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Empowerment has been studied extensively in the field of psychology for more than three decades. Extant research in the area of empowerment is often at the employee level in an employee-employer relationship or at the team level in an organizational setting. However, research that examines the role of Computer-Mediated Communication (CMC) media in consumer empowerment in the healthcare context has been neglected in the Information Systems (IS) literature. This dissertation uses three studies to address this gap in IS literature.

In Study 1, an interpretive approach using a qualitative methodology was used to understand patients’ motivations and barriers for health information seeking and/or sharing online. Results from the interviews showed that there are seven major motivations and barriers dimensions namely media-enabled health information seeking, health output quality produced by media, media-enabled health-related content management and communication, media-enabled convenience, media-enabled health information sharing, and media-enabled health problem solving and decision-making.

In Study 2, a positivist approach using a survey methodology was used to test a research model linking the motivations and barriers dimensions identified in Study 1 to CMC media use and patient empowerment. The Uses and Gratifications theory was used to categorize the seven motivations and barriers dimensions identified in Study 1 into the three gratifications, namely, content gratifications, process gratifications, and social gratifications. Results from a national survey of 230 patients showed that content

gratifications and social gratifications are positively related to CMC media use for health information seeking and/or sharing online, and that CMC media use for health information seeking and/or sharing online is positively related to patient empowerment.

In Study 3, a survey methodology was used to examine the consequences of CMC media-enabled patient empowerment. Survey results showed that patient empowerment positively impacts quality of care, patient coping with illness, and patient confidence in treatment, and that quality of care mediates the relationship between patient empowerment and patient satisfaction.

Together, the three studies help understand the role CMC media play in empowering healthcare consumers thereby addressing calls from IS researchers to focus on the consumer-perspective on the use of health information technologies (HIT).

THE ROLE OF COMPUTER MEDIATED COMMUNICATION (CMC) MEDIA IN  
PATIENT EMPOWERMENT: A “USES AND GRATIFICATIONS”  
PERSPECTIVE

by

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To my ever-inspiring and selfless mother Geetha, who never once hesitated to spend her last penny on my education while expecting absolutely nothing in return. To my friend Sujatha, whose constant words of encouragement helped me get through this incredible, at times arduous, journey. To my friend Rosili and her family who continue to keep my best interests in their prayers.

## APPROVAL PAGE

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## CHAPTER I

### INTRODUCTION

Empowerment, which has its roots in the field of psychology (Conger & Kanungo, 1988; Spreitzer, 1995; Thomas & Velthouse, 1990), has been studied extensively for more than three decades. Empowerment is defined as the process of enhancing individuals' feelings of self-efficacy by identifying and removing conditions that foster powerlessness (Conger & Kanungo, 1988). It is a psychological enabling process rather than a power delegating process (McClelland, 1975), which involves "creating conditions for heightening motivation for task accomplishment through the development of a strong sense of personal efficacy" (Conger & Kanungo, 1988, p. 474). Empowerment is a "motivational construct manifested in four cognitions: meaning, competence, self-determination, and impact" (Spreitzer 1995, p. 1444). Consumer empowerment, which refers to empowerment of the individual consumer, is defined as the individual's experience of increased self-determination and efficacy (Füller, Mühlbacher, Matzler, & Jawecki, 2009). Individuals need personal empowerment to exercise judgment when selecting information that is relevant to their decision making (Chen, Brown, Hu, King, & Chen, 2011).

Concurrent with consumer empowerment, there has been an increased focus on health information technology (HIT). HIT refers to the use of information technologies



(IT) in healthcare. Examples of HIT include IT-enabled innovations such as computerized physician order entry (CPOE) (Davidson & Chrismar, 2007), electronic health records (EHRs) (Hanseth, Jacucci, Grisot, & Aanestad, 2006), telemedicine (Cho & Mathiassen, 2007), and application of bar coding for medication administration can improve care delivery and increase efficiency (Poon et al., 2006). The use of HIT can improve the individual experience of care, improve the health of populations, and reduce the per capita costs of healthcare for populations. These three goals are referred to as the Triple Aim (Berwick, Nolan, & Whittington, 2008). HIT can improve the individual experience of care through better interpersonal communication between the healthcare professional and the patient.

Agarwal, Gao, DesRoches, and Jha (2010) state that web-based services will be the mainstream of HIT adoption in the next few years adding that healthcare providers are experimenting with using the Internet to deliver services remotely. This brings an increased focus on the role Computer-Mediated Communication (CMC) media, such as the Internet, play in healthcare service delivery. An example of CMC media-based HIT is the personal health record (PHR). A PHR is “an electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be drawn from multiple sources while being managed, shared, and controlled by the individual” (NAHIT, 2008). A PHR contains patient information, insurance, family history, medications, and other special conditions and is made available to patients in a format easily accessible to them (HITSP Consumer Empowerment Interoperability Specification, 2007). CMC media-based HIT can increase transparency

and data availability by bringing data-driven methods to improve healthcare service delivery. An initiative by the UK government to improve physician quality transparency resulted in a new service that allows patients to post anonymous reviews on physician practices (Agarwal et al., 2010). Health information sharing between the clinician and the patient will allow both to make the most informed decisions about treatments (American Hospital Association, 2011). This increase in the use of Internet based HIT services is matched by a corresponding increase in patients' use of the CMC media such as the Internet for seeking and/or sharing health information online. Several surveys have confirmed that the Internet is the number one medical resource for patients (Pew Internet Research, 2011; Pew Internet Research, 2014). Some of the reasons for the increased use of the Internet by patients include the ubiquity of computers and broadband connectivity, decreased face time with physicians, abundance of patient education websites, increased availability of Web 2.0 tools (e.g., blogs, podcasts, Wikis), increased availability of healthcare services provided online, and patients' quest to find the best medical care at the lowest cost (Hoyt, Sutton, & Yoshihashi, 2008). The extant Information Systems (IS) literature on empowerment focuses mainly on employee empowerment in an organizational context (e.g., Armstrong & Sambamurthy 1999; Joshi, Chi, Datta, & Han, 2010). However, research that examines the role of CMC media-based HIT in consumer empowerment in the healthcare context has been neglected in the IS literature. This research aims to address that gap in IS literature.

The research in this dissertation addresses Computer-Mediated Communication (CMC) media-enabled empowerment of patients as healthcare consumers. First, an

interpretive approach is used to understand the motivators and the barriers to both seeking health information online and sharing health information online. Next, a survey research methodology is used to test a model of CMC media-enabled patient empowerment. Finally, a survey methodology is used to examine the consequences of CMC media-enabled patient empowerment. Specific research areas of interest include how health information seeking and health information sharing are related to CMC media use and CMC media-enabled patient empowerment, and whether CMC media-enabled patient empowerment affects quality of care, patients' abilities to cope with illness, patients' confidence in their treatment, and patient satisfaction.

CMC media-enabled patient empowerment refers to the use of CMC to aid in the empowerment of patients, the primary healthcare consumers. CMC media refers to computer-based systems that allow individuals to communicate with others (Rice, Grant, Schmitz, & Torobin, 1990). Commonly used CMC tools include the Internet, e-mail, instant messaging, videoconferencing, blogs, social networks, wikis, and mobile devices. Consumer empowerment in healthcare refers to the "active involvement of consumers (i.e., individuals) in managing their healthcare" (HITSP Consumer Empowerment Interoperability Specification 2007). McKemmish, Manaszewicz, Burstein, and Fisher add that "consumer empowerment and the role of the expert patient in their own healthcare, enabled through timely access to quality information, have emerged as significant factors in better health and lifestyle outcomes" (2009, p. 1792). Consumer empowerment when viewed from patients' perspectives is referred to as patient empowerment. Patient empowerment is defined as "an educational process designed to

help patients develop the knowledge, skills, attitudes, and degree of self-awareness necessary to effectively assume responsibility for their health-related decisions” (Feste & Anderson 1995, p. 139). Patient empowerment is “a process designed to facilitate self-directed behavior change” (Anderson & Funnell, 2010, p. 277). There is a growing need for patient empowerment. Primary care physicians have very little time to review the latest evidence from the medical literature and to peruse the details of each patient’s medical record, which means patients must be more proactive in taking control of their own healthcare, especially since only they control the lifestyle changes that are required for better health and wellbeing (Simborg, 2010).

Examples of the use of CMC media to empower healthcare consumers include the use of the Internet as a whole, the use of web portals and online knowledge repositories for health, and the use of social media tools such as Facebook and Twitter (Hoyt et al., 2008). The Internet plays a critical role in patient empowerment. According to a 2011 Pew Internet survey, of the 74 percent of adults who use the Internet, 80 percent have searched online for health information, 34 percent have read someone else’s healthcare experience online, 25 percent have watched an online healthcare video, and 24 percent have used the Internet to do their own research on specific drugs or treatments (Fox, 2011). Of the 62 percent of adults who use online social networks, 23 percent have followed their friends’ personal health updates (Fox, 2011). The survey found that the most popular health related online activity is looking for symptoms. Patients can use web portals such as MedFusion to maintain their personal health information online. They can also use online knowledge repositories such as WebMD, MedlinePlus, and Mayo Clinic

to get credible health information on diseases, symptoms, treatment and diagnosis services, and diet and nutrition information. The proliferation of social media has also contributed to patient empowerment. Patients have the option to sign up to receive tweets on Twitter from healthcare information agencies such as the Centers for Disease Control and Prevention (CDC), and even their own healthcare providers. The CDC's Twitter profile for emergency information (<https://twitter.com/CDCemergency>) has more than 1.5 million followers. Patients can also use social networking sites such as Facebook to get information from their friends on which physicians, hospitals, and insurance companies provide the best services in their cities. Von Hippel (1998) adds that individual consumers are greatly empowered through the use of Web 2.0 technologies such as wikis and blogs since they are able to solve problems without having to rely on specialists for solutions. Medical information available on the Internet has been identified as a possible source of patient empowerment (Holmström & Röing, 2010).

A better understanding of CMC media-enabled patient empowerment is needed for four main reasons. First, it is claimed that patients who are empowered are healthier than patients who are not (Holmström & Röing, 2010; Roberts, 1999; Wallerstein, 1992). This has important implications not only for the health and welfare of the patients, but also from a healthcare cost perspective. Berwick and Hackbarth (2012) state that “at almost 18% of the gross domestic product (GDP) in 2011, headed for 20 percent by 2020 (Keehan et al., 2011; Shatto & Clemens, 2011), the nation's increasing healthcare expenditures reduce the resources available for other worthy government programs, erode wages, and undermine the competitiveness of US industry” (p. E1). For the overall US

healthcare, the sum of the lowest estimates for wasteful spending in just six categories of waste (overtreatment, failures of care coordination, failures in execution of care processes, administrative complexity, pricing failures, and fraud and abuse) is “\$558 billion per year, or 21% of national health expenditures; and the sum of midpoint estimates is \$910 billion per year, or 34%” (Berwick & Hackbarth, 2012, p. E2). These estimates are much more unsustainable (close to 50 percent) at the federal level. Healthcare providers are initiating new efforts to cut down unnecessary costs. For example, Cone Health in Greensboro, North Carolina in the U.S. is forming a patient network which blends a computer database with extra help from nurses to keep medical costs down, and to cut down on redundancies and delays arising from lack of communication (Fain, 2012). However, there is a greater scope for reducing healthcare costs by empowering patients and making them more proactive in their own health. In HIT, such as Cone Health’s patient network, the power is still with the healthcare providers and patients are passive participants in the network. There needs to be a shift in power from the providers to the patients in order to bring down the healthcare costs per capita in the U.S. Empowered patients are expected to be healthier healthcare consumers and are expected to help the U.S. healthcare system eliminate redundancies (unnecessary blood tests, needless visits to the healthcare provider tying up valuable resources etc.) in patient care.

Second, empowered patients have the ability to assume responsibility for their own health behaviors. Feste and Anderson (1995) identify the link between empowerment and behavior by stating that “to be healthy, people must be able to bring

about changes, not only in their personal behavior, but also in their social situations and the organizations that influence their lives” (p.140). Empowered patients are more proactively involved in assuming responsibility for their health-related behavior.

Third, by understanding how the processes of information seeking and information sharing lead to CMC media-enabled patient empowerment, healthcare professionals can facilitate such empowerment through the use of intervention mechanisms (Ellins & McIver, 2009). An example of patient empowerment through the use of information is the treatment of diabetes mellitus. An intensive treatment program was designed to empower patients with Type 1 diabetes mellitus. This treatment program required patients to be more proactive in managing their diabetes mellitus by providing them with appropriate medications, a skilled and committed healthcare team, diabetes education, empowerment education, and support from volunteer health agencies (Feste & Anderson, 1995). Results of the intensive treatment program showed that the risk of eye, kidney, and nerve damage was reduced by approximately 60 percent compared to conventional methods of treating the disease (Feste & Anderson, 1995).

Fourth, patient empowerment can have several consequences for both patients and healthcare providers. From patients’ perspectives, empowerment has the potential to increase satisfaction (Hage & Lorensen, 2005; Nyatanga & Dann, 2002), improve quality of life (Aujoulat, d’Hoore, & Deccache, 2007; Gibson, 1991; Rodwell, 1996), enhance coping with illness and promote well-being (Hage & Lorensen 2005; Michie, Miles, & Weinman, 2003; Rodwell, 1996), advance patient health (Aujoulat et al., 2007; O’Cathain et al., 2005), facilitate patient personal development (Aujoulat et al., 2007;

Gibson, 1991; Hage & Lorensen 2005; Kuokkanen & Leino-Kilpi 2000; Rodwell, 1996), and allow patients control over interactions with their healthcare professionals (Roberts, 1999; O’Cathain et al., 2005). From healthcare providers’ points of view, patient empowerment can increase patients’ perceived quality of care by the provider, and improve patient satisfaction with the provider. However, it could also potentially increase tension between patients and physicians (Agarwal et al., 2010). A well informed patient should be able to better understand the treatment options suggested by the healthcare provider, be able to actively participate in decision-making regarding treatments, and be able to stick to the selected treatment in a better manner compared to a patient who is not well informed.

The proposed research addresses three important gaps in the IS literature. First, empowerment has not been studied in the IS literature in the healthcare context especially from a patient perspective. Knowledge and information are at the core of empowerment. What is not clear in the IS literature is patients’ motivations for and barriers to seeking health information online and the patients’ motivations for and barriers to sharing health information online through the use of IT. Second, there is no empirical research that links the motivators and barriers to seek and share medical information online to patient empowerment enabled through the use of IT. Third, the consequences of CMC media-enabled patient empowerment have not been addressed in the literature. The academic community will benefit as this project addresses “the need for more theory-driven investigations of the underlying phenomenon of use and impacts of e-healthcare systems” (Venkatesh, Zhang, & Sykes, 2011, p. 524). E-healthcare systems refer to the use of HIT



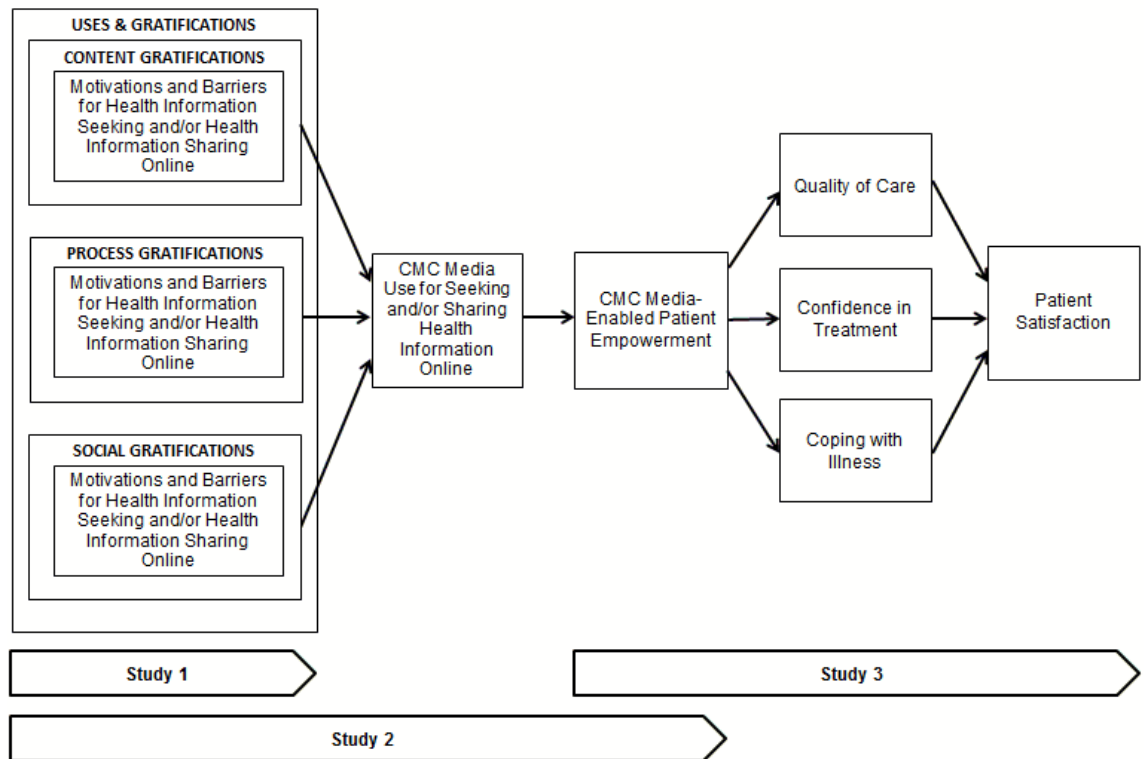
made available using CMC media. The practitioner community will also benefit since healthcare providers will have a better understanding of how to improve their patient satisfaction levels by designing intervention mechanisms designed to increase patient empowerment.

There are three studies that are a part of this dissertation. Each study addresses one of the aforementioned IS research gaps. Study 1 is an exploratory, interpretive study which helps understand why some patients seek and share health information online while others do not. A Uses and Gratifications perspective is used in Study 1 to categorize the identified motivations and barriers dimensions into content gratifications, process gratifications, and social gratifications.

Study 2 is a confirmatory, positivist study that tests an empirical model which is informed by the findings from Study 1. The model links the motivators and barriers to seeking and sharing health information online, categorized into the three gratifications dimensions, to CMC media-enabled patient empowerment, mediated by the patients' patients' actual use of CMC media to seek and/or share health information online.

Study 3 is a confirmatory, positivist study which is aimed at understanding the consequences of CMC media-enabled patient empowerment. Findings from the study will help healthcare providers understand the impact of patient empowerment on quality of care, patient coping with illness, patient confidence in treatment, and patient satisfaction.

The full research model for this research is presented in Figure 1. All three studies that are a part of this dissertation are highlighted in the figure.



**Figure 1. Full Research Model**

The research questions for the three studies in this dissertation are as follows:

*RQ1: Study 1: What are the patients' motivations for seeking health information online?*

*What are patients' barriers to seeking health information online?*

*RQ2: Study 1: What are the patients' motivations for sharing health information online?*

*What are patients' barriers to sharing health information online?*

*RQ1: Study 2: Do patients' use of CMC media to seek and/or share health information online lead to patient empowerment?*

*RQ1: Study 3: What are the consequences of CMC media-enabled patient empowerment?*

The outline for remainder of dissertation is as follows. The theoretical foundations including relevant literature review are presented in Chapter II. Chapter III provides the details of Study1, which is a qualitative study aimed at understanding the motivations for health information seeking and/or sharing online, and the barriers to health information seeking and/or sharing online. Chapter IV presents details about Study 2, which is a quantitative study which uses a large scale survey to test a research model linking media use to patient empowerment. Study 3, a quantitative study using survey methodology that examines the consequences of patient empowerment, is presented in Chapter V. Chapter VI highlights the contributions of this dissertation to knowledge. Future research directions based on the work in this dissertation are presented in Chapter VII. Chapter VIII lists the limitations and the major assumptions made in the three studies that are a part of this dissertation. Chapter IX presents the conclusion from this research.

## CHAPTER II

### THEORETICAL FOUNDATIONS

The theoretical foundations for this research are presented in this section. This includes a brief overview of the history of empowerment from the literature on psychology, a discussion of knowledge and information and their relationship with empowerment, a review of information seeking and information sharing from the IS literature, a review of patient empowerment from the healthcare literature, and a review CMC media use from the IS literature.

#### **2.1 Empowerment in Psychology Literature**

Empowerment is closely related to the motivational concept of self-efficacy (Conger & Kanungo, 1988). Bandura (1986) defines self-efficacy beliefs as “people’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performances” (p. 391). During the process of empowerment, an individual believes that her / his self-efficacy is enhanced (Conger & Kanungo, 1988). While Conger and Kanungo (1988) envisioned empowerment as a one dimensional concept involving self-efficacy, Thomas and Velthouse (1990) argued that empowerment is multifaceted and cannot be captured by self-efficacy alone. Spreitzer (1995) defines empowerment as “a motivational construct manifested in four cognitions: meaning, competence, self-determination, and impact” (p. 1444). Meaning is the personal importance an individual attaches to a certain task or activity (Spreitzer, 1995).

Competence is an individual's ability to skillfully perform a given task or activity (Gist, 1987). Self-determination is belief of having a choice in initiating and regulating actions (Deci, Connell, & Ryan, 1989). Impact is the degree to which an individual can influence the outcomes of a task or activity (Ashforth, 1989).

The empowerment being referred to here is psychological empowerment.

Psychological empowerment refers to "a set of psychological states that are necessary for individuals to feel a sense of control in relation to their work" (Spreitzer, 2008, p. 56).

Psychological empowerment has been studied at both the individual level (Conger & Kanungo 1988; Spreitzer, 1995; Thomas & Velthouse, 1990) and the team level (e.g., Hyatt & Ruddy, 1997; Kirkman, Rosen, Tesluk, & Gibson, 2004; Srivastava, Bartol, & Locke, 2006). This dissertation adds to the extant literature on individual level psychological empowerment.

Spreitzer (1995) discussed the antecedents and consequences of psychological empowerment. The antecedents and consequences of psychological empowerment and their definitions, as described by Spreitzer (1995), are presented in Table 1.

**Table 1. Factors Related to Psychological Empowerment**

<b>Factor</b>	<b>Type</b>	<b>Meaning</b>
Locus of control	Antecedent	Locus of control explains the degree to which people believe that they, rather than external forces, determine what happens in their lives (Rotter, 1966)
Self-esteem	Antecedent	Self-esteem is defined as a general feeling of self-worth (Brockner, 1988)
Access to information	Antecedent	Access to information refers to access to organizational mission-specific information and performance related information (Spreitzer, 1995)
Rewards	Antecedent	Rewards are incentives for exceptional individual-level job performance (Bowen & Lawler, 1992)

Managerial effectiveness	Consequence	Managerial effectiveness is defined as the degree to which a manager fulfills or exceeds work role expectations (Spreitzer, 1995)
Innovation	Consequence	Innovation refers to the creation of a new product, service, idea, procedure, or process (Woodman, Sawyer, & Griffin, 1993)
(Source: Spreitzer, 1995)		

The individual level antecedents of psychological empowerment are access to information, self-esteem, locus of control, and rewards (Spreitzer, 1995). Access to information about the performance of a task is fundamental to reinforcing a sense of competence in an individual and this leads to empowerment (Spreitzer, 1995). Kanter (1989) adds that to empower people, they need to have greater access to information. Brockner (1988) defined self-esteem as a general feeling of self-worth. Individuals with high self-esteem see themselves as more competent and more valuable compared to individuals with low self-esteem (Spreitzer, 1995). Locus of control explains “the degree to which people believe that they, rather than external forces, determine what happens in their lives” (Spreitzer, 1995, p. 1446). Individuals with an internal locus of control are more likely to feel empowered compared to individuals with an external locus of control (Spreitzer, 1995). Rewards enhance empowerment by reinforcing competencies and provide incentives for participating in decision-making (Spreitzer, 1995).

## **2.2 Knowledge and Information as the Core of Empowerment**

In 1597, Sir Francis Bacon uttered one of history’s greatest motivational quotes when he said “Knowledge is Power”. Knowledge and information are at the heart of psychological empowerment. Knowledge contributors who possess unique knowledge

have considerably more power than those who do not (Kankanhalli, Tan, & Wei, 2005a). Knowledge affects empowerment through the processes of knowledge seeking and knowledge sharing. Knowledge management systems such as Electronic Knowledge Repositories (EKR) are useful resources where individuals can seek and share knowledge (Kankanhalli et al., 2005a).

Prior to discussing how knowledge use may lead to empowerment, it is important to understand the motivations behind why people seek knowledge from EKRs and why people share their knowledge by contributing to EKRs. Holmström and Röing, (2010) argue that some individuals choose not to be empowered, in which case, it is critical to understand the barriers to seeking knowledge from EKRs and the barriers to sharing knowledge with EKRs.

## **2.3 Information Seeking and Sharing in IS Literature**

Researchers in the IS literature have tried to understand the motivations and barriers to both information seeking (Bock, Kankanhalli, & Sharma, 2006; Brazelton & Gorry, 2003; Kankanhalli, Tan, & Wei, 2005b; Kulkarni, Ravindran, & Freeze, 2006; Phang, Kankanhalli, & Sabherwal, 2009; Xu, Kim, & Kankanhalli, 2010; Zhang & Watts 2008) and information sharing (Angst & Agarwal 2009; Bateman, Gray, & Butler, 2011; Chai, Das, & Rao, 2011; Durcikova & Gray 2009; Kankanhalli et al., 2005a; Leimeister, Ebner, & Krcmar, 2005; Ma & Agarwal, 2007; Paul & McDaniel, 2004; Phang et al., 2009; Wasko & Faraj, 2005; Zahedi & Song, 2008).

### ***2.3.1 Information Seeking***

The Internet has become the primary information source for many users. The reasons why people seek information online have been researched extensively in the IS literature. Some of the reasons include resource availability (Bock et al., 2006; Borgatti & Cross, 2003; Brazelton & Gorry, 2003; Kankanhalli et al., 2005b), perceived usefulness (Bock et al., 2006; Kulkarni et al., 2006), perceived output quality (Kankanhalli et al., 2005a; Zhang & Watts, 2008), perceived relational benefit (Xu et al., 2010), knowledge seeking self-efficacy (Bock et al., 2006), knowledge growth (Bock et al., 2006), perceived usability (Phang et al., 2009), perceived sociability (Phang et al., 2009), and user satisfaction (Kulkarni et al., 2006).

Despite the growth in Internet use, the proliferation of mobile devices, and the availability of vast amounts of information online, several barriers to people effectively seeking information online exist. These barriers include difficulty in using EKR (Kankanhalli et al., 2005b), fear of displaying ignorance (Borgatti & Cross, 2003; Kankanhalli et al., 2005b), inertia to reuse knowledge (Kankanhalli et al., 2005b), and future obligation (Bock et al. 2006).

### ***2.3.2 Information Sharing***

While the motivations for seeking information online have been studied extensively, the reason behind why people share their personal information online has been studied less – relatively. Some of the reasons for sharing information online include trust (Kankanhalli et al., 2005a; Paul & McDaniel, 2004; Leimeister et al., 2005; Zahedi & Song, 2008), reputation (Kankanhalli et al., 2005a; Wasko & Faraj, 2005), reciprocity



(Kankanhalli et al., 2005a; Wasko & Faraj, 2005; Chai et al., 2011), commitment (Wasko & Faraj, 2005; Bateman et al., 2011), enjoyment in helping others (Kankanhalli et al., 2005a; Wasko & Faraj, 2005), knowledge sharing self-efficacy (Kankanhalli et al., 2005a), perceived identity verification (Ma & Agarwal, 2007), perceived usefulness of knowledge sharing (Kulkarni et al., 2006), user satisfaction (Kulkarni et al., 2006), perceived usability (Phang et al., 2009), and perceived sociability (Phang et al., 2009). The barriers to sharing information online include information privacy concerns (Angst & Agarwal, 2009; Chai et al., 2011), loss of knowledge power (Kankanhalli et al., 2005a), codification effort (Kankanhalli et al., 2005a), perceived knowledge quality (Durcikova & Gray, 2009), and lack of any direct or tangible benefits to the knowledge contributor (Kankanhalli et al., 2005a).

## **2.4 Patient Empowerment in Healthcare Literature**

Patient empowerment is defined as: “an educational process designed to help patients develop the knowledge, skills, attitudes, and degree of self-awareness necessary to effectively assume responsibility for their health-related decisions” (Feste & Anderson, 1995, p. 139). Patient empowerment is “a process designed to facilitate self-directed behavior change” (Anderson & Funnell, 2010, p. 277). Patient empowerment is different from employee empowerment due to the differences in the underlying relationships. The patient-provider relationship is dissimilar from the employee-employer relationship for a variety of reasons. First, the patient can switch providers any time without major hurdles. An employee does not have the same luxury with her / his employer. Next, the patient can choose not to use the IT tools offered by the provider. An employee does not have

control over the choice of using the employer provided IT systems. Finally, patients can use resources like medical information available on the Internet or patient support groups outside of their healthcare provider resources to get empowered. Individual employees, on the other hand, will have to rely on their employer provided mechanisms and proprietary information, that is not readily available outside the organization, to get empowered.

Holmström and Röing (2010) discussed the antecedents and consequences of patient empowerment. Those antecedents and consequences are presented in Table 2.

**Table 2. Factors Related to Patient Empowerment**

<b>Factor</b>	<b>Type</b>	<b>Source</b>
Patient motivation	Antecedent	Aujoulat et al. (2007) Ellis-Stoll and Popkess-Vawter (1998)
Shared responsibility between caregiver and patient	Antecedent	Roberts (1999)
Mutual trust and respect between caregiver and patient	Antecedent	Hage and Lorensen (2005) Nyatanga and Dann (2002)
Patient control over decisions	Antecedent	Gibson (1991) Nyatanga and Dann (2002)
Patient self-reflection	Antecedent	Aujoulat et al. (2007) Hage and Lorensen (2005)
Patient behavioral change	Antecedent	Ellis-Stoll and Popkess-Vawter (1998)
Information regarding diagnosis, pathology, treatment and prognosis	Antecedent	Rodwell (1996)
Education, decision aids, self-reflective tools, provided by caregiver	Antecedent	Aujoulat et al. (2007) Rodwell (1996)
Patient satisfaction	Consequence	Hage and Lorensen (2005) Nyatanga and Dann (2002)
Patient well-being	Consequence	Hage and Lorensen (2005) Michie et al. (2003)

		Rodwell (1996)
Patient health and self-management	Consequence	Aujoulat et al. (2007) O' Cathain et al. (2005)
Patients take charge of interactions with provider	Consequence	Roberts (1999) O' Cathain et al. (2005)
Patient insight into own world	Consequence	Rodwell (1996) Hage and Lorensen (2005)
Patient positive self-concept	Consequence	Aujoulat et al. (2007) Gibson (1991) Rodwell (1996)
(Source: Holmström and Röing, 2010)		

Holmström and Röing (2010) identified patient motivation, shared responsibility between caregiver and patient, mutual trust and respect between caregiver and patient, patient control over decisions, patient self-reflection, patient behavioral change, information (regarding diagnosis, pathology, treatment and prognosis), and tools provided by the caregiver (education, decision aids, self-reflective tools) as the antecedents to patient empowerment. The outcomes of improved patient empowerment include increased patient satisfaction, enhanced patient well-being, patient health and self-management, patients taking charge of interactions with providers, patient insight into own world, and patient positive self-concept (Holmström & Röing, 2010).

## 2.5 CMC Media-Enabled Patient Empowerment

CMC media refers to computer-based systems that allow individuals to communicate with others (Rice et al., 1990). Examples of CMC include the Internet as a whole, email, instant messaging, social networks, blogs, wikis, podcasts etc. CMC media use has been studied in a wide variety of contexts in the IS literature. Table 3 presents some of the ways in which CMC media has been studied in the IS literature.

**Table 3. Summary of IS Research Investigating CMC Media Use**

<b>Research Domain</b>	<b>Literature</b>	<b>Use of CMC Media</b>
Internet Commerce	Ou, Pavlou, and Davison (2014)	Enabling a form of <i>guanxi</i> (i.e., a close and pervasive interpersonal relationship) in online marketplaces.
Text Mining	Abbasi and Chen (2008)	Evaluating the effectiveness of electronic communication in various organizational settings.
Strategic Communication	George, Carlson, and Valacich (2013)	Understanding why people select the media they choose for a particular type of communication
Multiplicity of Media Choices	Watson-Manheim and Bélanger (2007)	Investigating the use of multiple media in organizations through examination of communication media repertoires
Social Networks	Xiaohua and Liyuan (2013)	Understanding social ties and user content generation in photo-hosting website Flickr
Social Media Management	Miller and Tucker (2013)	Examining how much firms should actively manage their social media presence
Digitally Enabled Teams	Robert Jr., Denis, and Ahuja (2008)	Understanding the impact of social capital on knowledge integration and performance within digitally enabled teams
Virtual Communities	Bin, Konana, Rajagopalan, and Chen (2007)	Investigating how users value virtual communities and how virtual communities differ in their value propositions
Knowledge Contribution in Online Communities	Meng and Agarwal (2007)	Understanding how the use of IT-based features in online communities is associated with online knowledge contribution
Knowledge Transfer	Sussman and Siegal (2003)	Examining how knowledge workers are influenced to adopt the advice that they receive in mediated contexts
Technology Mediated Learning	Gupta and Bostrom (2009)	Understanding technology mediated learning and training in organizational contexts
Computer Anxiety	Brown, Fuller, and	Determining the joint impact of computer anxiety and communication apprehension

	Vician (2004)	on individual attitudes toward using CMC
Collaboration in Electronic Networks	Kudaravalli and Faraj (2008)	Studying the collaboration practices in electronic networks
Chat Communities	Dickey, Burnett, Chudoba, and Kazmer (2007)	Examining synchronous, text-based chat communications between customers and customer service representatives (CSRs)
Feedback and Coherence	Wilson and Djasasbi (2013)	Distinguishing interpersonal messages from broadcast messages in CMC
Learning	Guo, Tan, and Cheung (2010)	Understanding students' motivations for using CMC alongside non-CMC media within a learning context.
Trust	Robert Jr., Denis, and Hung (2009)	Testing a two-stage theoretical model of trust formation and the influence of information and communication technologies (ICT) on trust formation.
Group Decision Making	Zhang, Lowry, Zhou, and Fu (2007)	Investigating the impact of individualism—collectivism, social presence, and group diversity on group decision making under majority influence

CMC media-enabled patient empowerment is defined as patient empowerment that can be attributed to the use of computer mediated communication media. CMC media such as the Internet, e-mail, instant messaging, videoconferencing, blogs, social networks, wikis, and mobile devices allow individuals to communicate with others (Rice et al., 1990). CMC is information technology that has the potential to play a key role in enabling patient empowerment. IT can be used to empower individuals through the distribution of key information (Armstrong & Sambamurthy, 1999). An example is the use of automated reminders sent to patients reminding them to refill a prescription. HIT “has the potential to empower patients and support a transition from a role in which the patient is the passive recipient of care services to an active role in which the patient is

informed, has choices, and is involved in the decision-making process” (Demiris et al., 2008, p. 8).

## **2.6 Implications for IS Empowerment Research**

Empowerment has received relatively less attention in the IS literature compared to the organizational behavior literature. Specifically, empowerment of patients in a patient-healthcare provider relationship through the use of IT is an area that has been neglected in the IS field. Kankanhalli et al. (2005a) state that IS researchers should take a closer look at how knowledge contributors perceive power. By focusing on the specific area of CMC media-enabled patient empowerment, this dissertation fills the gap in IS literature and addresses the calls from IS researchers (Agarwal et al., 2010) to focus on the consumer-perspective on health information technology (HIT) specifically the effect of personal health information management tools on health outcomes of patients.

## CHAPTER III

### STUDY 1: PATIENTS' MOTIVATIONS AND BARRIERS FOR HEALTH INFORMATION SEEKING AND/OR SHARING ONLINE

#### **3.1 Research Objectives**

The proliferation of the Internet and the number of devices connected to it has resulted in widespread use of Computer-Mediated Communication (CMC) media in healthcare. CMC media refers to computer-based systems that allow individuals to communicate with others (Rice et al., 1990). Commonly used CMC tools include the Internet, e-mail, instant messaging, videoconferencing, blogs, social networks, wikis, and mobile devices. Research on the use of CMC in healthcare include its impact on telemedicine (Breen & Matusitz, 2009), patient support groups (Bender, O'Grady, & Jadad, 2008; Wright & Bell, 2003), coping with illness (Scheiber & Gruendel, 1999), mental health and substance abuse treatment (Budman, 2000), and patient-clinician communication (Priebe et al., 2007).

The Uses and Gratifications theory is widely used to explain media use in the field of communication studies (Guo et al., 2010) to investigate the motivations for the use of the Internet as a whole and specific CMC media in particular (Papacharissi & Rubin, 2000; Stafford, Stafford, & Schkade, 2004; Walther & Hancock, 2005). However, there is a scarcity of research that applies Uses and Gratifications perspective in the healthcare context to identify the motivations for using different communication media to investigate the motivations and barriers to health information seeking and/or health

information sharing online. According to the Uses and Gratifications theory, different types of CMC media vary not only in technological characteristics, but also in how well they satisfy the different motivations of users. Thus, the Uses and Gratifications theory is used as a guide to examining the motivations and barriers to health information seeking and/or health information sharing online.

The Internet is not only allowing patients to access resources that were previously not available to them, but also to share their personal health experiences with other patients who seek health information online. According to a 2011 Pew Internet Study, more than 59 percent of adults have searched online for health information (Fox, 2011). The most commonly searched for health topics are presented in Table 4.

