by two key components: personal beliefs and attitude toward the behavior and social normative beliefs, or what a person thinks other people think he/she should do. Basically, the theory explains what influences people's behavioral choices. More specifically, it acknowledges that it is not only the individual factors of beliefs and attitudes but also the social factor of social-normative beliefs that matter when people make a behavioral choice. Hence, it is necessary in this research to consider both personal and social factors when examining doctors' behavior toward patients.

In TRA, attitudes and beliefs are measured both directly and indirectly. The direct measure of attitude is the overall evaluation of the behavior (Fishbein, 1967). For example, consider the behavior of increasing exercise by one hour per week. A person will have certain beliefs about this behavior, such as exercising more will (a) help him lose weight; (b) help him feel better; (c) leave less time for other activities; and (d) help him make new friends who also like to exercise. The indirect measure of attitude is the evaluation of the beliefs he attaches to the behavior. For example, he might believe losing weight, feeling better and making new friends are good outcomes and having less time for other activities is a bad outcome. More positive than negative outcomes would mean the person has a positive attitude toward increasing exercise.

The second component of TRA, subjective norm, is a social factor of whether people important to the person (those whose opinions the person values) performing the behavior approve or disapprove of the behavior. A person who does not think referents will endorse performing the behavior has a negative subjective norm; one who is not motivated to comply

with referents has a neutral subjective norm. In other words, the chance of the behavior being performed is increased if the person a) believes the outcome of the behavior will be positive and thus has a positive attitude toward it and b) believes referents will approve of the performance of the behavior and c) is motivated to comply with those referents.

Using the exercise example, a person is more likely to increase exercise if he believes that overall, his friends or family think it would be beneficial. Another part of the measure is the motivation to comply with these referents. Therefore, a person's intention to increase exercise is affected by whether the person is motivated to comply with each referent.

In their study of predictors of condom use among crack smokers, Bowen, Williams, McCoy and McCoy (2001) surveyed 586 participants. The researchers' goal was to identify the relationship between beliefs about condom use and outcome expectancies and intention to use them. Participants were asked about their intention to use a condom within the next 30 days. Subjective norms were assessed by asking the participants if significant others used condoms or thought the respondent should use condoms. Outcome expectancies were measured by asking the participants how pleasant the outcome of condom use would be. Beliefs about condoms in general were also assessed.

The results showed subjective norms to be strongly correlated with intention to use condoms. Beliefs that condoms block romance and beliefs about condom pleasure were strongly related to outcome experience. The study shows how influential subjective norms are on a person's decision to perform a behavior. This suggests that doctors' behaviors toward patients are heavily influenced by colleagues. For this reason, this study will measure doctors' subjective norms, which will be used to predict their behaviors by assessing their perceived peer

endorsement (whether they think other doctors also perform the behaviors) about certain behaviors.

Further verification that it is appropriate to use TRA in this study is that it has already been widely used in the health field and applied to several studies, including websites' use of behavior change theories (Doshi, Patrick, Sallis & Calfas, 2003) and a study using health education theories to explain behavior change (Murray-Johnson, Witte, Boulay, Figueroa, Storey & Tweedie, 2006). These studies show how TRA has successfully been applied to the health care world to explain certain behaviors.

TRA assumes that factors such as demographics do not exclusively contribute to the probability of performing a behavior (Montaño & Kasprzyk, 2002). TRA explores a person's decision to perform a behavior based on social norms and personal beliefs. It will help explain how and why doctors use certain mediation behaviors when dealing with patients and e-health in their consultations. In this study TRA will explore doctors' attitudes and subjective norms and examine their effects on behaviors toward e-health. The theory will be useful in explaining why doctors are more likely to engage in certain mediation behaviors. TRA says the most powerful predictor of actual behavior is behavioral intention; however, this study is not examining the variable of behavioral intention. It is a preliminary study of the relationship between doctors' beliefs/attitudes and their behaviors toward patients. The purpose of the study is to understand how doctors' beliefs/attitudes are related to their actual mediation behavior, instead of predicting what theoretical concept may influence behavioral outcomes.

Parental Mediation

Parental mediation is a theoretical construct that has been examined in the context of parents mediating their children's media use. It was developed by media researchers who were

concerned about the negative influence of television content on children (Austin, 1993; Austin et al., 1999; Austin et al., 2000), particularly violent and sexual content and health-related media messages, including television commercials (Austin, Pinkleton & Fujioka, 2000; Buijzen & Valkenburg, 2003). Later, it has also been applied to examine mediation effects children in a variety of content (e.g., gender stereotyping, Nathanson, 1999) and different media channels such as children's video game playing (Nikken & Jansz 2006). The basic tenet of parental mediation is that parents can influence the way their children interpret television messages by discussing media content with the child. The parental mediation literature has identified key reasons why parents engage in mediation behavior, which seems relevant and applicable to this research investigating doctors' behavior toward patients and their use of e-health.

Three specific types of parental mediation have emerged in the literature include (a) *positive mediation*, or endorsement of media content; (b) *negative mediation*, or discussing the negative aspects of television (Austin, Fujioka, Bolls & Engelbertson, 1999); and (c) *restrictive mediation*, when the parent is mostly concerned with controlling how much time the child spends watching television (Atkin, Greenberg & Baldwin, 1991; Austin, 1993; Corder-Bolz, 1980; Huston & Wright, 1996.). In the past, positive mediation and negative mediation were both categorized as active mediation, where parents intentionally engage in discussion with their children, and was believed to be the most effective form of mediation. However, more current research suggests that only negative mediation can be characterized as active mediation because positive mediation typically takes place on a more "haphazard" basis (Fujioka & Austin, 2003). Restrictive mediation also differs from negative mediation because the goal of restrictive mediation is parental control of the child's media use without much discussion of the media content with the child (Fujioka & Austin, 2002).

As seen in the description above, positive mediation occurs when parents wish to endorse television content. Past research suggests that parents are likely to use positive mediation when (a) they believe the content is beneficial to their children; (b) they are less skeptical about media content (Austin, 2001); and (c) they have positive views of television content (Austin, et al., 1999).

Negative mediation occurs when parents wish to denounce the content. Parents tend to engage in negative mediation when (a) they have concerns with how it could negatively affect their children and they wish to engage in "protective" behavior (Austin et al., 1999; Nathanson, 2001); and (b) they wish to reduce the influence of television on children (Fujioka & Austin, 2003); and (d) if there are perceived negative effects (Bybee, Robinson & Turow, 1982; Valkenburg, Kremar, Peeters & Marseille, 1999; van der Voort, Nikken, & van Lil, 1992).

Restrictive mediation occurs when parents make rules about which shows their children can watch. Past research indicates that parents tend to engage in restrictive mediation when they (a) also engage in one form of active mediation (Valkenberg, Kremar, Peeters & Marseille, 1999; van der Voort, Nikken & van Lil, 1992) (b) if they wish to censor content; (c) if there are perceived threats to children (Nathanson, Eveland, Park & Paul, 2002); and (d) if there are perceived negative effects (Bybee, Robinson & Turow, 1982; Valkenburg, Kremar, Peeters & Marseille, 1999; van der Voort, Nikken, & van Lil, 1992).

The fact that parents are more likely to engage in active (negative) mediation if they are concerned about the effects of television media suggests that parents' mediation behaviors are related to their perceived influence of mediated information. More specifically, parents are more likely to engage in negative mediation if they are concerned or incredulous about television messages and are more likely to use positive mediation if their level of skepticism is low

(Austin, 2001). Nathanson et al., (2002) name television content, specifically sex and violence, as a predictor of the type of mediation behavior the caregivers would perform.

It is evident that parents' beliefs and attitudes about television content influence the type of mediation behavior they use with their children. It will be useful to apply the same idea to doctors and patients. In the same way that parents' attitudes and beliefs shape their mediation behavior, doctors' attitudes and beliefs about the effects of e-health may influence the kind of mediation behavior they use with patients. It can be assumed that they will use positive mediation when they believe e-health has possible benefits for patients or if they tend to evaluate e-health highly. It is also possible that a high frequency of e-health use on the part of doctors would make them more likely to practice positive mediation, as these doctors may be more aware of potential benefits. An example of a behavior that would be classified as positive mediation would be a doctor endorsing e-health, perhaps by stating a positive opinion about it.

