

Patients' Computer-Mediated Communication Media Uses and Gratifications in Healthcare

Full paper

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Abstract

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. According to a 2011 Pew Internet Study, more than 59 percent of adults have searched online for health information (Fox, 2011). What is not clear in literature is why patients seek health information online and why patients share health information online. This study informs the academic and practitioner community on the motivations and barriers for seeking and/or sharing health information online by providing a rich explanation of such behavior through an interpretive exploration involving patients who engage in such behavior.

Keywords

Healthcare, patient-perspective, CMC media, uses and gratifications.

Introduction

The proliferation of the Internet and the number of connected devices to the Internet has resulted in widespread use of Computer-Mediated Communication (CMC) media by patients 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. 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 1.

Topic	Percentage of Users Who Searched for the Topic
Specific Disease	63%
Medical Treatment	47%
Diet and Nutrition	44%
Exercise	36%
Medication Issues	34%
Depression	21%
Doctor or Hospital	21%

Table 1. Commonly Searched Health Topics (Source: Pew Internet, 2005)

What is not clear in literature is why patients seek health information online and why patients share health information online. 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 and Rubin, 2000; Stafford, Stafford, and Schkade, 2004; Walther and Hancock, 2005). However, there is a scarcity of research that applies the Uses and Gratifications perspective in the healthcare context to identify patients' motivations for using different communication media to seek and to share health information 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. By using the Uses and Gratifications perspective, this study seeks to address these gaps in information systems (IS) research.

CMC Media Research in IS Literature

CMC media use has been studied in a wide variety of contexts in the IS literature. Table 2 presents a sample of CMC media related research in the IS literature (since 2010).

Research Domain	Literature	Use of CMC Media
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
Strategic Communication	George, Carlson, and Valacich (2013)	Understanding why people select the media they choose for a particular type of communication
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
Feedback and Coherence	Wilson and Djamasbi (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

Table 2. Sample of IS Research Investigating CMC Media Use (Since 2010)

Based on the literature review, there was a scarcity of studies that focus on patients' motivations for using CMC media. This study seeks to fill that gap in literature.

Theoretical Foundation

The theoretical foundation for the study are presented in this section. Technology use has been studied extensively in the IS literature using a variety of theoretical foundations such as Rogers' diffusion of innovations theory (Rogers, 1995) and Davis' Technology Acceptance Model (TAM) (Davis, 1986; 1989). 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.

Uses and Gratifications Approach

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 and Tan, 2009). Content gratifications relate to the message carried by the medium (Cutler and 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 and Tan, 2009). Process gratifications relate to the actual use of the medium itself (Cutler and Danowski, 1980). Social gratification refers to people's use of a particular media purely for interacting with other people (Mendes-Filho and Tan, 2009). Social gratifications relate to the social interaction allowed by the medium (Stafford et al., 2004).

The Uses and Gratifications theory has been widely used to explain media use in the field of communication studies (Guo et al., 2010; Papacharissi and Rubin, 2000; Stafford, Stafford, and Schkade, 2004; Walther and 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.

In this study, 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.

Research Methodology

An interpretive approach using a qualitative methodology was used to answer the research questions in this study. 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).

Data Collection

A total of 14 in-depth interviews were conducted with patients of a regional healthcare provider. The CEO of the regional healthcare provider was contacted and the goal of the study was communicated to her. Once she bought in to the research project, she was asked to distribute a recruitment flyer to all patients in her hospital. The patients that were interviewed were the ones that saw those flyers and responded stating that they were interested in participating in the research study. Most of them are working professionals who indicated that they are active users of CMC media such as the Internet, blogs, social networks, mobile devices, and the patient portal (eClinicalWorks) provided to them by the healthcare provider. The goal of the interviews was to explore patient motivations for seeking and/or sharing health information online using CMC media. All interviews were conducted face-to-face. The sample size for the interviews was based on literature (Creswell, 2007; Guo et al., 2010; Tan and 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.

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 and content analysis.

Coding

The first step in the qualitative analysis is coding (Rubin and Rubin, 1995). Saldaña (2009) defines a code as "a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (p. 3). The process of coding is

further subdivided into three types of coding: descriptive coding, topical coding, and thematic coding (Richards, 2005). Descriptive coding is the first step in the coding process (Richards, 2005). Descriptive codes contain demographic information about the interview candidates. The descriptive codes used in this study include the patients' age, gender, and ethnicity. Dedoose refers to demographic information as descriptor codes. The second step in the coding process is topical coding (Richards, 2005). 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. The third step in the coding process is pattern coding (Richards, 2005), where the codes identified during the topical coding process are grouped into categories based on theoretically determined categories (Brewerton and Millward, 2001), resulting in a smaller set of themes for the next coding cycle (Saldaña, 2009). 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 4 categories are used as patterns to group the codes identified in step 2. The pattern coding categories are presented in Table 3.

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

Table 3. Pattern Coding Categories

Content Analysis

Content analysis allows making inferences from the text based on thematic patterns (Bernard, 1995). This step includes the three sub-steps of thematic coding, code frequency analysis, and code co-occurrence analysis (Brewerton and Millward, 2001; Krippendorff, 2004; Saldaña, 2009). 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 (Saldaña, 2009). 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 (Brewerton and Millward, 2001; Krippendorff, 2004). 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 (Saldaña, 2009). Dedoose allows the capability to do code frequency analysis and code co-occurrence analysis. In Dedoose, 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. A prerequisite for code co-occurrence analysis is application of multiple codes to excerpts or quotes from the interview transcripts. The next step is to do a code co-occurrence analysis. In Dedoose, the 36 codes are presented as both rows and columns with the intersection of each row and column referring to the number of times the two codes co-occurred with each other across all 14 interview transcripts. Data analysis results are presented in the following section.