**Table 4. Commonly Searched Health Topics**

<b>Topic</b>	<b>Percentage of Users Who Searched for the Topic</b>
Specific Disease	63%
Medical Treatment	47%
Diet and Nutrition	44%
Exercise	36%
Medication Issues	34%
Alternative Medications	28%
Insurance Companies	25%
Depression	21%
Doctor or Hospital	21%
(Source: Pew Internet, 2005)	

What is not clear in literature is why patients seek health information online and why patients share health information online. Also missing in the literature is research that seeks to identify the barriers that prevent patients from seeking health information online and from sharing health information online. The research questions for Study 1 are



as follows: *What are patients' motivations for seeking health information online? What are patients' barriers to seeking health information online? What are patients' motivations for sharing health information online? What are patients' barriers to sharing health information online?* Upon completion, the study will not only inform the academic and practitioner community on the motivations and barriers for seeking and/or sharing health information online, but also provide a rich explanation of such behavior through an interpretive exploration involving patients who engage in such behavior.

## 3.2 Literature Review

### 3.2.1 Motivations for Seeking Health Information Online

The Internet has become the primary information source for many consumers. The reasons why people seek information online have been researched extensively in the IS literature. Some of the reasons include: resource availability (Bock et al., 2006; Brazelton & Gorry 2003; Kankanhalli et al., 2005b), perceived usefulness (Bock et al., 2006; Kulkarni et al., 2006), perceived output quality (Kankanhalli et al., 2005b; Zhang & Watts, 2008), perceived relational benefit (Xu et al., 2010), knowledge seeking self-efficacy (Bock et al., 2006), knowledge growth (Bock et al., 2006), perceived usability (Phang et al., 2009), perceived sociability (Phang et al., 2009), and user satisfaction (Kulkarni et al., 2006).

**Table 5. Motivations for Seeking Information Online**

<b>Motivation</b>	<b>Definition</b>	<b>Source</b>
Resource availability	Availability of resources such as the technology that facilitates knowledge seeking from electronic knowledge repositories (EKR), the time available	Bock et al. (2006)

	on the part of the users to seek knowledge from the EKR, and any resources that are available to train the users on seeking knowledge from the EKR	
Perceived usefulness	Extent to which a person believes that the IT system they are using will help them perform their job better	Davis (1989)
Perceived output quality	The relevance, reliability and timeliness of the search output	Kankanhalli et al. (2005b)
Perceived relational benefit	The improved interpersonal relationship a seeker develops with an information source through the process of information seeking	Xu et al. (2010)
Knowledge seeking self-efficacy	The seeker's confidence in their ability to seek knowledge from EKR	Bock et al. (2006)
Knowledge growth	The expansion in the knowledge base of the seeker through the process of information seeking	Bock et al. (2006)
Perceived usability	The extent to which the EKR can be used easily and effectively to seek or share knowledge	Phang et al. (2009)
Perceived sociability	The extent to which the EKR's support social interaction for achieving shared goals	Phang et al. (2009)
User satisfaction	The subjective evaluation of the various outcomes of the knowledge seeking process	Kulkarni et al. (2006)

Table 5 presents the definitions of the motivations for information seeking in an online context. Those motivations are discussed in detailed as follows.

Resource availability refers to availability of resources such as the technology that facilitates knowledge seeking from electronic knowledge repositories (EKRs), the time available on the part of the users to seek knowledge from the EKRs, and any resources that are available to train the users on seeking knowledge from the EKRs (Bock et al., 2006). Brazelton and Gorry (2003) further highlight the importance of resources by stating that “technology may support a knowledge-sharing environment, but getting users to participate in effective ways is key” (p. 23). Kankanhalli et al. (2005b) showed that

resource availability affects EKR usage specifically in the context of knowledge seeking when the task tacitness is low.

Perceived usefulness is the extent to which a person believes that the IT system they are using will help them perform their job better (Davis, 1989). Bock et al. (2006) state that perceived usefulness of EKRs “can serve as a motivator for knowledge workers to seek knowledge from EKRs” (p. 360). Kulkarni et al. (2006) showed that perceived usefulness enhances knowledge use mediated by increased user satisfaction.

Perceived output quality refers to the relevance, reliability and timeliness of the search output (Kankanhalli et al., 2005b). Kankanhalli et al. (2005b) showed that perceived output quality directly affects EKR usage for knowledge seeking. The information relevance dimension of perceived output quality deserves special mention. Xu et al. (2010) define perceived information relevance as “the information seeker’s perception of the extent that the information provided by a source is related to and helpful to solve the seeker’s problem at hand” (p. 217). Perceived information relevance was found to be a significant antecedent to information seeking for both task and social information seeking (Xu et al., 2010). Zhang and Watts (2008) associate output quality with argument quality and source credibility. Argument quality refers to the persuasiveness of the posted output and source credibility refers to the trustworthiness and reliability of the source who posted the output (Zhang & Watts, 2008). Zhang and Watts (2008) established that argument quality and source credibility have a significant main effect on information adoption.

Perceived relational benefit refers to the improved interpersonal relationship a seeker develops with an information source through the process of information seeking (Xu et al., 2010). It is an important motivation in forming preference for an information source and allows the seeker to put aside social risks associated with information seeking. Xu et al. (2010) found that perceived relational benefit significantly affects task information seeking, which refers to the technical information needed to perform assigned tasks.

Knowledge-seeking self-efficacy is the seeker's confidence in their ability to seek knowledge from EKR (Bock et al., 2006). Bock et al. (2006) found that knowledge-seeking self-efficacy is positively related to EKR use.

Knowledge growth refers to the expansion in the knowledge base of the seeker through the process of information seeking (Bock et al., 2006). There is a significant positive relationship between knowledge growth and EKR use (Bock et al., 2006).

Perceived usability is the extent to which the EKR can be used easily and effectively to seek or share knowledge (Phang et al., 2009). Phang et al. (2009) found that perceived usability had a significant positive relationship with knowledge seeking.

Perceived sociability refers to the extent to which the EKR's support social interaction for achieving shared goals (Phang et al., 2009). Perceived sociability was found to be significantly related to knowledge seeking using EKR (Phang et al., 2009).

User satisfaction is the subjective evaluation of the various outcomes of the knowledge seeking process (Kulkarni et al., 2006). Kulkarni et al. (2006) found a significant positive relationship between user satisfaction and knowledge use.

While the above factors are the motivators for seeking knowledge in an online context, it is not clear whether the same factors motivate seeking of health information online. This is a question that Study 1 seeks to answer.

### ***3.2.2 Barriers to Seeking Health Information Online***

Despite the omnipresence of the Internet, the proliferation of mobile devices, and the availability of vast amounts of information online, several barriers exist as to why people do not seek information online. These barriers include difficulty in using EKR's (Kankanhalli et al., 2005b), fear of displaying ignorance (Borgatti & Cross, 2003; Kankanhalli et al., 2005b), inertia to reuse knowledge (Kankanhalli et al., 2005b), and future obligation (Bock et al., 2006).

**Table 6. Barriers to Seeking Information Online**

<b>Barrier</b>	<b>Definition</b>	<b>Source</b>
Difficulty in using EKR's	Extended effort on the part of the seeker to formulate and refine the search	Kankanhalli et al. (2005b)
Fear of displaying ignorance	The interpersonal risks an individual takes by admitting ignorance on a given topic	Borgatti and Cross (2003)
Inertia to reuse knowledge	The seeker's propensity to "reinvent the wheel" instead of seeking preexisting knowledge	Kankanhalli et al. (2005b)
Future obligation	The belief of being indebted to the knowledge contributor, for having sought her / his knowledge from an EKR	Bock et al. (2006)

A list of barriers to seeking information online and their respective definitions are provided in Table 6. Each of the barriers presented in Table 6 is discussed in detail as follows.

Difficulty in using EKR has been identified as a barrier to knowledge use (Goodman & Darr, 1998; Kankanhalli et al., 2005b). While ease of use is a motivator to use EKR, EKR that require extended effort on the part of the seeker to formulate and refine the search may lead to the seeker just abandoning the search (Kankanhalli et al., 2005b). Hence this is a significant barrier to knowledge seeking.

Fear of displaying ignorance is a barrier to online information seeking (Argyris, 1992; Borgatti & Cross, 2003; Kankanhalli et al., 2005b). Borgatti and Cross (2003) state that “a potentially significant cost of seeking information from others in organizational settings lies with the interpersonal risks an individual takes by admitting ignorance on a given topic” (p. 435).

Inertia to reuse knowledge, which refers to the seeker’s propensity to “reinvent the wheel” instead of seeking preexisting knowledge, is a barrier to knowledge use (Argyris, 1992; Kankanhalli et al., 2005b).

Future obligation is defined as “the belief of being indebted to the knowledge contributor, for having sought his or her knowledge from an EKR” (Bock et al., 2006, p. 360). Bock et al. (2006) found that future obligation acts as a barrier to knowledge seeking when the collaborative norms are weak. Collaborative norms refer to the degree of consensus among EKR users with regards to cooperation, collaboration, importance of knowledge, and use of knowledge through the EKR (Bock et al., 2006). Under weak collaborative norms, not enough knowledge is being shared within the community and this creates a burden on the part of the knowledge seeker to pay back knowledge to the

community. This expectation of future obligation acts a barrier to knowledge seeking in EKR.s.

Thus, there are several barriers to seeking information online. The question of interest here is whether the same barriers exist to seeking health information online. In the healthcare context, some obvious barriers to information seeking exist including privacy and anonymity. Study 1 aims to explore this topic in detail to identify the possible barriers to seeking health information online.

### ***3.2.3 Motivations for Sharing Health Information Online***

Some of the reasons behind why people may share information online include trust (Kankanhalli et al., 2005a; Paul & McDaniel, 2004; Leimeister et al., 2005; Zahedi & Song, 2008), reputation of the knowledge contributor (Kankanhalli et al., 2005a; Wasko & Faraj, 2005), reciprocity (Kankanhalli et al., 2005a; Wasko & Faraj, 2005; Chai et al., 2011), commitment (Wasko & Faraj, 2005; Bateman et al., 2011), enjoyment in helping others (Kankanhalli et al., 2005a; Wasko & Faraj, 2005), knowledge sharing self-efficacy (Kankanhalli et al., 2005a), perceived identity verification (Ma & Agarwal, 2007), perceived usefulness of knowledge sharing (Kulkarni et al., 2006), user satisfaction (Kulkarni et al., 2006), perceived usability (Phang et al., 2009), and perceived sociability (Phang et al., 2009).

A list of definitions for the motivations for sharing health information online is presented in Table 7.

**Table 7. Motivations for Sharing Information Online**

<b>Motivation</b>	<b>Definition</b>	<b>Source</b>
Trust	The belief that the knowledge from EKR's will be contributed to and reused by reliable and competent individuals with good intent	Kankanhalli et al. (2005a)
Reputation of the knowledge contributor	Perceived increase in the knowledge contributor's image due to knowledge contribution using an EKR	Kankanhalli et al. (2005a)
Reciprocity	The belief that current contribution to EKR would lead to future request for knowledge being met	Kankanhalli et al. (2005a)
Commitment	A sense of responsibility to help others on the basis of shared membership"	Wasko and Faraj (2005)
Enjoyment in helping others	The perceived pleasure a knowledge contributor experiences by helping others through the knowledge contributed to the EKR	Kankanhalli et al. (2005a)
Knowledge sharing self-efficacy	The confidence in a knowledge contributor's ability to provide valuable knowledge to an EKR	Kankanhalli et al. (2005a)
Perceived identity verification	The perceived confirmation from other community members of a focal person's belief about his identities	Ma and Agarwal (2007)
Perceived usefulness of knowledge sharing	The extent to which the knowledge contributor believes that contributing to the EKR will help improve her or his job performance, productivity, effectiveness, ease of doing the job	Kulkarni et al. (2006)
User satisfaction	The subjective evaluation of the various outcomes of the knowledge sharing process	Kulkarni et al. (2006)
Perceived usability	The extent to which the EKR can be used easily and effectively to seek or share knowledge	Phang et al. (2009)
Perceived sociability	The extent to which the EKR's support social interaction for achieving shared goals	Phang et al. (2009)



The above motivations for sharing information in an online context are described in detail in the following section.

Trust refers to the belief that the knowledge from EKR will be contributed to and reused by reliable and competent individuals with good intent (Kankanhalli et al., 2005a). Trust is especially critical in the virtual context due to the lack of face-to-face interactions (Paul & McDaniel, 2004). Leimeister et al. (2005) showed that “trust provides the foundation for the successful implementation and operation of a virtual community” (p. 101). They add that this is especially true for online health-care communities which are patient-oriented. Zahedi and Song (2008) argue that the dynamics of how trust evolves over time beyond the initial trust formation is especially important in the context of health information providers who are online.

Reputation refers to a perceived increase in the knowledge contributor’s image due to knowledge contribution using an EKR (Kankanhalli et al., 2005a). Wasko and Faraj (2005) found that reputation is a significant predictor of individual knowledge contribution both in quality and frequency of knowledge contribution.

Reciprocity is defined as “the belief that current contribution to EKR would lead to future request for knowledge being met” (Kankanhalli et al., 2005a, p. 123). Wasko and Faraj (2005) found that reciprocity affects the volume of knowledge contribution to an EKR. Chai et al. (2011) showed that reciprocity has a positive effect on knowledge sharing behavior.

Commitment is defined as “a sense of responsibility to help others ... on the basis of shared membership” (Wasko & Faraj, 2005, p. 42). Marks, Polak, McCoy, and

Galletta (2008) refer to this as group identification. Wasko and Faraj (2005) found that individuals who are committed contributed more helpful knowledge to the EKR. Commitment was also found to be a significant predictor of knowledge sharing behavior (Bateman et al., 2011).

Enjoyment in helping others is the perceived pleasure a knowledge contributor experiences by helping others through the knowledge contributed to the EKR (Kankanhalli et al., 2005a). Wasko and Faraj (2005) found evidence that individuals make more helpful knowledge contributions when they enjoy helping others.

Knowledge sharing self-efficacy is defined as the confidence in a knowledge contributor's ability to provide valuable knowledge to an EKR (Kankanhalli et al., 2005a). Kankanhalli et al. (2005a) found that knowledge sharing self-efficacy is positively related to knowledge contributors' use of EKR.

Perceived identity verification is defined as "the perceived confirmation from other community members of a focal person's belief about his identities" (Ma & Agarwal, 2007, p. 46). Ma and Agarwal (2007) found that perceived identity verification is strongly linked to knowledge contribution in online communities.

Perceived usefulness of knowledge sharing is defined as the subjective evaluation of the extent to which the knowledge contributor believes that contributing to the EKR will "help improve his or her job performance, productivity, effectiveness, ease of doing the job" (Kulkarni et al., 2006, p. 315). Kulkarni et al. (2006) showed that perceived usefulness of knowledge sharing enhances knowledge use mediated by increased user satisfaction.

User satisfaction is the subjective evaluation of the various outcomes of the knowledge sharing process (Kulkarni et al., 2006). Kulkarni et al. (2006) found a significant positive relationship between user satisfaction and knowledge sharing in an organizational context.

Perceived usability is the extent to which the EKR can be used easily and effectively to seek or share knowledge (Phang et al., 2009). Phang et al. (2009) found that perceived usability had a significant positive relationship with knowledge sharing in a learning-focused online community.

Perceived sociability refers to the extent to which the EKR's support social interaction for achieving shared goals (Phang et al., 2009). Perceived sociability was found to be significantly related to knowledge sharing using EKRs in a learning-focused online community (Phang et al., 2009).

While the above factors are the motivators to sharing information online in general, whether the same factors motivate health information sharing online is not clear. Study 1 helps address this question.

### ***3.2.4 Barriers to Sharing Health Information Online***

The barriers for sharing information online include information privacy concerns (Angst & Agarwal, 2009; Chai et al., 2011), loss of knowledge power (Kankanhalli et al., 2005a), codification effort (Kankanhalli et al., 2005a), and perceived knowledge quality (Durcikova & Gray, 2009). A list of barriers to sharing information online is presented in Table 8.

**Table 8. Barriers to Sharing Information Online**

<b>Barrier</b>	<b>Definition</b>	<b>Source</b>
Information privacy concerns	The extent to which a knowledge contributor is concerned about the collection, accuracy, unauthorized access, and secondary use of information	Angst and Agarwal (2009)
Loss of knowledge power	The perceived loss of power or value when a knowledge contributor shares unique knowledge to the online community	Kankanhalli et al. (2005a)
Codification effort	The effort it takes on the part of the knowledge contributor to explicate and codify knowledge	Kankanhalli et al. (2005a)
Perceived knowledge quality	The extent to which an individual believes that a repository provides precise and accurate content that meets her or his knowledge needs	Durcikova and Gray (2009)

The above barriers to sharing information in an online context are discussed in greater detail below.

Information privacy concerns refer to the extent to which a knowledge contributor is concerned about the collection, accuracy, unauthorized access, and secondary use of information (Angst & Agarwal, 2009). Information privacy concerns negatively affect people's intention to share personal information online (Awad & Krishnan, 2006).

Loss of knowledge power refers to the perceived loss of power or value when a knowledge contributor shares unique knowledge to the online community (Kankanhalli et al., 2005a). Loss of knowledge power has been identified as a barrier to knowledge sharing (Davenport & Prusak, 1998; Orlikowski, 1993).

Codification effort is defined as the effort it takes on the part of the knowledge contributor to explicate and codify knowledge (Kankanhalli et al., 2005a). Codification effort was found to be negatively related to knowledge sharing (Orlikowski, 1993) especially in the context of weak generalized trust (Kankanhalli et al., 2005a).

Perceived knowledge quality is defined as “the extent to which an individual believes that a repository provides precise and accurate content that meets his or her knowledge needs” (Durcikova & Gray, 2009, p. 84). Zimmer, Henry, and Butler (2007) investigated the relationship between perceived knowledge quality and frequency of knowledge contribution. Durcikova and Gray (2009) found that perceived knowledge quality negatively impacts knowledge contribution.

Lack of any direct or tangible benefits to the knowledge contributor is yet another barrier to sharing health information online. Kankanhalli et al. (2005a) state that under conditions of weak pro-sharing norms, knowledge contributors may require extrinsic benefits in order to contribute their knowledge to EKR.

The next goal of Study 1 is determine whether the same barriers apply to sharing health information online. Results of the interpretive approach are used to address that question.

### **3.3 Methodology**

An interpretive approach using a qualitative methodology is used to answer the research questions associated with Study 1. Interpretive research is one of the three paradigms for conducting qualitative research, the other two being positivist and critical research epistemologies (Chua, 1986). Interpretive research does not require an a priori

model with predefined constructs, but rather “focuses on the complexity of human sense making as the situation emerges” (Kaplan & Maxwell, 1994). IS research can be classified as interpretive “if it is assumed that our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools, and other artifacts” (Klein & Myers, 1999, p. 69). Interpretive research in IS is “aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context” (Walsham, 1993, pp. 4-5). Qualitative methodologies “are designed to help understand people and the social and cultural contexts within which they live” (Palvia et al. 2004, p. 529). A meta-analysis of methodologies in the IS field showed that qualitative analysis was not widely used as a methodology by IS researchers outside of case research (Palvia et al., 2004).

The Klein and Myers (1999) principles are used for conducting and evaluating interpretive research in this study. Klein and Myers (1999) propose the following seven principles for conducting and evaluating interpretive IS field research:

1. *The fundamental principle of the hermeneutic circle* – suggests that “all human understanding is achieved by iteration between considering the interdependent meaning of parts and the whole that they form. This principle of human understanding is fundamental to all the other principles.” (p. 72).
2. *The principle of contextualization* – requires “critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged.” (p. 72).

3. *The principle of interaction between the researchers and the subjects* – requires “critical reflection on how the research materials (or “data”) were socially constructed through the interaction between the researchers and participants.” (p. 72).
4. *The principle of abstraction and generalization* – requires “relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action.” (p. 72).
5. *The principle of dialogical reasoning* – requires “sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings (“the story which the data tell”) with subsequent cycles of revision.” (p. 72).
6. *The principle of multiple interpretations* – requires “sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it.” (p. 72).
7. *The principle of suspicion* – requires “sensitivity to possible “biases” and systematic “distortions” in the narratives collected from the participants.” (p. 72).

A qualitative study was conducted by interviewing patients of a regional healthcare provider to determine patient motivations for using CMC in health information seeking and health information sharing contexts. The main goal of the interviews is to use

the Uses and Gratifications perspective to identify a set of motivations that patients seek to satisfy during communication through the CMC media.

### ***3.3.1 Data Collection***

A total of 14 in-depth interviews were conducted with patients of a regional healthcare provider. The goal of the interviews is to make sure that we understand all of the patient motivations for seeking and/or sharing health information online. The interview questions are provided in Appendix A. The interviews were completely voluntary to ensure that our results were unbiased. The interviews were recorded on digital audio devices with permission from the Institutional Review Board (IRB). Participants were given an incentive to participate in the interviews. To ensure the representativeness of the selected sample to the population, patients were recruited for the interviews based on different demographic criteria such as age, gender, education, and economic status. All interviews were conducted face-to-face. The sample size for the interviews was based on literature (Creswell, 2007; Guo et al., 2010; Tan & Hunter, 2002). Creswell (2007) recommends using 20 to 30 interviews for qualitative research. Guo et al. (2010) used a sample size of 15 interviews to investigate student motivations in a learning context using Uses and Gratifications perspective as the theoretical background. Tan and Hunter (2002) state that a comprehensive list of constructs can be elicited from a relatively small sample size of 15 to 25 interviews. The sample size of 14 patients was also based on the fact that theoretical saturation had occurred where additional patient interviews did not lead to any new patient motivation dimensions.



The selection criteria for interview candidates were as follows:

1. Patients who are using publicly available resources on the Internet to seek and/or share health information online.
2. Patients who are using their healthcare provider's patient portal to seek and/or share health information online.
3. Patients who were previously using publicly available resources on the Internet to seek and/or share health information online, but have stopped doing so due to various reasons.
4. Patients who were previously using their healthcare provider's patient portal to seek and/or share health information online, but have stopped doing so due to various reasons.

### ***3.3.2 Interview Protocol***

The interview protocol was based on semi-structured, open ended questions. Please see Appendix A for a list of interview questions. Each interview candidate was asked to provide an appointment to meet at a location convenient to them. During the appointment, the interview protocol was explained to the interview candidates and their written permission was obtained to indicate that they not only understood the interview protocol, but also agreed to be recorded on audio tape. None of the 14 interview candidates had any issues with their voices being recorded on audio tape.

The interviews began with the main questions listed in Appendix A. Interview candidates were then asked follow up questions when additional information was needed to understand their motivations for and barriers in using CMC media to seek health

information online and to share health information online. Typical interviews took about 20 to 30 minutes. At the end of the interviews, candidates were asked permission to be contacted by email or by phone should further clarification be required. Candidates were given a gift card in exchange for their participation in the interviews.

### ***3.3.3 Qualitative Analysis***

Once the interviews were completed, they were transcribed. A qualitative analysis of the transcriptions then followed using Dedoose software. Dedoose is a cross-platform app that allows users to effectively analyze data collected using qualitative interviews in social science research (Dedoose, 2011).

Data analysis included coding, content analysis, and hermeneutic interpretation. The unit of analysis is the individual patient. The unit of data collection is also the individual patient.

#### **3.3.3.1 Step 1: Coding**

The first step in the qualitative analysis is coding. The process of coding is further subdivided into three types of coding: descriptive coding, topical coding, and thematic coding.

Descriptive coding is the first step in the coding process. Descriptive codes contain demographic information about the interview candidates. The descriptive codes used for this study include the patient's age, patient's gender, and patient's ethnicity. Dedoose refers to demographic information as descriptor codes. The descriptor codes for this study as coded in Dedoose are presented in Figure 2. In addition to the age, sex, and ethnicity descriptors, an ID field was added to each record. This ID field is a combination

of the date the patient was interviewed and the interview number. For example, the first row in Figure 2 has the ID 06.07.13.06. This implies that the interview was conducted on June 7, 2013 and was the 6th out of 14 interviews.

Descriptors In Set:			
ID	Age	Sex	Ethnicity
06.07.13.06	65	Female	Caucasian
06.05.13.04	43	Male	Caucasian
06.06.13.05	40	Female	Caucasian
06.27.13.10	33	Female	Caucasian
07.11.13.14	30	Female	Caucasian
06.07.13.07	40	Male	Caucasian
04.19.13.01	35	Male	Caucasian
04.19.13.02	53	Male	Caucasian
06.12.13.09	35	Female	African American
06.10.13.08	52	Female	Caucasian
06.29.13.11	55	Male	Caucasian
04.22.13.03	30	Female	Caucasian
07.02.13.12	30	Female	African American
07.05.13.13	28	Female	Caucasian

**Figure 2. Descriptor Codes in Dedoose**

The second step in the coding process is topical coding. Topical coding is a process where the transcribed interviews are reviewed to identify specific candidate quotes to which predefined codes can be applied. Dedoose refers to these specific quotes as excerpts and the process of topical coding as excerpting. The process of topical coding is not restricted to application of the predefined codes. New codes can also emerge during the process of topical coding and the transcribed interviews are reviewed again in an

iterative process to see if the new codes can be applied to more excerpts from the interviews.

The topical coding process began with identification of the predefined codes based on a review of the literature. These predefined codes are presented in Table 9.

**Table 9. List of Predefined Codes Based on Literature**

<b>List of Codes</b>	
Details of information	Control over interactions
Sources of information	Synchronicity
Range of information	Feedback
Reliability of information	Familiarity of communicators
Usefulness of information	Personalness of interaction
Cost	Not feeling alone
Knowledge growth	Encouragement
Altruism	Awareness
Anonymity	Accessibility
Venting	Ease of use
Privacy concerns	Speed
Codification effort	Information sharing
Clarification of issues	One to many communication
Complexity of Issues	Social influence
Criticality of issues	Large quantity of information
Coping	Multifunctioning
Decision making	File management
Control over health problems	Communication history
Accuracy of information	Frequency
Output quality	Provider provided information
Self-efficacy	Tension between patient and provider
Satisfaction	Trustworthiness of information
Effort to seek information	

The third step in the coding process is pattern coding, where the codes identified during the topical coding process are grouped into categories based on the research questions for this study. In this study, the goal is to identify patients' motivations for

seeking health information online, patients' motivations for sharing health information online, patients' barriers to seeking health information online, and patients' barriers to sharing health information online. These four categories are used as patterns to group the codes identified in step 2. The pattern coding categories are presented in Table 10.

**Table 10. Pattern Coding Categories**

Category
Motivations to seek health information online
Barriers to seek health information online
Motivations to share health information online
Barriers to share health information online

#### **3.3.3.2 Step 2: Content Analysis**

Content analysis is step 2 of the qualitative analysis process. This step includes the three sub-steps of thematic coding, code frequency analysis, and code co-occurrence analysis.

Thematic coding refers to the process of using content analysis to elicit analytical patterns or themes based on the coding categories, subcategories, and codes developed in step 1 of the qualitative analysis process. Code frequency analysis is a part of content analysis where codes which are repeated more frequently than others are interpreted to be of greater importance to the interview candidates. Code co-occurrence analysis is the final step of content analysis with the goal of identifying those excerpts to which multiple codes were applied during the coding process.

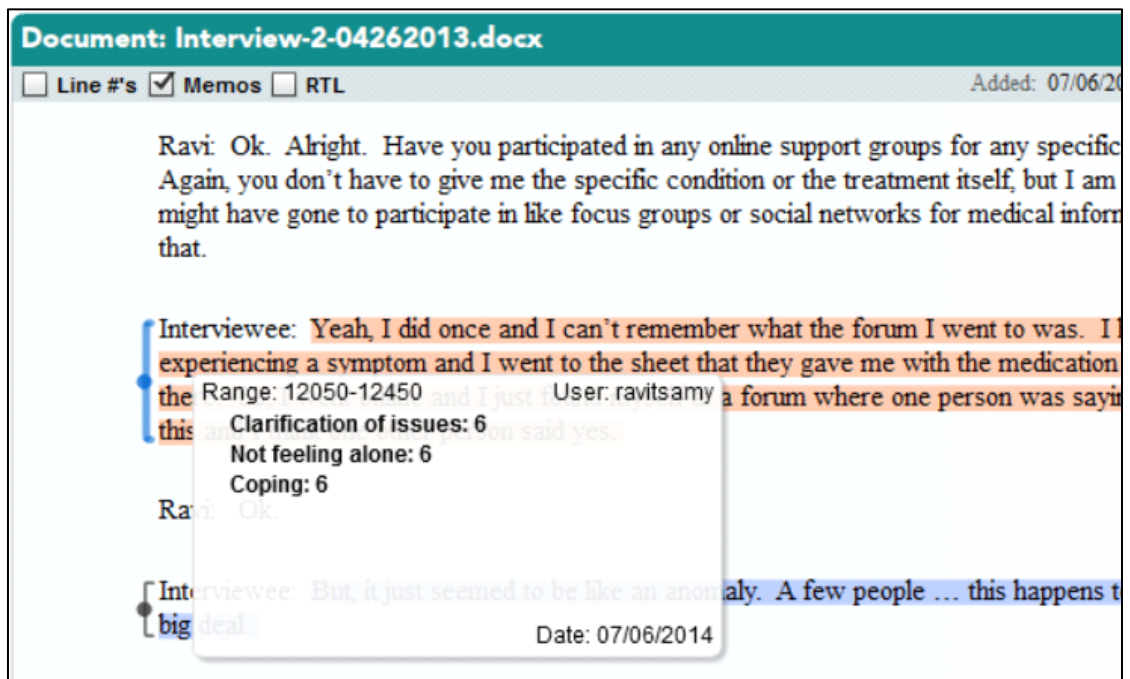
Dedoose allows the capability to do code frequency analysis and code co-occurrence analysis. Figure 3 shows how Dedoose displays code frequencies per interview transcript.

Code Applications									
Media	Codes								
	Accessibility	Altruism	Anonymity	Awareness	Clarification of issues	Codification effort	Communication history	Complexity of issues	Control over health
Interview-9-06122013.docx	2				2				
Interview-8-06102013.docx	3	1			3			2	1
Interview-7-06072013.docx	1	2	2	1	1	1	3		
Interview-6-06072013.docx	1				2	4	2		
Interview-5-06062013.docx	6	1		1	3	1	4	4	
Interview-4-06052013.docx									
Interview-3-04222013.docx					3	1			

**Figure 3. Code Frequency Analysis in Dedoose**

As seen in the figure, the media, which refers to interview transcripts, is presented as rows and the codes are presented as columns. At the intersection of each row (media) and column (code) is the number of times that particular code was applied in that specific media. The highlighted cell in Figure 3 indicates that the code accessibility was applied 6

times in the transcript from interview number 5. A prerequisite for code co-occurrence analysis is application of multiple codes to excerpts or quotes from the interview transcripts. Dedoose allows application of multiple codes to multiple excerpts in each interview transcript. An example of this is shown in Figure 4 above where a single excerpt in interview number 2 is applied the codes clarification of issues, not feeling alone, and coping.



**Figure 4. Applying Multiple Codes to an Excerpt in Dedoose**

In addition to application of codes to excerpts in the interview transcripts, Dedoose allows application of weights to each code applied to an excerpt. In this study, all codes were weighted from 1 through 7 where 1 refers to poor support from the CMC media for that code and 7 refers to full support from the CMC media for that code. In Figure 4, the codes clarification of issues, not feeling alone, and coping are weighted at 6,

which means that the CMC media provides plenty of support for patients to clarify health-related issues, to give them the feeling that they are not alone in dealing with their health-related problems, and to help them cope with their illnesses in a better manner.

Code Co-Occurrence											
Codes	Codes										
	Accessibility	Altruism	Anonymity	Awareness	Clarification of issues	Codification effort	Communication history	Complexity of issues	Control over health	Control over interactions	Coping
Accessibility							1				
Altruism				3				1			2
Anonymity											
Awareness		3			1	1					2
Clarification of issues				1				3		1	6
Codification effort				1			1				1
Communication history	1					1					
Complexity of issues		1			3					1	2
Control over health											
Control over interactions					1			1			
Coping		2		2	6	1		2			
Cost	2	1		1							
Criticality of issues		1			1	1		1		1	2

Figure 5. Code Co-Occurrence Analysis in Dedoose



The next step after application of multiple codes to the excerpts in all the transcribed interviews is to do a code co-occurrence analysis. A screenshot of this from Dedoose is presented in Figure 5.

As seen from the figure, the 36 codes are presented as both rows and columns with the intersection of each row and column referring to the number of time the two codes co-occurred with each other across all 14 interview transcripts. The highlighted cell in Figure 5 shows that the codes clarification of issues and coping co-occurred 6 times in the 14 interview transcripts.

### 3.4 Study 1 Results

The results of data analysis for Study 1 are presented in this section. These results include information about demographics, codes, code categories, and themes.

#### 3.4.1 Demographics

The demographic related information for all 14 interviewees is presented in Table 11. In terms of age, a majority (57 percent) of the interview candidates were in the 30 to 40 years old category followed by 21 percent who belonged to the 50 to 60 years old category. In terms of gender, 36 percent of the interview candidates were male and 64 percent of the interviewees were female. Based on ethnicity, 86 percent of the interview candidates were Caucasian and 14 percent were African-American.

**Table 11. Demographics**

<b>Interview #</b>	<b>ID</b>	<b>Age</b>	<b>Gender</b>	<b>Ethnicity</b>
1	04.19.13.01	35	Male	Caucasian
2	04.19.13.02	53	Male	Caucasian

3	04.22.13.03	30	Female	Caucasian
4	06.05.13.04	43	Male	Caucasian
5	06.06.13.05	40	Female	Caucasian
6	06.07.13.06	65	Female	Caucasian
7	06.07.13.07	40	Male	Caucasian
8	06.10.13.08	52	Female	Caucasian
9	06.12.13.09	35	Female	African-American
10	06.27.13.10	33	Female	Caucasian
11	06.29.13.11	55	Male	Caucasian
12	07.02.13.12	30	Female	African-American
13	07.05.13.13	28	Female	Caucasian
14	07.11.13.14	30	Female	Caucasian

### 3.4.2 Codes

The initial coding process resulted in identification of 36 codes. The following table lists those codes along with the number of interview participants mentioning this code during their interviews ordered by the frequency of occurrence of those codes.

**Table 12. Codes by Frequency**

<b>Code</b>	<b>Number of Interviews Containing this Code (N = 14)</b>	<b>Frequency of Occurrence</b>
Clarification of issues	14	46
Reliability of information	13	46
Range of information	11	28
Privacy concerns	14	28
Large quantity of information	12	28
Accessibility	10	26
Ease of use	10	25
Information sharing	12	21
Details of information	11	20
Knowledge growth	10	20
Sources of information	11	19
Multifunctioning	10	19
Criticality of issues	8	17
Decision making	8	17
Not feeling alone	9	17
Coping	9	16

Usefulness of information	14	14
Encouragement	7	14
Cost	8	12
Codification effort	7	12
Control over interactions	8	12
Personalness of interaction	5	12
Synchronicity	7	11
One to many communication	7	11
Communication history	5	11
Complexity of Issues	4	10
Awareness	8	10
File management	6	9
Altruism	6	8
Anonymity	6	8
Venting	5	8
Feedback	7	8
Social influence	5	7
Familiarity of communicators	5	5
Speed	3	3
Control over health problems	2	2

### 3.4.3 Code Categories

Table 13 below shows the four major categories and the initial set of 36 codes classified according to those categories.

**Table 13. Coding Categories**

Category	Code
Motivations to seek health information online	Details of information
	Sources of information
	Usefulness of information
	Cost
	Knowledge growth
	Clarification of issues
	Complexity of Issues
	Criticality of issues
	Coping
	Decision making
	Control over health problems

	Control over interactions
	Synchronicity
	Feedback
	Speed
	One to many communication
	Social influence
	Large quantity of information
	Multifunctioning
	File management
	Communication history
Barriers to seek health information online	Range of information
	Reliability of information
	Familiarity of communicators
	Accessibility
	Ease of use
	Accuracy of information
	Trustworthiness of information
	Timeliness of information
Motivations to share health information online	Altruism
	Anonymity
	Venting
	Personalness of interaction
	Not feeling alone
	Encouragement
	Awareness
	Connectivity
Barriers to share health information online	Privacy concerns
	Codification effort

#### ***3.4.4 Motivation and Barrier Themes Categorized by the Uses and Gratifications Perspective***

In this section, the Uses and Gratifications perspective is used to categorize the motivations for health information seeking and/or sharing online and barriers to health information seeking and/or sharing online identified in Table 13 into seven themes of media-enabled health information seeking online, media-enabled health information sharing online, media-enabled convenience, media-enabled connectivity, media-enabled

health-related communication and control, media-enabled health problem solving, and health output quality produced by media. The patterns or coding categories for this study are derived from the Uses and Gratifications theory. Uses and Gratifications for consumer use of communication media such as the Internet can be classified into content gratifications, process gratifications, and social gratifications (Stafford et al., 2004). Content gratification refers to media use by consumers just for the information and knowledge that the media offers (Mendes-Filho & Tan, 2009). Process gratification refers to media use by consumers who just use the media for its convenience, simplicity, and enjoyment (Stafford et al., 2004; Mendes-Filho & Tan, 2009). Social gratifications refer to media use by consumers who use it mainly to interact and communicate with other consumers who use the media (Stafford et al., 2004).

Based on careful analysis of the data using the three Uses and Gratifications dimensions of content gratifications, process gratifications, and social gratifications, seven themes emerged. These themes are media-enabled health information seeking online, media-enabled health information sharing online, media-enabled convenience, media-enabled connectivity, media-enabled health-related communication and control, media-enabled health problem solving, and health output quality produced by media. These seven themes were then categorized into content gratifications, process gratifications, and social gratifications. The content gratifications category includes the subcategories of media-enabled health information seeking online and health output quality produced by media. The process gratifications category includes the subcategories of media-enabled convenience and media-enabled connectivity. The social gratifications

category includes the subcategories of media-enabled health information sharing online, media-enabled health problem solving, and media-enabled health-related communication and control. Table 14 presents the three categories (content gratifications, process gratifications, and social gratifications), seven sub categories (media-enabled health information seeking online, health output quality produced by media, media-enabled convenience, media-enabled connectivity, media-enabled health information sharing online, media-enabled health problem solving, and media-enabled health-related communication and control), and their respective codes.