Regarding past experiences, doctors' positive experiences may come from doctors believing e-health is having a positive effect on and is beneficial to patients; negative experiences may occur when they are concerned or have doubt about their patients' abilities to use e-health in the best way possible. Therefore, past experiences may impact doctors' beliefs about e-health which may impact which mediation behavior doctors use.

Like parents, doctors may use negative mediation when they have concerns about possible negative effects of e-health or if they tend to give low evaluations to e-health sites. It is even possible that positive past experiences will make them more likely to practice negative mediation. If they feel constructive or comfortable discussing e-health, then it follows that they would feel comfortable discussing not only its positive but also its negative characteristics. An example of the way doctors might use this type of mediation would be to point out that not all

online health information is accurate and/or explain to patients how to recognize the credibility of health sites.

Also like parents, doctors may practice restrictive mediation if they believe there are benefits associated with e-health *and* if they have concerns about it. For the same reason they would practice negative mediation because of positive experiences, they would also probably practice restrictive mediation. It seems doctors who use e-health frequently would also practice restrictive mediation because they might know exactly which sites their patients should and should not visit. One major difference between parents and doctors is that when parents engage in restrictive mediation regarding children's television watching, they have the option to turn off the television or make rules about what shows their children can watch and then make sure those rules are followed. Doctors do not have this kind of ability with patients. Their methods of restrictive mediation might include directing patients to one or two specific websites, avoiding the topic of e-health in patient consultations, or attempting to limit the kinds of health websites their patients visit.

Hypotheses

This study will examine doctors' mediation behavior toward patients, based on their attitude toward and evaluation of e-health, past experiences when discussing e-health with their patients and perceived peer endorsement of e-health (subjective norm). The three kinds of mediation behavior being measured are positive mediation, negative mediation and restrictive mediation. Positive mediation refers to the endorsement of e-health, perhaps through the expression of a positive opinion. For example, a doctor may make a statement that he believes e-health can be a good source of information for patients. Negative mediation is the discussion of negative aspects of e-health, such as the fact that some health sites may not be credible.

Restrictive mediation is the attempt to limit patients' use of e-health by telling them not to visit certain sites while suggesting they visit others. Another example of restrictive mediation would be telling patients not to use e-health at all.

The review of research done on doctors and e-health reveals that many doctors use it for obtaining patient-specific information. They also seem to have generally accepted its existence in the health care world, as many doctors think it has benefits for patients. At the same time, a few doctors have expressed their concerns about the possible negative influence of e-health on their patients and are hesitant to embrace e-health as a health resource for patients to use.

Some doctors believe that discussing the information patients find from e-health leads to better communication in the consultation. Evidence also shows some doctors prescribe specific websites for their patients to visit, known as "Internet prescriptions" (Gerber & Eiser 2001), which is an example of restrictive mediation. Patients' wide use of e-health has affected the doctor-patient relationship, both negatively and positively.

Hypothesis 1

Research shows that doctors often use e-health to look up information on behalf of patients (Bennett et al., 2004; Bennett et al., 2005). Doctors also search e-health for information used to solve patient problems related to diagnosis, management and patient education materials like brochures (Bennett et al., 2004).

Taking into consideration the evidence of patient-related Internet use by doctors, we can make assumptions about a relationship between frequency of doctors' patient-related Internet use and mediation behavior. Hypothesized relationships appear in Figure 1.

Hypothesis 1: Doctors' frequency of patient-related Internet use will be related to actual mediation behavior.

H1a: Doctors' high patient-related Internet use will be related to more positive mediation.

H1b: Doctors' high patient-related Internet use will be related to more restrictive mediation.

In parental mediation literature, parents who watch television are more likely to use positive mediation but not negative mediation with their children. Because the content of e-health differs from television content in that patients use e-health to make health decisions, doctors may be likely to practice negative mediation. Thus,

Research Question 1: Is doctors' high patient-related Internet use related to more negative mediation?

Hypothesis 2

Doctors who believe e-health is beneficial to patients would be more open to discussing the helpful and positive aspects of e-health. Additionally, they may encourage the use of e-health to patients. Hypothesized relationships appear in Figure 2.

H2a: Perceived benefits from e-health will be related to more positive mediation.

Literature on parental mediation and children's television watching reports no relationships between perceived benefits and restrictive mediation. However, it may be postulated that doctors will practice restrictive mediation with their patients if they think e-health has benefits, but only if patients visit health sites the doctors recommend. Thus,

Research Question 2: Are perceived benefits related to more restrictive mediation?

Hypothesis 3

If doctors are concerned about the negative influence of e-health, they would be more likely to use negative mediation by telling patients there are some risks involved with using e-health for health purposes, thus discouraging patients from using it. Also, doctors who are skeptical about some health websites and/or e-health information would probably want to

discourage patients from using e-health sites of which they do not approve. Therefore, they may also use restrictive mediation by suggesting their patients visit only certain sites. Hypothesized relationships appear in Figure 3.

H3a: Greater perceived concerns about a negative influence of e-health would be related to more negative mediation.

H3b: Greater perceived concerns about a negative influence of e-health would be related to more restrictive mediation.

Hypothesis 4

It can be argued that doctors' mediation behavior might be related to how doctors evaluate the quality of e-health information. One of the criticisms about e-health has been that inaccurate information could cause patients not to seek necessary medical help (Dickerson et al., 2006). Nathanson et al. (2002), showed that nature of television content determined mediation behavior. The same idea may be applied to doctors. Content of e-health sites will determine doctors' evaluations of them, which could determine their mediation behaviors. As predicted in Hypothesis 3, doctors who perceive e-health as less accurate and less credible would be more likely to discourage e-health use and/or counter e-health information by engaging in negative mediation and/or restrictive mediation. Therefore, those who consider e-health info credible will endorse it. Hypothesized relationships appear in Figure 4.

H4: Doctors' evaluations of the quality of e-health information would be related to their actual mediation behavior.

H4a: Higher evaluation of e-health information will be related to more positive mediation.

H4b: Lower evaluations of e-health information will be related to more negative mediation.

H4c: Lower evaluations of e-health information will be related to more restrictive mediation.

Hypothesis 5

Some doctors do not approve of e-health because they feel challenged when patients ask questions or bring in information from it (Schwartz et al., 2006). They may also relate it to longer consultations, which can be problematic because doctors today spend less time with patients than they did 10-15 years ago (Anderson et al., 2003) Talking with patients about why e-health may not be credible or trustworthy, along with other negative aspects, may discourage patients from using it, which may be the goal of some doctors. Hypothesized relationships appear in Figure 5.

H5a: High frequency of patient-generated inquiries about e-health (those who frequently receive e-health-related questions from patients) will be related to more negative mediation.

Hypothesis 6

There is also some evidence that shows that many physicians believe it is unobtrusive when patients bring in information from health sites; some even believe it has a positive effect on the patient-doctor relationship because it can lead to better communication (Casebeer, et al., 2002). This leads to the notion that if doctors feel positive (constructive or comfortable) when discussing e-health, then they will practice more mediation behavior. Hypothesized relationships appear in Figure 6.

H6a: More positive experiences that doctors had when they discussed e-health information with patients would be related to more positive mediation.

H6b: More positive experiences that doctors had when they discussed e-health information with patients would be related to more negative mediation.

Hypothesis 7

Another factor that will affect doctors' behavior toward patients is their perceived peer endorsement, or whether their colleagues approve of the behavior, also referred to subjective

norm. If a doctor is motivated to comply with his colleagues, he is more likely to perform the behavior, whether it is positive, negative or restrictive mediation. Hypothesized relationships appear in Figure 7.

H7a: Greater perceived peer endorsement will be related to more positive mediation.

H7b: Greater perceived peer endorsement will be related to more negative mediation.

H7c: Greater perceived peer endorsement will be related to more restrictive mediation.

CHAPTER 3

Methodology

Participants

Demographics are presented in Table 1. One hundred and four doctors responded to the survey, including 63 doctors from St. Joseph's Hospital, 27 from Piedmont Hospital, 12 from the Georgia OB/GYN Society and two from the Georgia Academy of Family Physicians (GAFP). The mean age of participants was 48.1 years, ranging from 29 to 75, with 15 not providing this information. Approximately 61.2% of respondents were male and 25.5% were female; 12.7% did not answer. Most respondents (69.6%) were Caucasian/White; 6.9% were African-American/Black; 5.9% were Asian-American/Asian; 2.9% were Hispanic/Chicano(a)/Latino(a); 1% reported "other" as European Hispanic; 13.7% did not answer this question.

