PATTERNS OF ACCESS AND USE OF ONLINE HEALTH INFORMATION AMONG INTERNET USERS: A CASE STUDY

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ABSTRACT

Srinivas Melkote, Advisor

Internet and Information Technology have contributed immensely to an ever-changing information structure, especially in healthcare. Medical practitioners, healthcare professionals and health communication researchers alike find themselves in an evolving discourse of aware and empowered health consumers instead of patients. Increasingly, health is being looked upon as an individual responsibility, and health information is playing an important role for responsible health seekers. The basic purpose of this study was to explore factors that are related to or predictive of patterns of access and use of online health information among Internet users in Northeast Ohio. In addition, the study examined the relationship between behavior modifications and access to online health information, as well as sources of online health information and credibility of sources.

Of the 521 respondents of this study, 441 were health seekers. The results of the study showed that ease of information seeking, feeling empowered, self-health management and support from the online community were powerful motivators for health seekers. The study showed a positive relationship between health-related behavior modifications and access to online health information. Results also showed that health seekers are more likely to choose sources of online health information that can generally be considered reliable.

Additionally, the study showed a positive relationship between access to online health information and Internet self-efficacy of health seekers. The study showed that people are more likely to access online health information if they suffer from chronic disease or disability, if their loved ones suffer from chronic disease or disability and if they suffer from nagging health
concerns. Access to online health information was explained by feelings of empowerment, support from the online community, cognitive involvement, and lower age. Use of online health information was explained by ease of information seeking, feelings of empowerment, support from the online community and the positive outcomes related to use of Internet for networking and learning.

For health communicators and health professionals, findings confirm the emergence of an empowered consumer, and hence imply that in content and in format, health information will have to cater to an increasingly involved and aware audience. Health information from online sources is a significant component of people’s self-health plan and results show a positive relationship between health-related behavior modifications and online health information. Health professionals and health consumers should work together to integrate online health information into a larger overall health plan.
Dedicated to my grandparents
Late Shri Shashikant Jagad and Late Smt. Manorama Jagad,
and
Late Shri Madhavrao Kavathe and Smt. Pramodini Kavathe
for teaching me the importance of being educated, aware, motivated and involved.
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“Go online,

Use common sense,

Be Skeptical.”

~Susannah Fox,  
Associate Director, Editorial  
Pew Internet and American Life Project
CHAPTER 1. INTRODUCTION

Internet and Information Communication Technologies (ICT) are an indispensable part of the world we live in today. From shopping to entertainment to information, for many of us, whatever we want or need is at our fingertips just a mouse-click away. However, what truly defines us as an information society is not only the free exchange and availability of information, but also our belief that knowledge and information are, indeed, power. Eysenbach (1999) suggests that the advent of the Internet has been the "most profound change in communication since Gutenberg," (para. 2). Following the norms of technological determinism, Eysenbach posits that content is following form, and this brings about significant changes in the structures of thought. Effectively, the Internet has made possible a structure that allows for changing power centers.

Post World-War II, the world underwent a structural transformation from being a manufacturing society to an information society. Castells (2006) indicates that this transformation is a multi-dimensional process that resulted in an emergence of a new technological paradigm based upon Information Communication Technology (ICT). In fact, Castells continues, in this new world structure, "technology doesn’t determine society: it is society," (p. 3). While information has always been critical to growth and society in any historical period, the information society is particularly characterized by production, consumption, and comprehension of information in almost all areas of modern culture.

The advent and the subsequent popularity of the Internet in the last decade have substantially changed media consumers and their media consumption habits. According to a study conducted by Cole (2006), Internet users are less likely to watch television, spend more time on the Internet for their information needs and attribute their increased productivity at work and better communication skills to their online habits. The existence of the information societies rests entirely on communication networks, and the widespread popularity of Internet and ICT
among millions of users have ensured the obsolescence of national and other geographical boundaries. Additionally, users of these communication technologies are both consumers and producers of content, leading to a materialization of what Castells (2006) calls “self-directed mass communication” (p. 3), for it globally diffuses through the Internet and is often initiated by individuals almost entirely sidestepping the mainstream media process.

In global or local contexts, ICT has not been accessible to everyone equally, or simultaneously. But communication scholars are also interested in ICT beyond the questions of physical access; its socio-cultural significance has considerably piqued academic interest.

Internet and computer-mediated communication have emerged as powerful tools to track social and economic progress of nations in transition (Cardoso, 2006). Castell (2006) suggests that the essence of information technologies is not just in its structure, but its usage: where, by whom, for whom, and most importantly, to what end?

Information seeking on the Internet

Research suggests that consumer information seeking is a popular behavior among Internet users (Keum & Cho, 2003; Peterson & Merino, 2003), and that 91% of all Internet users have delved into information seeking at one time or another (“Internet use,” 2007). In fact, according to Cole (2006), Internet users tend to turn to online sources of information more than any other source of information. Kivits (2004) argues that information seeking has become central in all activities of life, indicative of information societies that we now inhabit. Several different factors contribute to the increasing popularity of online information seeking. Those studied by Mittman and Cain (2001) suggest that current users gravitate toward online resources because new consumers have characteristics that make them unique, like more disposable income, higher education and easy access to computers. In addition, they have had varied online
experiences like online shopping and email, and they understand Internet as a functional, inexpensive, and an easy-to-use medium that works well across time and space.

Online information seeking is appealing not only because of the characteristics of the users, but also due to the advantages the medium itself has to offer (Murero & Rice, 2006). Online resources allow for quick access to easily understandable information in diverse areas, with multiple viewpoints, and with alternative options. Moreover, as Freeman and Spyridakis (2004) suggest, information on the Internet is available 24/7, to answer without judgment questions that may be private or personal in nature.