**Table 14. Categories, Sub-Categories, and Corresponding Codes**

<b>Category</b>	<b>Sub Category</b>	<b>Code</b>
Content gratifications	Media-enabled health information seeking online	Details of information
		Sources of information
		Range of information
		Knowledge growth
		Quantity of information
		Accessibility
	Health output quality produced by media	Trustworthiness of information
		Accuracy of information
		Information relevance
		Up-to-date information
		Current information
		Timeliness of information
Process gratifications	Media-enabled convenience	Reliability of information
		Usefulness of information
		Cost of communication
		Anonymity
		Ease of use for sharing
		Speed of communication
	Media-enabled connectivity	Clarification of issues
		Familiarity of communicators
Social gratifications	Media-enabled health information sharing online	File management
		Altruism
		Venting

		Multifunctioning
		Information sharing
		Personalness of interaction
		Encouragement
		Awareness of others
		Ease of use
	Media-enabled health problem solving	Complexity of issues
	Media-enabled health-related communication and control	Criticality of issues
		Communication history
		One-to-many communication
		Synchronicity
		Feedback
		Control over health problems
		Control over interactions

The seven themes, their coding frequencies (the number of times the codes appeared in all 14 interview transcripts), and definitions are presented in Table 15.

**Table 15. Themes, Coding Frequencies, and Definitions**

Theme	Coding Frequency	Definition
Media-enabled health information seeking online	154	The extent to which patients use the communication medium to seek health information online
Health output quality produced by media	120	The extent to which the search output produced by the media is relevant, reliable, and timely
Media-enabled convenience	53	The extent to which patients feel that the communication medium is to access and to use for health information seeking and/or sharing
Media-enabled connectivity	39	The extent to which the communication medium allows patients to connect with others to share health information
Media-enabled health information sharing online	64	The extent to which patients use the communication medium to share health information online

Media-enabled health problem solving	120	The extent to which the communication medium allows patients to solve their health related problems
Media-enabled health-related communication and control	77	The extent to which the communication medium allows patients to communicate with others and to take control over their own health and interactions with the provider

### 3.4.5 *Qualitative Validity and Reliability*

Validity in qualitative research is established by allowing the interview candidates to review the transcribed interviews to check for any inconsistencies between what they said during the interviews and what was captured in the transcribed data. If the interview candidates did not see any reasons to change the interview transcriptions, then the data is considered to have high validity. Some of the feedback received from the interview candidates are presented in Table 16.

**Table 16. Feedback from Interviewees**

<b>Feedback</b>
Reading the interview (transcript) was eye-opening
Even though I was there at the time (obviously), when I read the conversation, and saw how you had identified various passages as supporting elements of your thesis — it all clicked.
It seems clear to me that your inquiry will yield productive guidelines for medical practices that want to empower their patients via the use of today's technology.
... a move in this direction will benefit not just the patients but the physicians and practices as well.
I'm excited to see how people like yourself are advocating for greater access to



information for patients, and greater control over their treatment.
... the transcript looks fine
good job of capturing my rambling answers
... the seven themes and how my transcript is coded seems fine and an accurate reflection of my interview.

The interview candidates did not suggest any changes to the transcripts and hence the data is considered to have high validity.

Reliability in qualitative research refers to the consistency with which the interview process, the transcription process, the coding process, and the qualitative analysis process were handled by the researcher. The qualitative data should be considered highly reliable since the same interview protocol was followed for each interview, the interviews were audio recorded, the interviews were transcribed by the researcher himself, and data coding was done in a very organized manner. An inquiry audit was conducted to evaluate the reliability of the data collection and data analysis processes used in this study. An inquiry audit was used instead of an inter-rater reliability, which may not be appropriate since interpretive research assumes that each researcher will have a unique interpretation of the findings (Lincoln & Guba, 1985). The inquiry audit was performed by one professor (trained in qualitative research) at a local university to examine and assess the process of inquiry and review the interview transcripts, coding sheets, and data analysis.

### **3.5 Uses and Gratifications – The Seven Themes**

As stated earlier, application of Uses and Gratifications theory to the codes in the thematic coding process resulted in identification of the seven themes of media-enabled health information seeking online, media-enabled health information sharing online, media-enabled convenience, media-enabled connectivity, media-enabled health-related communication and control, media-enabled health problem solving, and health output quality produced by media. In this section each of those themes is examined in greater detail. Each of the seven themes is defined first, followed by a listing of the codes that make up that theme. The definition of each code that makes up a theme is presented next, followed by examples of excerpts from the interview transcripts to which the codes from each theme were applied.

#### ***3.5.1 Media-Enabled Health Information Seeking Online***

Media-enabled health information seeking online refers to the extent to which patients use the communication medium to seek health information online. This dimension includes the following codes: details of information, sources of information, range of information, knowledge growth facilitated by information seeking, quantity of information, and accessibility to the media. The code “*details of information*” refers to the medium’s ability to allow patients to obtain detailed health-related information (or not). The code “*sources of information*” refers to the medium’s ability to allow patients to obtain health information online from different sources (or a single source). The code “*range of information*” refers to the medium’s ability to allow patients to obtain a broad (or narrow) range of health information online. The code “*knowledge growth*” refers to

the ability of the medium to allow patients to accumulate health-related knowledge (or not). The code “*quantity of information*” refers to the ability of the medium to allow patients to transfer or obtain a large (or small) quantity of health-related information. The code “*accessibility*” refers to whether the medium is easy (or difficult) to access. Examples of the media-enabled health information seeking online theme from the interview transcripts are presented in Table 17.

**Table 17. Examples of the Media-Enabled Health Information Seeking Online Theme**

<b>Examples</b>
I am looking for health and wellbeing and I don’t assume that my doctor knows everything and certainly my experiences borne that out. What I found is that a greater degree of health and wellbeing is possible than what the medical profession is offering.
I have searched for a wide variety of information. I have an illness called <removed for privacy concerns> and so I have sought a lot of information about thyroid disease and how to improve my health with that. It is an auto immune disease with a lot of things going on with that. I have found significant information.
He ended up saying ok here is this experimental treatment kind of thing. I have never done it before. Here is what I know. Here is the website of the place that makes this device. Here is what’s all involved in it and so on. I was like ok.
... I have had a few physicians over the years that have given me links. More often than not, they give me hard literature which doesn’t go as in depth as I would like which also then leads me to go online.
I found the Mayo Clinic has been my favorite since it has been the most comprehensive and I like the amount of pictures that they have that can be tied to symptoms.
A lot of times, it is just dealing with the Parkinson’s. Mostly, I look up certain symptoms. Is it common? Is it normal? Is it something that I should be afraid of?
But, if just say someone wants to know about shingles vaccine, I mean any vaccine

whatsoever, I just go to CDC because you can print something off.
I Google it. Google my symptoms or especially with children and what is going on with them. I just Google it and then WebMD and Mayo Clinic, I'll always see those. They are one of the first ones that always pop up and they sound good to me. So I go to those.
... if I am looking up a new medication the doctor has recommended, I am looking at two things. I am looking at that site, the medications site to see what they have posted and then I am looking on message boards to see what people's successes have been.
Umm, I usually punch it in like Yahoo!, but I normally refer to like WebMD or something.
I sort of have ... my general attitude about health is I have been healthy most of my life. If something happens, I'll probably be fine. I just want to check online and make sure should I check this out. Usually I get enough information online to go ah, don't worry about it.
I just figured ... I mean in the old days, the doctor might have gone out of the office, looked it up in a book and come back or he might not have known and he said the best I can do is something I remember from medical school. This (referring to health information seeking online) is better.
For a while, it got pretty bad, so I started to do a lot more searching. That involved things like the dietary aspects, you know, how to consistently have a low salt diet, and the lifestyle changes that go along with that.
... when I first started getting the Meniere's which is going back 10 years. There's actually a relative who just did some searching based on my symptoms and came back with ... I don't know ... sound's kind of like this weird thing Meniere's. And I didn't really think about it all that much. And then the doctor said let's test this and then they ruled everything out and so I found ok Meniere's. So, that was pretty early on. And I am pretty sure the relative would have gotten it from some probably like a WebMD kind of thing. But once I had that diagnosis, it's very much ... I narrowed it down to specialty kinds of things like a lot of the Meniere's stuff I got from was actually set up by a group of people who have Meniere's but it's kind of a database kind of a thing. Here's all the journal articles that appeared in the last month. Here's a famous person who has Meniere's kind of stuff.
My primary doctor's office, they do a portal where, when they do lab work, I get my results online.

I guess, what I am used to is the actual medications I take, they have their own websites, so I actually go on them to look up different information.
If I am seeing someone is saying something unique and there is no other agreement anywhere about it, then I am going to be skeptical.
I use I guess critical thinking, meaning if you go to a WebMD, it just clearly has authority. They reference clinical studies. Something like Wikipedia is going to be less trustworthy.
When you hear people going to the Mayo Clinic, it is like really great. It just seems it just has a really good reputation. I don't know why WebMD. Once again, it just sounds legitimate.
With children, I go a lot to the baby center. Once again, they are a really big, well known website.
... my Dad has a heart thing, I am going to look at I can't remember the name of ... something like the American Heart Association or something like that, something that has a lot of physicians involved, it's an institutional kind of thing, it's not just somebody trying to make money off of advertising on a website and that kind of thing.
I found WebMD to be pretty useful. I usually don't need anything more than what they show me.
I would say in general I found it really useful. I felt that it has helped me a lot in terms of those two specific situations, the Meniere's and the dementia.
Mmm, most of the time, there's some good information there but I have a hard time getting through all the stuff to get to what I am actually looking for.
It costs a lot of money sometimes to go see one (referring to a doctor). So, I go online.
I mean I knew that I wasn't going to solve the problem, but I just wanted to know as much as I could.
He/she was saying that they were alarmed when they were talking to the doctor and the doctor sat down on the computer and then looked up something online, WebMD or something ...

I just want to be as informed as possible when I talk to the doctor. I still trust the doctor. They are still way more trained than me. But I just want to go in ... it will make everything easier for both of us if I know already as much as I can.
I am going to go in armed with as much knowledge as possible because he is going to try and run some tests and I am going to say I know I don't need that test or whatever.
... you don't want to seem stupid. I think there is a big reluctance to ask your physician a question and maybe be persistent.
You can look at it and say you know this patient is really proactive and is really trying to find out what is going on versus elderly patients don't really do the Internet because they trust the physicians because they grew up trusting them whereas us, the younger generation ok I don't know about all this. I am looking at myself. I am going to see if what they say match with what is on the Internet.
Sometimes, it is just a follow up to see what the stuff is all about. I guess the more knowledge, the better. If I have a question about it, then I'll look it up online first to see that's what it is and not.

### **3.5.2 Media-Enabled Health Information Sharing Online**

Media-enabled health information sharing online refers to the extent to which patients use the communication medium to share health information online. This dimension includes the following codes: altruism, venting, multifunctioning, information sharing, personalness of interaction, encouragement, awareness of others, and ease of use. The code “*altruism*” refers to the ability of the medium to allow patients to be altruistic, i.e., share health information for the benefit of other patients without expecting anything in return. The code “*venting*” refers to the ability of the medium to allow patients to vent by sharing bad health-related experiences. The code “*multifunctioning*” refers to the ability of the medium to allow patients to use multiple tools (or a single tool) for communication of health-related information (email, chat, talk, text, attach file, etc.). The

code “*information sharing*” refers to the ability of the medium to allow patients to share health-related information with others (or not). The code “*personalness of interaction*” refers to whether communication through the medium provides patients a more personal (or impersonal) touch. The code “*encouragement*” refers to the ability of the medium to allow patients to receive health-related encouragement from others users. The code “*awareness*” refers to the ability of the medium to allow patients to be aware of others in the interaction. The code “*ease of use*” refers to whether the medium is easy (or difficult) to use. Examples of the media-enabled health information sharing online theme from the interview transcripts are presented in Table 18.

**Table 18. Examples of the Media-Enabled Health Information Sharing Online Theme**

<b>Examples</b>
What people do different to help, some might work, some might not work, so I think something like that (referring to information sharing) is really good.
I think if you present information to people from a personal point of view and you are not telling others what to do, but just what your experience is so far, then they can take it and do with it what they want. If I suffered with something, I don’t want others to suffer from it.
Well, I guess, the sharing that I have done is like one, I have done a little bit with the Meniere’s support groups kind of like here’s my experience. For example, if I am on it and a discussion comes up about this experimental procedure that I had done, I will chime in a little bit there because I know it’s not usually expensive, but insurance doesn’t cover it.
The other thing has been kind of I have shared in the sense of a general sense of awareness. In that case it might be on Facebook or might post something on a blog kind of a thing. Here’s what a bad day looks like for me kind of a thing. Or I might share something on Facebook about here’s a new treatment that helped me, blah, blah, blah. In that sense, part of my ... with regards to that it has a little bit to do with awareness in the sense of ... my experience is basically a) when you say Meniere’s to somebody, it means nothing, 99 times out of 100. And it is also ... it

is very much in the category of ... it's not only a disease you can't see, but you don't know. The symptoms are often completely hidden. You can't look at somebody and know oh, they are standing really still because they are dizzy. So, part of it is like kind of like helping people understand, not just with regard to Meniere's, but also other kinds of things like Crohn's disease or something like that. People have to deal with crap.
The only time I have has been on this one Facebook page. Specifically, where people have said do you have these symptoms, what has worked and not worked. I have posted there.
I think if you had a good experience, then another person had the same problem you do, even though you don't really know these people, I will like for them to have a good experience. I mean. It's just ... I don't know how to say it, but it is just common courtesy to anyone. You don't have to know people to do that.
And there's all kinds of other stuff where it's like I have a separate name, a separate email address, all that kind of stuff. I mean if you really, really, really dug, you can probably track it back to me, but there are ways that I can engage in the Internet and be 99 percent sure that people are not going to trace it back to me.
I mean if it was anonymous, you can share anything you want. Because I think people I know share a little too much, so being anonymous about sharing, I think it is good.
I think more of people being scared of sharing their information, adding their name to it.
I don't like to go through putting your email. If I want to be anonymous, I should be anonymous. I shouldn't have to put in any kind of information. I should be able to just post. Maybe have an option for being anonymous and then putting whatever opinion with whomever. If you have been through that situation, you can then whatever else. That's something that deters me is putting your email, date of birth, your address. I just feel like you don't have to do that.
More of the privacy. I don't like my information floating out there.
They ask my date of birth and all that. I will tell you how old I am, but I am not going to tell you my exact date of birth. Usually I lie. I lie when they ask me my date of birth. I might put the right year, but I put a different month and a different day.



I don't like the fact that the Internet providers are now storing information permanently.
... and a little bit of the what are they doing with this information? Why do they need this information?
the thing is that like for law enforcement jobs, or a future job and you are taking bipolar medicine, anything that gets back to your name, that can hurt your career and what you're going to do.
I am private offline and online.
I am not going to be comfortable putting something on that I would not say to the person.
A little bit of privacy concerns, but more just the bother of me typing in all that stuff because in websites, I just can go into ... without going through all that.
You know how people post stuff and you read, I have never done that. I have never felt comfortable doing that. I feel like somebody is going to hack and make me do all this, maybe find where I am going to live. So, I don't do that. I read other people's stuff, but I don't post my stuff.
A lot of the communities that I have found have more people complaining versus like actually sharing symptoms or sharing tips of what's worked.
I started to feel like some of it as I was tracking I was just focused on the negative.
She couldn't complain to her Dad how tired she was but she could complain on her blog.
I don't take other people's comments too seriously because happy patients are not more likely to put comments on the Internet.
And also too, if you are going to read a review or comment and that type of thing, so many times, it is a disgruntled person.
Just takes more time. It is just one more thing to do ... to type up my own thing.
I think in my case, it's just ... there have not been many opportunities necessarily to share. I have been very open about my illness and how I have dealt with it and have not dealt with it, but there's not necessarily easy portals to kind of say here's been my story. I see a lot of people creating their own blogs and I don't really have

interest in that. I wouldn't mind doing an article or two on a health blog about here's been my experience, but I don't necessarily know if I have enough information to want to do my own blog. But I don't really see that there's a lot of places to post.
It takes a lot to share stuff.
I think if they have a bad experience, then they will definitely share it. If they have a good experience, it takes a lot of time and effort, so they are not going to do it.
I don't have time to go in there and post every experience I have come in contact with.

### 3.5.3 Health Output Quality Produced By Media

Health output quality produced by media refers to the extent to which the search output produced by the media is relevant, reliable, and timely. This dimension includes the following codes: trustworthiness of information, accuracy of information, information relevance, up-to-date information, current information, timeliness of information, and reliability of information. The code “*trustworthiness of information*” refers to the extent to which the output produced by the media is trustworthy. The code “*accuracy of information*” refers to the extent to which the output produced by the media is free from mistakes or errors. The code “*current information*” refers to the extent to which the output produced by the media is new. The code “*timeliness of information*” refers to the extent to which the output produced by the media is available to patients at the exact time they need it. The code “*reliability of information*” refers to whether health information provided by the medium is reliable (or unreliable). Examples of the health output quality produced by the media theme from the interview transcripts are presented in Table 19.

**Table 19. Examples of the Health Output Quality Produced by Media Theme**

Examples
I have sought a lot of information about thyroid disease and how to improve my health with that. It is an auto immune disease with a lot of things going on with that. I have found significant information.
My only experience ... I haven't joined a support group or anything, but when you look up things going on with your children, like nursing issues or anything pregnancy related is what I have done a lot. And you'll get tons of moms saying their stories and in one regard it helps you feel not alone and really can be hopeful when you read someone else's story that changed and took a turn and was good.
What I did is I spent a lot of time looking online through medical journals and going through the abstracts and studies of the efficacy of the treatments and so on.
I really ... I would be surprised honestly if something developed and really had to look to find basic information about it.
But I think that also part of the reason why I found it useful is that I did enough digging and researching and comparing that I felt confident that it was useful. It wasn't like I found the first thing that made sense to me or told me something that I liked and I guess part of that kind of is a reflection of my training as an academic. So, I think, if, at least in my case with that kind of training in methodology and data analysis and that kind of stuff, it can be really, really useful. But on the other hand, I could ... in doing that really useful stuff, I see a lot of things that is just boy that just sounds stupid or that's sounds really iffy. If it's ... you are doing a superficial kind of engagement with it, I guess it could be really easy to be lead astray or to miss the really important stuff.
I think that there's a lot of information and it may not always be accurate.
You read an awful lot before you find the answer to your question.
Yeah, you can email a question to the doctor. They say to be concise and not overuse it obviously
I suppose if I take my blood pressure for example, I can email the doctor. More than likely what he's going to say is come in and let us check it.
Well, it gives me an email alert when there is a message or when there is a lab report. That is a nice feature.

My daughter-in-law had some neurological symptoms, so I went online to find out what ... and the doctors didn't even know what it was and so I went online and saw some videos and stuff like that.
Basically I was healthy but my blood pressure was really high which was strange because my blood pressure has always been fine. So I told him about it. He said well let's just be safe. It might just be the medication. I'd like you to take your blood pressure every day for a month and then send me the results. You can email it to me. You could send it to me on paper in an envelope with a stamp. He said however you get it to me it is fine. It just occurred to me I could be easily probably send that information through the portal.
I would be fine with putting my own information in to have it somewhere if it was on me or that I had access to it especially with the fact that it is tough to get your medical records. You are paying multiple cents per page and when we moved to North Carolina from New York, my medical records were literally the size of a phonebook.
I don't think they have all your records on it yet, just some of the ... like the ... more notes of the visits.
You are able to read through them. I don't think you ... you are not are able to download or save them or anything like that.
On the portal, yes. So, I get a link and what I love is that it says here are your results and here's the normal range and then they do a paragraph that interprets it so that I can look at it and go ok, here's the big picture. Of all the blood work they did, here's what is maybe at the far end of normal one way or the other and then here's what's not normal and how they interpret whether that is a big deal or not. So, that's been really helpful for me to see. I get it as soon as soon as they get the results back. I can look at it and can also refer back to it. So when I have gone to specialists, we can log in on my phone and say here is my most recent blood work and xyz and have them interpret. And part of the reason that I love that is that a few years ago, I was referred to a specialist, went in and they said that they have to take a little bit of blood, but they didn't say what they were doing with it. Well they ran full scans of everything I had just had done at the primary doctor a week before and so needless to say my insurance company wasn't really thrilled with getting these thousands of dollars in blood work bills ...
I am a patient at Alamance regional and the urgent care has access to all that information. I know that because when I go to a primary, I go urgent care, I go to the ER, or I go to the gastroenterologist, they all can see what my current medications are. They all can see all of that. So, if I am there in the ER, I probably

didn't bring my meds and they can see what I am on and they can see what I have had allergic reactions to, they can see what the symptoms have been and that's really helpful.
They give you your ID number. Then you go in and you look at your history or your blood test or anything like that.
You can view your labs and I think up to the last three months.
Obviously, the whole patient's chart is in there, their whole history.
... if you go to a WebMD, it just clearly has authority. They reference clinical studies. Something like Wikipedia is going to be less trustworthy.

### ***3.5.4 Media-Enabled Convenience***

Media-enabled convenience refers to the extent to which patients feel that the communication medium is to access and to use. This dimension includes the following codes: usefulness of information, cost of communication, anonymity, ease of use for sharing, speed of communication, and clarification of issues. The code “*usefulness of information*” refers to whether the health information provided online by the medium is useful (or useless). The code “*cost of communication*” refers to whether it is cheap (or expensive) to communicate with the medium. The code “*anonymity*” refers to the ability of the medium to allow patients to share health information online anonymously. The code “*ease of use for sharing*” refers to the ability of the medium to allow patients to share health information online easily. The code “*speed of communication*” refers to whether the medium allows patients quick (or slow) communication with others. The code “*clarification of issues*” refers to the ability of the medium to allow patients to

clarify health-related issues easily (or not). Examples of the media-enabled convenience theme from the interview transcripts are presented in Table 20.

**Table 20. Examples of the Media-Enabled Convenience Theme**

<b>Examples</b>
And I have only recently started doing it (referring to accessing the patient portal) because they did have a ... there was something ... it was difficult to get in and I can't remember what the problem was. It might have been that because I use a Mac and that might have been what was trying to prevent me from using it regularly.
So when I have gone to specialists, we can log in on my phone and say here is my most recent blood work and xyz and have them interpret.
Where if I didn't have access to that community, I used to get really scared with every symptom that was new. So one day something new would show up and I would be in a panic and immediately at the doctor's office and they'd run all this blood work and within a couple of days it would be gone.
I would be fine with putting my own information in to have it somewhere if it was on me or that I had access to it especially with the fact that it is tough to get your medical records.
When they ask you for what kind of medication are you taking, instead of carrying the paper, you have got it right there.
I mean we definitely have access to Internet and I know how to do it (referring to seeking health information).
I think information is so accessible now.
It's easy. It's really, I mean it's just like ... it is just so accessible to me. So much knowledge there.
I have an issue with that. That bothers me. Like if I look up something and I want an article and I think this is going to be an interesting article, but when I click ok logon and subscribe ... I don't want to pay you \$35 for access. I don't feel like I should do that.

That bothers me because not everybody ... I know this is a new technology but not everybody is number one, computer literate, not everybody has a computer at home and not everyone has access. You might tell me that there's a library up the street, but ok, I am 75 years old, I have severe rheumatoid arthritis, it is going to hurt me to walk. So, that bothers me because I don't feel like I can give everyone access to the same thing. I do know that some offices offer a number where you can call or logon and get all your lab results. That's ok but what about the people that can't do that. What about the people that don't have access?
I found it very easy to set up appointments. When you call, you are on hold forever. So setting up appointments has been very easy.
I found the Mayo Clinic has been my favorite since it has been the most comprehensive and I like the amount of pictures that they have that can be tied to symptoms. I have found that it's very easy to use and it is not so much a scare zone as some of them are.
I didn't think it was hard, but then when my Dad went to go use it ... he's not dumb by any means, I mean he's got a business but he obviously, he didn't understand. Somehow he did not understand this. So, obviously it can be made more user-friendly.
I Google, but I think because I don't know anything, the more easily it is available, you know you can Google on something and I think it will be easier for people.
A 10 year old should be able to go on a website and lookup something. Or an 80 year old who has some issues is able to go online and able to find something about something they are struggling with and not have to call their son or grandson and say ok, what does this mean to me? So, I think that would help.
I guess my thing is I am not very Internet savvy, so I will type something in and it will give me fifty million different things. If you give me a few choices, I can go directly to what I am looking for.
... I get my test results more quickly and I get to see the entire test results.
... if I send my doctor a message, I get a reply by the end of ... I don't know ... I send her a message, send me something back, it's like we email each other.
It feels like an immediate answer. Even if it is in working hours, you have to leave a message with the nurse, and then they call you back. ... when you have little kids and sometimes you don't hear your phone, or you are putting them down and you miss them, It is just a pain. So, the Internet feels like it is an immediate response.

### 3.5.5 Media-Enabled Connectivity

Media-enabled connectivity refers to the extent to which the communication medium allows patients to connect with others to share health information online. This dimension includes the following codes: familiarity of communicators and file management. The code “*familiarity of communicators*” refers to the ability of the medium to allow patients to know who you are communicating with (or not). The code “*file management*” refers to ability of the medium to allow patients to store and manage files (or not). Examples of the media-enabled connectivity theme from the interview transcripts are presented in Table 21.

**Table 21. Examples of the Media-Enabled Connectivity Theme**

Examples
... you can easily find message boards where people have tried various things and they can tell you their experiences of whether they worked or not.
For instance, I was interested in a supplement the other day and I began to do research on it. I found some message boards and they said it is a waste of time. It is expensive and it is not going to work.
Yes, I participated in a support group online and I had a blog for a while. Although the blog was not related to health issues, I did share a little bit of my personal experiences.
I thought that there was an important link from where I was reading online for stress and so I wanted to be able to document that because a lot of what I was hearing in the doctor’s appointments were you know the symptoms just sound nuts, you are probably just tired, you are probably stressed, you are working long and just kind of minimizing it. So, I wanted to be able to show I am not stressed the pain is at a 10 and really kind of track all of that. So, it would have been nice with the apps to have been able to fill in my own information.
I usually go with what’s most popular.
She setup a blog, her own blog where she told the story.



She's gaining from there. She was gaining back from there and it gave ... a kind of release for her. She couldn't complain to her Dad how tired she was but she could complain on her blog.
If I had a bad experience at a hospital, I would have no problem telling them I had a bad experience. Once I had a good one, and the surgery that I had, it all went very well. The doctor was great, the nurses, the whole thing ...
I use an app called My Fitness File where I put in my calorie and it tells me how many calories I have to use for the rest of the day. I have now heard of phones where you can actually do your own EKG and send it to your provider.
And you'll get tons of moms saying their stories and in one regard it helps you feel not alone and really can be hopeful when you read someone else's story that changed and took a turn and was good.
I continued to read things here and there because some of the symptoms seemed to vary a lot between different people and so on.
So, I have done looking around into that, trying to find local support groups for my Mom to go to or read things online and kind of get ideas to share with me, my brother, his kids and so on, about how to respond, how to think about things, how to support my Mom because she is the one who has to deal with it on a daily basis.
Since the diagnosis, there still are lots of symptoms which come and go and it's very helpful for me to see from other patients that they have had the same symptoms so that I know it's just part of that and not something separate that I need to go and see the doctor for. I know it's just a flare up of whatever. So, that's been really important.
There's thousands of people on it and if I pose a question like I have had this symptom, it is new, when I get back 500 responses in 15 minutes that yeah I have got the same symptoms and my doctor says that that's just part of the illness then I just kind of make a note on the calendar this happened here and if it continues, then obviously I can go to the doctor, but if not I mentioned it at my next appointment.
When you hear people going to the Mayo Clinic, it is like really great. It just seems it just has a really good reputation.
With children, I go a lot to the baby center. Once again, they are a really big, well known website.

And she had a lot of response, a lot of people saying that they understood from her point of view as a caretaker, gave her suggestions, and so I think that was incredibly helpful for her.
And then you have got the stuff that ... you need to look at the source which can sometimes be concealed.
And also too, if you are going to read a review or comment and that type of thing, so many times, it is a disgruntled person. I mean you have got to feel good. You can't take every one at face value. You have got to look at it because I mean you have got 10 good ones and 1 bad one. Some just don't add up. So every time you read comments or reviews or anything, I think you have to be open minded.
You are able to read through them. I don't think you ... you are not are able to download or save them or anything like that.

### 3.5.6 *Media-Enabled Health-Related Communication and Control*

Media-enabled health-related communication and control refers to the extent to which the communication medium allows patients to communicate with others and to take control over their own health and interactions with the provider. This dimension includes the following codes: communication history, one-to-many communication, synchronicity, feedback, control over health problems, and control over interactions. The code “*communication history*” refers to the ability of the medium to allow patients to keep a record of their communication history (email history, chat history, save file attachments etc.)(or not). The code “*one-to-many communication*” refers to the ability of the medium to allow patients to communicate with multiple people simultaneously (or only one at a time). The code “*synchronicity*” refers to the ability of the medium to allow patients to have a real-time communication (or not). The code “*feedback*” refers to the ability of the medium to allow patients to provide quick (or slow) feedback. The code

“*control over health problems*” refers to the ability of the medium to allow patients to take control over their own health. The code “*control over interactions*” refers to the ability of the medium to allow patients to take control over the interactions with their healthcare provider. Examples of the media-enabled health-related communication and control theme from the interview transcripts are presented in Table 22.

**Table 22. Examples of the Media-Enabled Health-Related Communication and Control Theme**

Examples
It feels like an immediate answer. Even if it is in working hours, you have to leave a message with the nurse, and then they call you back. Especially when you have little kids and sometimes you don’t hear your phone, or you are putting them down and you miss them. It is just a pain. So, the Internet feels like it is just an immediate response.
So, on my arm ... I have been camping and I got this ... I don’t know ... something and it got infected while I was camping. So, I ended up in urgent care, tying up the medical system where I would have loved to have just taken a picture, emailed it to the doctor and have them say here is the antibiotic.
There’s thousands of people on it and if I pose a question like I have had this symptom, it is new, when I get back 500 responses in 15 minutes that yeah I have got the same symptoms and my doctor says that that’s just part of the illness then I just kind of make a note on the calendar this happened here and if it continues, then obviously I can go to the doctor, but if not I mentioned it at my next appointment.
Like, I have to take my blood pressure. I do it on a worksheet that the doctor gave me. It would be great to be able to get a blood pressure cuff that hooks into my iPhone and uploads the information and they have it. I think too that with my doctor’s office being a portal is great because it is my primary doctor.
And then you have got the stuff that ... you need to look at the source which can sometimes be concealed.
Because I think people I know share a little too much, so being anonymous about sharing, I think it is good.

Umm, just by you know the website I went to about that particular medication, but I don't know who these people are. Like I have never known who that person was giving the information.
That's what I stick with especially because anyone can post anything on the Internet, you know. If I search, I try to stick to what's familiar, what I have seen before.
Yes, I participated in a support group online and I had a blog for a while. Although the blog was not related to health issues, I did share a little bit of my personal experiences.
Or if I am looking for ... looking through testimonies and personal experiences and so on, I have that kind of basic grain of salt type of thing. This is one person's experience from their perspective, kind of thing. I want to get a whole bunch of people to be saying different things and am not going to come to conclusion based on what one person said.
I'll have to go online to make my appointment. Well, I don't want to go online. I want to talk to a person because number one, I feel like I have the connection online ... I mean on the phone with someone, it is more personable. I don't want to go on the computer, make appointment. I don't want to tell the computer what my problem is. I personally don't want to do that. I don't want to do that.
I want to see your face and I want to hear your voice. I want to talk to you. Like the office that I work, it is probably one of the only offices where you can call and if you want to talk to a CMA or a nurse, you can just speak to one. Most offices, you have to leave a message, you know. You have to hear our voice when you call, you know. Patients are concerned about things. They have questions they should probably already have the answer to, but at the same time, they want that personable connection with someone.
Some people are going to take advantage of it, some people are not. They are still like I want to see my doctor ... I want to talk to my doctor. They feel like it is taking away from certain things.
He thought it was awesome that you can actually ... the patient be in a room and a doctor can be somewhere else and they can actually tell the doctor you know ... I have this right here, what do you think doc and the doctor could tell them that. I mean still, it is taking away from that personable connection to me. I want the doctor to touch me, I want him to examine me, listen to my heart, look in my ears, look in my nose, look in my mouth.

I understand some places that don't have doctors here, doctors there, those places, third world countries if they are able to have telemedicine, that's fine. If that's all they can afford, that's all they can have, then go with it, but for us who are able to ... I can walk to the doctor's office, go to the doctor's office, I would rather have a face to face connection than look at him on the phone, computer, camera or something.
I also started looking into what other people who had Meniere's had to say about their experiences. Like a Yahoo! Forum, I checked on there and got people's experiences and one of the net results of that ... there are a couple of things. One is I didn't feel quite so alone because I did not know anybody in my life that had it. I had never heard of it.
Yeah, I did once and I can't remember what the forum I went to was. I had a new medication and I was experiencing a symptom and I went to the sheet that they gave me with the medication and I read that and the symptom wasn't on there. So, I went online and I just found myself at a forum where one person was saying hey, has anybody out there experienced this and I think one other person said yes.
Like a Yahoo! Forum, I checked on there and got people's experiences and one of the net results of that ... there are a couple of things. One is I didn't feel quite so alone because I did not know anybody in my life that had it. I had never heard of it.
Another part was just Wow I don't have it nearly as bad as a lot of these other people. So, that kind of made me feel like I can deal with it.
There's a couple of times when I was kind of like ok, here's my general experience, but that's always more like hi, I am so and so, here's my experience, I am glad to be a part of the group and that kind of thing.
Since the diagnosis, there still are lots of symptoms which come and go and it's very helpful for me to see from other patients that they have had the same symptoms so that I know it's just part of that and not something separate that I need to go and see the doctor for. I know it's just a flare up of whatever. So, that's been really important.
I know one medication that I was supposed to try that I did try. I could go online and you have like a chat room to talk because of the type of medication it was. Then I had a nurse to call me weekly to check on me because I had to try to treat myself up. They had to make sure I was doing the right dosage because I was concerned I want a particular type of titration I was able to talk to another patient who had been through the same program with me.

And I initially sought out some information simply because my doctor was ... I saw an EMT about it and he was basically saying there's a lot we do not understand about this particular disease, and the treatments, and its progress. So, what I remember is he encouraged me to look around.
So, in that case, the doctor was definitely encouraging. He was a pretty young doctor too. I kind of got that impression ... he was a little bit younger than me. So he kind of grew up a little bit with the Internet. It was not a strange thing for him.
Our doctor encourages us or my husband's doctor encourages us to go online. He's constantly giving us websites ... look at this or look at that and I like that I can look at it in my own home. I can go back and read it again. I like to see what's out there for my husband who has Parkinson's disease and that's basically what I do.
He is always saying you know go online, or if I ask something, he will say yeah that's a good question and whatever.
And she had a lot of response, a lot of people saying that they understood from her point of view as a caretaker, gave her suggestions, and so I think that was incredibly helpful for her.
I think if you present information to people from a personal point of view and you are not telling others what to do, but just what your experience is so far, then they can take it and do with it what they want.
If I suffered with something, I don't want others to suffer from it.
The other thing has been kind of I have shared in the sense of a general sense of awareness. In that case it might be on Facebook or might post something on a blog kind of a thing. Here's what a bad day looks like for me kind of a thing.
The only time I have has been on this one Facebook page. Specifically, where people have said do you have these symptoms, what has worked and not worked. I have posted there.
Well, my wife has fibromyalgia and I think what I have seen her do is they share in her group to try to help manage their pain.
Umm, my guess is maybe they have been through it and maybe they had a horrible time getting down to the bottom of it at the doctor's office. They feel that by sharing it online, somebody that may have what they have could skip over all the hustle and bustle at the office and spending money.

### 3.5.7 Media-Enabled Health Problem Solving

Media-enabled health problem solving refers to the extent to which the communication medium allows patients to solve their health related problems. This dimension includes the following codes: complexity of issues, and criticality of issues. The code “*complexity of issues*” refers to whether the medium is good (or poor) at helping patients solve complex health-related issues. The code “*criticality of issues*” refers to whether the medium is good (or poor) at helping patients solve critical health-related issues. Examples of the Health Problem Solving theme from the interview transcripts are presented in Table 23.

**Table 23. Examples of the Media-Enabled Health Problem Solving Theme**

Examples
I have sought a lot of information about thyroid disease and how to improve my health with that.
If I don't understand something, then I will look elsewhere to try to understand the definition.
I am looking for health and wellbeing and I don't assume that my doctor knows everything and certainly my experiences borne that out. What I found is that a greater degree of health and wellbeing is possible than what the medical profession is offering.
you can easily find message boards where people have tried various things and they can tell you their experiences of whether they worked or not.
For instance, I was interested in a supplement the other day and I began to do research on it. I found some message boards and they said it is a waste of time. It is expensive and it is not going to work.
If I am experiencing what may be a health issue, I go to WebMD.
... if the WebMD article says if you are experiencing this you should seek medical attention, then I'll do it.