Approximately 77.5% said they worked at a private organization; 9.8% reported working at a public one; 12.7% did not answer this question. Respondents practiced a wide variety of specialties (over 20), but the most frequently cited specialties were internal medicine (16.7%); family medicine (12.7%); obstetrics and gynecology (12.7%); cardiology (8.8%). 13.7% did not respond. Terminate degrees earned were mostly M.D. (84.3%); one reported D.D.S.; another D.P.M; another N.M.P; 12.7% did not answer.

The average number of years practicing medicine was 21, ranging from 3 to 50, with 29.4% working 11-20 years; 24.5% having worked 21-30 years; 18.6% at 3-10 years; 11.8% at 31-40; 2% working 41-50 years, and 13.7% not responding. 83.3% reported working full-time; 3.9% reported working part-time; 12.7% did not answer. Respondents reported seeing an average of 96.7 patients per week, ranging from 15 to 200. Eighteen respondents did not report

this information. The number of hours spent in face-to-face consultations ranged from 7 to 120 and averaged 40.9 hours; 15 respondents did not report this information.

Research Design

A cross-sectional online survey was used for collecting data from doctors. Participants responded to a questionnaire through a website. SurveyMonkey, an online custom survey tool, was used to create the survey. The survey took approximately 15 minutes to complete. It included measures of mediation variables, doctors' patient-related Internet use, perceived benefits of e-health use, perceived concerns about the negative influence of e-health, doctors' evaluations of e-health, experiences with patient-generated inquiries, positive experiences (doctors feeling constructive and/or comfortable discussing e-health), and perceived peer endorsement (subjective norms).

Participant Recruitment Procedure

The only criterion was that the survey be taken by doctors who see patients on a weekly basis. WellStar Health System, Emory University Hospital and Piedmont Hospital's medical staff offices were contacted about having their physicians complete the survey. Only Piedmont Hospital agreed to send the survey out. Several other organizations were contacted to find more physicians and, eventually, four organizations agreed to send the survey to their physicians. A survey link was e-mailed to four contacts, one from each of the four organizations who agreed to send the survey out. The survey link was sent to 100 physicians at Piedmont Hospital which is located in the Atlanta area; 725 physicians at St. Joseph's Hospital of Atlanta, a not-for-profit institution located in Atlanta, Ga; 20 physicians who are members of the GAFP, a professional medical organization based in Tucker, Ga; and 100 physicians who are members of the Georgia Obstetrical & Gynecological (OB/GYN) Society, a professional medical organization based in

Suwanee, Ga. The contacts then e-mailed the link out to the physicians with a message explaining the purpose of the survey.

Measures

Positive Mediation Behavior. Positive mediation behavior (Austin, et al., 1999) was measured with five items which follow a study by Austin et al. (1999) which examined patterns of television-related interaction. The items assessed the frequency of participants' performance of behaviors such as encouraging patients to use e-health or explaining why e-health use may be beneficial. Questions were answered with a five-point Likert scale ranging from "very often" (5) to "never" (1) (Likert, 1932).

Negative Mediation Behavior. Negative mediation behavior was assessed by following Nathanson's (1999) study of the relationship between parental mediation and child aggression. Participants were asked about their discussions of negative qualities of e-health. This behavior was measured with four items which assessed the frequency of participants' performance of behaviors such as explaining how to recognize the credibility of websites or having discussions about how some online health sites are not good sources of information. Questions were answered with a five-point Likert scale ranging from "very often" (5) to "never" (1).

Restrictive Mediation Behavior. The survey also followed Nathanson's (1999) study to assess restrictive mediation behavior and asked about certain suggestions doctors may have made to patients that would limit or cease their e-health use. Restrictive mediation behavior was measured with four items which asked participants how often they performed behaviors such as suggesting one or two specific sites to visit or telling patients to limit their e-health use altogether. Questions were answered with a five-point Likert scale ranging from "very often" (5) to "never" (1).

Frequency of Internet use. Doctors' frequency of Internet use and what they use it for were measured with a six-item scale with questions that were answered with a five-point Likert scale ranging from "very often" (5) to "never" (1). Items from Bennett et al.'s (2004) study were used. Doctors were asked how often they use the Internet for certain tasks. The question answered was, "How often have you used the Internet for the following purposes?" Answers were categorized into professional use (reading journals, checking CME information) patient-related use (looking up information for patients, checking information related to patients), and personal use (checking e-mail, reading daily news.)

Perceived benefits of e-health use. Items to assess doctors' perceived benefits of patient e-health use were taken from a survey conducted by Potts and Wyatt (2002) that asked doctors about the benefits of e-health. A five-item scale asked doctors about their opinions on whether they think e-health increases certain things, such as knowledge and awareness of health-related issues and diseases. The items were rated with a five-point Likert scale ranging from "strongly agree" (5) to "strongly disagree" (1).

Perceived concerns of e-health use. The Potts and Wyatt (2002) survey provided items to assess doctors' perceived concerns about the negative effects of e-health use. A five-item scale asked doctors about their opinions on whether they think e-health decreases certain things, such as the likelihood of patients seeking necessary medical help. The items were rated with a five-point Likert scale ranging from "strongly agree" (5) to "strongly disagree" (1).

Evaluation of e-health. Doctors' evaluations of the quality of e-health information were assessed by doctors' opinions about health websites' accuracy, credibility, trustworthiness, completeness and readability (Eysenbach et al., 2002). Participants responded to a five-item scale. The stem of each statement read, "Most e-health websites _____." Sample items read,

"provide accurate information," and "are trustworthy and credible." A five-point Likert scale ranging from "strongly agree" (5) to "strongly disagree" (1) was used to rate this part of the survey.

Frequency of patient-generated inquiries. Participants were asked to indicate how often they answer patients' questions or give advice about e-health. This index variable was created based on what patients and consumers search for (Cotton & Gupta, 2004; Fox, 2005; Schwartz et al., 2006. Answers were rated with a five-point Likert-scale ranging from "very often" (5) to "never" (1).

Positive past experiences. This variable was measured with one item which asked how often participants feel constructive when e-health is discussed and one reverse item which asked how often they feel uncomfortable when it is discussed. Answers were rated with a five-point Likert scale ranging from "very often" (5) to "never" (1).

Perceived peer endorsement (subjective norm.) Following Ross, et al.'s (2007) cancer study, the measure of perceived peer endorsement was obtained with a three-item scale that assessed doctors' overall beliefs about whether other doctors approve or disapprove of discussing e-health with patients. The stem of each statement read, "Most physicians/colleagues who are important to me think_____." Items were measured on a five-point Likert-scale ranging from "strongly agree" (5) to "strongly disagree" (1).

Demographics. The survey also collected demographic information about participating doctors (Murray et al., 2003). It asked them to provide information on what type of organization they practice in, number of years practicing, number of patients seen per week, how many hours they spend per week on face-to-face consultations, and age, gender and ethnicity. Information

was also taken from the Medical Marketing Service and asked doctors to provide information on their specialty (primary and secondary), type of practice and type of degree (M.D. or D.O.)

Data Analysis

Descriptive analysis was used to describe participating doctors. Cronbach's alpha was used to assess measurement reliabilities of each multiple-item measure. Correlation analysis using the Pearson product-moment correlation coefficient was used to examine all of the hypotheses that examine the relationships between mediation behaviors and several individual variables such as doctors' attitudes toward e-health, past experiences and subjective norms. The data were analyzed using SPSS.

CHAPTER 4

Results

Mean scores for main variables are presented in Table 2.

Internet use

When asked how often they use the Internet for professional, patient, and personal use, doctors indicated that they use the Internet "very often" for personal matters, "often" for patients, and "sometimes" for professional use. More specifically, physicians said they "sometimes" use the Internet to read journals (*M*=2.93, *SD*=1.19) and check continuing medical education opportunities (*M*=2.98, *SD*=1.13). They "often" use it to look up specific information for patients (*M*=3.57, *SD*=1.17) and check information related to patients (*M*=3.51, *SD*=1.21). They use the Internet "very often" to check e-mail (*M*=4.7, *SD*=.68) and "often" use it to read daily news (*M*=3.73, *SD*=1.4). Doctors use the Internet "very often" for personal use, "often" for patient use, and "sometime" for professional use.