Data Analysis Results

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

Demographics

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.

Codes

The initial coding process resulted in identification of 36 codes. A list of those codes categorized by the 4 pattern coding categories (from Table 3), the number of interview participants referring to the code during their interviews, and the frequency of occurrence of each code is presented in Table 4.

Category	Code	Interviews Containing Code	Frequency of Occurrence
Motivations to seek health information online	Clarification of issues	14	46
	Large quantity of information	12	28
	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
	Coping	9	16
	Usefulness of information	14	14
	Cost	8	12
	Control over interactions	8	12
	Synchronicity	7	11
	One to many communication	7	11
	Communication history	5	11
	Complexity of Issues	4	10
	File management	6	9
	Feedback	7	8
	Social influence	5	7
	Speed	3	3
Control over health	2	2	
Barriers to seek health information online	Reliability of information	13	46
	Range of information	11	28
	Accessibility	10	26
	Ease of use	10	25
	Familiarity of communicators	5	5

Motivations to share health information online	Information sharing	12	21
	Not feeling alone	9	17
	Encouragement	7	14
	Personalness of interaction	5	12
	Awareness	8	10
	Altruism	6	8
	Anonymity	6	8
	Venting	5	8
Barriers to share health information online	Privacy concerns	14	28
	Codification effort	7	12

Table 4. Codes by Pattern Coding Category and Frequency of Occurrence

Motivation and Barrier Codes Categorized by the Uses and Gratifications Theory

Based on careful analysis of the 36 codes using the three Uses and Gratifications dimensions of content gratifications, process gratifications, and social gratifications, 7 themes emerged. The 7 themes, their frequency of occurrence in the interview transcripts, and their meaning are presented in Table 5.

Gratification	Theme	Frequency	Meaning
Content gratifications	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
Process gratifications	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
Social gratifications	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

Table 5. Themes, Coding Frequencies, and Definitions

Sample Quotes from the Interview Transcripts for Each Theme

Table 6 presents a sample quote from the interview transcripts for each of the seven themes that were identified in Table 5.

Theme	Sample Quote from Interview Transcripts Representing the Theme
Media-enabled health information seeking online	<i>"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."</i>
Health output quality produced by media	<i>"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>
Media-enabled convenience	<i>"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>
Media-enabled connectivity	<i>"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>
Media-enabled health information sharing online	<i>"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."</i>
Media-enabled health problem solving	<i>"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>
Media-enabled health-related communication and control	<i>"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."</i>

Table 6. Sample Quotes from the Interview Transcripts for Each Theme

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. Feedback from interview candidates indicated that the interview transcriptions and the dimensions that emerged out of those transcripts were accurate, and hence the data analysis results are 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 and 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. The auditor was satisfied with the rigor followed in data collection and data analysis procedures.

Discussion

The goal of this study was to identify the motivations and barriers to health information seeking and/or sharing online. Based on the results of the qualitative study, 36 codes related to patients' motivations and barriers were identified. Using the Uses and Gratifications perspective as the theoretical background, the 36 codes were then categorized into 7 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 7 themes were further categorized into the three Uses and Gratifications dimensions of content gratifications, process gratifications, and social gratifications (Stafford et al., 2004).

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 and Danowski, 1980). Factor analysis results from this research 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*.

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 and Danowski, 1980). Factor analysis results from this research 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 since not enough items loaded on to that factor.

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 this research 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*.

The differences between the motivation dimensions identified in literature (Guo et al., 2010; Papacharissi and 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.

Implications and Conclusion

This research offers key insights to both the academic and the practitioner communities by investigating the motivations and barriers to health information seeking and/or sharing online using CMC media.

Implications for Research

This research addresses several gaps in the literature. First, 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 addresses that gap in literature by investigating the role CMC media plays in

patient health information seeking and/or sharing online. 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, several studies (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 and Rubin, 2000; Stafford et al., 2004; Walther and 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.

Implications for Practice

This research offers several useful outcomes for the practitioner community as well. First, it highlights the important role that CMC media plays in allowing patients to seek and/or share health information online. One of the main goals of healthcare providers is to improve their patients' health and wellbeing. This research shows that CMC media can be used as a key mechanism to achieve that goal. This research confirms the argument made by McKemmish et al., (2009) that timely access to quality information has emerged as a significant factor in better patient health and lifestyle outcomes. Second, once healthcare providers understand how CMC media enables patient health information seeking and/or sharing online, they can invest adequate resources in information-based intervention mechanisms that can help increase patient satisfaction.

Limitations

The study used convenience sampling since patients of a local healthcare service provider were targeted for the interviews. As a consequence, the generalizability of the study's findings is limited to samples which are similar both in size as well as the demographic distribution to this study.

Conclusion

In this study, 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. This study helps understand the role CMC media play in health information seeking and/or sharing online thereby addressing calls from IS researchers to focus on the consumer-perspective on the use of health information technology.

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