My daughter-in-law had some neurological symptoms, so I went online to find out what ... and the doctors didn't even know what it was and so I went online and saw some videos and stuff like that.
Yeah, I did once and I can't remember what the forum I went to was. I had a new medication and I was experiencing a symptom and I went to the sheet that they gave me with the medication and I read that and the symptom wasn't on there. So, I went online and I just found myself at a forum where one person was saying hey, has anybody out there experienced this and I think one other person said yes.
I had a neoplasm of uncertain behavior few weeks ago and went to see a doctor and he said ok, here's the situation. The doctor did the biopsy. So, what did I do? I looked at American Cancer Society or something like that. Here's the kind of things that happen. So, that kind of thing.
when I first started getting the Meniere's which is going back 10 years. There's actually a relative who just did some searching based on my symptoms and came back with ... I don't know ... sound's kind of like this weird thing Meniere's. And I didn't really think about it all that much. And then the doctor said let's test this and then they ruled everything out and so I found ok Meniere's. So, that was pretty early on. And I am pretty sure the relative would have gotten it from some probably like a WebMD kind of thing. But once I had that diagnosis, it's very much ... I narrowed it down to specialty kinds of things like a lot of the Meniere's stuff I got from was actually set up by a group of people who have Meniere's but it's kind of a database kind of a thing. Here's all the journal articles that appeared in the last month. Here's a famous person who has Meniere's kind of stuff.
A lot of times, it is just dealing with the Parkinson's. Mostly, I look up certain symptoms. Is it common? Is it normal? Is it something that I should be afraid of?
My daughter-in-law had some bizarre sort of Parkinsons-like symptoms and she was very concerned about it and went ... she was at that time living in Louisiana ... went to the neurologist. Umm, and they couldn't figure out what was wrong with her, but before ... from the time the symptoms occurred until when she was referred to a neurologist, she did vast Internet searching ...
Because, it is kind of ... he is normal and friendly, and then at night, he will you know ... weird, ugly stuff will happen. So it's like how do you deal with it? That's horrible ... you've been married for more than 50 years kind of thing.
So, it is very much kind of ok ... it's like so I read things online so I could I tell my Mom ok they recommend thing like keeping a journal about the kind of things



that happen so that you can chart the progress and see what kind of things might set off these episodes and so on. So, a lot of that kind of stuff.
I have an auto-immune disease that took a very long time to be diagnosed because it is the nature of the illness. It has various symptoms that change a lot. So for me initially, it was important to try to figure out with all these different symptoms what might be going on, when I was going from doctor to doctor looking for a diagnosis.
The things that I look for because of the nature of my illness and my symptoms vary widely. So, what happens is that it attacks different parts of me. So, I am looking online to say essentially is this something that I need to go and spend the money on a co-pay and see the doctor or is this just another part of the illness I have never experienced before but it is normal and should I give it a couple of days. So, I just wanted to say that there was a period of 48 hours where my legs did not work. Whenever I tried to walk them, they would just give out. Well, looking at it, I saw that that does sometimes happen and so I leave it 48 hours and then it went away.
For me, I think the nature of having spent so much time sounding crazy from doctor to doctor with these random symptoms trying to figure what was going on. It would have been helpful to have known that there are other people having those same experiences that have finally got diagnosed. So, I have always just been really open about it and I think too because of the nature of my illness I never know from one day to another how I am going to be feeling or what's going to be affected. So, it has been important to be upfront about that because one day it may be trouble walking, another day it might be trouble with my memory, and another day I may have illusions. So, knowing that I know I have to be upfront to some degree about why I am using a walker one day or why I am not driving.
Dad had cancer and his oldest sister took care of his Dad in the last years of his life and she had regular postings about what she as a caretaker was going through and what he was going through.
... my health has much improved from finding (the information).
For a while, it got pretty bad, so I started to do a lot more searching. That involved things like the dietary aspects, you know, how to consistently have a low salt diet, and the lifestyle changes that go along with that.
The other involves my father who has had a number of health problems. He had a double bypass and artificial valve put in couple of years ago. So I read a little bit about that. That's kind of ... I mean the doctor was pretty much ... did the test ...

you have to have this or you will die soon.
Now, under other circumstances, had I not seen that, I would have been in a total panic and probably in the emergency room going ok, I can't walk every time I walk a few steps, my legs give out and really been more panicky.
I was diagnosed with narcolepsy, a sleeping disorder. I was prescribed a particular medication. Even though I work in the medical field, I wasn't really sure if I really wanted to take the medication. So, I looked up the medication and decided not to take it. I guess most websites now, you can go and people put if they have taken the medication. On this specific website, people say they took the medication. After six months, they were suicidal and all this stuff, sounds like I don't think I want to take the medication.
But, the medication wound up not working. But, had I not looked up the information, I would not have known that that would have been a side effect for me. I knew that mental illness, there's a history of that in my family. I did not want to take that chance. That's why I looked it up because I was not sure about the medication that was prescribed to me.
I mean, it is probably going to say a lot of different things, you're about to think you are dying because the Internet says you have got two symptoms, one symptom that says you are dying.
It is an auto immune disease with a lot of things going on with that. I have found significant information
I had a new medication and I was experiencing a symptom and I went to the sheet that they gave me with the medication and I read that and the symptom wasn't on there. So, I went online and I just found myself at a forum where one person was saying hey, has anybody out there experienced this and I think one other person said yes.
Another part was just Wow I don't have it nearly as bad as a lot of these other people. So, that kind of made me feel like I can deal with it.
So, I have done looking around into that, trying to find local support groups for my Mom to go to or read things online and kind of get ideas to share with me, my brother, his kids and so on, about how to respond, how to think about things, how to support my Mom because she is the one who has to deal with it on a daily basis.
I think it has contributed a lot to my understanding of the situation, possibilities, how to deal with it, treatment options, all those kinds of things.

And I don't look ... I don't have much pain, so I don't look a lot of pain. It is just more of dealing with my ADHD and trying to manage it while seeing other people's experiences.
Well, my wife has fibromyalgia and I think what I have seen her do is they share in her group to try to help manage their pain.
What he told me was that some doctors now say you don't need to have the prostate exam and then other doctors say you do. So, he told me that and he gave me the pluses and minuses and he let me choose and I was like that's great. He trusted me to understand that it is not black and white issue.
But, it just seemed to be like an anomaly. A few people ... this happens to a few people, so I just concluded it isn't a big deal.
My conclusion was that this seems a pretty hit or miss kind of treatment. Even if it does work, it seems like you have to do it fairly repeatedly. And I was like, I think I want to pull back and basically I decided I needed to pull out of this very stressful situation.
The other reason I have gone on is once the doctor has presented options, before I decided on those options, I have gone online so that these are the side effects, from a clinical standpoint, but also anecdotally ... what are other people saying ... it's really helpful or not helpful ... to try to get a better idea of what those options were.
Where if I didn't have access to that community, I used to get really scared with every symptom that was new. So one day something new would show up and I would be in a panic and immediately at the doctor's office and they'd run all this blood work and within a couple of days it would be gone
I had hernia and so I was asking her what was a good place to go and everything and so she checked the doctor out and when I went for the procedure, she went with me the first time and then she did some research on the procedure and so ... I mean we had a lot of questions that we were able to ask the doctor and he was very nice, he answered them all.
I told my provider I did not want to take the medication daily simply because of what I have read from other people.
It really makes you feel way more in control of things.

He is one of those people. And he is ... he is very uh oh ... it is calming for him. He finds it ... he feels more in control when he is able to search.
Sometimes, when I am with my doctor and I say I looked it up online, I get the feeling that he's like ugh, not this.
I just want him to know this is what I have heard and then I am ready. My basic philosophy is this is my doctor, he knows way more than me. So, whatever he says is fine. I just want to tell him what I know and then he can tell me what.
Yeah, because he was like ... here's what to do ... it's a very easy surgery and so on and so forth and they did the lot and then I would look it up and say, I don't know they are cutting into my skull and that seems eeegh. It's not like ... Anyway, so it was a very different situation. It was much more like I said ... I am the expert and here's ... you should follow my advice. I ultimately got a little annoyed with that. In part just because it was like ... look I am not a stupid person and second of all, there's all this stuff saying different things.
I think the good doctors, that really are promoting patient empowerment are excited to hear that you have done some research and that you have said here are some things that I think may be could be, tell me what you think.
The doctor I have is old school, but he is willing to ... he is into the technology. So, if you found something that he doesn't know and if you talk to him about it, he'll tell you ... well, I didn't really know anything about that.
So, when she finally went to see the neurologist, he said I know you have researched this on the Internet and I know you think you have all these diseases, we are going to go through and so it turned out to be an auto immune disorder, not some of these more severe things.
And some doctors if you ask them questions, they kind of just brush you off.
My younger sister is a special ed teacher and my Mom, she's deceased now, she was having problems with her arms hurting, shoulder and everything. And so it happened, my sister was living in Alaska so she asked her what kind of medicine she was taking because she had been back to her doctor and her doctor hadn't done anything. So she went back and did some research and that was one of the symptoms of this type of medicine. So, my Mom went to the doctor and told him what my sister found and everything and they took her off of that medicine, put her on another kind of medicine and did.
I feel like a certain way when I go to the doctor's office because I am also like I

am getting the right treatment because they are on the computer. They are not ... I never get examined when I go. I see a neurologist monthly. I never get examined. She is always on the computer and she tells me ... I hate this ... the whole time she is doing it, she is complaining. And I sort of understand it. She's so busy. I understand you have to do this. Because I understand it, I don't get bothered as much as some patients do.

To summarize, the analysis of the 14 interview transcripts resulted in identification of the seven themes of information seeking, information sharing, content management, convenience, connectivity, social presence, and health problem solving. Each theme was referred to in each of the interviews and hence there is support for generalizing the results of the study to the larger population of patients who engage in health information seeking and health information sharing behaviors online.

### **3.6 Discussion**

The goal of Study 1 was to identify the motivations and barriers to health information seeking and/or sharing online. Based on the results of the qualitative study, 38 motivations and barriers were identified. Using the Uses and Gratifications perspective as the theoretical background, the 38 motivations and barriers were then categorized into seven themes of media-enabled health information seeking online, media-enabled health information sharing online, media-enabled convenience, media-enabled connectivity, media-enabled health-related communication and control, media-enabled health problem solving, and health output quality produced by media. These seven themes were further categorized into the Uses and Gratifications dimensions of content gratifications, process gratifications, and social gratifications (Stafford et al., 2004).

There is strong support in the psychology literature for the link between motivation and empowerment (Conger & Kanungo, 1988; Spreitzer, 1995). Empowerment involves “creating conditions for heightening motivation for task accomplishment through the development of a strong sense of personal efficacy” (Conger & Kanungo, 1988, p. 474). Empowerment is a “motivational construct manifested in four cognitions: meaning, competence, self-determination, and impact” (Spreitzer, 1995, p. 1444). Healthcare literature also supports this link between motivation and empowerment (Aujoulat et al., 2007; Ellis-Stoll & Popkess-Vawter, 1998). Patient motivation was found to be a key antecedent to patient empowerment (Aujoulat et al., 2007; Ellis-Stoll & Popkess-Vawter, 1998). The first step in establishing the link between patient motivation and patient empowerment enabled by the use of CMC media (Study 2) was to identify the patient motivation dimensions based on application of the Uses and Gratifications perspective to the data collected through the qualitative interviews (Study 1).

Stafford et al. (2004) used the Uses and Gratifications theory to conduct an empirical investigation to identify the dimensions of consumer Internet use and usage gratifications among consumers of a prominent Internet Service Provider. Results from their study show that there are three key dimensions related to consumer use of the Internet, namely content gratifications, process gratifications, and social gratifications (Stafford et al., 2004). While Stafford et al. (2004) studied consumer use of the Internet for empowerment in the context of an ISP, this research examined patients’ use of CMC media for empowerment in the context of healthcare.

Stafford et al. (2004) describe content gratifications as the gratification dimension that refers to people's use of media for the content carried by that media, including information or entertainment. Content gratifications relate to the *message* carried by the medium (Cutler & Danowski, 1980). Factor analysis results from Stafford et al. (2004) showed that the variables *education, information, knowledge, learning, and research* loaded on to the first factor which they termed content gratifications. Factor analysis results from this research (Study 2) showed that the content gratifications dimension includes the sub-dimensions of *media-enabled health information seeking, media health output quality, and media-enabled health-related content management and communication*. While the content gratification sub-dimensions from this research vary slightly from those identified by Stafford et al. (2004), the sub-dimensions identified in this research definitely relate to the *message* carried by the medium as suggested by Cutler & Danowski (1980) and hence qualify as content gratifications.

Stafford et al. (2004) describe process gratifications as the gratification dimension that refers to people's use of media for the simple experience of the media usage process. Process gratifications relate to the *actual use* of the medium itself (Cutler & Danowski, 1980). Factor analysis results from Stafford et al. (2004) showed that the variables *resources, search engines, surfing, technology, and web sites* loaded on to the second factor which they termed process gratifications. Factor analysis results from this research (Study 2) showed that the process gratifications dimension includes the sub-dimension of *media-enabled convenience*. The *media-enabled connectivity* dimension was dropped as a result of factor analysis from Study 2 since not enough items loaded on to that factor.

While the process gratification sub-dimension from this research varies from those identified by Stafford et al. (2004), the sub-dimension identified in this research definitely relate to the *actual use* of the medium itself as suggested by Cutler & Danowski (1980) and hence qualifies as process gratifications.

Stafford et al. (2004) describe social gratifications as the gratification dimension that refers to people's use of media as a social environment adding that this dimension is especially relevant to the use of CMC media such as the Internet. Factor analysis results from Stafford et al. (2004) showed that the variables *chatting, friends, interaction, and people* loaded on to the third factor which they termed social gratifications. Factor analysis results from this research (Study 2) showed that the social gratifications dimension includes the sub-dimensions of *media-enabled health information sharing, and media-enabled health-related content management and communication*. While the social gratification sub-dimensions from this research vary from those identified by Stafford et al. (2004), the sub-dimensions identified in this research definitely relate to the *social interaction* allowed by the medium and hence qualify as social gratifications.

Guo et al. (2010) used the Uses and Gratifications perspective to identify the motivation dimensions for students' use of CMC media in learning contexts. They identified seven dimensions, namely information seeking, convenience, connectivity, problem solving, content management, social presence, and social context cues that were relevant to students' motivations for the use of CMC media in a learning context. While Guo et al. (2010) studied students' motivations for the use of the Internet for empowerment in the context of online student learning, this research examined patients'



motivations for the use of CMC media for patient empowerment in the context of healthcare.

Papacharissi and Rubin (2000) applied the Uses and Gratifications theory to identify the motivation dimensions for students' use of CMC media in general. They identified five dimensions, namely information seeking, convenience, interpersonal utility, pass time, and entertainment that were relevant to students' use of CMC media in general. While Papacharissi and Rubin (2000) studied students' motivations for the use of the Internet in general, this research examined patients' motivations for the use of CMC media for empowerment in the context of healthcare.

The differences between the motivation dimensions identified in literature (Guo et al., 2010; Papacharissi & Rubin, 2000; Stafford et al., 2004) and this research are due to the change in context from consumer use of ISPs and student use of CMC for learning and general use to patients' use of CMC media in healthcare. Context plays a key role in identification of dimensions related to media usage. Stafford et al. (2004) state that "[t]o appreciate the distinction between content-based motivations and process-based surfing effects in generating motivated Internet use, the distinctions between process and content gratifications specific to the Internet must be defined *in context*" (p. 267). Thus, differences in variables that make up the dimensions of content gratifications, process gratifications, and social gratifications between different contexts such as ISPs, online student learning, and healthcare are expected.

Unlike Guo et al. (2012) and Papacharissi and Rubin (2000) who stop with their original gratification dimensions, this research takes it a step further to categorize the

identified dimensions into content gratifications, process gratifications, and social gratifications following the work done by Stafford et al. (2004) and Mendes-Filho and Tan (2009).

### **3.7 Next Steps**

The next steps involve using a large scale survey to test the impact of the seven themes and the three gratifications categories on patient empowerment through the use of CMC media.

## CHAPTER IV

### STUDY 2: IMPACT OF PATIENTS' USES AND GRATIFICATIONS ON CMC MEDIA-ENABLED PATIENT EMPOWERMENT

#### **4.1 Research Objectives**

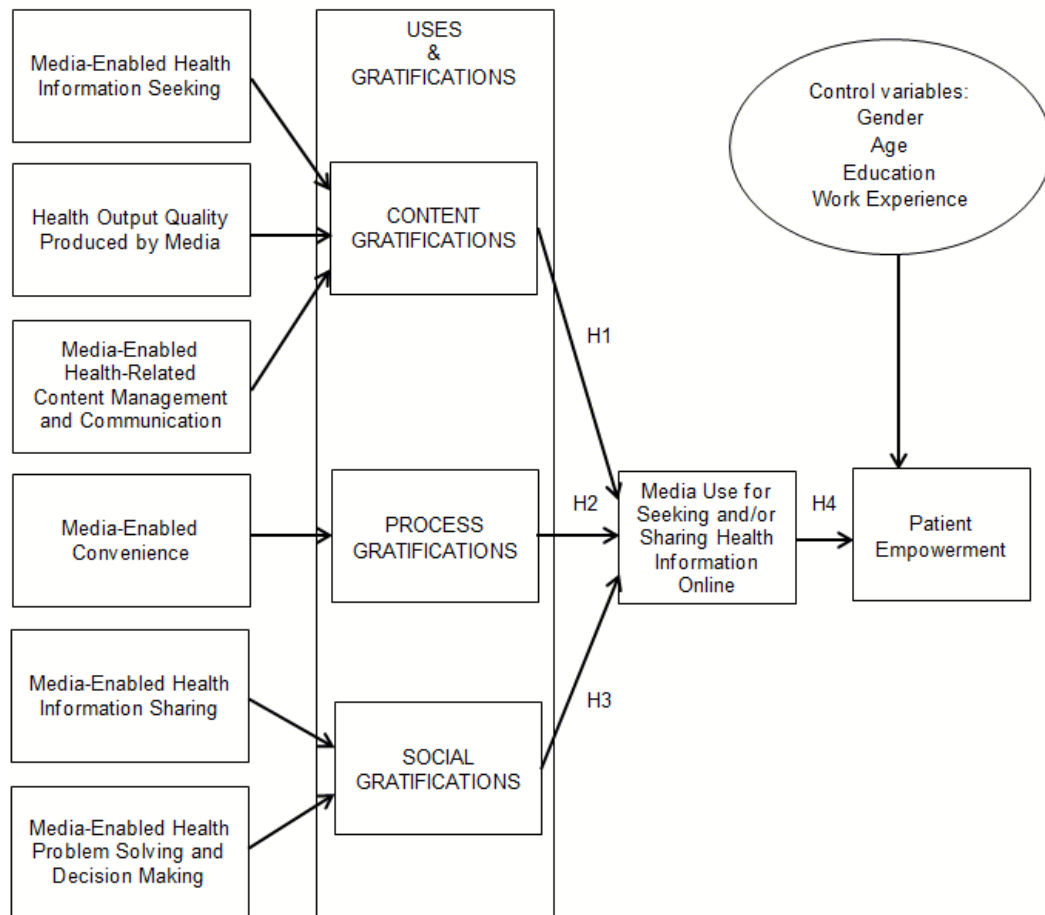
The main objective of Study 2 is to understand whether patients' motivations to seek health information online and share health information online leads to patient empowerment through the use of CMC media. The notion of empowerment and the role motivation plays in empowerment have received considerable attention in the psychology literature. Empowerment is defined as "a motivational construct manifested in four cognitions: meaning, competence, self-determination, and impact" (Spreitzer, 1995, p. 1444). Thomas and Velthouse (1990) referred to empowerment as increased intrinsic task motivation manifested by the four cognitions. Empowerment involves "creating conditions for heightening motivation for task accomplishment through the development of a strong sense of personal efficacy" (Conger & Kanungo, 1988, p. 474).

Information is the core of empowerment. Kanter (1989) states that making more information readily available to more people through more devices leads to empowerment. Spreitzer (1995) found that access to information is positively related to the psychological empowerment. While the link between information and empowerment in general is established, it is not clear whether use of CMC media for health information seeking online and health information sharing online can lead to patient empowerment. The research questions for Study 2 are as follows: *Does patients' motivations and*

*barriers to seek and/or share health information online lead to increased use of CMC media for health information seeking and/or sharing online? Does patients' use of CMC media to seek and/or share health information online lead to patient empowerment?*

## 4.2 Research Model

The research model for Study 2 is presented in Figure 6.



**Figure 6. Study 2 Research Model**

In the above research model, the independent variables are the patient motivations and barriers for seeking and/or sharing health information online, represented by the

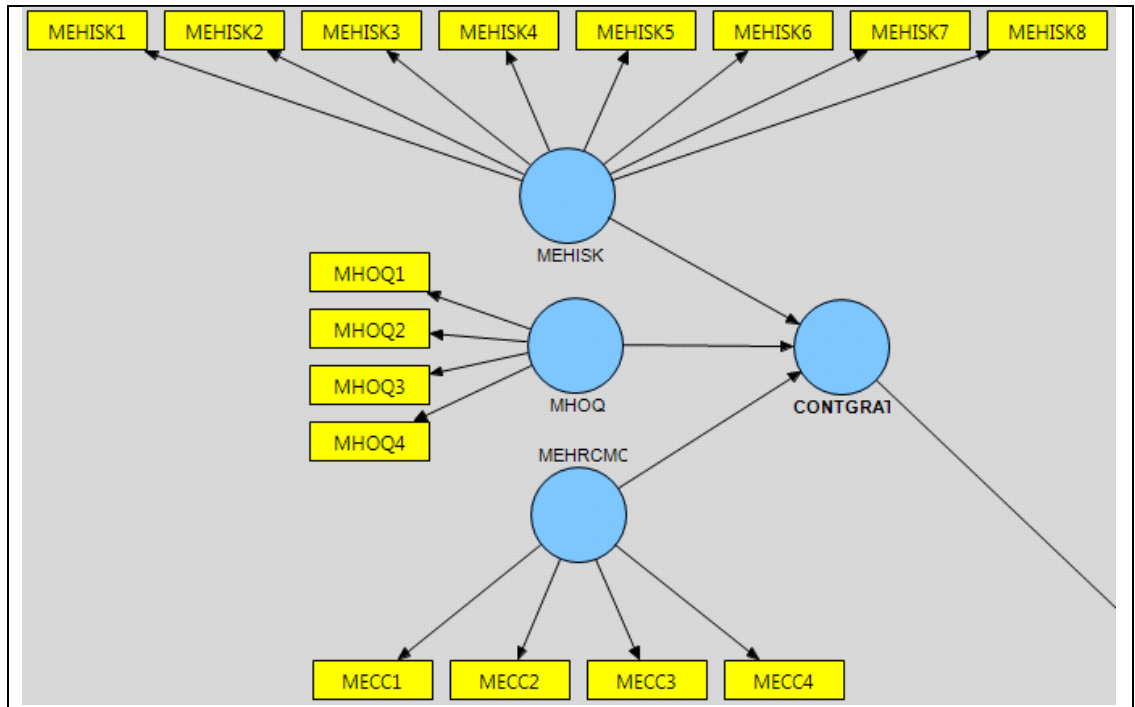
seven themes and the three types of gratifications based on the Uses and Gratifications theory identified from the results of Study 1. The dependent variables are media use for seeking and/or sharing health information online, and patient empowerment.

In this study, the Uses and Gratifications dimensions, namely content gratifications, process gratifications, and social gratifications, are modeled as formative constructs. Formative constructs are those in which the formative measures cause changes in the underlying construct as opposed to reflective constructs where a change in the construct affects the underlying measures (Jarvis, MacKenzie, & Podsakoff, 2003). Jarvis et al. (2003) suggest using four decision rules to determine whether a construct is formative or reflective. The first decision rule is that the direction of causality is from the items to the construct (Jarvis et al., 2003). Formative measures “cause” the construct as opposed to reflective measures which are caused by the construct (Petter, Straub, & Rai, 2007). The second decision rule is that the indicators are not necessarily interchangeable and hence dropping an indicator may alter the meaning of the construct itself (Jarvis et al., 2003). MacKenzie, Podsakoff, and Jarvis (2005) state that “dropping a measure from a formative-indicator model may omit a unique part of the conceptual domain and change the meaning of the variable, because the construct is a composite of all the indicators” (p. 712). The third decision rule is that the indicators need not covary (Jarvis et al., 2003). While measures for reflective constructs are expected to covary with each other, indicators for formative constructs need not covary with each other (Petter et al., 2007). The fourth decision rule is that the indicators need not have the same antecedents and consequences (Diamantopoulos & Winklhofer, 2001; Jarvis et al., 2003). Petter et al.

(2007) add that “when you consider that a formative construct is made up of distinct items that form the construct, each item may, in fact, have very different antecedents and/or consequences” (p. 634).

For all three gratifications constructs, the direction of causality is from the measurement items to the constructs as indicated in the construct operationalization for content gratifications, process gratifications, and social gratifications in Figure 7, Figure 8, and Figure 9 respectively. In all three gratifications constructs, the indicators are not interchangeable and hence dropping an indicator will alter the meaning of the construct. For example, if media health output quality is dropped from the content gratifications construct, this will alter the meaning of the construct since output quality is essential to patients’ continued use of CMC media to seek and/or share health information online. For all three gratifications constructs, it is not necessary for the indicators to covary with each other. For example, the media-enabled health information sharing and media-enabled health problem solving and decision making indicators for the social gratifications construct are not expected to covary since the former refers to health information sharing by a patient whereas the latter refers to the use of social interaction by patients to help solve their health related problems and make decisions related to their health. The indicators for all three constructs are not expected to have the same antecedents and consequences since they are conceptually distinct from each other. Thus, the three constructs of content gratifications, process gratifications, and social gratifications satisfy the decision criteria suggested by Jarvis et al. (2003) and hence are operationalized as formative.

In this study, all three gratifications constructs are operationalized as reflective first-order, formative second-order constructs. Jarvis et al. (2003) refer to this as a Type II model.

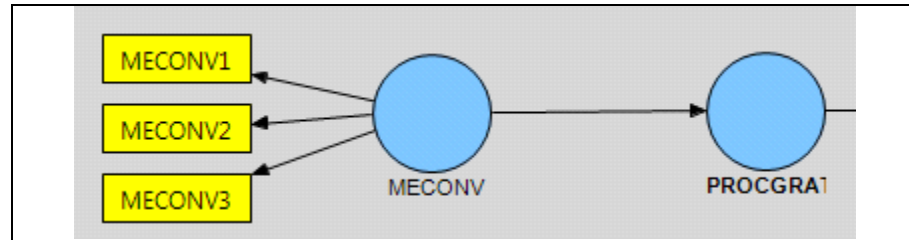


**Figure 7. Operationalization of the Content Gratifications Construct**

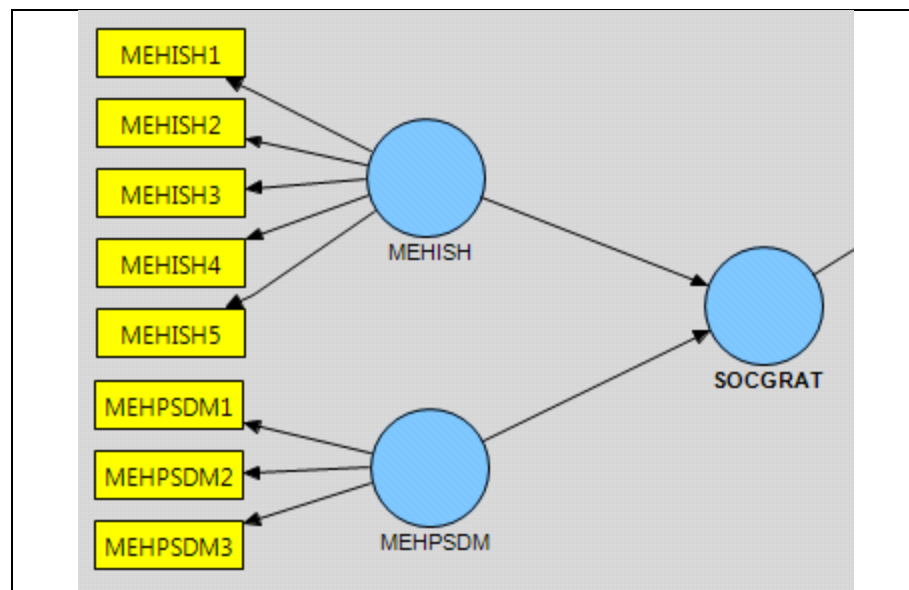
The operationalization of the content gratifications construct as reflective first-order, formative second-order is presented in Figure 7. The content gratifications construct is operationalized as a second-order formative construct using the three measures of media enabled health information seeking, media health output quality, and media-enabled health related content management and communication.

The process gratifications construct is operationalized as a second-order formative construct using the measure media enabled convenience. Figure 8 shows the

operationalization of the process gratifications construct as reflective first-order, formative second-order.



**Figure 8. Operationalization of the Process Gratifications Construct**



**Figure 9. Operationalization of the Social Gratifications Construct**

The operationalization of the content gratifications construct as reflective first-order, formative second-order is presented in Figure 9. The social gratifications construct is operationalized as a second-order formative construct using the two measures of media enabled health information sharing, and media-enabled health problem solving and



decision making. Each of these two measures captures a different aspect of social gratifications and hence the operationalization of this construct is considered formative.

By operationalizing the three gratifications constructs, namely, content gratifications, process, gratifications, and social gratifications as reflective first-order, formative second-order, this research addresses the call by Jarvis et al. (2003) for more research that focuses on Type II formative models.

### **4.3 Theoretical Foundation and Hypotheses Development**

The theoretical foundations and hypotheses development for the study are presented in this section. Technology use has been studied extensively in the IS literature using a variety of theoretical foundations. Rogers' diffusion of innovations theory has been widely used in the IS literature (e.g. Agarwal & Prasad, 1997; Huff & Munro, 1985; Moore & Benbasat, 1991) to explain how new technology related innovations can be introduced successfully into populations. According to the diffusion theory, people are motivated to select a technology based on the interpersonal influence of other people who are close to the adopter (Rogers, 1995). Another widely used theory to explain technology selection and use is the Technology Acceptance Model (TAM) by Davis (1986; 1989). According to TAM, people's adoption of a new technology as measured by their intention to use the technology depends on the perceived usefulness of the technology and the perceived ease of use of the technology (Davis, 1989). TAM was extended to include several additional constructs (Venkatesh & Davis, 1996; 2000; Venkatesh, Morris, Davis, & Davis, 2003). Theories such as diffusion theory and TAM generally relate to technology usage choices in the workplace and are not immediately

useful in examining personal motivations of consumers in using a particular media (Stafford et al., 2004). Furthermore, diffusion theory is concerned with how people come to know of a particular technology innovation and how they decide to use a technological innovation initially, but it does not explain continued use and increased use of the technology (Stafford et al., 2004). The Uses and Gratifications theory is best suited for this research since it not only applies to individual consumer motivations for selecting a particular technology to use, but also explains continued use and increased use of the technology.

#### ***4.3.1 Uses and Gratifications Theory***

As stated earlier in Study 1, the Uses and Gratifications theory has been widely used to explain media use in the field of communication studies (Guo et al., 2010) to investigate the motivations for the use of the Internet as a whole and specific CMC media in particular (Papacharissi & Rubin, 2000; Stafford et al., 2004; Walther & Hancock, 2005). Stafford et al. (2004) used the Uses and Gratifications theory to conduct an empirical investigation to identify the dimensions of consumer Internet use and usage gratifications among consumers of a prominent Internet Service Provider. Guo et al. (2010) uses the Uses and Gratifications perspective to identify the motivation dimensions for students' use of CMC media in learning contexts. Papacharissi and Rubin (2000) applied the Uses and Gratifications theory to identify the motivation dimensions for students' use of CMC media in general.

According to the Uses and Gratifications theory, people use the media for three main reasons or gratifications, namely, content gratifications, process gratifications, and social gratifications. Content gratification refers to people's use of a particular media purely for the content carried by that medium, such as information, knowledge, or research (Mendes-Filho & Tan, 2009). Content gratifications relate to the message carried by the medium (Cutler & Danowski, 1980). Process gratification refers to people's use of a media just for the simple experience, such as browsing or playing with the technology (Mendes-Filho & Tan, 2009). Process gratifications relate to the actual use of the medium itself (Cutler & Danowski, 1980). Social gratification refers to people's use of a particular media purely for interacting with other people (Mendes-Filho & Tan, 2009). Social gratifications relate to the social interaction allowed by the medium (Stafford et al., 2004).

#### ***4.3.2 Independent Variable: Patient Motivations for Seeking and/or Sharing Health Information Online***

Patient motivations for seeking and/or sharing health information online are represented by the seven themes of media-enabled health information seeking online, media-enabled health information sharing online, media-enabled convenience, media-enabled connectivity, media-enabled health-related communication and control, media-enabled health problem solving, and health output quality produced by media based on the results of Study 1. According to Uses and Gratifications theory, gratifications can be classified as content gratifications, process gratifications, and social gratifications (Stafford et al., 2004; Mendes-Filho & Tan, 2009). The content gratifications category

includes the subcategories of media-enabled health information seeking online, health output quality produced by media, and media-enabled health-related content management and communication. The process gratifications category includes the subcategory media-enabled convenience. The social gratifications category includes the subcategories of media-enabled health information sharing online and media-enabled health problem solving and decision making.

The three Uses and Gratifications theory based categories, the seven themes that fall into those categories, and the definitions for the seven themes are presented in Table 24 below.

**Table 24. Uses and Gratifications Theory-Based Categories, Themes and Definitions**

<b>Uses and Gratifications Dimension</b>	<b>Theme</b>	<b>Definition</b>
Content gratifications	Media-enabled health information seeking online	The extent to which patients use the communication medium to seek health information online
	Health output quality produced by media	The extent to which the search output produced by the media is relevant, reliable, and timely
	Media-enabled health-related content management and communication	The extent to which the communication medium allows patients to manage their files and communication histories
Process gratifications	Media-enabled convenience	The extent to which patients feel that the communication medium is to access and to use for health information seeking and/or sharing

Social gratifications	Media-enabled health information sharing online	The extent to which patients use the communication medium to share health information online
	Media-enabled health problem solving and decision making	The extent to which the communication medium allows patients to solve their health related problems and make decisions regarding their health

Aujoulat et al. (2007) conducted a thematic content analysis of 55 journal articles published over a 10 year span (1995–2004) using the terms “empowerment” and “patient education” and found that patient motivation is a key antecedent to patient empowerment. They state that the key features of an empowerment-based approach are “ideology driven and concern choice and responsibility on the one hand, and skills-development so as to become more competent in relating to self and others, and dealing with one’s disease, life and environment on the other hand” (p. 5). While Aujoulat et al. (2007) showed a direct link between patient motivations and patient empowerment, this research hypothesizes that patient empowerment in the online context has no such direct link between patient motivations and patient empowerment. This research posits that the relationship between patient motivations for seeking and/or sharing health information online and patient empowerment is mediated by patients’ actual use of CMC media to seek and/or share health information online.

Media-enabled health information seeking online is the first motivation and barrier dimension. Information seeking refers to the extent to which patients use the communication medium to seek health information online. According to a 2011 Pew

Internet Study, more than 59 percent of adults have searched online for health information (Fox, 2011). This number is expected to increase given the proliferation of the Internet and the number of devices connected to it. More and more patients are using CMC media as their first choice source to seek health information online due to the fact that the media provides an inexpensive way to access extensive details of useful and reliable health information from a wide variety of sources. The link between information and system use for empowerment in an organizational context has been well established in literature (Armstrong & Sambamurthy, 1999; Kanter, 1989; Spreitzer, 1995). Distribution of key information using IT can empower individuals (Armstrong & Sambamurthy, 1999). Kanter (1989) adds that making more information readily available to more people through more devices leads to empowerment. Access to information about the performance of a task is fundamental to reinforcing a sense of competence in an individual and this leads to empowerment (Spreitzer, 1995). Holmström and Röing (2010) state that patient empowerment can be facilitated by making medical information available on the Internet. Rodwell (1996) provides several examples of information that can lead to patient empowerment including information related to diagnosis, pathology, treatment and prognosis. Thus, patients who are motivated to seek health information online are more likely to use CMC media to seek and/or share health information online.

Health output quality produced by the media is the second motivation and barrier dimension. Health output quality produced by the media refers to the extent to which the search output produced by the media is relevant, reliable, and timely. During the interviews as a part of Study 1, patients indicated that they were more likely to use CMC

media for health information seeking and/or sharing online if the media provided reliable and accurate information that is trustworthy and made available when the patients need it. This is not surprising given that patients dealing with critical illnesses seek actionable information when it comes to their health care management and patients cannot act on health information provided by the media unless they perceive the output quality to be high. The link between perceived output quality and system use for knowledge seeking has been established in the IS literature (Kankanhalli et al., 2005b; Xu et al., 2010; Zhang & Watts, 2008). Perceived output quality directly affects EKR usage for knowledge seeking (Kankanhalli et al., 2005b). Perceived information relevance is a significant antecedent to system use for information seeking (Xu et al., 2010). Zhang and Watts (2008) associate output quality with argument quality and source credibility. Argument quality refers to the persuasiveness of the posted output and source credibility refers to the trustworthiness and reliability of the source who posted the output (Zhang & Watts, 2008). Zhang and Watts (2008) established that argument quality and source credibility have a significant main effect on information adoption online. Thus, patients who are motivated by health output quality produced by the media are more likely to use CMC media to seek and/or share health information online.

Media-enabled health-related content management and communication is the third motivation dimension. Media-enabled health-related content management and communication refers to the extent to which the communication medium allows patients to manage their health-related files and communication histories. This dimension relates to patients who use content management tools to manage their health information online

and need quick feedback on their health questions and hence expect the communication to happen in real-time which will allow them to take control over their health. Increased availability of healthcare services provided online is one of the reasons for the increased use of the Internet by patients (Hoyt et al., 2008). One such service that allows patients to manage their health-related content and communication is the personal health record (PHR). Increased use of PHRs provides patients with increased access to and management of their health information leading to consumer empowerment in healthcare (BCBS, 2014). Thus, patients who are motivated by health-related content management and communication needs are more likely to use CMC media to seek and/or share health information online.