Mediation Behavior

Doctors "sometimes" use positive mediation with patients (*M*=2.67; *SD*= 4.38). More specifically, they "sometimes" encourage patients to use health websites (*M*=2.96, *SD*=.922), "sometimes" say they like some health websites (*M*=2.76, *SD*=1.22), "sometimes" point out that some of the services or content of health websites are good (*M*=3.01, *SD*=1.12), "rarely" say they like products and services found on health websites (*M*=2.12, *SD*=.932), and "rarely" explain the benefits of e-health use (*M*=2.49, *SD*=1.03).

Doctors "sometimes" use negative mediation (*M*=2.95, *SD*=3.89). They "sometimes" talk to patients about the risk of relying only on online health information (*M*=3.22, *SD*=1.05), "sometimes" explain why some health websites might not be credible (*M*=3.02, *SD*=1.16),

“sometimes” explain how to recognize the credibility of health websites (*M*=2.54, *SD*=1.15), and “sometimes” discuss with their patients that some online health information is not good (*M*=3.09, *SD*=1.07).

Doctors “rarely” use restrictive mediation (*M*=2.06, *SD*=2.81). More specifically, they “rarely” attempt to limit the kinds of health websites their patients may visit (*M*=2.08, *SD*=1.14), “sometimes” suggest one or two specific health websites their patients could visit (*M*=2.67, *SD*=1.21), and “rarely” (*M*=1.69, *SD*=.95) discuss with patients instances where it may be beneficial to consult the Internet rather than visit a medical professional.

Reliability

Reliability for each of the key index variables was examined using Cronbach’s alpha. Results are presented in Table 2. For the mediation behavior subscales, reliability was high for positive mediation (alpha = .89) and negative mediation (alpha = .91) but was relatively low for restrictive mediation (alpha = .65). Reliability was also high for the following index variables: Doctors’ patient-related Internet use (alpha = .85); perceived benefits (alpha = .71); perceived concerns (alpha = .73); evaluation (alpha = .86); neutral past experiences (alpha = .77); and subjective norm (alpha = .86). Reliability for the two positive experience items (doctors feeling constructive and comfortable when discussing e-health) did not reach the acceptable level (alpha = -.062.) Thus, these two items were examined individually.

Testing Hypotheses

Results of hypotheses testing are shown in Table 3.

Hypothesis 1

Hypothesis 1 stated that doctors’ frequency of patient-related Internet use would be related to their actual mediation behavior.

Hypothesis 1a predicted that doctors' high patient-related Internet use would be related to more positive mediation. Results showed a significant positive correlation, r=.56 (87), $p < .01$. H1a was supported.

Hypothesis 1b stated that doctors' high patient-related Internet use would be related to more restrictive mediation. There is a significant positive correlation, r=.50 (87), $p < .01$. H1b was supported.

Research Question 1

RQ1 asked if doctors' high patient-related Internet use was related to more negative mediation. Results showed a significant correlation between doctors' high patient-related Internet use and negative mediation, r=.22 (87), $p < .05$. The finding indicated that doctors who use e-health to look up information related to patients were more likely to practice negative mediation.

Hypothesis 2

H2a predicted that perceived benefits from e-health would be related to more positive mediation. There is a significant positive correlation between perceived benefits and positive mediation, r=.41 (88), $p < .01$. H2a was supported.

Research Question 2

RQ2 asked if there was a positive relationship between perceived benefits and restrictive mediation. Results showed a significant correlation between perceived benefits and restrictive mediation, r=.22 (88), $p < .05$. The findings indicated that doctors who believe e-health is beneficial to patients practiced more restrictive mediation.

Hypothesis 3

H3a stated that perceived concerns (negative influence of e-health) would be related to more negative mediation. Results show a significant positive correlation, r=.32 (88), $p < .01$; H3a was supported.

H3b stated that greater perceived concerns would be related to more restrictive mediation. Results showed a significant positive correlation, r=.18 (90) $p < .05$. H3b was supported.

Hypothesis 4

H4 predicted that doctors' evaluations of the quality of health information on e-health would be related to their actual mediation behavior. H4a predicted that higher evaluation of e-health information would be related to more positive mediation. The results indicated higher evaluations were significantly positively correlated with positive mediation, r=.25 (88), $p < .01$. H4a was supported.

H4b predicted that lower (or negative) health evaluations would be related to more negative mediation. There was a significant correlation between doctors' evaluations of e-health and negative mediation r= .29 (88), $p < .01$. H4b was supported.

H4c predicted that lower health evaluations would be related to more restrictive mediation. The correlation between evaluation and restrictive mediation was not significant r=.01 (88), $p < .05$. H4c was rejected.

Hypothesis 5

H5a predicted more frequent patient-generated inquiries about e-health information would be related to more negative mediation. Results showed a positive relationship between

frequency of patient-generated inquiries and negative mediation r=.46 (89), $p < .01$. H5a was supported.

Hypothesis 6

H6 predicted that the more positive experiences that doctors had when they discussed e-health information with patients would be related to more mediation behavior. The two items related to positive experiences (doctors feeling constructive and doctors feeling comfortable), were run separately in the correlation analysis because of low reliability scores. H6a stated that the more comfortable the doctors felt when discussing e-health information with their patients would be related to more positive mediation. The result showed a significant positive correlation between doctors feeling constructive and positive mediation, r=.52 (92), $p < .01$. The result, however, indicated a non-significant relationship between doctors feeling comfortable and positive mediation, r= .16 (92), $p < .06$. H6a was partially supported.

H6b predicted that the more comfortable the doctors felt when discussing e-health information with their patients would be related to more negative mediation. The results indicated that the more comfortable doctors felt when discussing e-health with their patients was significantly related to negative mediation, r= .29 (92), $p < .01$. Also, the results showed the more constructive doctors felt when discussing e-health with their patients was significantly related to negative mediation, r=.23 (92), $p < .05$. Hypothesis 6b was supported.

Hypothesis 7

H7a predicted that greater perceived peer endorsement for mediation behavior (subjective norms) would be related to more actual mediation behavior. H7a predicted that greater perceived peer endorsement would be related to more positive mediation. The results indicated a significant positive correlation, r=.44 (88), $p < .01$. H7a was supported.

H7b predicted that greater perceived peer endorsement would be related to more negative mediation. This prediction was not supported r= -.01 (88), p < .46. H7b was rejected.

H7c predicted that greater perceived peer endorsement would be related to more restrictive mediation. There was a positive correlation between perceived peer endorsement and restrictive mediation, r=.24 (88), p < .05. H7c was supported.

CHAPTER 5

Discussion

The purpose of this research was to examine possible factors that influence doctors' engagement in different types of mediation behaviors. Whereas most of the parental mediation research looked at entertainment media content, such as television violence and sex, this study applied mediation behavior to the context of e-health. Additionally, previous studies examining the health Internet focused on the patients' and doctors' perspectives of how e-health is changing health care, including patients' changing roles in the decision-making process and the fact that many doctors believe e-health has created a challenge in consultations. However, no study could be found that investigated what specific factors influence doctors' behavior toward patients. Examining what influences doctors' mediation behavior may be particularly important, considering the high popularity of e-health among patients, and that patients seem to have a difficulty in validating the quality of information on e-health (Ayantunde et al., 2007).

This study used the theory of reasoned action (TRA) to look at how doctors' attitudes toward e-health and subjective norm might be related to doctors' actual mediation behaviors. The study also used parental mediation to predict a specific relationship between mediation behavior and personal beliefs and social normative beliefs. By investigating doctors' evaluations of e-health, perceptions of benefits and concerns of e-health, past experiences with patients and subjective norms, this research identified several significant correlates for positive, negative and restrictive mediation, which will be summarized below.