Content gratifications include the three dimensions of media-enabled health information seeking online, health output quality produced by the media, and media-enabled health-related content management and communication. Several Uses and Gratifications theory based studies (Drèze & Zufryden, 1997; McDonald, 1997; Stafford & Stafford, 1998) hypothesize that website content may be gratifying to Internet users. Based on the above arguments, we hypothesize the following:

*H1: The content gratification dimensions of media-enabled health information seeking online, health output quality produced by the media, and media-enabled health-related content management and communication will be positively related to patients' actual use of CMC media to seek and/or share health information online.*

Media-enabled convenience is the fourth motivation and barrier dimension. Media-enabled convenience refers to the extent to which patients feel that the



communication medium is easy to access and to use. One of the biggest reasons for the increased use of CMC for health information seeking online is how easy it is to access health information online using those media. Even patients who do not own a computer themselves can walk to their nearest libraries to get free access to the CMC media for health information seeking online. Another example of media-enabled convenience is patients' use of smartphones to access health information online. Media-enabled convenience also refers to how easy it is to use the CMC media to share health information online, how quickly the CMC media allow patients to communicate to others, and how cheap it is to communicate through the medium. In terms of ease of use, several patients who participated in the interviews as a part of Study 1 indicated that they use a search engine as their gateway to seek health information online and to clarify health-related issues. Finding health information online is as simple as typing in a phrase in a search engine. In terms of quick communication, given the nature of the CMC media, especially the Internet as a whole, several million people are always connected and are available online which typically leads to a very quick response time when a health related query is posted online. In terms of cost, the use of communication media to access pertinent health information online is cheaper than a visit to the healthcare provider's office. Thus, patients who are motivated by media-enabled convenience are more likely to use CMC media to seek and/or share health information online.

Process gratifications include the dimension media-enabled convenience. Process gratification refers to people's use of a media just for the simple experience, such as browsing or playing with the technology (Mendes-Filho & Tan, 2009). Process

gratifications relate to the *actual use* of the medium itself (Cutler & Danowski, 1980).

Some of the reasons for the increased use of the Internet by patients include the ubiquity of computers and broadband connectivity, abundance of patient education websites, increased availability of Web 2.0 tools (e.g., blogs, podcasts, Wikis), increased availability of healthcare services provided online, and patients' quest to find the best medical care at the lowest cost (Hoyt et al., 2008). The Internet allows patients a convenient way to access health information online. As newer forms of technologies such as social networking websites, patient portals, and Web 2.0 come into the picture, patients are expected to be gratified with the simple experience of using such new technologies for health information seeking and/or sharing online. Based on the above arguments, we hypothesize the following:

*H2: The process gratification dimensions of media-enabled convenience will be positively related to patients' actual use of CMC media to seek and/or share health information online.*

Media-enabled health information sharing online is the fifth motivation and barrier dimension. Media-enabled health information sharing online refers to the extent to which patients use the communication medium to share health information online.

Patients share health information online for a wide variety of reasons. Some patients share their health information online since they are altruistic, while some others do so to vent their frustrations with a particular treatment or a particular healthcare provider etc. One of the key motivations for sharing health information online is enjoyment in helping others. Enjoyment in helping others is the perceived pleasure a knowledge contributor

experiences by helping others through the knowledge contributed to a knowledge management system (Kankanhalli et al., 2005a). Wasko and Faraj (2005) found evidence that individuals make more helpful knowledge contributions when they enjoy helping others. Research has shown that patients seek health information online more than they share (Pew Internet, 2014). According to the Pew Internet Research Project, 63% of adult Internet users have searched online for health information compared to only 8% of adult Internet users who have shared their own personal health experiences online (Pew Internet, 2014). One possible explanation for this is the lack of any direct or tangible benefits to the knowledge contributor. Kankanhalli et al. (2005a) state that under conditions of weak pro-sharing norms, knowledge contributors may require extrinsic benefits in order to contribute their knowledge to EKR. Another possible reason for this could be the privacy concerns in sharing health information online. Patients who participated in the interviews as a part of Study 1 also indicated that they would share more online if they are able to do so anonymously and if it does not take too much time and effort on their part. CMC media offers several ways in which patients can share their health information online. Examples of the use of CMC media to facilitate health information sharing online include the use of social media tools such as Facebook and Twitter (Hoyt et al., 2008). The CDC's Twitter profile for emergency information (<https://twitter.com/CDCemergency>) has more than 1.5 million followers. Other Web 2.0 technologies such as wikis and blogs also allow patients to share health related information with other patients who are seeking such information online (Von Hippel,

1998). Thus, patients who are motivated to share health information online are more likely to use CMC media to seek and/or share health information online.

Media-enabled health problem solving and decision making is the sixth motivation and barrier dimension. Media-enabled health problem solving and decision making refers to the extent to which the communication medium allows patients to solve their health related problems and make decisions related to managing their own health. CMC media offer patients immediate access to a wide variety of healthcare resources to allow them to help solve their complex health-related issues, and to solve their critical health-related issues. Von Hippel (1998) states that individual consumers are greatly empowered through the use of Web 2.0 technologies such as wikis and blogs since they are able to solve problems without having to rely on specialists for solutions. Xu et al. (2010) state that information becomes relevant when it is helpful to solve the problem at hand. Health information sharing between the clinician and the patient will allow both to make the most informed decisions about treatments (American Hospital Association, 2011). Feste and Anderson (1995) state that patient empowerment is designed to allow patients to effectively assume responsibility for their health-related decisions. Patient control over decisions was found to be antecedent of patient empowerment (Gibson, 1991; Nyatanga & Dann, 2002). Thus, patients who are motivated by health problem solving and decision making are more likely to use CMC media to seek and/or share health information online.

*H3: The social gratification dimensions of media-enabled health information sharing online, media-enabled health problem solving and decision making will be*

*positively related to patients' actual use of CMC media to seek and/or share health information online.*

#### ***4.3.3 Mediating Variable: Patients' Actual Use of Media to Seek and/or Share Health Information Online***

The mediating variable in the research model is patients' actual use of CMC media to seek and/or share health information online. Actual use includes the use of the Internet by patients to engage in health information seeking and health information sharing behaviors online.

#### ***4.3.4 Dependent Variable: Patient Empowerment***

Patient empowerment is the dependent variable for Study 2. Patient empowerment “is based on the assumption that to be healthy, people must be able to bring about changes, not only in their personal behavior, but also in their social situations and the organizations that influence their lives” (Feste & Anderson, 1995). In this study, patient empowerment is defined as patient empowerment that can be attributed to the use of CMC media such as computers, tablet PCs, smart phones, and the Internet as a whole. Medical information available on the Internet has been identified as a possible source of patient empowerment (Holmström & Röing, 2010). Kanter (1989) states that making information readily available to multiple people using multiple systems leads to empowerment. Use of CMC media such as the Internet as a whole, use of web portals and online knowledge repositories for health, and the use of social media tools such as Facebook and Twitter empower healthcare consumers (Hoyt et al., 2008). Von Hippel (1998) adds that individual consumers are greatly empowered through the use of Web 2.0

technologies such as wikis and blogs. The goal of Study 2 is to empirically test this relationship between health information available online and patient empowerment specifically through the use of IT. This leads to the following hypothesis:

*H4: Patients' actual use of health information online will be positively related to their patient empowerment.*

#### **4.4 Methodology**

Once the motivations for seeking and sharing health information online were understood using the qualitative interviews from Study 1, a survey instrument was created to test the link between the motivations to seek and/or share health information online, patients' actual use of health information online, and patient empowerment. The unit of data collection and the unit of data analysis is the individual patient.

The focus of survey research is to advance scientific knowledge or develop theory (Malhotra & Grover, 1998). Survey research refers to research methodology that uses predefined and structured questionnaires to capture data from individuals (Palvia et al., 2004). Malhotra and Grover (1998) add that the key characteristics of survey research are that they are quantitative, and that they use a sample. Malhotra and Grover (1998) explain the ideal survey attributes in conducting survey research. These attributes include the unit of analysis, content validity, reliability, construct validity and test-retest reliability to address concerns related to measurement error, random sampling to correct sampling errors, using SEM to reduce internal validity errors, and ensuring the statistical power of the tests being used to address statistical conclusion errors.

Malhotra and Grover (1998) state that measurement error could be due to poorly worded questions, length of instrument, bias induced by method, etc. and add that Churchill's (1979) validation techniques can be used for reducing measurement errors for multi-item measures of a variable. These techniques include content validity, reliability, construct validity, and test-retest reliability. Malhotra and Grover (1998) define content validation as an "assessment of the appropriateness of the items to the domain of the construct" (p. 412). They add that content validity can be assessed either through the theoretical basis for the items from the literature or using a Q-sort technique with a panel of researchers who are experts in the domain. Content validity refers to whether the instrument measures are drawn from all possible measures of the properties under investigation (Straub, 1989). Reliability of the items refers to whether the items "hang together" and can be ensured through assessment of Cronbach's Alpha. Reliability refers to whether the measures show stability across the units of observation (Straub, 1989). Malhotra and Grover (1998) state that construct validation addresses the question of what the instrument is actually measuring. Construct validity refers to whether the measures show stability across the methodologies (Straub, 1989). Construct validation includes addressing the convergent and discriminant validity. Malhotra and Grover (1998) add that construct validity can be addressed using factor analysis or the multitrait-multimethod (MTMM) approach and that Structural Equation Modeling (SEM) can be performed to confirm existing measures.

Malhotra and Grover (1998) then discuss how to reduce sampling error. They state that sampling error can either be due to sample frame error or due to error of

selection adding that the sample frame error is introduced when the sampling frame is not representative of the population of interest whereas the error of selection is due to the sample used for analysis not being representative of the sampling frame. Sampling error can be reduced using random sampling, ensuring a good response rate (> 20 percent), and by estimating the non-response bias (Malhotra & Grover, 1998).

Next, Malhotra and Grover (1998) elaborate on internal validity error. Internal validity error addresses the question of whether differences in the dependent variable are indeed caused by the independent variable or could other variables be confounding the relationship. Internal validity refers to whether there are untested rival hypotheses for the observed effects (Straub, 1989). Malhotra and Grover (1998) add that internal validity can be tested either informally through a discussion of why causality exists or why alternate explanations are unlikely or formally using SEM and LISREL.

Finally, Malhotra and Grover (1998) discuss statistical conclusion error adding that it relates to the statistical power of tests being used. Statistical conclusion validity refers to whether the variables demonstrate relationships not explainable by chance (Straub, 1989).

#### ***4.4.1 Instrument Development***

The first step of the survey research process involved reviewing extant literature and coming up with multi-item measures for the variables in the research model. In instrument design, existing (validated) scales were used wherever possible and were adapted to suit this study. This was followed by the pre-test, pilot test, and full study phases. The instrument was first pre-tested using the help of researchers at a local



university. Pre-test procedures included making the instrument available online, identifying a sample for the pre-test, sending e-mails to the subjects, collecting pre-test data, and analyzing pre-test data to refine the measures. The goal of the pre-test is to ensure that the questions in the instrument are easy to understand and are not misleading or biased in any way. Minor changes were made as a result. In the pilot test phase following the development of the preliminary instrument, the instrument was pilot tested using a representative sample of 38 patients. Pilot test procedures included developing the preliminary instrument, making the instrument available online, identifying a sample for the pilot test, sending e-mail to subjects in sample, collecting pilot test data, and analyzing pilot test data to refine measures. The goal of the pilot test is to ensure that the questions in the instrument were easy to understand and were not misleading or biased in any way to reduce measurement error. The pilot test data was also used to refine the measures using a field-based validation of the research, and to assess reliability and construct validity of the instrument. The pilot test data was analyzed using statistical software package SAS. The objective of the pilot test was to refine the measures using a field-based validation of the instrument. Minor changes were made to the instrument based on the pilot test feedback. The pilot test results are presented in section 4.5.

#### **4.4.2 Measures**

The complete list of measurement items is shown in the Appendix B. A brief description of these measures follows.

*Media-enabled health information seeking online* refers to the extent to which patients use the communication medium to seek health information online. Media

enabled health information seeking online was measured using six items derived from Study 1. These six items are details of information, sources of information, range of information, quantity of information, accessibility to the media, and knowledge growth. The item “*details of information*” refers to the medium’s ability to allow patients to obtain detailed health-related information (or not). The item “*sources of information*” refers to the medium’s ability to allow patients to obtain health information online from different sources (or a single source). The item “*range of information*” refers to the medium’s ability to allow patients to obtain a broad (or narrow) range of health information online. The item “*quantity of information*” refers to whether the medium allows you to transfer or obtain a large (or small) quantity of health-related information. The item “*accessibility to media*” refers to whether it is easy (or difficult) to access to the medium. The item “*knowledge growth*” refers to whether the medium allows you to accumulate health-related knowledge (or not).

*Media-enabled health information sharing online* refers to the extent to which patients use the communication medium to share health information online. This construct was measured using eight items derived from the qualitative study. These items include altruism, venting, multifunctioning capability, information sharing, personalness of interaction, encouragement, awareness of others, and ease of use for sharing health information online. The item “*altruism*” refers to the ability of the medium to allow patients to be altruistic, in other words, share health information online for the benefit of other patients without expecting anything in return. The item “*venting*” refers to the ability of the medium to allow patients to vent by sharing bad health-related experiences.

The item “*multifunctioning capability*” refers to whether the medium allows patients to use multiple tools (or a single tool) for communication of health-related information (email, chat, talk, text, attach file, etc.). The item “*information sharing*” refers to whether the medium allows patients to share health-related information with others (or not). The item “*personalness of interaction*” refers to whether the communication through the medium provides a more personal (or impersonal) touch. The item “*encouragement*” refers medium allows you to receive health-related encouragement from others users. The item “*awareness of others*” refers to whether the medium allows transmission of the awareness of others in the interaction. The item “*ease of use for sharing*” refers to whether the medium is easy (or difficult) to use for sharing health information online.

*Health output quality produced by media* refers to the extent to which the search output produced by the media is relevant, reliable, and timely. *Health output quality produced by media* was measured using seven items developed from Study 1. These items are trustworthiness of information, accuracy of information, information relevance, up-to-date information, current information, timeliness of information, and reliability of information. The item “*trustworthiness of information*” refers to the extent to which the output produced by the media is trustworthy. The item “*accuracy of information*” refers to the extent to which the output produced by the media is free from mistakes or errors. The item “*current information*” refers to the extent to which the output produced by the media is new. The item “*timeliness of information*” refers to the extent to which the output produced by the media is available to patients at the exact time they need it. The

item “*reliability of information*” refers to whether health information provided online by the medium is reliable (or unreliable).

*Media-enabled convenience* refers to the extent to which patients feel that the communication medium is to access and to use. A six-item measure was employed based on the results from the qualitative study. The six items are usefulness of information, cost of using the media, anonymity, ease of use for sharing, quick communication, and clarification of issues. The item “*usefulness of information*” refers to whether the health information provided online by the medium is useful (or useless). The item “*cost*” refers to whether it is cheap (or expensive) to communicate with the medium. The item “*anonymity*” refers to the ability of the medium to allow patients to share health information online anonymously. The item “*ease of use for sharing*” refers to the ability of the medium to allow patients to share health information online easily. The item “*speed of communication*” refers to whether the medium allows patients quick (or slow) communication with others. The item “*clarification of issues*” refers to the ability of the medium to allow patients to clarify health-related issues easily (or not).

*Media-enabled connectivity* refers to the extent to which the communication medium allows patients to connect with others to share health information online. Connectivity was measured using the two items of familiarity of communicators and file management. The item “*familiarity of communicators*” refers to the ability of the medium to allow patients to know who they are communicating with (or not). The item “*file management*” refers to the ability of the medium to allow patients to store and manage files (or not).

*Media-enabled health related communication and control* refers to the extent to which the communication medium allows patients to communicate with others and to take control over their own health and interactions with the provider. A six-item measure based on Study 1 was used for assessing social presence. The six items used to measure social presence are communication history, one-to-many communication, synchronicity, feedback, control over health problems, and control over interactions. The item “*communication history*” refers to the ability of the medium to allow patients to keep a record of their communication history (email history, chat history, save file attachments etc.) (or not). The item “*one-to-many communication*” refers to the ability of the medium to allow patients to communicate with multiple people simultaneously (or only one at a time). The item “*synchronicity*” refers to the ability of the medium to allow patients to have a real-time communication (or not). The item “*feedback*” refers to the ability of the medium to allow patients to provide quick (or slow) feedback. The item “*control over health problems*” refers to the ability of the medium to allow patients to take control over their own health. The item “*control over interactions*” refers to the ability of the medium to allow patients to take control over the interactions with their healthcare provider.

*Media-enabled health Problem Solving* refers to the extent to which the communication medium allows patients to solve their health related problems. Media-enabled health problem solving was measured using two items based on the results of the qualitative study. The two items are complexity of issues, and criticality of issues. The item “*complexity of issues*” refers to whether the medium is good (or poor) at helping patients solve complex health-related issues. The item “*criticality of issues*” refers to

whether the medium is good (or poor) at helping patients solve critical health-related issues.

*Media Use for Health Information Seeking and/or Sharing Online* refers to actual use of the Internet by patients to engage in health information seeking and health information sharing behaviors online. It is based on literature from CMC media use (Guo et al., 2010). A six-item measure was used to measure this construct. Items include self-rated ability to use media to seek and/or share health information online, accessibility to media to seek and/or share health information online, experience using the media for health information seeking and/or sharing online, frequency of use of the Internet for seeking and/or sharing health information online, and self-rated use of the media for health information seeking and/or sharing online.

*Patient Empowerment* refers to patient empowerment that can be attributed to the use of CMC media such as computers, tablet PCs, smart phones, and the Internet as a whole. It is based on the literature on patient empowerment through CMC media (Oh & Lee, 2012). This construct was measured using 12 items based on the three sub-constructs of “motivation to achieve disease-related goals”, “sense of confidence”, “and sense of control”. The sub-construct “*motivation to achieve disease-related goals*” refers to the extent to which the patients are willing to understand their disease, manage their disease, and achieve their disease-related goals. The sub-construct “*sense of confidence*” refers to a patient’s faith in her / his ability to make a realistic disease-related plan and to know where to ask for help if needed. The sub-construct “*sense of control*” refers to the power or control a patient has over her / his health-related decision-making.

The constructs, definitions, and the corresponding literature sources for this study are presented in Table 25.

**Table 25. Constructs, Definitions, and Literature Sources**

<b>Construct</b>	<b>Definition</b>	<b>Literature Source</b>
Media-enabled health information seeking online	The extent to which patients use the communication medium to seek health information online	Based on results from Study 1
Media-enabled health information sharing online	The extent to which patients use the communication medium to share health information online	Based on results from Study 1
Media health output quality	The extent to which the health output produced by the media is relevant, reliable, and timely	Based on results from Study 1
Media-enabled health problem solving and decision making	The extent to which the communication medium allows patients to solve their health related problems and make decisions related to their health	Based on results from Study 1
Media-enabled communication and control	The extent to which the communication medium allows patients to communicate with others and to take control over their own health and interactions with the provider	Based on results from Study 1
Media-enabled convenience	The extent to which patients feel that the communication medium is to access and to use	Based on results from Study 1
Media use for health information seeking and/or sharing online	Patients' duration of media use, frequency of media use, and intensity (extent) of media use for health information seeking and/or sharing online	Venkatesh et al. (2008)

Patient Empowerment	Patient perceptions of their ability to be motivated to achieve health-related goals, their sense of confidence, and their sense of control	Oh and Lee (2012)
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#### ***4.4.3 Data Collection***

The final stage of the survey research methodology involves collecting data for the full study. The procedures included identifying the sample for full study, sending e-mail to subjects in sample, collecting data for the full study, and analyzing the data. The primary target population for the survey is patients who are using publicly available resources on the Internet to seek and/or share health information online, patients who are using their healthcare provider's patient portal to seek and/or share health information online, patients who were previously using publicly available resources on the Internet to seek and/or share health information online, but have stopped doing so due to various reasons, and patients who were previously using their healthcare provider's patient portal to seek and/or share health information online, but have stopped doing so due to various reasons. A sample of patients was carefully selected based on various demographics like age, sex, educational background, and economic status to ensure that they accurately represent the population of interest which is patients who use CMC media to seek and/or share health information online. The sample size was determined based on the requirements for the use of the data analysis tool SmartPLS. To encourage participation in the survey, subjects were offered an incentive in the form of gift cards to complete the survey.



Once the full survey was pretested, and pilot tested, it was uploaded on Qualtrics, an online survey solutions website. Using the Qualtrics Panels feature, a national sample of 262 patients was surveyed for the full study. This sample size is comparable to other such surveys. For example, Anderson, Fitzgerald, Gruppen, Funnell, and Oh (2003) used a sample of 229 patients to validate the short form of their diabetes empowerment scale. Similarly, Phang et al. (2009) used a sample of 274 individuals to conduct a comparative study of knowledge seeking and knowledge contribution. Low response rates are endemic to healthcare IT research (Hikmet & Chen, 2003); therefore tests were conducted for response bias. These results are presented later along with instrument validation steps. Finally, structural equation modeling (SEM) was used for data analysis and hypotheses testing.

#### ***4.4.4 Analysis***

The data analysis procedure included data preparation, analysis of demographic data, descriptive statistics, checking for the sample response bias, instrument validity testing, and final analysis. In step 1, data from the survey was prepared for further analysis. First, data was exported into a CSV file for use with Excel. Next, the data was reviewed for inconsistencies so that the inconsistent responses can be dropped from the data sheet. The responses were then coded using appropriate Likert type scales. This was followed by a check of the appropriateness of data using mean, SD, and histograms to ensure that there are no signs of bimodality, and that the skewness and kurtosis of item responses were well within acceptable ranges

Next, in step 2, the sample of responses was analyzed for respondent demographics. The demographic information includes patients' age, sex, education, and work experience. Results are presented in tables 30–33.

In step 3, the sample response bias was assessed. Armstrong and Overton (1977) suggest checking for non-response bias by sampling a group of non-respondents (or obtaining data on them through secondary sources) and comparing them with respondents on key characteristics. If such a sample is not available, characteristics of early respondents were compared with those of the late respondents.

The next step, step 4, is the instrument validation stage. The initial reliability for elements was tested using Cronbach's alpha. Then, construct validity was assessed using the item-to-corrected total correlation for both construct-level and element-level using the Doll and Torkzadeh (1988) procedure. Next, criterion-related validity which demonstrates the accuracy of a measure or procedure was addressed by comparing it with another measure or procedure which has been demonstrated to be valid. This is followed by confirmatory factor analysis (CFA) where SmartPLS was used. After CFA, convergent and discriminant validity were assessed using the multitrait-multimethod matrix (MTMM) approach (Campbell & Fiske, 1959; Doll & Torkzadeh 1988; Palvia, 1996). The instrument was checked for final reliability using Cronbach's alpha at the construct level. The last step in instrument validation was to assess the common method bias, which refers to the variance that is attributable to the measurement method rather than to the constructs the measures represent. Commonly used techniques for assessing common method variance (CMV) include Harman's one-factor test, MTMM technique

(Campbell & Fiske, 1959), and the marker variable technique (Sharma, Yetton, & Crawford, 2009).

In the 5th and final stage, final analysis was performed using partial least squares (PLS), a variance-based structural equation modeling (SEM) technique. SEM is a multivariate technique that combines aspects of multiple regression and factor analysis (Straub, Boudreau, & Gefen, 2004). SEM models are typically expressed using path diagrams. The goal of PLS path modeling is to obtain estimates that minimize the residual variance of all dependent variables. The advantages of using PLS path modeling include the fact that it is quite robust to deviations from normality (Cassel, Hackl, & Westlund, 1999), it is non-parametric (it does not require independence of observations), and it requires much smaller sample sizes compared to covariance-based SEM. SmartPLS Version 2.0 Release M3 was used for path modeling and hypotheses testing in Studies 2 and 3. The coefficient of determination,  $R^2$ , was used to determine the usefulness of the model since no established goodness-of-fit indices are available for PLS models.  $R^2$  is a measure of the proportion of the variance of the dependent variable about its mean that is explained by the independent variables (Straub et al., 2004). Bootstrapping was used for statistical significance testing. Bootstrapping is a non-parametric approach for assessing the precision of PLS path estimates. Bootstrapping generates t-values for the item loadings in the measurement model and the path coefficients in the structural model. Significance testing for the path models was done using literature supported cutoff criteria for the t-values for the item loadings in the measurement model and for the path

coefficients in the structural model. The specific cutoff criteria are presented in the results section.

In the next section, the pre-test results are presented. This will be followed by the pilot test results and results from the full study.

#### 4.5 Results – Pretest

As stated earlier, the full survey instrument was pretested with the help of four researchers at a local university. Two of the researchers were from the field of information systems, one was from management, and the other from marketing. Pilot test feedback received from the four researchers is presented in Table 26.

**Table 26. Pretest Feedback**

<b>Researcher</b>	<b>Feedback</b>
Researcher #1	Drop the word “professional” from the question “How many years of professional work experience have you had?”.
	Replace the symbols $\geq$ and $<$ with the words “greater than or equal to” and “less than” respectively.
	Replace “How do you consider the extent of your current use of the Internet for seeking/sharing health information online?” with “What would you consider your use of the Internet for seeking and/or sharing health information online to be?”
	Replace “Compared with other subjects on my mind, the privacy of my electronic personal health information is very important” with “The privacy of my electronic personal health information is very important to me”.
Researcher #2	Describe to respondents what “medium” means.
	Spell out the words rather than use math symbols such as $\geq$ and $<$
	Use the age range 18-24, 25-34, 35-44, etc.
	In terms of the answer choices for education, keep in mind that approximately 75 percent of the U.S. population has not completed a B.A. or B.S.
	Try to make the survey as compact as possible to avoid respondent fatigue.

Researcher #3	Change the wording on the question related to websites frequently used to seek health information online to indicate that users can select more than one choice.
	Separate the motivations and barriers related questions for each media type.
Researcher #4	Add a question about the respondents' race.
	Think about adding some open-ended questions.

The survey instrument was updated to incorporate appropriate suggestions from the pretest feedback. The next step was to do a pilot test to do a field based validation of the survey instrument. Results from the pilot test are presented in the following section.

#### **4.6 Results – Pilot Test**

The pretested instrument was hosted on Qualtrics to solicit responses for the pilot test. 38 patients from all over the U.S. responded to the pilot survey.

The characteristics of the pilot test respondents are as follows: 66 percent of them were female and 34 percent male; 13 percent of them were in the 21-29 age group, 13 percent in the 30-39 age group, 11 percent in the 40-49 age group, 34 percent in the 50-59 age group and the remaining were 60 or older; 60 percent of them had at least one year of college education with 34 percent of them going on to graduate with a college degree; 76 percent of them had at least 6 years of work experience.

The next step was to establish the normality of data by examining the range of the skewness and kurtosis. Skewness refers to the extent to which a distribution deviates from symmetry around the mean. Acceptable values of skewness for psychometric purposes should be in the range  $-2$  to  $+2$ . Kurtosis refers to the extent to which a

distribution is peaked (or flat). Acceptable values for kurtosis for psychometric purposes should be in the range  $-2$  to  $+2$ .

**Table 27. Descriptive Statistics for the Motivations and Barriers Dimensions**

<b>Dimension</b>	<b>Items</b>	<b>Min</b>	<b>Max</b>	<b>Median</b>	<b>S.D.</b>	<b>Skew</b>	<b>Kurtosis</b>
Information Seeking	7	4.29	7.00	5.71	0.83	0.01	-1.01
Information Sharing	5	3.00	7.00	5.40	1.05	-0.39	0.11
Health Problem Solving	7	2.86	6.71	5.29	1.01	-0.41	-0.77
Social Presence	7	1.00	7.00	5.21	1.20	-1.14	2.62
Convenience	3	4.00	7.00	6.33	0.90	-0.93	-0.18
Connectivity	3	2.00	7.00	5.67	1.13	-0.97	1.21
Content Management	4	2.25	7.00	6.00	1.04	-1.24	2.04
Output Quality	4	3.00	7.00	5.00	0.99	0.09	-0.52

The descriptive statistics for the mean responses for the seven motivations and barrier dimensions are presented in Table 27. As seen from the table, none of the dimensions have a skewness which is below  $-2$  or above  $+2$ . Except for the social presence dimension, the other dimensions have a kurtosis around the  $-2$  to  $+2$  range as well and hence the data are assumed to be normally distributed.

The next step in the pilot data analysis was to validate the instrument using the pilot test data by estimating the reliability of the instrument and the construct validity of the latent variables using the software package SAS. Instrument validation should be done prior to any other type of core empirical validation (Cook & Campbell, 1979; Straub, 1989). The first step in instrument validation was to estimate the initial

reliabilities using Cronbach's alpha reliability analysis. The initial construct reliabilities for the survey instrument are presented in Table 28.

**Table 28. Initial Construct Reliabilities for the Survey Instrument**

<b>Construct</b>	<b>Number of Items</b>	<b>Cronbach's <math>\alpha</math> (Standardized)</b>
Media-enabled health information seeking online	7	0.82
Media-enabled health information sharing online	5	0.75
Media health output quality	4	0.85
Media-enabled health problem solving	7	0.81
Media-enabled connectivity	3	0.74
Media-enabled convenience	3	0.76
Media-enabled content management	4	0.78
Media-enabled social presence	7	0.89
Media use for health information seeking online	4	0.90
Media use for health information sharing online	4	0.79
Patient empowerment	12	0.90
Confidence in treatment	5	0.84
Coping with illness	5	0.92
Quality of care	13	0.97
Patient satisfaction	3	0.97
Entire instrument	86	0.97

Cronbach's alpha values of 0.7 are considered acceptable (George & Mallery, 2003; Kline, 1998) and Cronbach's alpha values of 0.8 are considered good (Doll & Torkzadeh, 1988; Straub, 1989). Based on the values from Table 28, the Cronbach's alpha values for all dimensions are in the acceptable to good category and hence initial reliability of the instrument was established.

The next step in the pilot data analysis was to establish construct validity. This was accomplished by performing an exploratory factor analysis and by estimating the item-to-corrected total correlations at the item level. An exploratory factor analysis was first performed on the pilot test data to ensure that the items loaded on to the appropriate factors. A principal components method was used for factor analysis using the Varimax rotation technique (Papacharissi & Rubin, 2000). A total of seven dimensions explaining 68.56 percent of the variance emerged as a result of the factor analysis. An item loading cutoff of 0.5 was applied in order for an item to load on a factor (Hair, Black, Babin, Anderson, & Tatham, 1998). As a result, five items (ISK1, HPS6, SOP4, POQ3, and POQ4) were dropped from further analysis. The item ISK1 refers to the ability of the communication medium to provide detailed health information online. The item HPS6 refers to the ability of the communication medium to allow patients to take control over their health. The item SOP4 refers to the ability of the communication medium to provide a more personal touch. The item POQ3 refers to the ability of the communication medium to provide relevant information. The item POQ4 refers to the ability of the communication medium to provide timely health information online. The remaining items satisfied the factor loading criterion of 0.5 set by Hair et al. (1998). Hence construct validity is established for the survey instrument.

The next step in establishing construct validity was to estimate the item-to-corrected total correlations at the item level. Doll and Torkzadeh (1988) suggest using 0.5 as the cutoff for item-to-corrected total correlations. Using this criterion, three items (ISK6, HPS4, and CMGT1) were dropped from subsequent analyses. The item ISK6



refers to the patients' perceptions of the cost of using the media to seek health information online. The item HPS4 refers to patients' perceptions of the communication medium's ability to help them cope with their medical conditions. The item CMGT1 refers to patients' perceptions of the communication medium's ability to transfer or obtain a large quantity of health information online. The item-to-corrected total correlations for the remaining items satisfy the cutoff criterion of 0.5 (Doll & Torkzadeh, 1988) and hence construct validity is established.

The main objective of the pilot test was to refine the measures using a field-based validation of the instrument by ensuring that there were no inconsistencies in wording the questions stems, the answer choices, and the scales employed in the survey. The pilot test respondents did not raise any issues with how the survey instrument was worded. One concern raised by pilot test respondents was to limit the number of questions that appeared in every page on Qualtrics and have more number of pages with fewer questions in them. This suggestion was incorporated into the full study survey instrument. A second suggestion provided by pilot test respondents was to split the matrix type questions on Qualtrics into individual questions to make the survey easy to take. This feedback was also incorporated into the design of the full study instrument.

The pilot test results show evidence of instrument validity by exhibiting strong content validity, construct validity, and reliability (Straub, 1989). Content validity for the survey instrument was established since the survey instrument measures were drawn from all possible measures of the properties under investigation (Straub, 1989) using a thorough literature review. Construct validity for the survey instrument was established

by performing an exploratory factor analysis and by examining the item-to-corrected total correlations for the measurement items. Reliability for the survey instrument was established by doing a Cronbach's alpha reliability analysis. Thus, it was appropriate to use the pilot tested survey instrument for data collection for the full study.

## **4.7 Results – Full Study**

Results of the full study are presented in this section. This includes details about sample size, sample response bias, demographics, instrument validation, and results of hypotheses testing.

### ***4.7.1 Sample Size***

The response rate for the study was 14.65 percent. Around 2000 requests were sent by email out of which 262 patients completed the survey. The questionnaires were reviewed for completeness and consistency of responses. This resulted in an effective sample size of 230 complete responses.

### ***4.7.2 Sample Response Bias***

The first step in the data analysis is to check for sample response bias. A commonly used method is to compare the characteristics of the early respondents with those of late respondents. The sample was therefore divided into two groups of early and late respondents based on the time each response was completed. Table 29 presents a comparison of early respondents and late respondents for the variables education, accessibility to the Internet for seeking and sharing health information online, experience

using the Internet to seek and share health information online, and self-rated use of media to seek and share health information online.

**Table 29. Sample Response Bias – Comparing Early and Late Respondents**

<b>Demographic</b>	<b>Group</b>	<b>Mean</b>	<b>t-value</b>	<b>Sig (2-tailed)</b>
Education	Early	3.63	0.16	0.88
	Late	3.59		
Accessibility to the Internet to seek health information online	Early	1.77	-0.79	0.43
	Late	1.86		
Accessibility to the Internet to share information online	Early	2.03	-0.75	0.45
	Late	2.15		
Experience using the Internet to seek health information online	Early	4.38	0.16	0.87
	Late	4.36		
Experience using the Internet to share health information online	Early	3.50	-0.08	0.93
	Late	3.51		
Self-rated use of media to seek information online	Early	4.01	1.56	0.12
	Late	3.70		
Self-rated use of media to share information online	Early	3.21	1.69	0.09
	Late	2.84		

The respondent characteristics are very similar for both early and late respondents and there are no significant differences between the two groups. Thus, response bias is not a significant issue that could confound our results.

#### **4.7.3 Demographics**

Demographic information for this study includes the patients' gender, patients' age, patients' education, and patients' work experience. These demographic variables are used as control variables in the research model. The survey respondents grouped by gender is shown in Table 30. As shown in the table, 55 percent of the sample respondents were male and 45 percent of the sample respondents were female.

**Table 30. Respondents by Gender**

#	Answer	Responses	Percentage
1	Male	127	55%
2	Female	103	45%
	Total	230	100%

Table 31 presents the respondents by age group. As seen from the table, all age groups are well represented in the sample.

**Table 31. Respondents by Age Group**

#	Answer	Responses	Percentage
1	21-29	29	12%
2	30-39	37	16%
3	40-49	41	18%
4	50-59	66	29%
5	60 or older	57	25%
	Total	230	100%

The survey respondents grouped by education is presented in Table 32. As seen from the table, 39 percent are college graduates and 68 percent have had at least one year of college education.

**Table 32. Respondents by Education**

#	Answer	Responses	Percentage
1	Graduated from high school	61	27%
2	1 year of college	21	9%
3	2 years of college	35	15%
4	3 years of college	12	5%
5	Graduated from college	60	26%
6	Some graduate school	12	5%
7	Completed graduate school	29	13%
	Total	230	100%

Table 33 shows the breakup of survey respondents by work experience. As shown in the table, a significant portion of them (83 percent) have more than six years of work experience.

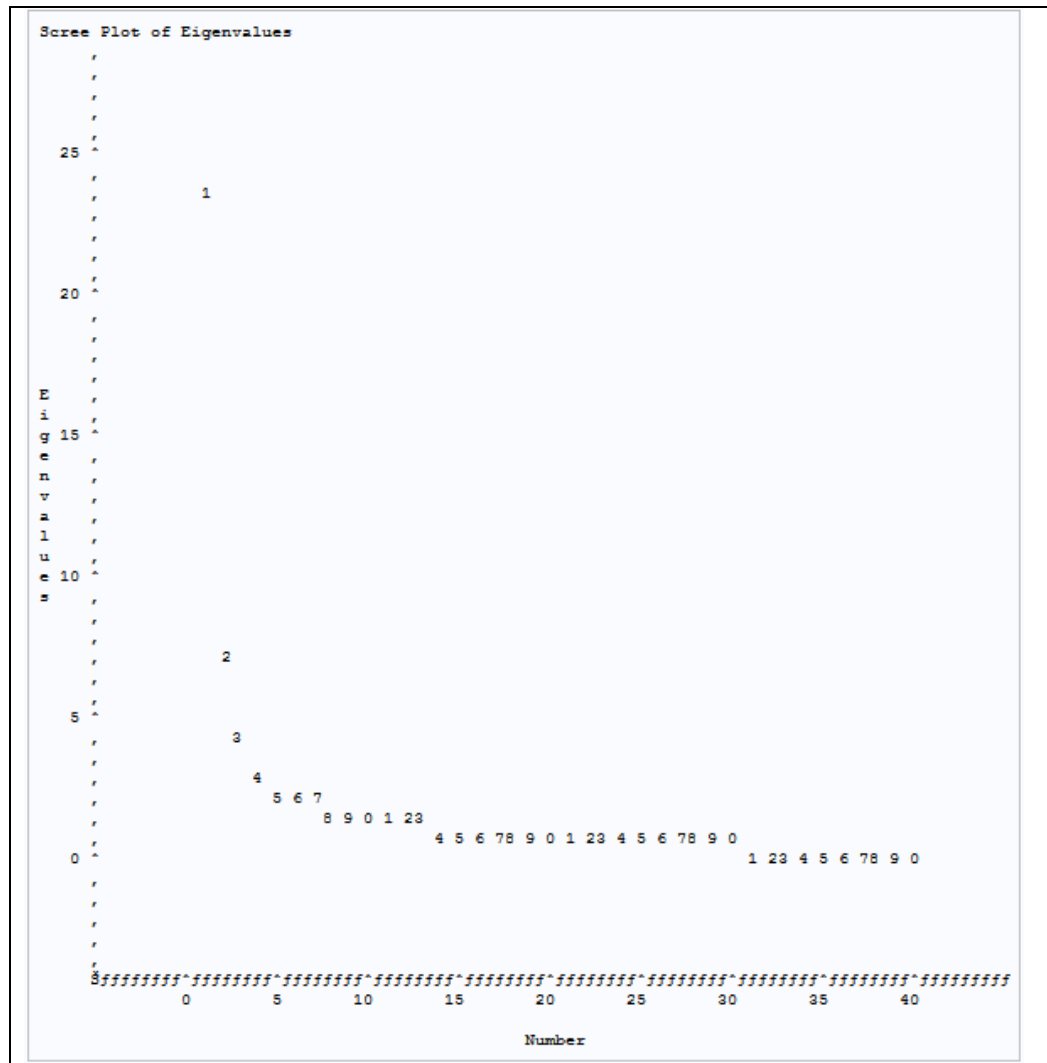
**Table 33. Respondents by Work Experience**

#	Answer	Responses	Percentage
1	None	6	3%
2	Less than 1 year	2	1%
3	Greater than or equal to 1 year but less than 2 years	7	3%
4	Greater than or equal to 2 years but less than 4 years	10	4%
5	Greater than or equal to 4 year but less than 6 years	14	6%
6	More than 6 years	191	83%
	Total	230	100%

#### ***4.7.4 Construct Validity and Reliability***

The first step in establishing construct validity was to do an exploratory factor analysis to see if the items were loading on the appropriate motivations and barriers dimensions. The exploratory factor analysis was conducted using statistical analysis software SAS. A principal components factor analysis with Varimax rotation (Papacharissi & Rubin, 2000) was used to extract the motivations and barriers dimensions from the codes identified in Study 1. An item loading cutoff of 0.5 was applied in order for an item to load on a factor (Hair et al., 1998). Cronbach's alpha reliability analysis was used to confirm the validity of the factors (Guo et al., 2010).

A scree plot of the eigenvalues is presented in Figure 10. As seen from the scree plot, a total of seven factors (motivations and barriers dimensions) emerged based on the *mineigen* criterion. Upon further inspection, one of the seven factors was dropped since it did not have at least two items load on the factor (Guo et al., 2010).



**Figure 10. Scree Plot of Eigenvalues**

Results of the factor analysis are presented in Table 34. A total of six factors (motivations and barriers dimensions), containing twenty-nine items, emerged as a result of the factor analysis. The six factors explained 67.67 percent of the variance. Two motivation items (CONN3, SOP5) did not meet the factor loading criterion of 0.5 (Hair et al., 1998) and hence were not included in the subsequent analyses. The item CONN3 refers to whether patients believe if everyone else they know uses the communication

medium for health information seeking and/or sharing online. The item SOP5 refers to whether the medium makes patients feel that they are not alone when dealing with their health problems.

**Table 34. Rotated Factor Loadings for the Six Motivations and Barrier Dimensions**

<b>Factor</b>	<b>F1</b>	<b>F2</b>	<b>F3</b>	<b>F4</b>	<b>F5</b>	<b>F6</b>
<b>Factor 1: Media-Enabled Health Information Seeking Online (F1)</b>						
Sources of information	0.71					
Range of information	0.76					
Usefulness of information	0.64					
Knowledge growth	0.69					
Accessibility	0.82					
Ease of use	0.74					
Speed	0.58					
Sharing with others	0.58					
One-to-many communication	0.51					
<b>Factor 2: Media-Enabled Health Information Sharing Online (F2)</b>						
Altruism		0.67				
Venting		0.82				
Encouragement		0.73				
Awareness of others		0.75				
Multifunctioning		0.68				
<b>Factor 3: Media Health Output Quality (F3)</b>						
Trustworthiness of information			0.83			
Accuracy of information			0.82			
Reliability of information			0.82			
Familiarity of communicators			0.72			
<b>Factor 4: Media-Enabled Health-Related Content Management and Communication (F4)</b>						
Synchronicity				0.66		
Feedback				0.54		
File management				0.65		

Communication history				0.64		
Control over interactions				0.55		
<b>Factor 5: Media-Enabled Health Problem Solving and Decision Making (F5)</b>						
Complexity of issues					0.75	
Criticality of issues					0.72	
Decision making					0.50	
<b>Factor 6: Media-Enabled Convenience (F6)</b>						
Anonymity						0.73
Codification effort						0.64
Clarification of issues						0.60

The Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy (MSA) is a popular diagnostic measure that is an indicator of the adequacy of the sample for factor analysis. The overall KMO MSA was 0.91 where a value greater than 0.9 is considered marvelous (Kaiser, 1974). Bartlett's test of Sphericity had a Chi-Square of 4524.5565 with 406 degrees of freedom at a significance of <0.0001. Thus, the null hypothesis that the data produces an identity matrix for the correlation matrix is rejected and hence the data are correlated, which is appropriate for factor analysis.

The six motivations and barriers dimensions were identified as media-enabled health information seeking online, media-enabled health information sharing online, media health output quality, media-enabled communication and control, media-enabled health problem solving and decision-making, and media-enabled convenience. The validity of the above dimensions was confirmed using Cronbach's alpha reliability analysis, the results of which are presented in Table 35. As seen from the table, the



Cronbach's alpha values are within the suggested rules-of-thumb criteria and hence construct validity is established for the entire instrument including the motivations and barriers dimensions.

**Table 35. Construct and Instrument Reliabilities**

<b>Construct</b>	<b>Number of Items</b>	<b>Cronbach's <math>\alpha</math> (Standardized)</b>
Media-enabled health information seeking online	9	0.91
Media health output quality	4	0.89
Media-enabled health information sharing online	5	0.89
Media-enabled health problem solving and decision making	3	0.80
Media-enabled health-related content management and communication	5	0.79
Media-enabled convenience	3	0.79
Media use for health information seeking online	4	0.90
Media use for health information sharing online	4	0.79
Patient empowerment	12	0.90
Confidence in treatment	5	0.84
Coping with illness	5	0.92
Quality of care	13	0.97
Patient satisfaction	3	0.97
Entire instrument	75	0.96

The second step in establishing construct validity is to examine the item-to-corrected total correlations for the measurement items. The item-to-corrected total correlations are presented in Table 36. Doll and Torkzadeh (1988) suggest using 0.5 as the cutoff for item-to-corrected total correlations. Using this criterion, one item (MUSK1) was eliminated. The item MUSK1 refers to the patients' duration of using the media to seek health information online. The item-to-corrected total correlations for the remaining

items satisfy the cutoff criterion of 0.5 (Doll & Torkzadeh, 1988) and hence construct validity is established.

**Table 36. Item-to-Corrected Total Correlations**

<b>Construct</b>	<b>Item</b>	<b>Item-to-Corrected Total Correlation</b>
Media-enabled health information seeking online	MEHISK1	0.70
	MEHISK2	0.75
	MEHISK3	0.65
	MEHISK4	0.71
	MEHISK5	0.77
	MEHISK6	0.73
	MEHISK7	0.63
	MEHISK8	0.69
	MEHISK9	0.61
Media health output quality	MHOQ1	0.82
	MHOQ2	0.81
	MHOQ3	0.78
	MHOQ4	0.57
Media-enabled health information sharing online	MEHISH1	0.66
	MEHISH2	0.75
	MEHISH3	0.77
	MEHISH4	0.74
	MEHISH5	0.74
Media-enabled health problem solving and decision making	MEHPSDM1	0.70
	MEHPSDM2	0.76
	MEHPSDM3	0.54
Media-enabled health-related content management and communication	MEHRCMC1	0.63
	MEHRCMC2	0.52
	MEHRCMC3	0.50
	MEHRCMC4	0.67
	MEHRCMC5	0.52
Media-enabled convenience	MECONV1	0.66
	MECONV2	0.70
	MECONV3	0.56
Media use for health information seeking online	MUSK1	0.35*
	MUSK2	0.63
	MUSK3	0.70
	MUSK4	0.55

Media use for health information sharing online	MUSH1	0.50
	MUSH2	0.75
	MUSH3	0.77
	MUSH4	0.74
Patient empowerment	EMP1	0.57
	EMP2	0.62
	EMP3	0.73
	EMP4	0.76
	EMP5	0.69
	EMP6	0.65
	EMP7	0.66
	EMP8	0.76
	EMP9	0.60
	EMP10	0.71
	EMP11	0.50
	EMP12	0.63
(* - dropped items)		

The full study results show evidence of instrument validity by exhibiting strong content validity, construct validity, and reliability (Straub, 1989). Content validity for the survey instrument was established since the survey instrument measures were drawn from all possible measures of the properties under investigation (Straub, 1989) using a thorough literature review. Construct validity for the survey instrument was established by doing an exploratory factor analysis to see if the items were loading on the appropriate motivations and barriers dimensions, and by examining the item-to-corrected total correlations for the measurement items. Reliability for the survey instrument was established by doing a Cronbach's alpha reliability analysis.

The next step in addressing construct validity was to assess the convergent and discriminant validities. Convergent validity is established when items that are part of the same construct are highly correlated (Campbell & Fiske, 1959; Straub, 1989). Each item-

to-corrected total correlation in Table 36 (except the item MUSK1) is above 0.50.

Therefore convergent validity is established.

**Table 37. Correlation Matrix**

	<b>MHOQ (1)</b>	<b>MECONV (2)</b>	<b>EMP (3)</b>	<b>MEHPSDM (4)</b>	<b>MEHISH (5)</b>	<b>MEHISK (6)</b>	<b>MU (7)</b>	<b>MEHRCMC (8)</b>
<b>1</b>	<b>0.78</b>							
<b>2</b>	0.62	<b>0.83</b>						
<b>3</b>	0.43	0.48	<b>0.75</b>					
<b>4</b>	0.65	0.53	0.40	<b>0.73</b>				
<b>5</b>	0.73	0.58	0.45	0.64	<b>0.74</b>			
<b>6</b>	0.74	0.80	0.49	0.74	0.65	<b>0.73</b>		
<b>7</b>	0.32	0.36	0.28	0.34	0.31	0.41	<b>0.64</b>	
<b>8</b>	0.72	0.51	0.38	0.73	0.73	0.63	0.24	<b>0.73</b>
(Note: The numbers in the diagonal are the square root of the AVE)								

Discriminant validity is established when items that are part of the different constructs are not highly correlated with each other (Campbell & Fiske, 1959, Straub, 1989). For discriminant validity, Chin (1998) suggests that SAVE (square root of AVE) should be greater than the correlations between each construct and all other constructs. The correlation matrix (Table 37) indicates that this is true for all but 4 of the total 56 comparisons of correlations. The instrument is considered to have discriminant validity so long as these violations do not completely overwhelm the good fits (Straub, 1989). Thus, discriminant validity is established.

The next step in instrument validation was to assess final reliabilities. Table 38 presents the composite reliabilities for each construct in the research model. Composite reliability is a better measure of internal consistency than Cronbach's alpha (Werts, Linn,

& Jöreskog, 1974). The composite reliability for each construct is well above 0.70, as suggested by Nunnally and Bernstein (1978). Hence the instrument is considered reliable.

**Table 38. Composite Reliabilities**

<b>Construct</b>	<b>Composite Reliability</b>
Media-Enabled Information Seeking Online (ISK)	0.887
Media-Enabled Information Sharing Online (ISH)	0.858
Health Output Quality Produced by Media (HOQM)	0.857
Media-Enabled Health Convenience (MECONV)	0.870
Media-Enabled Health Related Content Management and Communication (MEHRCMC)	0.891
Media-Enabled Health Problem Solving and Decision Making (MEHPSDM)	0.888
Media Use for Health Information Seeking and/or Sharing Online (MU)	0.823
Patient Empowerment (EMP)	0.937

The final step in the instrument validation was to do a Confirmatory Factor Analysis (CFA). As opposed to an Exploratory Factor Analysis (EFA) where the goal was to determine the underlying factor structure of a set of observed variables without imposing a preconceived structure on the outcome (Child, 1990), a CFA aims to verify the factor structure of a set of observed variables by constraining the number of factors and by forcing the items to load on their respective factors.

The original EFA resulted in six factors and hence the CFA was constrained for the same six factors. Two additional factors were added to represent the two constructs of CMC media use and CMC media-enabled patient empowerment.

CFA was performed using statistical software package SAS. Table 39 presents the factor loadings resulting from the CFA analysis.

**Table 39. CFA Factor Loadings**

<b>Item</b>	<b>Factor 1</b>	<b>Factor 2</b>	<b>Factor 3</b>	<b>Factor 4</b>	<b>Factor 5</b>	<b>Factor 6</b>	<b>Factor 7</b>	<b>Factor 8</b>
MEHISK1	0.72							
MEHISK2	0.79							
MEHISK3	0.70							
MEHISK4	0.74							
MEHISK5	0.80							
MEHISK6	0.78							
MEHISK7	0.68							
MEHISK8	0.74							
MEHISK9	0.66							
MEHISH1		0.71						
MEHISH2		0.79						
MEHISH3		0.83						
MEHISH4		0.79						
MEHISH5		0.81						
MHOQ1			0.96					
MHOQ2			0.94					
MHOQ3			0.79					
MHOQ4			0.56					
MECONV1				0.74				
MECONV2				0.88				
MECONV3				0.64				
MEHPSDM1					0.81			
MEHPSDM2					0.89			
MEHPSDM3					0.61			
MEHRCMC1						0.67		
MEHRCMC2						0.64		
MEHRCMC3						0.60		
MEHRCMC4						0.78		
MEHRCMC5						0.59		
MUSE1							0.77	
MUSE2							0.71	
MUSE3							0.61	
MUSE4							0.51	
MUSE5							0.86	

MUSE6							0.88	
MUSE7							0.79	
EMP1								0.60
EMP2								0.63
EMP3								0.80
EMP4								0.83
EMP5								0.77
EMP6								0.70
EMP7								0.71
EMP8								0.78
EMP9								0.61
EMP10								0.72
EMP11								0.48
EMP12								0.62

As seen from the table, all CFA factor loadings are above the 0.4 cutoff suggested by Hulland (1999). Reliability analysis was conducted again to ensure that the Cronbach's alpha reliability values satisfied the suggested cutoff criterion.

An analysis of the different fit indices (relative chi-square = 2.28; NNFI = 0.94; CFI = 0.95; RMSEA = 0.07; SRMSR = 0.07) indicated a reasonable model fit to the data. The model chi-square was 2399.035 with 1052 degrees of freedom. Chi-square is a statistic that uses the null hypothesis that the implied covariance matrix and the observed covariance matrix are equivalent. A sign of good model fit is failure to reject the null hypothesis. However, the chi-square test is widely considered to be problematic (Jöreskog, 1969) since it is sensitive to sample sizes and more difficult to retain the null as the number of observations increases. If the sample size exceeds 200 and other fit indices satisfy the suggested cutoff criterion, then the chi-square can be disregarded. Wheaton, Muthen, Alwin, and Summers (1977) recommend using relative chi-square or normed chi-square where the model chi-square is divided by the degrees of freedom as an

alternate approach to using chi-square. The rationale for using relative chi-square is that it is less sensitive to sample size. The relative chi-square for this model is 2.28, which is under the suggested criterion of less than 3 (Kline, 1998; Ullman, 2001). The Non-Normed Fit Index (NNFI), also known as the Tucker Lewis Index (TLI), is a statistic that assesses model fit by comparing the chi-square for the null model with the chi-square for the independence model. The NNFI for the model fit for this study was 0.94. This is considered a good fit according to the guidelines ( $\text{NNFI} > 0.90$ ) provided by Bentler and Bonnet (1980). More recently, Bentler and Hu (1999) recommended using 0.95 as the cutoff criterion for NNFI. The Comparative Fit Index (CFI) is a statistic similar to NNFI, but takes into account sample size (Bentler, 1990, Byrne, 1998). Results from the CFA indicate that the CFI for model fit for this study was 0.95. This satisfies the cutoff criterion of  $\geq 0.95$  suggested by Hu and Bentler (1999).

The Root Mean Square Error of Approximation (RMSEA) for model fit was 0.07. RMSEA is an indication of how well the model's parameter estimates fit the population covariance matrix (Byrne, 1998). Browne and Cudeck (1993) recommend that "the value of about 0.08 or less for the RMSEA would indicate a reasonable error of approximation" (p.144). Similar recommendations have been provided by other researchers (MacCallum, Browne, & Sugawara, 1996; Steiger, 1990). The Standardized Root Mean Square Residual (SRMSR) for model fit was 0.07. SRMSR is the mean absolute value of the covariance residuals. An SRMSR value of less than 0.08 is generally considered a good fit (Hu & Bentler, 1999).



The next step in the CFA is to determine convergent validity. Convergent validity is established when items that are part of the same construct are highly correlated (Campbell & Fiske, 1959, Straub, 1989). An accepted way of demonstrating convergent validity based on the literature (Hatcher, 1994; Smith, Milberg, & Burke, 1996) is to examine the significance of the t-values for the factor loadings. The t-values for factor loadings from the CFA results are presented in Table 40.

**Table 40. T-Values for Factor Loadings**

<b>Item</b>	<b>t-Value</b>
MEHISK1	12.40
MEHISK2	14.11
MEHISK3	11.82
MEHISK4	12.92
MEHISK5	14.24
MEHISK6	13.80
MEHISK7	11.36
MEHISK8	12.91
MEHISK9	10.95
MEHISH1	12.06
MEHISH2	13.99
MEHISH3	15.17
MEHISH4	13.84
MEHISH5	14.51
MHOQ1	19.77
MHOQ2	18.72
MHOQ3	14.36
MHOQ4	9.07
MECONV1	12.27
MECONV2	15.70
MECONV3	10.25
MEHPSDM1	14.21
MEHPSDM2	16.10
MEHPSDM3	9.74
MEHRCMC1	10.72
MEHRCMC2	10.16
MEHRCMC3	9.40

MEHRCMC4	13.35
MEHRCMC5	9.22
MUSE1	13.61
MUSE2	11.96
MUSE3	10.02
MUSE4	8.06
MUSE5	15.97
MUSE6	16.46
MUSE7	14.02
PATEMP1	9.74
PATEMP2	10.44
PATEMP3	14.33
PATEMP4	15.27
PATEMP5	13.61
PATEMP6	11.87
PATEMP7	12.04
PATEMP8	13.95
PATEMP9	9.97
PATEMP10	12.26
PATEMP11	7.51
PATEMP12	10.09

As seen from the table above, the t-values for all factor loadings are well above the critical value of 3.29 ( $p=0.001$ ) as suggested by Hatcher (1994) and hence convergent validity is established for the model.

**Table 41. Correlation Matrix**

	MESHISK (1)	MEHISH (2)	MHOQ (3)	MECONV (4)	MEHPSDM (5)	MEHRCMC (6)	MUSE (7)	PATEMP (8)
<b>1</b>	<b>0.73</b>							
<b>2</b>	0.67	<b>0.79</b>						
<b>3</b>	0.36	0.28	<b>0.83</b>					
<b>4</b>	0.76	0.67	0.32	<b>0.76</b>				
<b>5</b>	0.27	0.50	0.63	0.38	<b>0.78</b>			
<b>6</b>	0.70	0.71	0.46	0.57	0.58	<b>0.66</b>		
<b>7</b>	0.33	0.35	0.37	0.40	0.45	0.45	<b>0.74</b>	
<b>8</b>	0.46	0.28	0.27	0.44	0.17	0.44	0.16	<b>0.69</b>
(Note: The numbers in the diagonal are the square root of the AVE)								

The final step in the CFA is to establish discriminant validity. Discriminant validity is established when items that are part of the different constructs are not highly correlated with each other (Campbell & Fiske, 1959, Straub, 1989). For discriminant validity, Chin (1998) suggests that SAVE (square root of AVE) should be greater than the correlations between each construct and all other constructs. The correlation matrix (Table 41) indicates that this is true for all constructs except in 3 out of the total 56 comparisons. This is within the accepted range suggested by Doll and Torkzadeh (1988) and hence discriminant validity is established.

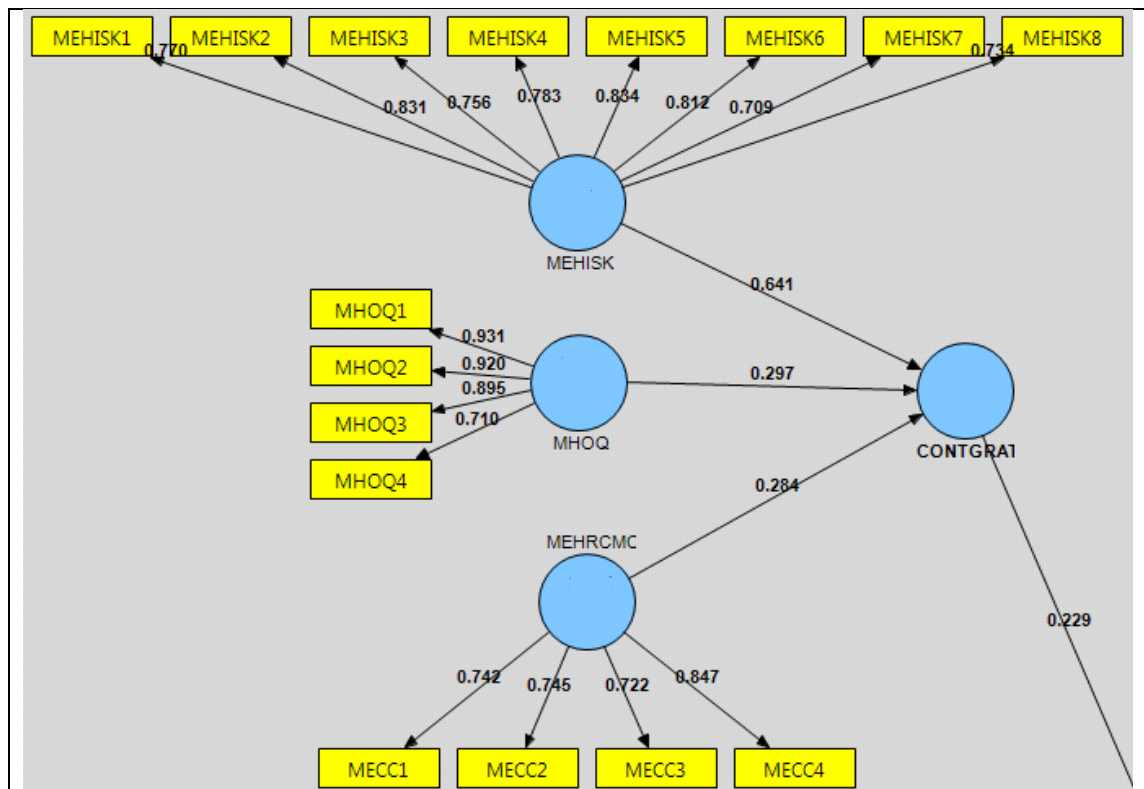
Results of the CFA show that the six factors of media-enabled health information seeking online, media-enabled health information sharing online, media health output quality, media-enabled convenience, media-enabled health problem solving and decision making, and media-enabled health-related content management and communication exhibit construct validity, reliability, convergent validity, and discriminant validity and hence are appropriate for this study.

In the next section, results of testing the hypotheses from the research model for this study are presented.

#### ***4.7.5 Hypotheses Testing***

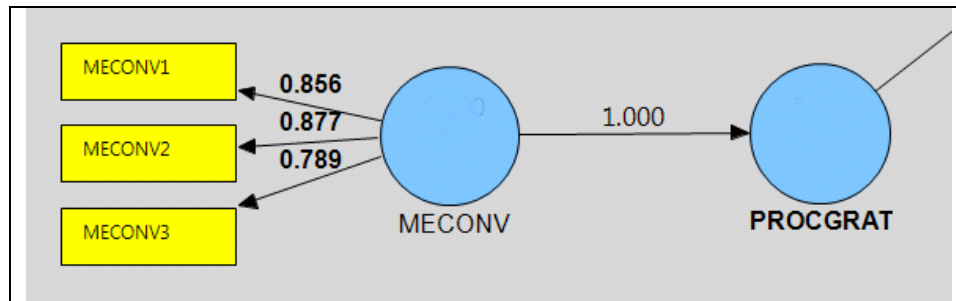
SmartPLS – Version 2.0 M3 was used for hypotheses testing. As discussed earlier, the three constructs of content gratifications, process gratifications, and social gratifications were operationalized as a first order reflective, second order formative constructs.

The content gratifications construct was operationalized as a second order formative construct using the dimensions media-enabled health information seeking, media health output quality, and media-enabled health-related communication and content management, each of which were measured using reflective items. Measurement model results for the content gratifications construct are presented in Figure 11.



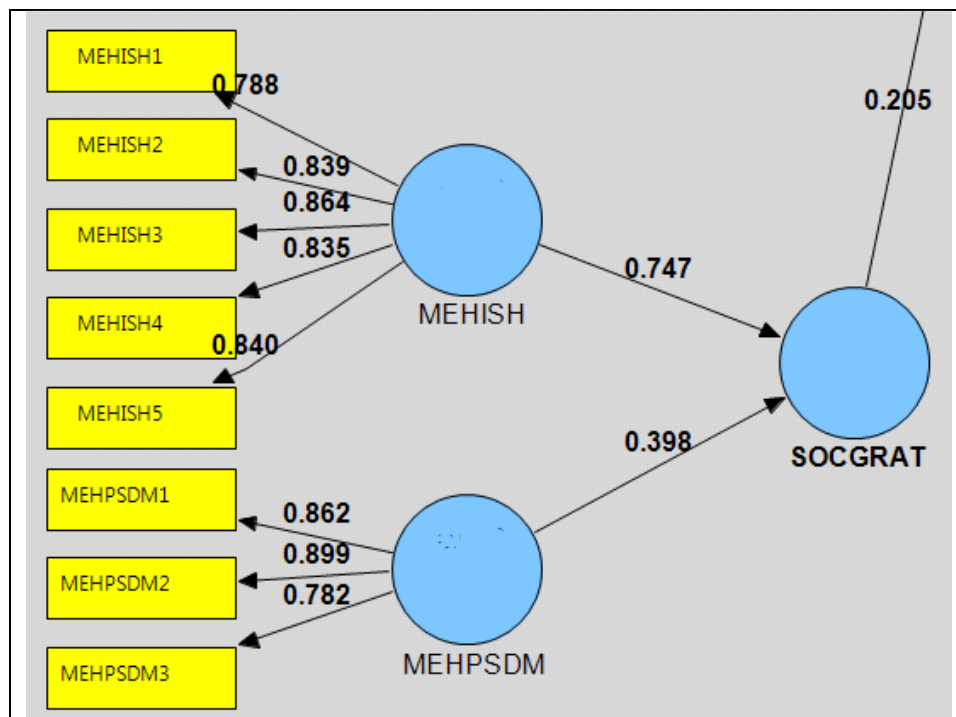
**Figure 11. Measurement Model Results for Content Gratifications**

The process gratifications construct was operationalized as a second order formative construct using the dimension media-enabled convenience, which was measured using reflective items. Measurement model results for the process gratifications construct are presented in Figure 12.



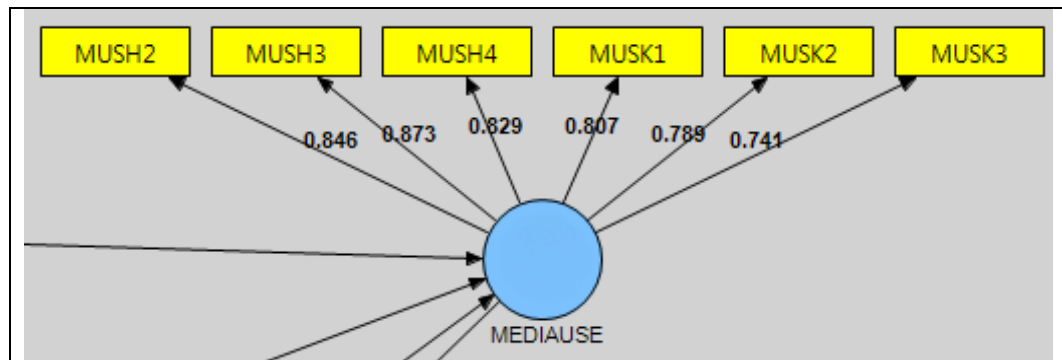
**Figure 12. Measurement Model Results for Process Gratifications**

The social gratifications construct was operationalized as a second order formative construct using the dimensions media-enabled health information sharing, and media-enabled health problem solving and decision making, each of which were measured using reflective items. Measurement model results for the social gratifications construct are presented in Figure 13.



**Figure 13. Measurement Model Results for Social Gratifications**

The CMC media use for health information seeking and/or sharing construct was operationalized as a first-order reflective construct with reflective measures. Figure 14 presents the measurement model results for the CMC media use for health information seeking and/or sharing construct in the research model.



**Figure 14. Measurement Model Results for Media Use**

Measurement items which have an outer loading of less than 0.7 were dropped. These items include MEHISH9, MECC5, and MUSH1. The remaining items in the measurement model had an outer loading of at least 0.7.

Results from testing the research model are shown in Figure 15. The statistics shown on the paths in Figure 15 are the t-values for the beta coefficients. All paths except for hypothesis H2 are significant at the 0.05 level of significance. Thus, three out of the four major hypotheses (H1, H3, and H4) are supported at the 0.05 level of significance. Hypotheses H2 was not supported.

The relationship between content gratifications and media use for health information seeking and/or sharing online was positive and significant (coefficient: 0.215, t-value: 2.645) supporting hypothesis H1 that content gratification will be

positively related to patients' actual use of CMC media to seek and/or share health information online. The relationship between process gratifications and media use for health information seeking and/or sharing online was positive, but not significant (coefficient: 0.081, t-value: 1.089) rejecting hypothesis H2 that process gratification will be positively related to patients' actual use of CMC media to seek and/or share health information online.

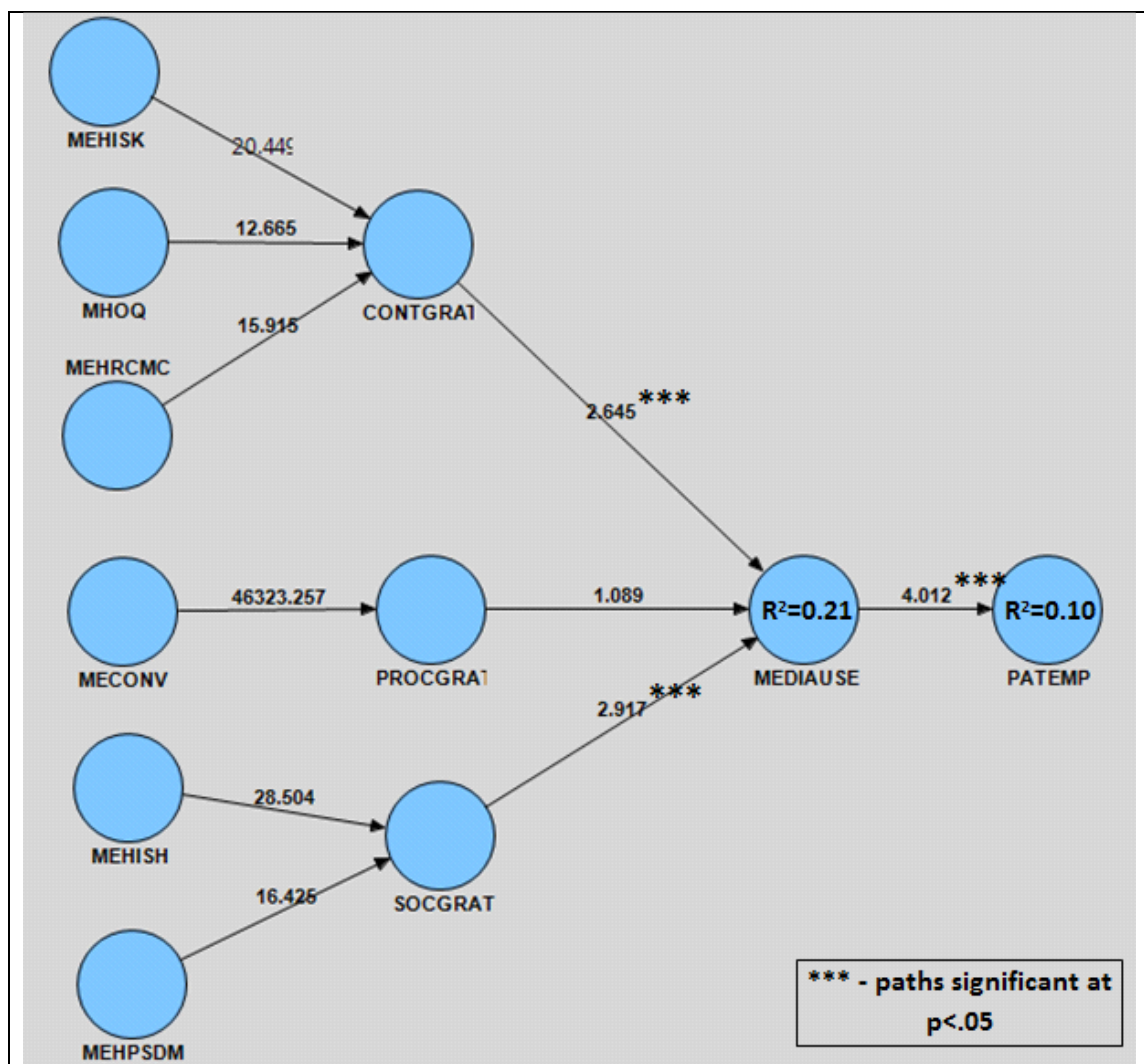


Figure 15. Testing the Main Hypotheses

The relationship between social gratifications and media use for health information seeking and/or sharing online was positive and significant (coefficient: 0.218, t-value: 2.917) supporting hypothesis H3 that social gratification will be positively related to patients' actual use of CMC media to seek and/or share health information online. The relationship between media use for health information seeking and/or sharing online and patient empowerment was positive and significant (coefficient: 0.320, t-value: 4.012) supporting hypothesis H4 that patients' actual use of health information online will be positively related to their empowerment.

The R-Square values for the dependent constructs are given in Table 42. The R-square values for the two dependent constructs namely, media use for health information seeking and/or sharing online and patient empowerment, are also presented in Figure 12. Media use for health information seeking and/or sharing online has an R-square value of 0.21. Patient empowerment has an R-square of 0.11.

**Table 42. R-Square Values for Full Model**

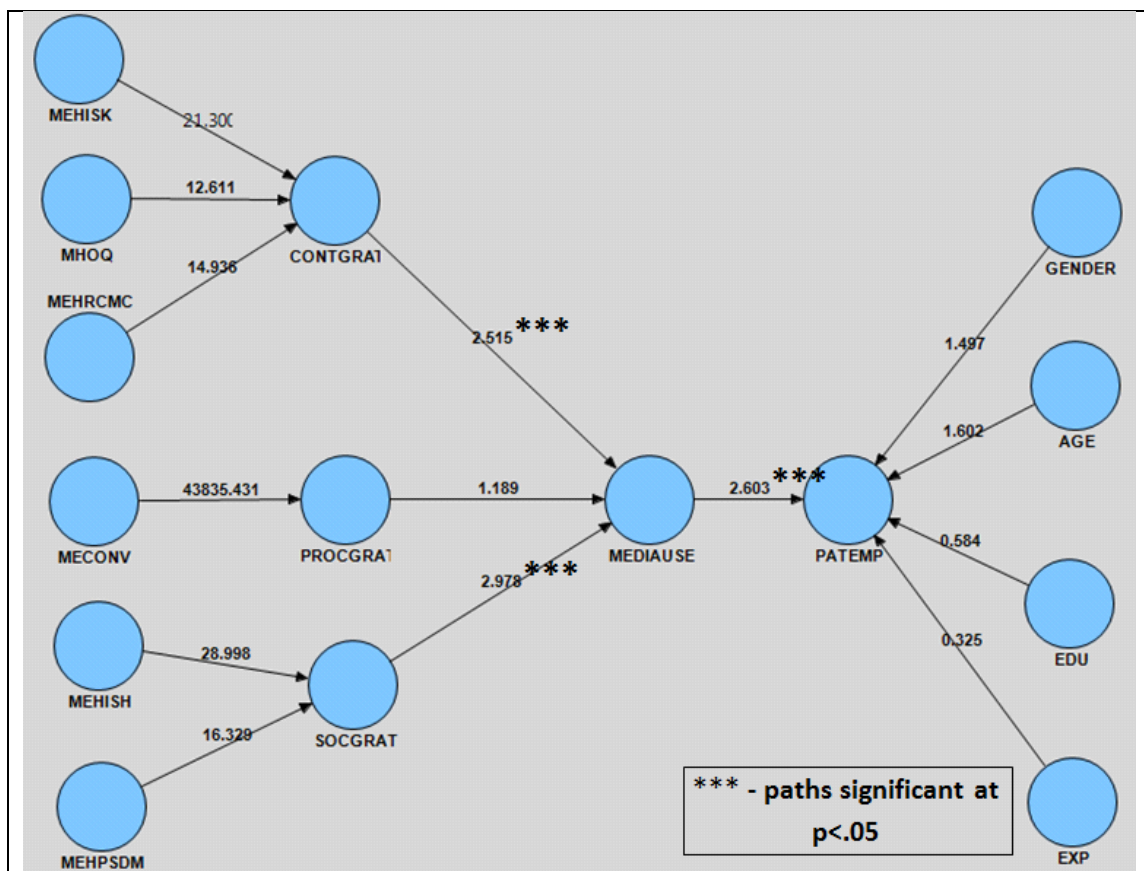
<b>Construct</b>	<b>R-Square</b>
Media Use for Health Information Seeking and/or Sharing Online (MU)	0.21
Patient Empowerment (EMP)	0.10

#### ***4.7.6 Control Variables***

In order to test the robustness of the relationships, four control variables which could potentially have an impact on the dependent variable were added to the model. The first control variable was the gender of the patient. The second control variable was the



age of the patient. The third control variable was the education level of the patient. The fourth control variable was the patient's work experience. Figure 16 shows the results of the structural model with the four control variables added to the model. The newly estimated path coefficients in the structural model are nearly the same as those from the model without control variables.