General Findings

Positive mediation. Positive mediation is the endorsement of e-health through discussion of its positive aspects with patients. Significant results showed that doctors were likely to

perform positive mediation in patient consultations when they frequently used e-health to look up patient-related information (H1a). Doctors were more likely to use positive mediation when they perceived e-health to be beneficial to patients (H2a) and when they evaluated e-health highly (H4a). When doctors had positive experiences of feeling constructive when e-health was discussed, they also used positive mediation (H6a). Finally, they were more likely to use positive mediation when their colleagues also used it (perceived peer endorsement) (H7a).

Negative mediation. Negative mediation is when doctors explain to patients the need to be cautious when using e-health because of certain risks, like inaccurate and incomplete health websites. Expected significant results showed doctors used negative mediation when they had concerns about the negative influence of e-health (H3a). They also used it when they rated e-health with low evaluations (H4b) and when there was a high frequency of patient-generated inquiries (H5a). Lastly, having positive experiences of feeling constructive and comfortable when e-health was discussed also made it more likely that they would practice negative mediation (H6b).

Restrictive mediation. Restrictive mediation is doctors' attempt to limit which sites patients visit by directing them to use sites the doctors approve of while telling them not to visit other sites. Expected significant results showed restrictive mediation occurred when doctors' patient-related e-health use was high (H1b). It also occurred when doctors were concerned about the negative effects of e-health (H3b). Doctors used restrictive mediation when their colleagues also practiced restrictive mediation (H7c).

Research Question 1 asked if a relationship existed between a high frequency of doctors' patient-related Internet use and negative mediation; a significant relationship did exist. Doctors' use of e-health in this manner shows they have an overall positive attitude toward it, which

means they would have a positive attitude about helping patients get as much advantage out of using e-health as they can. The best way to do this would be to discuss the positive and negative characteristics of e-health while going a step further and suggesting sites the patients should and should not visit.

Research Question 2 showed there was a relationship between perceived benefits and restrictive mediation. A way to explain this result is that although some doctors may believe e-health has benefits, they are aware of unreliable sites that exist and know their patients cannot reap the benefits of e-health if they visit these sites. Therefore they must engage in restrictive mediation and direct patients to sites they find worthy.

Unexpected Findings

It was thought that if doctors evaluated certain websites negatively, then they would engage restrictive mediation and tell patients to limit their searches to one or two websites that the doctors evaluated positively (H4c). However, the postulation that lower e-health evaluations would be positively related to restrictive mediation was rejected. This may be because doctors were asked to evaluate e-health as a whole; they were not asked about specific websites. Restrictive mediation says doctors will recommend to patients specific websites they evaluate highly. So, no relationship was found between negative evaluation and restrictive mediation. This means there could be a measurement issue with the restrictive mediation variable.

Hypothesis 6a addressed the matter of doctors using positive mediation when they have positive experiences (feeling constructive and comfortable discussing e-health.) This hypothesis was only partially supported, as doctors are more likely to employ positive mediation when they feel constructive discussing e-health, but not when they feel comfortable discussing it. It may be that doctors who feel at ease when discussing it do not always feel constructive (because it could

valuable take time away from the consultation) so they would not always take the time to discuss with patients about the good qualities of e-health.

The prediction that greater perceived peer endorsement would be related to negative mediation (Hypothesis 7b) was rejected. If doctors believe their colleagues think e-health is not a good resource for patients and should not be discussed, this may clarify why they would not talk about the negative aspects of e-health. Instead of taking the time to go into detail about why certain websites can or cannot be trusted, they may find it easier (if their colleagues *do* think e-health should be discussed) to simply talk about positive aspects of e-health and then recommend one or two sites to patients to visit.

Limitations

This study used a zero-order correlation, which is the relationship between two variables while ignoring the influence of other variables (Bakeman & Robinson, 2005). This type of analysis does not account for possible overlaps between other factors. Using other analyses, such as partial correlation or semi-partial correlation, in addition to the one used, would have provided a more in-depth breakdown of the factors that influence doctors' behaviors toward patients.

The study had a smaller-than-desired sample size. Response rates for online surveys among average people are fairly low at 26% (Hamilton, 2003); other research suggests that online surveys are not a good way to achieve a high response rate from physicians (Aitken, Power & Dwyer, 2004). The sample may also be considered limited in terms of all respondents being located in the state of Georgia. Ideally, the samples of the groups located in Atlanta (Piedmont Hospital and St. Joseph's Hospital), joined with the samples of respondents located

outside Atlanta (Georgia OB/GYN Society and the GAFP) are representative of the United States. However, a national survey would provide more depth.

The study's use of parental mediation literature provides some evidence that parental mediation measures, especially positive mediation and negative mediation, can be applied in a health mediation context. Although some hypotheses involving restrictive mediation were supported, the low reliability score of this variable (alpha = .65) shows that further study is needed to refine the measure.

Practical and Theoretical Implications

This study is possibly one of the few or the first studies to apply the concept of mediation to examine how doctors' attitudes about e-health are related to their behavior toward patients. The study also suggests the potential benefit for patients if their doctors discuss e-health with them. Clearly it is a popular source of health information and doctors have the ability, through mediation behavior, to ensure that patients get as much advantage as possible out of e-health.

The research of this study shows that doctors, if they are not already, should indeed make an effort to engage in mediation behavior regarding e-health and patients. Doctors who (a) use e-health themselves for patient-related information; (b) believe there are benefits associated with e-health; (c) have concerns about e-health; and (d) evaluate and have opinions about e-health are more likely to perform mediation behavior than doctors to whom these factors do not apply. Those doctors still need to be cognizant of the fact that patients are using e-health and mediation from doctors is necessary.

The mediation behavior concepts used in this study seem to be useful in the discussion of possible behaviors doctors may engage in with patients when e-health is involved. By categorizing doctors' behaviors into positive, negative, or restrictive mediation, the ideas from

this theoretical framework allowed for an efficient way to see exactly how doctors interact with patients when e-health is concerned.

In addition, the theory of reasoned action (TRA) has been useful in explaining how various factors influence doctors' behavioral choices. TRA's explanation of attitudes/beliefs toward e-health and the social influence of subjective norms that affect behavioral choices, combined with mediation behavior, make it possible to form hypotheses and make predictions about several issues related to e-health and how those issues would affect how the doctors behaved toward patients. This helps recognize how doctors will respond to e-health in the future, which is necessary because patients will continue to use this emerging phenomenon. This study also provided some evidence that, in addition to individual/personal behavior such as using condoms, TRA could also predict an "interpersonal" behavior that is more interactive and conditional, i.e., in most cases e-health is discussed only if the patient brings it up.

Future research in this subject might involve testing the role of behavioral intention in predicting doctors' actual mediation behaviors and identifying more possible influences on what mediation behavior doctors use and then analyzing those factors. Additionally, as mentioned previously, using other analysis, such as partial correlation, may provide a better understand of why some factors influence doctors' decisions to do certain behaviors and other factors do not. Another idea might be to study the effects of doctors' mediation behaviors on patients to see if doctors' mediation of patients contributes to better use of e-health and better overall health.

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Appendix A
Questionnaire

Introduction
The term *e-health* refers to the use of the Internet as a health resource and everything related to computers and medicine - health services and information available via the Internet, ranging from finding information to ordering medications online.

Frequency of Internet Use

Regarding your e-health use, please answer using the following scale:
5=very often 4=often 3=sometimes 2=rarely 1=never

How often do you use the Internet for the following purposes?

1. Reading journals.	5	4	3	2	1
2. Checking Continuing Medical Education (CME) information.	5	4	3	2	1
3. Looking up specific information for patients.	5	4	3	2	1
4. Checking information related to patients.	5	4	3	2	1
5. Checking personal e-mail.	5	4	3	2	1
6. Reading daily news.	5	4	3	2	1
7. Other	_____				

E-health: Online Health Information and Health Websites

For the next set of questions, think about your interactions with patients. Please note that e-health refers to “online health information” and/or “health websites.” How often do you engage in the following activities?

5=very often 4=often 3=sometimes 2=rarely 1=never

How often do you . . . .