**Figure 16. Testing the Main Hypotheses with Control Variables**

As seen from Figure 16, the same paths that were significant without the control variables (Figure 15) are also significant after the control variables gender, age, education, and experience were added to the model. It is also worth noting from Figure

16 that no new significant paths were added as a result of including the control variables and the control variables did not significantly influence the dependent variable in the model, thus providing further credibility to our results.

## **4.8 Discussion**

The objective of this study was to test a model connecting the motivations and barriers dimensions identified as a result of Study 1 to patient empowerment mediated by the use of CMC media. The independent variables were the six motivations and barrier dimensions of media-enabled health information seeking online, health output quality produced by media, media-enabled health-related content management and communication, media-enabled convenience, media-enabled health information sharing online, and media-enabled health problem solving. According to Uses and Gratifications theory, these motivations and barrier dimensions were classified as content gratifications (media-enabled health information seeking online, health output quality produced by media, and media-enabled health-related content management and communication), process gratifications (media-enabled convenience), and social gratifications (media-enabled health information sharing online, and media-enabled health problem solving) (Stafford et al., 2004; Mendes-Filho & Tan, 2009). The mediating variable was patients' actual use of CMC media for health information seeking and/or/sharing online. The dependent variable in the research model was patient empowerment.

Results of the data analysis showed that the content gratifications dimension was positively related to CMC media use for health information seeking and/or sharing online (hypothesis H1). Content gratification refers to people's use of a particular media purely

for the content carried by that medium, such as information, knowledge, or research (Mendes-Filho & Tan, 2009). The first sub-dimension of content gratifications is media-enabled health information seeking online. The number of patients who seek health information online has been steadily increasing. According to a 2011 Pew Internet survey, of the 74 percent of adults who use the Internet, 80 percent have searched for health information online (Fox, 2011). The reason for the increased use of the Internet by patients include abundance of patient education websites, increased availability of Web 2.0 tools (e.g., blogs, podcasts, Wikis), increased availability of healthcare services provided online, and patients' quest to find the best medical care at the lowest cost (Hoyt et al., 2008). The link between information and system use for empowerment in an organizational context has been well established in literature (Armstrong & Sambamurthy, 1999; Kanter, 1989; Spreitzer, 1995). Armstrong and Sambamurthy (1999) state that distribution of key information using IT can empower individuals in an organizational context. Kanter (1989) states that making more information readily available to more people through more devices leads to empowerment in an organizational context. Spreitzer (1995) found that access to information is positively related to the psychological empowerment in an organizational context. Spreitzer (1995) adds that access to information about the performance of a task is fundamental to reinforcing a sense of competence in an individual and this leads to empowerment. While the link between information and system use for empowerment has been well established in an organizational context, the role health information available online plays in CMC media-enabled patient empowerment in the healthcare context has not been addressed in

the IS literature. This research addresses that gap by establishing a link between health information seeking and patient empowerment through the use of CMC media. The link between health information and patient empowerment has been studied in the healthcare literature (Holmström & Röing, 2010; Rodwell, 1996). Medical information available on the Internet has been identified as a possible source of patient empowerment (Holmström & Röing, 2010). Examples of information that can lead to patient empowerment include information regarding diagnosis, pathology, treatment and prognosis (Rodwell, 1996). Results of this research confirm such a relationship between medical information available online and patient empowerment. The second sub-dimension of content gratifications is media health output quality, which refers to the relevance, reliability, and timeliness of health information available online. In the IS literature, the link between perceived output quality and system use for knowledge seeking has been established (Kankanhalli et al., 2005b; Xu et al., 2010; Zhang & Watts, 2008). Kankanhalli et al. (2005b) showed that perceived output quality directly affects EKR usage for knowledge seeking. Xu et al. (2010) found that perceived information relevance is a significant antecedent to system use for information seeking. Zhang and Watts (2008) associate output quality with argument quality and source credibility. Argument quality refers to the persuasiveness of the posted output and source credibility refers to the trustworthiness and reliability of the source who posted the output (Zhang & Watts, 2008). Zhang and Watts (2008) established that argument quality and source credibility have a significant main effect on information adoption. While the link between perceived output quality and system use has been well established in an organizational context, the role health output

quality plays in system use for patient empowerment in the healthcare context has not been addressed in the IS literature. This research addresses that gap by establishing a link between health output quality and patient empowerment through the use of CMC media. Results from this research also support the finding from the healthcare literature that timely access to quality information enables patient empowerment (McKemmish et al., 2009). The third sub-dimension of content gratifications is media-enabled health related content management and communication. Increased availability of healthcare services provided online is one of the reasons for the increased use of the Internet by patients (Hoyt et al., 2008). One such service that allows patients to manage their health-related content and communication is the personal health record (PHR). A PHR is “an electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be drawn from multiple sources while being managed, shared, and controlled by the individual” (NAHIT, 2008). A PHR contains patient information, insurance, family history, medications, and other special conditions and is made available to patients in a format easily accessible to them (HITSP Consumer Empowerment Interoperability Specification, 2007). CMC-media based HIT such as cloud-based PHRs allow patients to manage their personal health information online in a secure manner (Chen & Hsieh, 2012). Increased use of PHRs provides patients with increased access to and management of their health information leading to consumer empowerment in healthcare (BCBS, 2014). Another vital reason for the use of CMC media is to facilitate communication. For example, Cone Health in Greensboro, North Carolina in the U.S. is forming a patient network which blends a computer

database with extra help from nurses to keep medical costs down, and to cut down on redundancies and delays arising from lack of communication (Fain, 2012). Results from this research support this link between health-related content management and communication, and CMC use for patient empowerment.

Results of the data analysis showed that the process gratifications dimension was not positively related to CMC media use for health information seeking and/or sharing online (hypothesis H2). Process gratification refers to people's use of a media just for the simple experience, such as browsing or playing with the technology (Mendes-Filho & Tan, 2009). The process gratifications dimension includes the sub-dimension of media-enabled convenience. One possible explanation for the lack of a relationship between process gratifications and CMC media use for patient empowerment is that despite the increase in Internet use for seeking and/or sharing health information online (Fox, 2011), not all patients have immediate access to a computer or a broadband connection for health information seeking and/or health information sharing online. Another possible explanation is that a majority of the patients are not necessarily interested in playing around with the technology. They are more interested in using the media to seek and/or share health information online which helps them solve their health-related problems and helps them make more informed health-related decisions. Thus, the gratifications that patients experience through the process of using the media is secondary to the gratifications they experience through the content made available to them by the media (content gratifications) and the social presence made available to them by the media (social gratifications). Results from this research confirms the findings of other Uses and

Gratifications based studies (Drèze & Zufryden, 1997; McDonald, 1997; Stafford and Stafford, 1998) that website content may be more gratifying to Internet users than the process gratification of web surfing.

Results of the data analysis showed that the social gratifications dimension was positively related to CMC media use for health information seeking and/or sharing online (hypothesis H3). Social gratification refers to people's use of a particular media purely for interacting with other people (Mendes-Filho & Tan, 2009). The first sub-dimension of social gratifications is media-enabled health information sharing online. Examples of the use of CMC media to facilitate health information sharing online include the use of social media tools such as Facebook and Twitter (Hoyt et al., 2008). The CDC's Twitter profile for emergency information (<https://twitter.com/CDCemergency>) has more than 1.5 million followers. Other Web 2.0 technologies such as wikis and blogs also allow patients to share health related information with other patients who are seeking such information online (Von Hippel, 1998). While the motivations for health information seeking online result in extrinsic benefits to the information seeker in terms of improved health and wellbeing, knowledge growth, and overall satisfaction, the benefits of health information sharing are not that obvious. One of the key motivations for sharing health information online is enjoyment in helping others. Enjoyment in helping others is the perceived pleasure a knowledge contributor experiences by helping others through the knowledge contributed to a knowledge management system (Kankanhalli et al., 2005a). Wasko and Faraj (2005) found evidence that individuals make more helpful knowledge contributions when they enjoy helping others. Phang et al. (2009) found that perceived

sociability is another motivation that explains people's use of systems for information sharing. Perceived sociability refers to the extent to which the knowledge management system supports social interaction for achieving shared goals (Phang et al., 2009). The motivations for system use for sharing information online, namely enjoyment in helping others and perceived sociability, were studied in the IS literature in an organizational context. However, the motivations for CMC media use for health information sharing in the healthcare context have not been studied in the IS literature. Results from this research showed that health information sharing online is positively related to CMC media use. An example of health information sharing online is the initiative by the UK government to improve physician quality transparency resulting in a new service that allows patients to post anonymous reviews on physician practices (Agarwal et al., 2010). The second sub-dimension of social gratifications is media-enabled health problem solving and decision making. Von Hippel (1998) states that individual consumers are greatly empowered through the use of Web 2.0 technologies such as wikis and blogs since they are able to solve problems without having to rely on specialists for solutions. Xu et al. (2010) state that information becomes relevant when it is helpful to solve the problem at hand. Health information sharing between the clinician and the patient will allow both to make the most informed decisions about treatments (American Hospital Association, 2011). Feste and Anderson (1995) state that patient empowerment is designed to allow patients to effectively assume responsibility for their health-related decisions. Patient control over decisions was found to be antecedent of patient empowerment (Gibson, 1991; Nyatanga & Dann, 2002). Results from this research



confirm the relationship between health problem solving and decision making, and patient empowerment enabled by CMC media use.

Results of the data analysis showed the existence of a relationship between CMC media use for health information seeking and/or sharing online and perceived patient empowerment (hypothesis H4). Kanter (1989) states that making information readily available to multiple people using multiple systems leads to empowerment. Use of CMC media such as the Internet as a whole, use of web portals and online knowledge repositories for health, and the use of social media tools such as Facebook and Twitter empower healthcare consumers (Hoyt et al., 2008). Von Hippel (1998) adds that individual consumers are greatly empowered through the use of Web 2.0 technologies such as wikis and blogs. Medical information available on CMC media such as the Internet has been identified as a possible source of patient empowerment (Holmström & Röing, 2010). Results from this research confirm this relationship between CMC media use and patient empowerment.

#### **4.9 Next Steps**

In the next phase of the research, a survey methodology is utilized to examine the consequences of patient empowerment resulting from the use of different types of CMC media.

## CHAPTER V

### STUDY 3: CONSEQUENCES OF CMC MEDIA-ENABLED PATIENT EMPOWERMENT

#### 5.1 Research Objectives

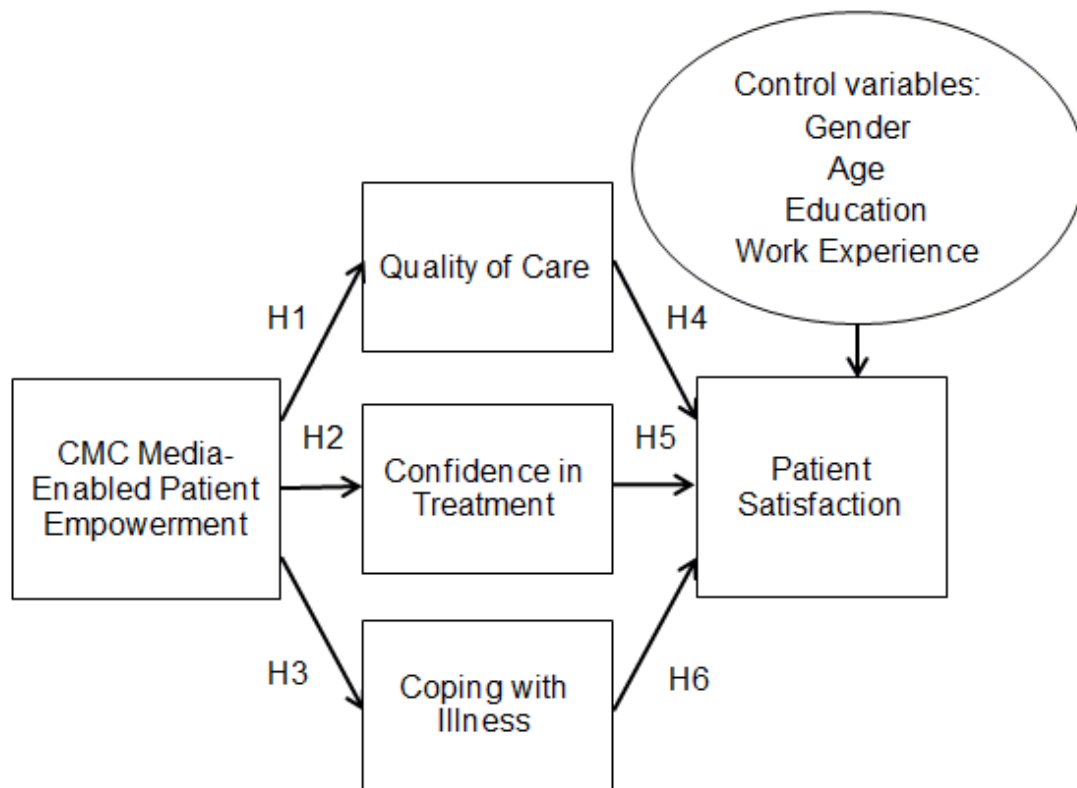
The goal of Study 3 is to identify the consequences of CMC media-enabled patient empowerment. Researchers in the field of psychology (e.g., Spreitzer, 1995) have studied the consequences of psychological empowerment in an organizational setting. The organizational level consequences of psychological empowerment include managerial effectiveness and innovation (Spreitzer, 1995). Likewise, researchers in healthcare (e.g., Holmström & Röing, 2010) have studied the consequences of patient empowerment. Some of the consequences of patient empowerment include increased patient satisfaction, enhanced health, improved quality of life, and allowing patients more control over interactions with healthcare professionals (Holmström & Röing, 2010). However the consequences of CMC media-enabled patient empowerment are not well-known.

The objective is to identify those factors which are impacted by the patients' empowerment attributable to the use of CMC media. CMC media-enabled patient empowerment has the potential to create more proactive, more knowledgeable, and more satisfied healthcare consumers. The research model for Study 3 is presented in Figure 13. The research question for Study 3 is as follows: *What are the consequences of CMC media-enabled patient empowerment?* Findings from Study 3 inform the academic and

practitioner community about the consequences of patient empowerment facilitated through the use of CMC media.

## 5.2 Research Model

The research model for Study 3, which examines the consequences of CMC media-enabled patient empowerment, is presented in Figure 17.



**Figure 17. Study 3 Research Model**

In the above research model, the independent variable is CMC media-enabled patient empowerment. The mediating variables are quality of care, coping with illness, and confidence in treatment. The dependent variable is patient satisfaction.

### **5.3 Theoretical Foundation and Hypotheses Development**

The theoretical foundations and hypotheses development for the study are presented in this section. Aujoulat et al. (2007) state that the features they identified for empowerment from their thematic content analysis were very similar to the features Deci and Ryan (2002) identified (competence, relatedness, self-determination) as contributors to intrinsic motivation as a part of their Self Determination Theory (SDT). Therefore, Self Determination Theory (Deci & Ryan, 2002; Ryan & Deci, 2000; Ryan, Kuhl, & Deci, 1997) was used as the theoretical background for this study (SDT). SDT is “an approach to human motivation and personality that uses traditional empirical methods while employing an organismic metatheory that highlights the importance of humans' evolved inner resources for personality development and behavioral self-regulation” (Ryan et al., 1997, p. 68). SDT is used to examine people's intrinsic psychological needs that form the basis for their self-motivation. Ryan and Deci (2000) identified three main needs related to self-determination, namely, the needs for competence, relatedness, and autonomy. Ryan and Deci (2000) showed that when the three innate psychological needs of competence, relatedness, and autonomy are satisfied, this leads to enhanced self-motivation and mental health for the individual. SDT is an appropriate theoretical framework to study the consequences of patient empowerment in this study since motivation, which plays a key role in empowerment, is highly valued for its consequences especially in the context of healthcare where the healthcare provider's role involves mobilizing others (mostly patients) to act (Ryan & Deci, 2000). In the healthcare context, SDT has been shown to be associated with greater adherence to medications

among people with chronic illnesses (Williams, Rodin, Ryan, Grolnick, & Deci, 1998), better long-term maintenance of weight loss among morbidly obese patients (Williams, Grow, Freedman, Ryan, & Deci, 1996), improved glucose control among diabetics (Williams, Freedman, & Deci, 1998) and greater attendance and involvement in an addiction-treatment program (Ryan, Deci, & Grolnick, 1995). Application of SDT to patients with Type 1 diabetes in a guided, group training environment showed that there was increased autonomy support perceived from health professionals, higher frequency of self-monitored blood glucoses, increased perceived competence in managing diabetes, fewer diabetes-related problems, and improved glycemic control (Zoffmann & Lauritzen, 2006).

#### ***5.3.1 Independent Variable: CMC Media-Enabled Patient Empowerment***

The independent variable in the research model is CMC media-enabled patient empowerment. This variable was the dependent variable in Study 2 where the effect of CMC media use on patient empowerment was examined. Patient empowerment “is based on the assumption that to be healthy, people must be able to bring about changes, not only in their personal behavior, but also in their social situations and the organizations that influence their lives” (Feste & Anderson, 1995). In this study, patient empowerment is defined as patient empowerment that can be attributed to the use of CMC media such as computers, tablet PCs, smart phones, and the Internet as a whole.

#### ***5.3.2 Mediating Variable: Quality of Care***

Quality of care is the first mediating variable in the research model. Quality of care refers to the overall experience of patients’ interactions with their healthcare

provider. Quality of care dimensions include technical quality of the healthcare professionals, communication quality, interpersonal interactions, and time the healthcare professionals spent with the patient (Venkatesh et al., 2011). Electronic healthcare system use has been shown to positively impact quality of care (Venkatesh et al., 2011). Patient empowerment facilitated by the use of electronic healthcare systems has the potential to improve quality of care (Aujoulat et al., 2007; Gibson, 1991; Rodwell, 1996). Thus, the more empowered patients are through the use of communication media, the greater that their perceived quality of care.

*H1: Patient empowerment will be positively related to the quality of care received by patients.*

### **5.3.3 Mediating Variable: Confidence in Treatment**

Confidence in treatment is the second mediating variable in the research model. Confidence in treatment refers to the extent to which patients are confident in their ability to stick to a treatment regimen and are able to follow the medical guidelines and advice of their physician (van Uden-Kraan et al., 2008). Increased levels of patient empowerment were found to allow patients to take charge of their interactions with healthcare professionals (Roberts, 1999; O’Cathain et al., 2005). These interactions include discussion and decision making about different possible treatment options. In a traditional healthcare environment, patients are often reduced to be passive listeners whose job is to follow the healthcare professional’s instructions without having any say in their own treatments. Patient informatics technologies are designed to overcome this drawback and to create more actively involved patients. IT plays a critical role in patient

informatics. Patient informatics technologies such as the PHRs, patient portals, and online knowledge repositories for health are designed to create a more knowledgeable healthcare consumer, one who can intelligently converse with the healthcare professionals to explain their conditions precisely, understand the available treatment options, and be actively involved in the decision-making process. Thus, communication media-enabled patient empowerment improves the quality of patients' interactions with their healthcare professionals thereby increasing their confidence in their treatments. Thus, patient empowerment facilitated by the use of communication media is expected to improve patients' confidence in their treatments.

*H2: Patient empowerment through the use of communication media will be positively related to patients' confidence in their treatments.*

#### **5.3.4 Mediating Variable: Coping with Illness**

Coping with illness is the third mediating variable in the research model. Coping with illness refers to the extent to which patients have improved their acceptances of their illnesses by being more open about it and asking for help more quickly (van Uden-Kraan et al., 2008). Patient empowerment has the potential enhance coping with illness (Hage & Lorensen, 2005; Michie et al., 2003; Rodwell, 1996). Thus, patient empowerment facilitated by the use of communication media is expected to improve patients' abilities to cope with their illnesses.

*H3: Patient empowerment through the use of communication media will be positively related to patients' abilities to cope with their illnesses.*

### ***5.3.5 Dependent Variable: Patient Satisfaction***

Patient satisfaction is defined as the extent to which a patient, or the patient's authorized decision maker, is pleased with the overall medical care received (Hays, Davies, & Ware, 1987, Zeithaml, Parasuraman, & Berry, 1990). Knowledge and information are at the core of empowerment. When patients perceive that there is an information asymmetry between them and their healthcare providers, they feel dissatisfied with the service they receive. To mitigate the effect of the information asymmetry, patients might use communication media such as the Internet as a whole, web portals, online knowledge repositories for health, and social media tools such as Facebook and Twitter (Hoyt et al., 2008). By reducing the information asymmetry between the patient and the healthcare provider, communication media have the ability to empower patients when the healthcare providers fail to do so. This increase in patient empowerment leads to more satisfied patients. Patient empowerment has been shown to increase patient satisfaction (Hage & Lorensen, 2005; Nyatanga & Dann, 2002). Venkatesh et al. (2011) have shown that an increase in quality of care resulting from electronic healthcare system use positively affects patient satisfaction. Venkatesh et al. (2011) state that the four key dimensions of quality of care, namely, technical quality, communication, interpersonal interactions, and time spent, are expected to influence patient satisfaction through the use of communication media. Thus, patients who experience improved quality of care are expected to be more satisfied.

*H4: Quality of care received by patients will be positively related to patient satisfaction.*



Patient satisfaction also depends on patients' perceived confidence in their treatment. Confidence in treatment refers to how well patients are able to stick to their treatment regimen and how well patients are able to follow the medical guidelines and advice of their physicians. Empowered patients are more informed and are more proactive in maintaining their own health and hence are expected to be able to stick to their treatment regimens better compared those patients who are passive and not well-informed. Empowered patients also know where to ask for help when they need additional clarification on the guidelines provided by their physicians. Thus, patients who have greater confidence in their treatments are more likely to follow through with the treatment suggested by their physician and consequently are more likely to be satisfied with the overall care that they receive.

*H5: Patients' confidence in their treatments will be positively related to patient satisfaction.*

Patient satisfaction is also impacted by patients' abilities to cope with illness. Coping with illness refers to how open and accepting patients are of their illnesses. Patients who are more accepting of their illnesses seek help more readily when the need it. They are also better able to tell others more easily when they are no longer able to do something. Thus, openness to acceptance of illness coupled with asking for help more quickly allows patients to cope with their illnesses better be more satisfied with their health.

*H6: Patients' abilities to cope with their illnesses will be positively related to patient satisfaction.*

In the next section, the methodology used to test this model of the consequences of CMC media-enabled patient empowerment is discussed.

## **5.4 Methodology**

A survey instrument was created to test the link between the patient empowerment and coping with illness, quality of care, confidence in treatment, and the link between quality of care and patient satisfaction. The research question from Study 3 is as follows: *What are the consequences of CMC media-enabled patient empowerment?* The unit of data collection and the unit of data analysis is the individual patient.

### **5.4.1 Instrument Development**

The instrument for Study 3 was created as a part of the survey instrument created for Study 2. The pretest was done with the help of four researchers at a local university. In the pilot test phase following the development of the preliminary instrument, the instrument was pilot tested using a representative sample of 38 patients.

### **5.4.2 Measures**

The complete list of measurement items is shown in the Appendix. A brief description of these measures follows.

*Patient empowerment* refers to patient empowerment that can be attributed to the use of CMC media such as computers, tablet PCs, smart phones, and the Internet as a whole. It is based on the literature on patient empowerment through CMC media (Oh & Lee, 2012). This construct was measured using twelve items.

*Quality of care* refers to the overall experience of patients' interactions with their healthcare provider. It is based on literature from quality of care (Venkatesh et al., 2011). This construct was measured using thirteen items. The items are based on the four dimensions of technical quality of the healthcare professionals, communication quality, interpersonal interactions, and time the healthcare professionals spent with the patient (Venkatesh et al., 2011).

*Patient satisfaction* is defined as the extent to which a patient, or the patient's authorized decision maker, is pleased with the overall medical care received (Hays et al., 1987, Zeithaml et al., 1990). It is based on the literature on patient satisfaction through the use of electronic healthcare systems (Venkatesh et al., 2011). This construct was measured using three items.

*Coping with illness* refers to the extent to which patients have improved their acceptances of their illnesses by being more open about it and asking for help more quickly (van Uden-Kraan et al., 2008). It is based on the literature on improved acceptance of disease by patients (van Uden-Kraan et al., 2008). A five-item measure was used to measure this construct.

*Confidence in treatment* refers to the extent to which patients are confident in their ability to stick to a treatment regimen and have a say in making decisions about their treatments (van Uden-Kraan et al., 2008). This construct is based on the literature on feeling more confident about the treatment (van Uden-Kraan et al., 2008) and was measured using five items.

#### ***5.4.3 Data Collection***

The data collection for Study 3 was completed as a part of data collection for Study 2. As stated in the data collection for Study 2, a national sample of 262 patients was surveyed for the full study which included Study 3.

#### ***5.4.4 Analysis***

The data analysis procedure is also very similar to Study 2 and included data preparation, analysis of demographic data, descriptive statistics, checking for the sample response bias, instrument validity testing, and final analysis.

### **5.5 Results**

The questionnaires were reviewed for completeness and consistency of responses. This resulted in an effective sample size of 230 complete responses.

#### ***5.5.1 Sample Response Bias***

As shown in the data analysis section from Study 2, it was already established that the sample response bias was a non-factor based on the comparison of characteristics of the early respondents with those of late respondents. Thus, response bias is not a significant issue that could confound our results.

#### ***5.5.2 Demographics***

The demographic information is the same as from Study 2.

#### ***5.5.3 Instrument Validation***

The first step in instrument validation was to estimate the initial reliability for the instrument. This is a two-step process where the reliability is estimated for the whole

instrument as well as for each construct. A reliability score of 0.8 or above is considered good for confirmatory purposes (Doll & Torkzadeh, 1988; Straub, 1989). These are shown in Table 43. The initial reliabilities for all constructs satisfy the suggested cutoff requirement of 0.8.

**Table 43. Initial Construct Reliabilities**

<b>Construct</b>	<b>Number of Items</b>	<b>Cronbach's <math>\alpha</math> (Standardized)</b>
Media-Enabled Patient Empowerment	12	0.92
Quality of Care	13	0.97
Coping with Illness	5	0.87
Confidence in Treatment	5	0.88
Patient Satisfaction	3	0.96
Entire Instrument	38	0.96

In the next stage of instrument validation, item-to-corrected total correlations were estimated at the construct level. Doll and Torkzadeh (1988) suggest using 0.5 as the cutoff for item-to-corrected total correlations. Table 44 presents the item-to-corrected total correlations for the items used in this study.

**Table 44. Item-to-Corrected Total Correlations**

<b>Construct</b>	<b>Item</b>	<b>Item-to-Corrected Total Correlation</b>
Media-Enabled Patient Empowerment	PATEMP1	0.57
	PATEMP2	0.62
	PATEMP3	0.73
	PATEMP4	0.76
	PATEMP5	0.69
	PATEMP6	0.65

	PATEMP7	0.66
	PATEMP8	0.76
	PATEMP9	0.60
	PATEMP10	0.71
	PATEMP11	0.50
	PATEMP12	0.63
Quality of Care	QOC1	0.83
	QOC2	0.82
	QOC3	0.87
	QOC4	0.86
	QOC5	0.78
	QOC6	0.89
	QOC7	0.90
	QOC8	0.83
	QOC9	0.88
	QOC10	0.79
	QOC11	0.83
	QOC12	0.84
	QOC13	0.83
Coping with Illness	COFIL1	0.63
	COFIL2	0.75
	COFIL3	0.73
	COFIL4	0.66
	COFIL5	0.68
Confidence in Treatment	CONFIT1	0.71
	CONFIT2	0.66
	CONFIT3	0.73
	CONFIT4	0.70
	CONFIT5	0.73
Patient Satisfaction	PATSAT1	0.90
	PATSAT2	0.94
	PATSAT3	0.91

As seen from the table, all of the item-to-corrected total correlations for the items that are used to measure each construct in the research model for this study are above the cutoff criterion of 0.5 suggested by Doll and Torkzadeh (1988) and hence construct validity is established. Consequently, no items were dropped for further analyses.

The instrument validation results show evidence of instrument validity by exhibiting strong content validity, construct validity, and reliability (Straub, 1989). A thorough literature review was conducted to ensure that the survey instrument measures were drawn from all possible measures of the properties under investigation and hence content validity was established (Straub, 1989). An examination of the item-to-corrected total correlations for the measurement items showed that the 0.5 cutoff recommended by Doll and Torkzadeh (1988) was satisfied and hence construct validity for the survey instrument was established. Cronbach's alpha reliability analysis was conducted to ensure the reliability of measurement items in the survey instrument.

The next step in addressing construct validity was to assess the convergent and discriminant validities. The AVE of each construct as shown in Table 45 is above 0.50, as suggested by Fornell and Larcker (1981). Therefore convergent validity is established.

**Table 45. Average Variance Extracted (AVE)**

<b>Construct</b>	<b>AVE</b>
Media-Enabled Patient Empowerment (EMP)	0.52
Quality of Care (QOC)	0.75
Patient Satisfaction (SAT)	0.93
Coping with Illness (COPIL)	0.64
Confidence in Treatment (CONF)	0.67

For discriminant validity, Chin (1998) suggests that SAVE (square root of AVE) should be greater than the correlations between each construct and all other constructs. The correlation matrix (Table 46) indicates that this is true for all constructs. Hence, discriminant validity is established.

**Table 46. Correlation Matrix**

	<b>CONFIT</b>	<b>COFIL</b>	<b>PATEMP</b>	<b>PATSAT</b>	<b>QOC</b>
<b>CONFIT</b>	<b>0.82</b>				
<b>COFIL</b>	0.60	<b>0.80</b>			
<b>PATEMP</b>	0.66	0.37	<b>0.72</b>		
<b>PATSAT</b>	0.58	0.48	0.32	<b>0.96</b>	
<b>QOC</b>	0.60	0.48	0.35	0.84	<b>0.87</b>
(Note: The numbers in the diagonal are the square root of the AVE)					

The next step in instrument validation was to assess final reliabilities. The composite reliabilities for each construct in the research model are presented in Table 47.

**Table 47. Composite Reliabilities**

<b>Construct</b>	<b>Composite Reliability</b>
Media-Enabled Patient Empowerment (PATEMP)	0.93
Quality of Care (QOC)	0.98
Coping with Illness (COFIL)	0.90
Confidence in Treatment (CONFIT)	0.91
Patient Satisfaction (PATSAT)	0.97

Werts et al. (1974) state that composite reliability is a better measure of internal consistency than Cronbach's alpha. Nunnally and Bernstein (1978) recommend using a cutoff value of 0.70 for composite reliability. As seen from Table 47 above, the composite reliability for each construct is well above 0.70 and hence the instrument is considered reliable.

The final step in the instrument validation was to do a Confirmatory Factor Analysis (CFA). The goal of a CFA aims to verify the factor structure of a set of



observed variables by constraining the number of factors and by forcing the items to load on their respective factors. The CFA was constrained for the five factors that are a part of the research model, namely, media-enabled patient empowerment, quality of care, coping with illness, confidence in treatment, and patient satisfaction. CFA was performed using statistical software package SAS. Table 48 presents the factor loadings resulting from the CFA analysis.

**Table 48. CFA Factor Loadings**

<b>Item</b>	<b>PATEMP</b>	<b>QOC</b>	<b>COPIL</b>	<b>CONFIT</b>	<b>PATSAT</b>
PATEMP1	0.60				
PATEMP2	0.63				
PATEMP3	0.78				
PATEMP4	0.81				
PATEMP5	0.76				
PATEMP6	0.73				
PATEMP7	0.72				
PATEMP8	0.81				
PATEMP9	0.60				
PATEMP10	0.72				
PATEMP11	0.48				
PATEMP12	0.62				
QOC1		0.85			
QOC2		0.83			
QOC3		0.89			
QOC4		0.88			
QOC5		0.80			
QOC6		0.91			
QOC7		0.92			
QOC8		0.84			
QOC9		0.89			
QOC10		0.80			
QOC11		0.84			
QOC12		0.84			
QOC13		0.83			
COPIL1			0.75		
COPIL2			0.83		

COPIL3			0.82		
COPIL4			0.66		
COPIL5			0.70		
CONFIT1				0.77	
CONFIT2				0.73	
CONFIT3				0.79	
CONFIT4				0.75	
CONFIT5				0.79	
PATSAT1					0.93
PATSAT2					0.97
PATSAT3					0.94

All CFA factor loadings are above the 0.4 cutoff suggested by Hulland (1999) as seen from Table 48.

An analysis of the different fit indices indicated a reasonable model fit to the data. The model chi-square was 2167.357 with 655 degrees of freedom. As stated earlier, the relative chi-square or normed chi-square (Wheaton et al., 1977) is a better statistic to use compared to chi-square since the relative chi-square is less sensitive to sample size. The relative chi-square for this model is 3.31, which is under the suggested criterion of less than 5 (Wheaton et al., 1977).

The Standardized Root Mean Square Residual (SRMSR) for model fit was 0.08. SRMSR is the mean absolute value of the covariance residuals. An SRMSR value of less than or equal to 0.08 is generally considered a good fit (Hu & Bentler, 1999).

The next step in the CFA is to determine convergent validity. Convergent validity is established when items that are part of the same construct are highly correlated (Campbell & Fiske, 1959, Straub, 1989). An accepted way of demonstrating convergent validity based on the literature (Hatcher, 1994: Smith et al., 1996) is to examine the

significance of the t-values for the factor loadings. The t-values for factor loadings from the CFA results are presented in Table 49.

**Table 49. T-Values for Factor Loadings**

<b>Item</b>	<b>t-Value</b>
PATEMP1	13.17
PATEMP2	14.89
PATEMP3	26.79
PATEMP4	31.66
PATEMP5	24.47
PATEMP6	21.36
PATEMP7	20.92
PATEMP8	31.07
PATEMP9	13.42
PATEMP10	20.48
PATEMP11	9.02
PATEMP12	14.28
QOC1	44.72
QOC2	39.29
QOC3	60.23
QOC4	55.71
QOC5	31.71
QOC6	74.39
QOC7	79.60
QOC8	42.31
QOC9	60.11
QOC10	32.16
QOC11	40.79
QOC12	41.29
QOC13	39.23
COPIL1	21.56
COPIL2	31.23
COPIL3	29.24
COPIL4	15.69
COPIL5	17.99
CONFIT1	24.83
CONFIT2	21.30
CONFIT3	27.03
CONFIT4	23.16
CONFIT5	26.74

PATSAT1	88.00
PATSAT2	147.79
PATSAT3	97.44

Hatcher (1994) recommends using the critical value of 3.29 ( $p=0.001$ ) for the t-values for the factor loadings for the measurement items. As seen from the table above, the t-values for all factor loadings satisfy the criterion and hence convergent validity is established for the model.

The final step in the CFA is to establish discriminant validity. When items that are part of the different constructs are not highly correlated with each other, discriminant validity is established (Campbell & Fiske, 1959, Straub, 1989). When the SAVE (square root of AVE) is greater than the correlations between each construct and all other constructs in the research model, discriminant validity is established (Chin, 1998). An analysis of the correlation matrix (Table 50) indicates that this is true for all constructs and hence discriminant validity is established.

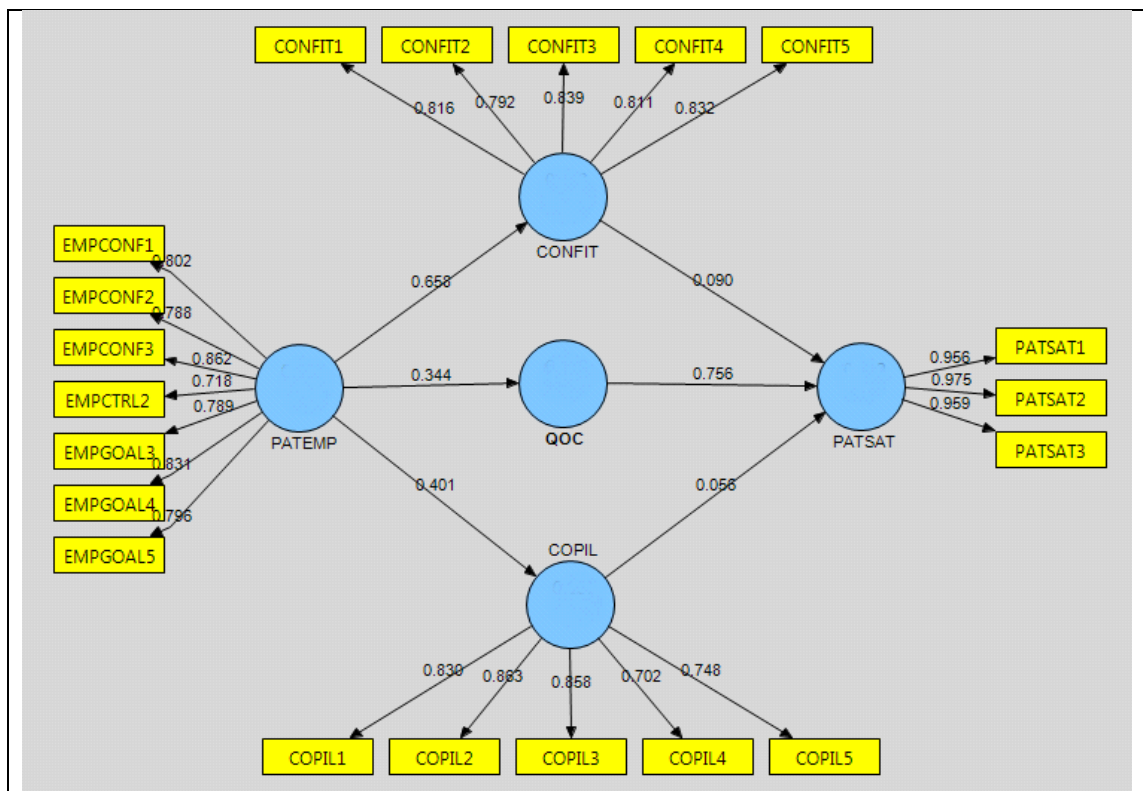
**Table 50. Correlation Matrix**

	<b>CONFIT</b>	<b>COFIL</b>	<b>PATEMP</b>	<b>PATSAT</b>	<b>QOC</b>
<b>CONFIT</b>	<b>0.82</b>				
<b>COFIL</b>	0.66	<b>0.80</b>			
<b>PATEMP</b>	0.71	0.38	<b>0.72</b>		
<b>PATSAT</b>	0.61	0.49	0.32	<b>0.96</b>	
<b>QOC</b>	0.64	0.50	0.33	0.86	<b>0.87</b>
(Note: The numbers in the diagonal are the square root of the AVE)					

Results of the CFA show that the five constructs of media-enabled patient empowerment, quality of care, coping with illness, confidence in treatment, and patient satisfaction exhibit construct validity, reliability, convergent validity, and discriminant validity and hence are appropriate for this study. In the next section, results of the hypotheses testing are presented.

#### 5.5.4 Hypotheses Testing

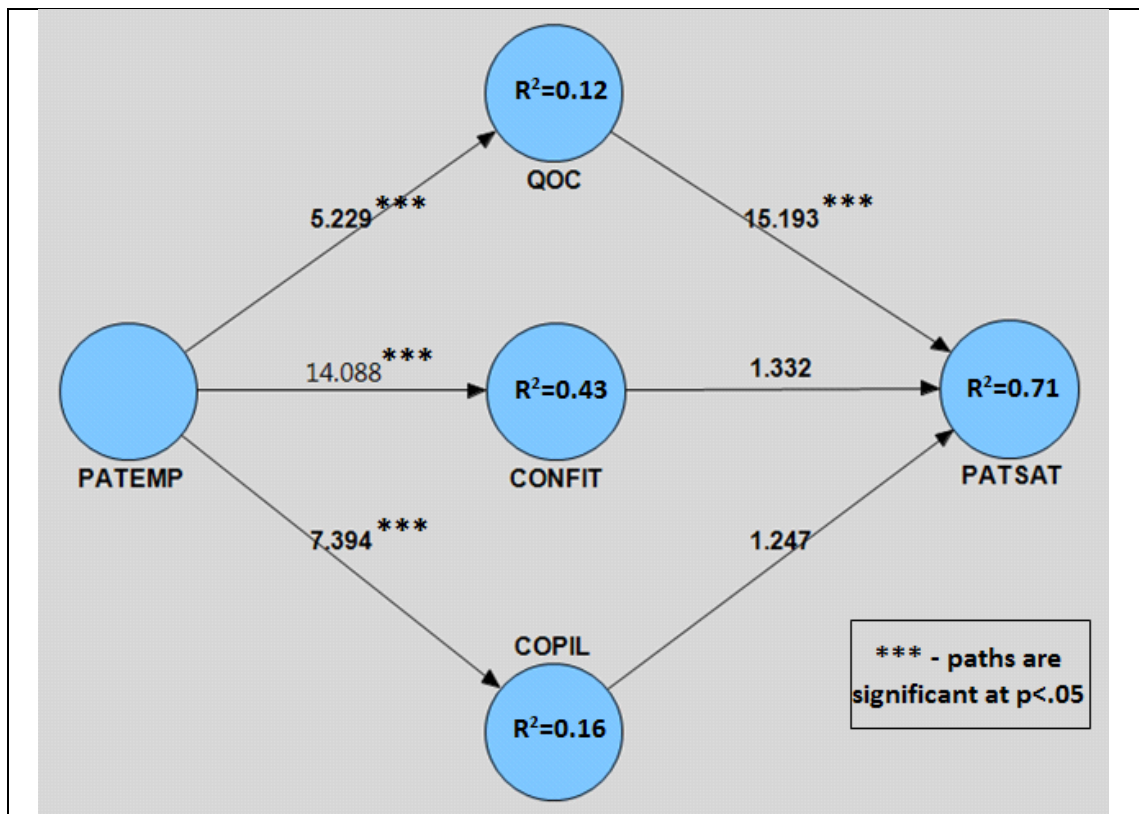
Hypotheses testing were conducted using SmartPLS - Version 2.0 M3. The measurement model results are presented in Figure 18.



**Figure 18. Measurement Model Results for Study 3**

Results from testing the research model are shown in Figure 19. Measurement items with outer loadings less than 0.7 were dropped from the measurement model. This resulted in the following items being dropped: PATEMP1, PATEMP2, PATEMP9, PATEMP11, and PATEMP12. The rest of the measurement items including all items form the quality of care, confidence in treatment, coping with illness, and patient satisfaction constructs satisfied the cutoff criterion of 0.7.

The structural path modeling results for Study 3 are presented in Figure 19. The statistics shown on the paths in Figure 19 are the t-values for the beta coefficients. All paths at the 0.05 level of significance are highlighted in Figure 19.



**Figure 19. Testing the Main Hypotheses**

The R-square values for the four dependent constructs namely quality of care, patient satisfaction, coping with illness, and confidence in treatment are also presented in Figure 19. Quality of care has an R-square value of 0.12. Patient satisfaction has an R-square value of 0.71. Coping with illness has an R-square value of 0.16. Confidence in treatment has an R-square value of 0.43. Thus, our model is effective in explaining much of the variance in the dependent variables.

The relationship between patient empowerment and quality of care was positive and significant (coefficient: 0.344, t-value: 5.229) supporting hypothesis H1 that CMC media-enabled patient empowerment will be positively related to the quality of care received by the patients. The relationship between patient empowerment and confidence in treatment was positive and significant (coefficient: 0.658, t-value: 14.088) supporting hypothesis H2 that CMC media-enabled patient empowerment will be positively related to the confidence patients have in their treatments. The relationship between perceived empowerment and coping with illness was positive and significant (coefficient: 0.401, t-value: 7.394) supporting hypothesis H3 that CMC media-enabled patient empowerment will be positively related to the patients' abilities to cope with their illnesses. The relationship between quality of care and patient satisfaction was positive and significant (coefficient: 0.756, t-value: 15.193) supporting hypothesis H4 that the quality of care received by patients will be positively related to their patient satisfaction. The relationship between confidence in treatment and patient satisfaction was positive, but not significant (coefficient: 0.090, t-value: 1.332) failing to support hypothesis H5 that patients' confidence in their treatment will be positively related to the patient satisfaction.

The relationship between coping with illness and patient satisfaction was positive, but not significant (coefficient: 0.056, t-value: 1.247) failing to support hypothesis H6 that patients' abilities to cope with their illnesses will be positively related to their patient satisfaction

The R-Square values for the dependent constructs are given in Table 51. Four out of the six hypotheses are supported at the 0.05 level of significance.

**Table 51. R-Square Values for Full Model**

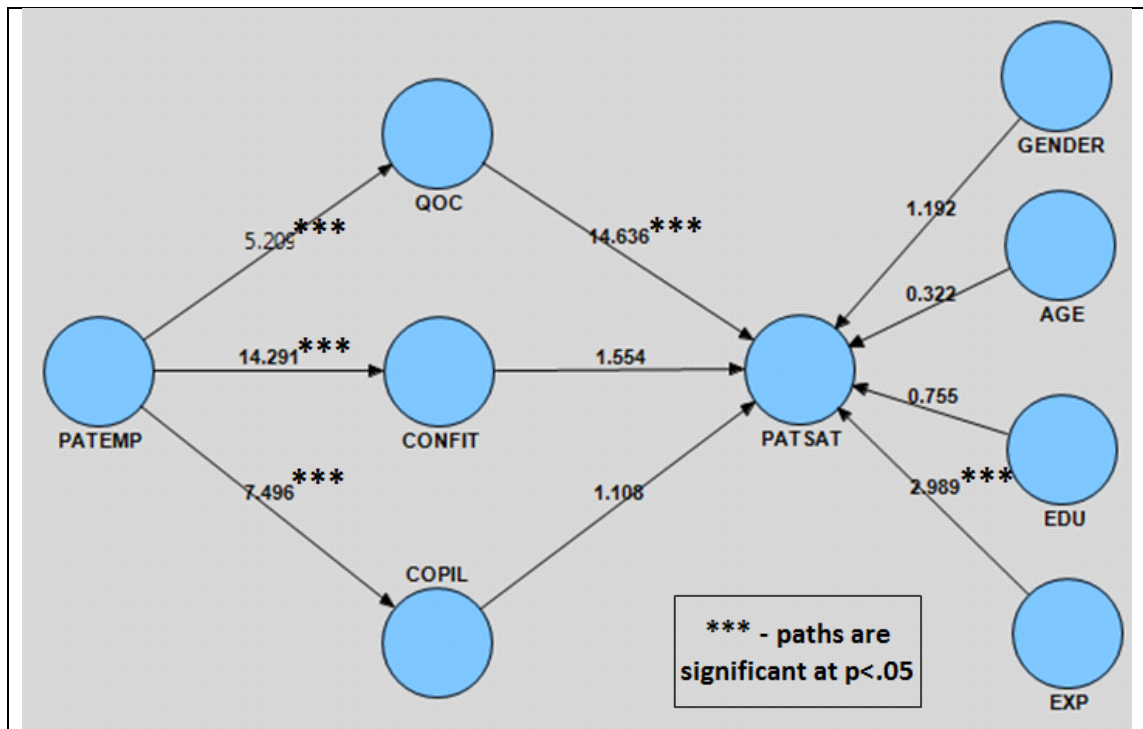
<b>Construct</b>	<b>R-Square</b>
Quality of Care (QOC)	0.12
Patient Satisfaction (SAT)	0.71
Coping with Illness (COPIL)	0.16
Confidence in Treatment (CONF)	0.43

#### **5.5.5 Control Variables**

In order to test the robustness of the relationships, four control variables which could potentially have an impact on the dependent variable were added to the model. The first control variable was the gender of the patient. The second control variable was the age of the patient. The third control variable was the education level of the patient. The fourth control variable was the patient's work experience. Figure 20 shows the results of the structural model with the four control variables added to the model. The newly estimated path coefficients in the structural model are nearly the same as those from the model without control variables. As seen from Figure 20, the same paths that were significant without the control variables (Figure 19) are also significant after the control



variables gender, age, education, and experience were added to the model. It is also worth noting from Figure 20 that no new significant paths were added as a result of including the control variables and that the control variables age, gender, and education did not significantly influence the dependent variable in the model.



**Figure 20. Testing the Main Hypotheses with Control Variables**

The control variable experience did significantly influence patient satisfaction, the dependent variable in the model. A couple of reasons could possibly explain this relationship between a patient's work experience and patient satisfaction. First, it is possible that patients who have greater work experiences have greater access to healthcare through their work organizations which could explain their increased levels of satisfaction. Next, organizations typically provide subsidized access to healthcare by

offering several health benefit plans to their more experienced employees resulting in improved patient satisfaction as a consequence of having to pay less for healthcare. Patients who have greater work experiences also have the ability to interact with fellow employees to find out information about which healthcare provider provides the best services for specific conditions. This knowledge-sharing culture in a work setting could possibly be another reason why patient work experience significantly influences patient satisfaction.

## **5.6 Discussion**

The objective of this study was to identify the consequences of patient empowerment resulting from patients' use of communication media to seek and/or share health information online. First, a research model was constructed based on a thorough literature review. A survey methodology was then used to collect data to test the research model. Results of the survey confirmed the relationships hypothesized in the research model.

Hypothesis H1 proposed a relationship between patient empowerment and quality of care. *Patient empowerment* refers to patient empowerment that can be attributed to the use of CMC media such as computers, tablet PCs, smart phones, and the Internet as a whole (Oh & Lee, 2012). *Quality of care* refers to the overall experience of patients' interactions with their healthcare provider (Venkatesh et al., 2011). Quality of care can be further subdivided into the four dimensions of technical quality of the healthcare professionals, communication quality, interpersonal interactions, and time the healthcare professionals spent with the patient (Venkatesh et al., 2011). Patient empowerment

enables patients to be more aware of the technical quality of their healthcare professionals, allows patients to have better, more informed, more interpersonal communications with their healthcare professionals. Results of hypotheses testing using SmartPLS confirmed the existence of this relationship.

Hypothesis H2 proposed a relationship between patient empowerment and confidence in treatment. *Confidence in treatment* refers to the extent to which patients are confident in their ability to stick to a treatment regimen and have a say in making decisions about their treatments (van Uden-Kraan et al., 2008). Empowered patients are not passive and do not simply accept treatment options suggested by their healthcare providers. They take the initiative to research on the different treatment options suggested by the healthcare providers and take greater control over decision making when it comes to selecting a specific treatment option. Thus, they are more confident in deciding on a treatment option and since they are actively involved in the decision making, they are more likely to stick to a treatment regimen. SmartPLS based hypotheses testing confirmed the existence of this relationship between patient empowerment and confidence in treatment.

Hypothesis H3 proposed a relationship between patient empowerment and coping with illness. *Coping with illness* refers to the extent to which patients have improved their acceptances of their illnesses by being more open about it and asking for help more quickly (van Uden-Kraan et al., 2008). Patients have a wealth of resources available to them to help them better cope with their illnesses. Examples include patient support groups that patients themselves form on the Internet and support groups created for the

patients by their healthcare providers. Empowered patients are more proactive and take responsibility for their own actions. Thus, they are more willing to accept the fact that they have this illness and seek help from the online communities to help them better deal with their illnesses. This relationship between patient empowerment and coping with illness was confirmed through the results of hypotheses testing.

Hypothesis H4 proposed a relationship between quality of care and patient satisfaction. *Patient satisfaction* is defined as the extent to which a patient, or the patient's authorized decision maker, is pleased with the overall medical care received (Hays et al., 1987, Zeithaml et al., 1990). Venkatesh et al. (2011) state that quality of care should be focused more on technical; quality of healthcare professionals, the communication quality between patients and providers, and the time healthcare professionals spend with patients, instead of focusing on reducing clinical errors. This represents a more patient-focused approach to quality of care since patients are the healthcare consumers. It would not be surprising if patient-focused quality of care measures improve patient satisfaction levels. Hypotheses testing results confirmed this link between quality of care and patient satisfaction.

Hypothesis H5 proposed a relationship between patients' confidence in treatment and patient satisfaction. *Confidence in treatment* refers to the extent to which patients are confident in their ability to stick to a treatment regimen and to follow the guidelines and advice provided by their physician (van Uden-Kraan et al., 2008). SmartPLS based hypotheses testing failed to confirm the existence of this relationship between patients' confidence in treatment and patient satisfaction. Some healthcare providers use a one-

size-fits-all approach in treating patients. If the patient has disease X, then the physician advocates treatment Y without regard to the individual differences between patients.

Therefore, it is possible for an empowered patient who has greater confidence in her / his treatment to not be satisfied with such an approach especially since the patient is more informed about alternate treatment options.

Hypothesis H6 proposed a relationship between patients' abilities to cope with illness and patient satisfaction. *Coping with illness* refers to the extent to which patients have improved their acceptances of their illnesses by being more open about it and asking for help more quickly (van Uden-Kraan et al., 2008). SmartPLS based hypotheses testing failed to confirm the existence of this relationship between patients' abilities to cope with illness and patient satisfaction. Regardless of how well patients are able to cope with their illnesses, patients still have a lot to deal with on a day-to-day basis. Interview transcripts from Study 2 provide several examples of patients having to deal with illnesses on a daily basis. Therefore, it sometimes becomes difficult or near impossible for patients to be satisfied with their health if they are fully aware that they have to deal with their illness as long as they live.

## **5.7 Next Steps**

In the next section, the knowledge contributions of this research to the academic and practitioner communities are highlighted.

## CHAPTER VI

### CONTRIBUTIONS TO KNOWLEDGE

This research offers several key insights to both the academic and the practitioner communities using three interrelated studies to investigate the motivations and barriers to health information seeking and/or sharing online using CMC media, to empirically test a model of CMC media-enabled patient empowerment, and to identify the consequences of CMC media-enabled patient empowerment.

#### **6.1 Implications for Research**

This research addresses several gaps in the literature. First, extant literature on empowerment in IS (e.g., Armstrong & Sambamurthy 1999; Joshi et al., 2010) focuses mainly on employee empowerment in an organizational context. Research that examines the role of CMC media-based HIT in consumer empowerment in the healthcare context has been neglected in the Information Systems (IS) literature. This research addresses that gap in literature by investigating the role CMC media plays in patient empowerment. The academic community will benefit as this project addresses “the need for more theory-driven investigations of the underlying phenomenon of use and impacts of e-healthcare systems” (Venkatesh et al. 2011, p. 524).

Second, there is no empirical research in the IS literature that links the motivators and barriers to seek and/or share health information online to patient empowerment enabled through the use of CMC media. Several studies (Pew Internet, 2008; Pew

Internet, 2011; Pew Internet, 2014) have shown that the number of adults who seek and/or share health information online has been increasing steadily. What is not clear in the literature is why patients seek and/or share health information online using CMC media. This research addresses that gap in literature by using an interpretive study to identify seven motivations and barriers dimensions that explain patients' use of CMC media to seek and/or share health information online.

Third, there is a lack of research in the IS community that utilizes the Uses and Gratifications perspective to identify the motivations for patients' use of CMC media to seek and/or share health information online. The Uses and Gratifications perspective has been widely applied to investigate the motivations for the use of the Internet as a whole and specific CMC media in particular (Papacharissi & Rubin, 2000; Stafford et al., 2004; Walther & Hancock, 2005). However, there is a scarcity of research that applies Uses and Gratifications perspective in the healthcare context to identify the motivations for using different communication media to investigate the motivations and barriers to health information seeking and/or health information sharing online. This research addresses that gap by using the Uses and Gratifications theory to categorize the seven motivations and barrier dimensions into the three gratifications, namely, content gratifications, process gratifications, and social gratifications.

Fourth, this research contributes to literature by operationalizing the content gratifications, process gratifications, and social gratifications constructs as first-order reflective, second-order formative, thus addressing calls by Jarvis et al. (2003) for more studies that focus on Type II formative constructs.

Fifth, the consequences of CMC media-enabled patient empowerment have not been addressed in the literature. This research addresses that gap in literature by using Self Determination Theory to investigate the consequences of CMC media-enabled patient empowerment. By focusing on the consequences of CMC media-enabled patient empowerment, this research addresses the call by for IS researchers to focus on the consumer-perspective on health information technology (HIT), specifically the effect of personal health information management tools on health outcomes of patients (Agarwal et al., 2010).

## **6.2 Implications for Practice**

This research offers several useful outcomes for the practitioner community as well. First, it highlights the important role that information provided by CMC media plays in patient empowerment. One of the main goals of healthcare providers is to improve their patients' health and wellbeing. This research shows that patient empowerment can be used as a key mechanism to achieve that goal. "Consumer empowerment and the role of the expert patient in their own healthcare, enabled through timely access to quality information, have emerged as significant factors in better health and lifestyle outcomes" (McKemmish et al., 2009 p. 1792).

Second, this research shows that empowered patients are more proactively involved in assuming responsibility for their health-related behavior confirming the results from prior literature (Feste & Anderson, 1995). Primary care physicians "have very little time to review the latest evidence from the medical literature and to peruse the details of each patient's medical record, which means individuals must to take control of



their own healthcare, especially since so much of their potential or real problems require lifestyle changes that only they control” (Simborg, 2010, p. 370). Thus, empowered patients are more likely to participate in joint decision-making and more likely to take accountability for their health-related decisions.

Third, patient empowerment has the potential to cut down on healthcare waste expenditures (\$558B to \$910B) which are spiraling out of control (Berwick & Hackbarth, 2012). Healthcare providers can trim this waste expenditure by investing in patient empowerment educational mechanisms.

Fourth, the practitioner community will benefit since healthcare providers will have a better understanding of how to improve their patient satisfaction scores by designing intervention mechanisms designed to increase patient empowerment (Ellins & McIver, 2009). Results from Study 3 showed that empowered patients are able to better appreciate the quality of care initiatives implemented by their healthcare providers. Thus, healthcare providers would benefit from implementing patient empowerment education mechanisms in a guided, group setting, which would result in greater patient awareness of the provider’s capabilities to improve quality of patient care thereby increasing patient satisfaction. One of the important consequences of patient empowerment is patient satisfaction (Hage & Lorensen, 2005; Nyatanga & Dann, 2002). Once healthcare providers understand how information enables patient empowerment, they can invest some of their resources in information-based intervention mechanisms that can help increase patient empowerment which in turn can lead to more satisfied patients.

## CHAPTER VII

### FUTURE RESEARCH

The three studies in this dissertation are part of a larger research stream that could spawn numerous other studies which could be pursued in the future. Possible research questions based on this research include the following:

- How to facilitate health information seeking online and health information sharing online in patients?
- What role do incentives play in increasing the use of health information online by patients?
- What measures are required to help overcome patients' barriers to seeking and sharing health information online?
- How do different communication media (publicly available information on the Internet, privately available information on the Internet through patient portals, and face-to-face interaction with the healthcare provider) differ in their abilities to enable patient empowerment?
- How does CMC media-enabled patient empowerment affect stakeholders in the healthcare context other than patients themselves?
- What are the benefits of CMC media-enabled patient empowerment to the healthcare providers?

- Is it possible to reduce the per capita healthcare cost using CMC media-enabled patient empowerment?
- How can healthcare providers increase CMC media-enabled patient empowerment?
- What role do personal health records (PHRs) play in CMC media-enabled patient empowerment?

## CHAPTER VIII

### LIMITATIONS AND KEY ASSUMPTIONS

Study 1 used convenience sampling since patients of a local healthcare service provider were targeted for the interviews. The generalizability of the results from Study 1 is limited as a consequence. The limitations of Studies 2 and 3 include issues common to the survey methodology. Survey research has limitations which include appropriateness of sample size, possibility of low survey response rates and lack of representativeness. The sample size issue was addressed by using a sample size that was comparable to prior studies from the literature, and by taking into consideration the sample size requirements for SmartPLS. Low response rates may be due to the presence of sample response bias. Sample response bias for Studies 2 and 3 was checked for using the procedure suggested by Armstrong and Overton (1977). While high response rates are desired, they don't necessarily signal higher representativeness, especially when probability based sampling methods are used (Krosnick, 1999). Every effort was made in the sampling process to ensure adequate representativeness of the sample. Other limitations include the fact that there may be other factors affecting CMC media-enabled patient empowerment that were not covered in the dissertation and the fact that there may be other consequences of CMC media-enabled patient empowerment that were not covered in the dissertation.

The key assumptions in this research project are as follows. Empowerment is assumed to be a continuum where patients are either more empowered or less empowered instead of assuming that patients are either empowered or not empowered. Empowerment

is also based on the assumption that “to be healthy, people must be able to bring about changes, not only in their personal behavior, but also in their social situations and the organizations that influence their lives” (Feste & Anderson, 1995).

## CHAPTER IX

### CONCLUSION

While the concept of empowerment in an organizational context has been studied extensively in the field of psychology for more than three decades, empowerment at the individual consumer level of analysis enabled by the use of CMC media in the healthcare context has been relatively scarce in the IS literature. This dissertation uses three interrelated studies to address this gap in IS literature.

In Study 1, patients' motivations and barriers for health information seeking and/or sharing online were examined using an interpretive approach and a qualitative methodology. Interview results revealed that there are seven major dimensions which explain patients' motivations and barriers for health information seeking and/or sharing online. Those seven dimensions are media-enabled health information seeking, health output quality produced by media, media-enabled health-related content management and communication, media-enabled convenience, media-enabled health information sharing, and media-enabled health problem solving and decision-making.

In Study 2, a research model linking the motivations and barriers dimensions identified in Study 1 to CMC media use and patient empowerment was tested using a positivist approach and a survey methodology. The Uses and Gratifications perspective was used as the theoretical background to categorize the seven motivations and barriers dimensions identified in Study 1 into the three gratifications, namely, content gratifications, process gratifications, and social gratifications. Results from a national

survey of 230 patients showed significant positive relationships between content gratifications and CMC media use for health information seeking and/or sharing online, between social gratifications and CMC media use for health information seeking and/or sharing online, and between CMC media use for health information seeking and/or sharing online and patient empowerment.

In Study 3, the consequences of CMC media-enabled patient empowerment were investigated using a survey methodology. Survey results revealed significant positive relationships between patient empowerment and quality of care, between patient empowerment and patient coping with illness, and between patient empowerment and patient confidence in treatment. Survey results also showed that quality of care mediates the relationship between patient empowerment and patient satisfaction.

Together, the three studies help understand the role CMC media play in empowering healthcare consumers thereby addressing calls from IS researchers to focus on the consumer-perspective on the use of health information technology (HIT).

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## APPENDIX A

### INTERVIEW QUESTIONNAIRE

Have you searched online for medical information?  
What type of medical information did you search for?  
Was it information related to doctors, hospitals, symptoms, or other patients' experiences?  
What online websites do you use to search for medical information?  
Do you always find the medical information you seek online?  
How confident are you in your ability to find online the medical information you are searching for?  
How useful do you find the medical information that you found online?  
Are you satisfied with the quality of the medical information you find online?  
Is the medical information you find online relevant to your situation?  
Do you feel that you have developed interpersonal relationships with the source providing the medical information online?  
What was the motivation behind your online search for medical information?  
Was the information provided by your health care provider inadequate?  
Do you discuss the medical information you found online with your health care professionals?  
How did your health care professionals react when you discussed the medical information you found online with them?  
Do you believe that the medical information you found online helped improve the quality of your communications with your health care professionals?  
Did your health care professionals point you to online resources where you can find additional medical information?  
Do you use the online resources provided by your health care provider (patient portal, Personal Health Record etc.) on a regular basis to monitor your own health?  
Did you feel empowered when you found medical information that you were seeking online?  
Did you feel you were able to make better decisions about your own health using the medical information you found online?  
Do you like the fact that you get more control over your treatment options as a result of being empowered by medical information online?  
Did you feel more proactive in managing your own health due to the availability of medical information online?  
Did you feel that medical information you found online helped you cope with an illness?  
Have you ever changed your health-related behavior based on medical information that you found online?

If you have never searched for medical information online, what are your concerns about searching medical information online?



What are some measures that can be taken to alleviate your concerns about searching online for medical information?

If you have searched online for medical information previously, but have stopped doing that now, what were some of the reasons for the change in your behavior?

Have you ever found searching for medical information online a difficult task to accomplish?

Do you ever feel that if you search for medical information online, you are also obligated to share your knowledge online?

Have you ever shared medical information online?

What type of medical information did you share online?

What was your motivation for sharing medical information online?

Do you trust that the medical information you share online will be used with good intent?

Do you believe others value the medical information that you share online?

Do you believe that if you share your medical information online to help others, you can expect others to share their medical information to you when you need it?

Do you feel a strong commitment to share medical information online to help others?

Do you derive pleasure in helping others by sharing medical information online?

Do you believe you have the ability to contribute valuable medical information online?

What online websites do you use to share medical information online?

If you have never shared medical information online, what are your concerns about sharing medical information online?

What are some measures that can be taken to alleviate your concerns about sharing medical information online?

APPENDIX B  
SURVEY INSTRUMENT

**PART A: DEMOGRAPHICS:**

Please provide the following demographic information:

1. Gender: (Liu et al., 2005)  
☐ Male ☐ Female
2. To what age group do you belong?  
☐ 21 – 29 ☐ 30 – 39 ☐ 40 – 49 ☐ 50 – 59 ☐ Over 60
3. Current education level  
☐ High School ☐ Some College Education ☐ Bachelor's  
☐ Master's ☐ Ph.D. ☐ Other
4. How many years of professional work experience have you had?  
☐ < 1 ☐  $\geq 1$  but < 2 ☐  $\geq 2$  but < 4 ☐  $\geq 4$  but < 6 ☐ > 6

**PART B: COMPUTER/INTERNET EXPERIENCE/USE:**

The following questions relate to your use of computer/Internet: (circle the appropriate response)

- |                                                                                                                                           |                     |                |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------|
|                                                                                                                                           | Extremely difficult | Extremely easy |
| 5. How easy is it for you to access a computer?                                                                                           | 1      2      3     | 4      5       |
| 6. How easy is it for you to access the Internet?                                                                                         | 1      2      3     | 4      5       |
|                                                                                                                                           | Not at all literate | Fully literate |
| 7. What is your computer literacy level?                                                                                                  | 1      2      3     | 4      5       |
| 8. For how many years have you been accessing the Internet?                                                                               |                     |                |
| <input type="checkbox"/> Less than 1 year <input type="checkbox"/> $\geq 1$ but < 3 years <input type="checkbox"/> $\geq 3$ but < 5 years |                     |                |
| <input type="checkbox"/> $\geq 5$ but < 10 years <input type="checkbox"/> More than 10 years                                              |                     |                |
| 9. For how many years have you been using the Internet for seeking/sharing health information online?                                     |                     |                |
| <input type="checkbox"/> Less than 1 year <input type="checkbox"/> $\geq 1$ but < 3 years <input type="checkbox"/> $\geq 3$ but < 5 years |                     |                |
| <input type="checkbox"/> $\geq 5$ but < 10 years <input type="checkbox"/> More than 10 years                                              |                     |                |

10. On average, how many hours do you use the Internet for seeking/sharing health information online each week?

- ☐ Less than 1 hour
- ☐ 1 hour up to 3 hours
- ☐ 3 hours up to 5 hours
- ☐ 5 hours up to 7 hours
- ☐ More than 7 hours

11. How often do you use the Internet for seeking/sharing health information online? 7-point Likert from Don't use at all to Use several times each day.

- ☐ Don't use at all
- ☐ A few times altogether
- ☐ A few times a year
- ☐ A few times a month
- ☐ A few times a week
- ☐ A few times a day
- ☐ Several times a day

12. How do you consider the extent of your current use of the Internet for seeking/sharing health information online? 7-point Likert from Non use to Heavy use.

- ☐ Non use
- ☐ Light use
- ☐ Less than average use
- ☐ Average use
- ☐ Above average use
- ☐ Above average but less than heavy use
- ☐ Heavy use

13. Which online website do you primarily use to seek health information online?

- ☐ WebMD
- ☐ Mayo Clinic
- ☐ MedlinePlus
- ☐ HealthCentral
- ☐ FamilyDoctor
- ☐ Health Finder
- ☐ KidsHealth
- ☐ CNN Health
- ☐ Yahoo!
- ☐ YouTube
- ☐ Google
- ☐ Bing
- ☐ U.S. Government websites (NIH, NLM, CDC etc.)
- ☐ Other

### **PART C: MOTIVATIONS FOR USING THE INTERNET FOR HEALTH INFORMATION SEEKING/SHARING ONLINE:**

The following question assesses your perceived helpfulness of the Internet for satisfying your motivations for using them for communication in your health information online seeking/sharing contexts.

14. Considering your **health information seeking/sharing environment online**, please indicate your level of agreement with the motivations for using each of the three media on a scale of 1–7 (where 1 = “Strongly Disagree”, 3 = “Neutral”, and 7 = “Strongly Agree”).

<b>Motivation for using the medium</b>	<b>Internet (Publicly Available Resources)</b>
Health information provided online by the medium is useful.	
It is cheap to communicate using the medium.	
The medium allows quick communication.	
The medium allows you to share health information online anonymously.	
Communication through the medium allows you to clarify health-related issues easily.	
The medium makes it easy to share health information online.	
The medium allows you to vent by sharing bad health-related experiences.	
The medium allows awareness of others in the interaction.	
Communication through the medium provides a more personal touch.	
The medium allows you to be altruistic.	
The medium allows you to receive health-related encouragement from others users.	
The medium allows you to use multiple tools for communication of health-related information (email, chat, talk, text, attach file, etc.).	
Everyone else uses the medium for online health-related communication.	
The medium is good at solving complex health-related issues.	
The medium allows you to obtain health information online from different sources (or a single source).	
The medium allows you to transfer or obtain a large quantity of health-related information.	
The medium is good (or poor) at helping users cope with medical conditions.	
The medium allows you to share health information online privately.	
The medium is good at solving critical health-related issues.	
The medium is good at helping you make decisions related to your own health.	
It is easy to access to the medium.	
The medium allows you to communicate with	

multiple people simultaneously.	
The medium provides quick (or slow) feedback.	
The medium allows you to obtain detailed health-related information.	
The medium allows you to accumulate health-related knowledge.	
The medium allows you to have a real-time communication.	
The medium allows you to keep communication record history (email history, chat history, save file attachments etc.).	
The medium allows you to take control over your own health.	
The medium allows you to share health-related information with others.	
The medium allows you to take control over your interactions with your health care provider.	
The medium allows you to store and manage files.	
The medium allows you to know who you are communicating with.	
The medium is easy to use.	
Online health-related information provided by the medium is reliable.	
Communication through the medium makes you feel you are not alone.	
The medium allows you to obtain a broad range of health information online.	

#### **PART D: EMPOWERMENT:**

15. Considering your **health information seeking/sharing environment online**, please indicate your level of agreement with the following empowerment statements on a scale of 1–7 (where 1 = “Strongly Disagree”, 3 = “Neutral”, and 7 = “Strongly Agree”).

<b>Statement</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
I will make use of necessary resources to effectively manage my health.							
I can understand my health better than anyone.							

I can motivate myself to manage my health and make a better life.							
I can make every possible effort to achieve my health-related goals							
I am enthusiastic about my own efforts to maintain good health.							
I know where I can ask for help to manage my health							
I can manage my health-related conditions.							
I can make a realistic health-related plan.							
I can manage minor ailments without seeing a doctor.							
I have the power to make my own health-related decisions.							
I have a right to make my own health-related decisions even though I may be wrong.							
I can make decisions regarding what is a good treatment for my health-related condition.							

## PART E: QUALITY OF CARE – TECHNICAL QUALITY

16. Considering your **health information seeking/sharing environment online**, please indicate your level of agreement with the following quality of care statements on a scale of 1–7 (where 1 = “Strongly Disagree”, 3 = “Neutral”, and 7 = “Strongly Agree”).

Statement	1	2	3	4	5	6	7
The doctor was careful to check everything.							
The doctor knew the latest medical developments.							
I have complete faith in the ability of my doctor.							
I have full faith in the advice my doctor gives me.							

### QUALITY OF CARE – COMMUNICATION

7-point Agreement Scale

My doctor explains the reason for tests.							
My doctor discusses everything important with me.							
My doctor listens carefully to me.							

### QUALITY OF CARE – INTERPERSONAL INTERACTIONS

7-point Agreement Scale

My doctor does her / his best to keep me from worrying.							
My doctor shows genuine interest in me.							
My doctor is very friendly and courteous.							

### QUALITY OF CARE – TIME SPENT

7-point Agreement Scale

My doctor spends plenty of time with me.							
My doctor was never rushing when treating me.							
I always felt that my doctor spends enough time with me.							

### PART F: COPING WITH ILLNESS

17. Considering your **health information seeking/sharing environment online**, please indicate your level of agreement with the following coping statements on a scale of 1–7 (where 1 = “Strongly Disagree”, 3 = “Neutral”, and 7 = “Strongly Agree”).

Statement	1	2	3	4	5	6	7
I am able to be more open about my own illness.							
I can tell others more easily when I am no longer able to do something.							
I can ask others for help more quickly.							

I can give in to my illness better.							
I can accept my illness better.							

## PART G: CONFIDENCE IN TREATMENT

18. Considering your **health information seeking/sharing environment online**, please indicate your level of agreement with the following confidence statements on a scale of 1–7 (where 1 = “Strongly Disagree”, 3 = “Neutral”, and 7 = “Strongly Agree”).

Statement	1	2	3	4	5	6	7
I can stick to my treatment regime better.							
I am more able to follow the medical guidelines and advice of my physician.							
I know where to go with questions about my illness.							
I feel I am more skilled at dealing well with my illness.							
I feel able to make the right decisions with regard to my illness.							

## PART H: PATIENT SATISFACTION

7-point Agreement Scale

19. Considering your **health information seeking/sharing environment online**, please indicate your level of agreement with the following patient satisfaction statements on a scale of 1–7 (where 1 = “Strongly Disagree”, 3 = “Neutral”, and 7 = “Strongly Agree”).

Statement	1	2	3	4	5	6	7
I am very satisfied with the care I received.							
The medical care I received was excellent.							
The care was just about perfect.							

## PART I: PATIENT EMPOWERMENT EXAMPLE

20. Please provide an example of a situation where seeking and/or sharing health information online using the Internet made you feel empowered? (OPTIONAL)

Thank you for your time!!!