8. Encourage your patients to use health websites?	5	4	3	2	1
9. Attempt to limit the kind of health websites your patients may visit?	5	4	3	2	1

10. Say you like some health websites?	5	4	3	2	1
11. Point out that some of the services or content health websites are good? 1		5	4	3	2
12. Talk to your patients about the risk of relying only on online health information?	5	4	3	2	1
13. Steer the conversation away from the topic of e-Health	5	4	3	2	1
14. Say you like some products/services found on health websites?	5	4	3	2	1
15. Suggest one or two specific health websites your patients could visit?	5	4	3	2	1
16. Explain why some health websites might not be credible?	5	4	3	2	1
17. Explain the benefits of e-Health use?	5	4	3	2	1
18. Warn the patient that not all the information on health websites is not accurate?	5	4	3	2	1
19. Explain how to recognize the credibility of health websites?	5	4	3	2	1
20. Discuss with your patients where it may be beneficial to consult the Internet rather than visit a medical professional?	5	4	3	2	1
21. Discuss with your patients that some online health information is not good?	5	4	3	2	1
22 Explain or clarify the information your patients fine on e-Health sites?	5	4	3	2	1
23. Feel uncomfortable when e-Health is brought up?	5	4	3	2	1
24. Answer your patients' questions					

related to e-health?	5	4	3	2	1
25. Answer questions about something specific your patients saw on the e-health?	5	4	3	2	1
26. Give advice/diagnosis(es) based on something your patients saw on the Internet?	5	4	3	2	1
27. Feel constructive when e-Health is discussed?	5	4	3	2	1

Perceptions of E-health

Please indicate the extent to which you agree with the following statements:

In your opinion, please indicate to what extent e-health INCREASES the following:

28. The ability to obtain social support.	5	4	3	2	1
29. The risk of obtaining inaccurate medical information.	5	4	3	2	1
30. The ability to seek necessary medical help sooner (than people would if they did not use e-health)	5	4	3	2	1
31. Anxiety and concerns.	5	4	3	2	1
32. Ability to obtain good medical advice.	5	4	3	2	1
33. The risk of patients becoming misinformed about their health conditions.	5	4	3	2	1
34. Knowledge and awareness of health-related issues and diseases.	5	4	3	2	1
35. Physicians' ability to communicate with their patients.	5	4	3	2	1

In your opinion, please indicate to what extent e-health DECREASES the following:

36. Patients' desire to obtain medical information from their physicians.	5	4	3	2	1
37. Patients' need to obtain medical information from their physicians because the Internet					

makes them more informed.	5	4	3	2	1
38. The likelihood of patients seeking necessary medical help (i.e., they consult the Internet in place of visiting the doctor.)	5	4	3	2	1
39. Medical professionals' ability to improve patients' health conditions.	5	4	3	2	1
40. Patients' trust in medical professionals.	5	4	3	2	1
41. The quality of patient-physician interaction.	5	4	3	2	1

Other Physicians' Opinions

For the next question, think about the other physicians and colleagues whose opinions matter to you. To what extent do you agree with each of the following statements?

42. E-Health is a good resource for patients' health questions.	5	4	3	2	1
43. Discussing e-health with patients would help them make better health decisions.	5	4	3	2	1
44. Physicians should talk with patients about e-health.	5	4	3	2	1

Your Opinions

Please indicate the extent to which you agree with the following statements.

45. Discussing e-health with patients can help patients make better use of e-health.	5	4	3	2	1
46. Discussing e-health with patients can help patients make better health decisions.	5	4	3	2	1
47. I am able to discuss e-health with my patients in a constructive way.	5	4	3	2	1
48. I am able to discuss e-health with my patients so that they can make better health decisions.	5	4	3	2	1

Evaluation of E-health Information

In general, what do you think about health information presented on health websites? Please indicate how you feel about each of the following statements.

Most e-health websites

48b. Provide accurate information.	5	4	3	2	1
49. Present information that is consistent with the generally accepted medical practice.	5	4	3	2	1
50. Are trustworthy and credible.	5	4	3	2	1
51. Provide comprehensive information.	5	4	3	2	1
52. Present information in a manner that is easy for the average patient or consumer to understand.					

Demographics

Finally, we would like to know about you. The next few questions are for statistical purposes only.

1. What type of organization do you practice in?
   Public
   Private

2. What is your specialty?
   Primary_____
   Secondary_____

3. What is your terminate degree?

4. How many years have you been practicing? (including residency)

5. Do you work
   Full-time
   Part-time

6. On average, how many patients do you see per week?

7. On average, how many hours per week do you see patients face-to-face?

8. What is your age?

9. What is your gender?

Male
Female

10. What is your ethnicity?
African-American/Black
Asian-American/Asian
Arab/Middle Eastern
Caucasian/White
Hispanic/Chicano(a)/Latino(a)
Other (please specify)

Appendix B
Georgia State University
Department of Communication
Informed Consent

Title: Doctors and the Health Internet: A Study of Interactions with Patients

Principal Investigator Dr. Yuki Fujioka
Student Principal Investigator Erin Robinson

I. Purpose:
You are invited to participate in a research study. The purpose of this study is to investigate your beliefs about obtaining health information from the Internet. The information gained from this questionnaire will help us to better understand how doctors' personal beliefs about the health Internet are related to their interactions with patients.

You are invited to participate because you are a doctor who sees patients on a regular basis. A minimum of 200 and a maximum of 250 participants will be recruited for this study. Participation will require 10 minutes of your time.

II. Procedures:
If you decide to participate, you will fill out an online questionnaire that may be completed anywhere you are able to access the Internet (home, office, library, Internet café, etc.). You will complete the survey only once, which will take 10 minutes to complete.

III. Risks:
In this study, you will not have any more risks than you would in a normal day of life.

IV. Benefits:
Participation in this study may not benefit you personally, but the results should benefit society. Overall, we hope to gain information about the effects of doctors' beliefs about the health Internet on patient interactions.

V. Voluntary Participation and Withdrawal:
Participation in research is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or stop participating at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

VI. Confidentiality
We will keep your records private to the extent allowed by law. This is an online survey, so we cannot guarantee complete anonymity. However, we do not ask for any identifying information about you. The results will be summarized and reported in group form. You will not be identified personally.

VII. Contact Persons:

If you have any questions about this study, contact Erin Robinson at (404) 272-3303 or erobinson7@gsu.edu. If you have questions or concerns about your rights as a participant in this research study, you may contact SusanVogtner in the Office of Research Integrity at (404) 413-3513 or svogtner1@gsu.edu.

If you are willing to volunteer for this research, please click the "I agree" button below.

Table 1: Physician Demographics

Demographic		Frequency	Percent
Type of organization	Private	79	77.5%
	Public	10	9.8%
	No answer	13	12.7%
Specialty	Internal Medicine	17	16.7%
	Family Medicine	13	12.7%
	OB/GYN	13	12.7%
	Cardiology/cardiac surgery	9	8.8%
	Gastroenterology	5	4.9%
	Nephrology/Pathology/Endocrinology	4	3.9%
	Colon & Rectal Surgery	3	2.9%
	Oncology/Surgical Oncology	3	2.9%
	Emergency Medicine	2	2.0%
	General Surgery	2	2.0%
	Infectious Diseases	2	2.0%
	Neurology	2	2.0%
	Orthopaedics/Orthopaedic Surgery	2	2.0%
	Pediatrics	2	2.0%
	Anesthesiology	1	1.0%
	Ear, Nose and Throat	1	1.0%
	Opthamology	1	1.0%
	Oral and Maxillofacial Surgery	1	1.0%
	Physical Medicine/Rehab	1	1.0%
	Plastic Surgery	1	1.0%
	Podiatry	1	1.0%
	Radiology	1	1.0%
	Transplant Surgery	1	1.0%
	No answer	14	13.7%
Degree	MD	86	84.3%
	DDS (Doctor of Dental Surgery)	1	1.0%
	DPM (Doctor of Podiatric Medicine)	1	1.0%
	NMP (Non-Medical Prescribing)	1	1.0%
	No answer	13	12.7%

Years practiced	3-10	19	18.6%
	11-20	30	29.4%
	21-30	25	24.5%
	31-40	12	11.8%
	41-50	2	2.0%
	No answer	14	13.7%
Work	Full-time	85	83.3%
	Part-time	4	3.9%
	No answer	13	12.7%
# Patients seen/wk	15-40	13	12.7%
	45-80	31	30.1%
	90-200	40	39.2%
	No answer	18	17.6%
# Hours with patients	7-20	11	10.8%
	21-40	41	40.2%
	41-70	31	30.1%
	71-120	3	2.9%
	No answer	15	14.7%
Age	29-40	25	24.3%
	41-60	50	48.5%
	61-75	12	11.7%
	No answer	15	14.6%
Gender	Male	63	61.2%
	Female	26	25.5%
	No answer	13	12.7%
Ethnicity	African-American/Black	7	6.9%
	Asian-American/Asian	6	5.9%
	Caucasian/White	71	69.6%
	Hispanic/Chicano(a)/Latino(a)	3	2.9%
	Other (European Hispanic)	1	1.0%
	No answer	14	13.7%

Table 2: Means, standard deviation of variables

Variables	N	Mean	SD	Range
Index: Frequency of Internet Use				
Doctors use Internet for:				
Reading journals	93	2.93	1.19	1-5
Checking CME	93	2.98	1.13	1-5
Specific patient info	93	3.57	1.17	1-5
Information related to patients	93	3.51	1.21	1-5
Personal email	93	4.70	.68	2-5
Reading daily news	93	3.73	1.4	1-5
Cronbach's alpha: .77				
Index: Positive Mediation				
How often:				
Encourage patients to use it	96	2.95	.92	1-5
Say you like some sites	96	2.75	1.21	1-5
Say some services/content is good	96	2.99	1.13	1-5
Say you like products/services	96	2.10	.93	1-5
Explain benefits	95	2.49	1.03	1-5
Cronbach's alpha: .89				
Index: Negative Mediation				
How often:				
Talk to patients about risk	96	3.22	1.05	1-5
Explain why some sites aren't credible	96	3.02	1.16	1-5
Explain how to recognize credibility	94	2.54	1.15	1-5
Say some online health info is not good	93	3.09	1.07	1-5
Cronbach's alpha: .91				
Index: Restrictive Mediation				
How often:				
Limit sites that patients visit	96	2.08	1.14	1-5
Suggest one or two sites	95	2.67	1.21	1-5
Say it's better to use e-health than doctor	94	1.69	.95	1-5
Cronbach's alpha: .65				
Index: Past experiences (Frequency)				
How often:				
Clarify information	93	3.43	1.00	1-5
Answer e-health questions	92	3.58	1.03	1-5
Answer questions about something specific patients saw	93	3.43	.93	1-5
Advise/diagnose based on it	93	2.77	1.10	1-5
Cronbach's alpha: .77				

Index: Past Experiences (Positive Scale)				
Feel uncomfortable when it is brought up	93	4.25	.99	1-5
Feel constructive when it is discussed	93	2.91	.96	1-5
Index: Benefits				
E-health increases:				
Ability to obtain social support	91	3.32	.95	1-5
Seeking medical help sooner	91	3.30	.86	1-5
Ability to obtain good medical advice	90	3.09	.83	1-5
Knowledge/awareness of health issues	92	3.76	.75	2-5
Ability to communicate with patients	91	3.22	.90	1-5
E-health decreases:				
Need to get info from physicians	90	2.62	.96	1-5
Cronbach's alpha: .71				
Index: Concerns				
E-health increases:				
Risk of obtaining inaccurate info	91	3.95	.75	2-5
Anxiety and concerns	91	3.75	.84	1-5
Risk of patients becoming misinformed	91	3.79	.89	1-5
E-health decreases				
Desire to get medical info from doctors	92	2.61	.94	1-5
Likelihood of seeking medical help	91	2.79	.91	1-5
Doctors' ability to improve health conditions	90	2.63	.92	1-5
Trust in medical professionals	91	2.78	1.04	1-5
Quality of patient-physician interaction	91	2.75	.93	1-5
Cronbach's alpha: .73				
Index: Subjective Norm				
Physicians/colleagues important to me:				
It's a good resource for questions	88	3.16	.86	1-5
Helps patients make decisions	88	3.23	.96	1-5
Doctors should talk about it with patients	88	3.28	.88	1-5
Cronbach's alpha: .86				
Index: Evaluation				
Most e-health websites:				
Provide accurate information	89	3.12	.81	1-5
Info is consistent with medical practice	89	3.09	.83	1-5
Are trustworthy and credible	89	2.99	.85	1-5
Provide comprehensive information	88	2.66	.84	1-4
Information is easy to understand	89	3.28	.77	1-5
Cronbach's alpha: .86				

Table 3: Correlations between mediation and major indexes

	a	b	c	d	e	f	g	h	i	j
a. Pos.Mediation	---									
b. Neg.Mediation	.50**	---								
c Res. Mediation	.72**	.70**	---							
d. Doctors' patient-related Internet use	.56**	.22*	.50**	---						
e. Perceived benefits	.41**	-.10	.22*	.28**	---					
f. Perceived concerns	.01	.32**	.18*	.07	-.38**	---				
g. Evaluations	.26**	-.29**	.01	.27**	.61*	-.35**	---			
h. Patient-generated inquiries	.51**	.46**	.45**	.37**	.05	.17	.09	---		
i. Pos. experiences (feel constructive)	.52**	.23*	.32**	.41**	.50**	-.10	.30**	.44**	---	
j. Pos. experience (feel comfortable) (Reverse item)	.16	.29**	.29**	-.095	-.01	-.17	.03	-.17	-.05	---
k. Perceived peer endorsement	.44**	-.01	.24*	.40**	.56**	-.28**	.46**	-.01	.41**	.20*

Notes: Res. = restrictive. Pos. = positive. Neg. = negative. Res. = Restrictive. Exp. = experience (r) = reverse item. * p=<.05. **p=<.01

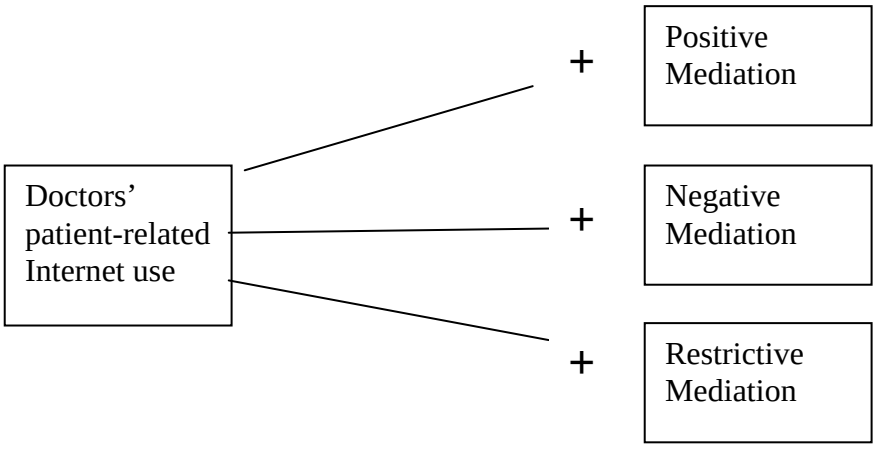

Figure 1: Hypothesis 1. This figure shows significant positive (+) relationships of doctors' patient-related Internet use to mediation behavior.

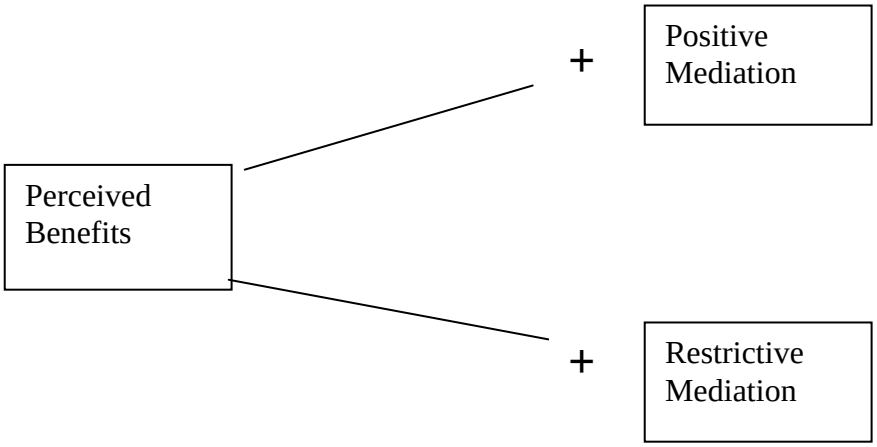

Figure 2: Hypothesis 2. This figure shows significant positive (+) relationships of perceived benefits to mediation behavior.

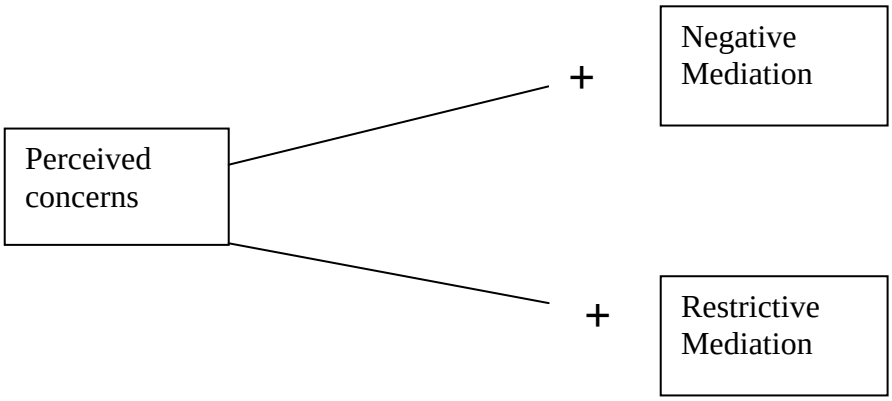

Figure 3: Hypothesis 3. This figure shows significant positive (+) relationships of perceived concerns to mediation behavior.

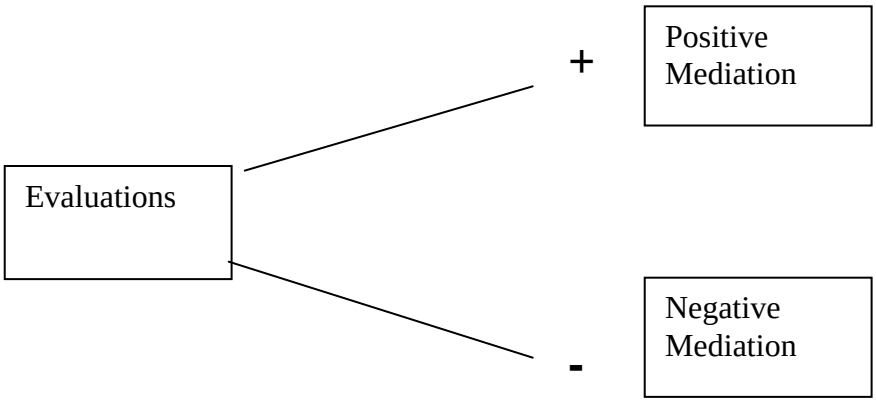

Figure 4: Hypothesis 4. This figure shows significant positive (+) and negative (-) relationships of evaluations to mediation behavior.

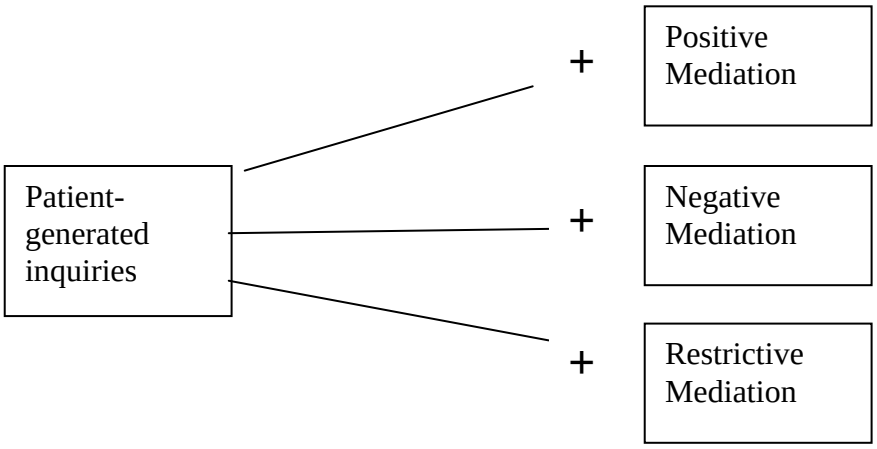

Figure 5: Hypothesis 5. This figure shows significant positive (+) relationships of patient-generated inquiries to mediation behavior.

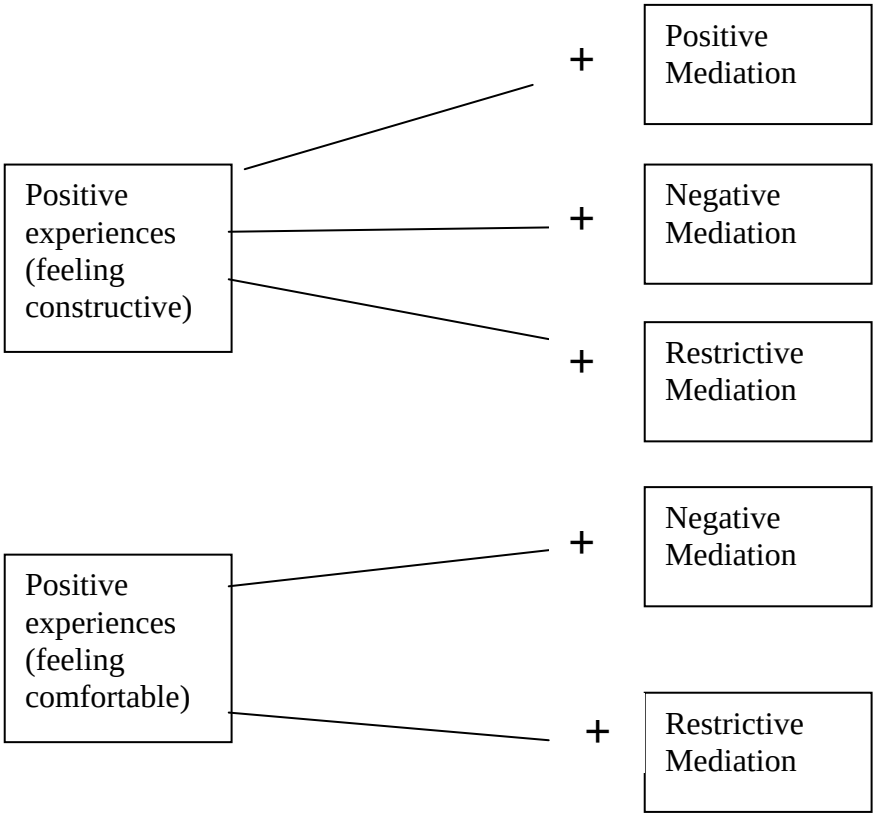

Figure 6: Hypothesis 6. This figure shows significant positive (+) relationships of positive experiences (feeling constructive and comfortable) to mediation behavior.

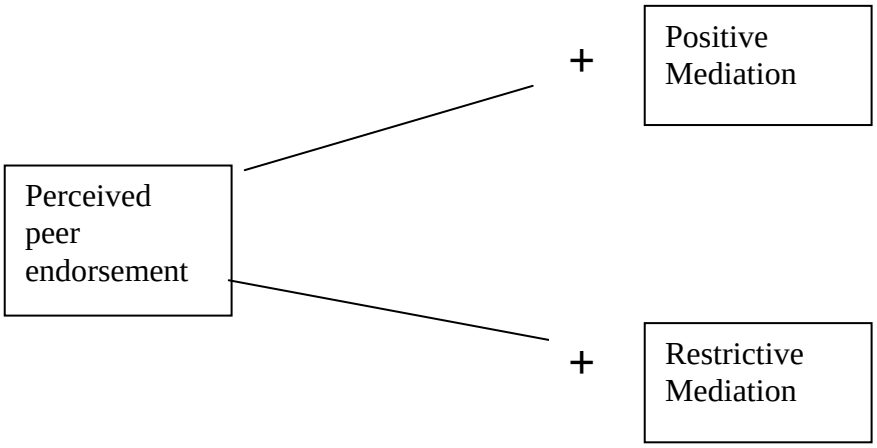

Figure 7: Hypothesis 7. This figure shows significant positive (+) relationships of perceived peer endorsement to mediation behavior.