Peterson and Merino (2003) suggest that the popularity of online information seeking is primarily due to the availability of large volume and variety of information with minimal expense of time, effort, and money. Furthermore, the authors continue, online information mimics (in its content and format) information available from a variety of sources like mass media (television, radio) as well as interpersonal sources (co-worker, relatives). In an effort to get unbiased health-related information, users are also reaching out to independent sources like news media, universities, and not-for-profit organizations.

Internet as a health information resource: why is this significant?

With a vast array of websites that offer health-related services (information, diagnosis/prognosis, support), health-related content has never been so easy to access, understand, and reproduce by millions of Internet users. This highly visible turn of the information revolution has effectively contributed to a changing nexus of knowledge sharing and dissemination in the fields of health and medicine, where the laypersons are no longer barred from the world of medical expertise.

This fairly recent development in the field of healthcare is largely due to the fact that new communication technologies provide easy, low-cost access to health communication, with the
added advantage of bringing together communities and health groups globally to share
information and resources (Banerjee & Hsi-Shi Leong, 2006). Additionally, Lewis (2006) points
out that increasingly, health issues are being discussed in terms of individual responsibility
instead of them being the responsibility of the government or the larger society. From television
to print to websites, the general discourse is about promoting an empowered, self-aware
individual as “essentially self-managing and self-monitoring subject” (p. 521). Subsequently, it is
imperative within the field of healthcare to study the opportunities and challenges that the current
online health information scenario provides. However, little research exists to ascertain whether
this health-related content is being used, how it is being used and how relevant and reliable this
freely available information is.

Eng (2005) writes of population health models that focus on health issues that affect
communities and a larger population, with an emphasis on prevention. Population health
technologies support the population health model, and consist of applying emerging technologies
for the benefit of the health of the population. Using cancer as an example, Eng suggests that
online technologies have the potential to develop health interventions that utilize a collaborative
multidisciplinary approach to address the larger issue of prevention and good health. The author
also writes that with further development, emerging technologies will allow for true
customization of health information for each individual, taking into account the environmental
and socio-cultural context while discussing individual healthcare scenarios.

With the advent of ICT, the field of health communication has reached a new era of
health communication as “the interaction of an individual—consumer, patient, caregiver or
professional—with or through an electronic device or communication technology to access or
transmit health information,” (p. 1264), and one of the most common indicators of interactive
health communication is information seeking by interested individuals.
Brashers, Goldsmith and Hsieh (2002) suggest that recent literature in the field of health and wellness highlights the importance of information and information management as one possible response to illness-related uncertainty. The authors define information as “stimuli from a person’s environment that contribute to his or her knowledge or beliefs,” (p. 259) and information management as “communicative and cognitive activities such as seeking, avoiding, providing, appraising and interpreting those environmental stimuli,” (p. 259). Illnesses often cause information related needs not only for those who are ill but also those around them in order to formulate effective coping strategies. Cullen (2006) explains that health information is, “any information related to the practice of medicine and healthcare. This includes knowledge of human anatomy, physiology and pathology, and the maintenance of good health and treatment of disease, as well as information related to patient care, such as patient records and epidemiological databases.” This broad working definition of health information allows the inclusion of several aspects of health and wellness that users might be seeking.

In addition to self-health management, online health information seeking affects patient-physician communication as well, with patients bringing to their office visits the knowledge they gain from their web navigations (Wald, Dube & Anthony, 2007). The advantages and disadvantages to this dynamic development are numerous, but the authors agree that use of online information helps strengthen doctor-patient relationships particularly if doctors steer their patients in the direction of credible and relevant information. Online health information has also greatly contributed to effective patient-doctor relationships with technology like email and more informed discussions between health professionals and patients. Moreover, online information seeking has led to reduced healthcare costs, particularly for those who are under or uninsured (Murero & Rice, 2006).

A significant consideration in the availability of online information is the economics of online publishing. Although information may be expensive to produce, with low marginal, fixed
and publishing costs, the overall expense is minor particularly when compared to the conventional business of publishing (Cullen, 2006). Effectively, Cullen suggests, the maintenance of the website is the only major cost a producer will have to bear. Online health information contributes to the development of the informed citizen, who is able to participate in development processes and is responsible for his/her own health and wellness. Audio-visual aspects can also be included online which is a considerable step forward from print-only information.

This is not to say that all is well in the virtual world of publishing economics, particularly since intellectual property rights are very easily risked. Nevertheless, on the whole, online health information has made knowledge accessible to those who actively seek it in better formats with greater ease. By making room for discussion and support, online spaces help patients feel empowered to deal with their own situations, all with an added aspect of anonymity for those who want it (Murero & Rice, 2006). Without geographic constraints, medical information and research diffuse faster, and can be tailored to individual needs thanks to interactive web designs.

Frequent web users are drawn to Internet based on their experiences, and positive experiences lead to further use. According to a study conducted by Leung (2008), online health information seeking impacts how users determine the role of Internet in their lives. Health seekers with high scores on expectancy values of health information websites (i.e. expectations of online health information especially in terms of relevance of the information and its quality) tend to perceive the Internet as being embedded in their lives. This link between Internet embeddedness and online health information seeking is a significant finding in light of the discourse of empowered consumers.

Fox (2008) suggests that it is not only convenience that draws users to online health information seeking, but the positive experiences people have. Acknowledging that online health information poses some risks to users’ health, the general consensus is that online health
information seeking has yielded positive results, and most users respond that they or someone they know have been helped by online health information. On the flip side, online information may be a refuge or final resort for some patients. Craan and Oleske (2002) identify that consumers turn to the Internet out of desperation or alternative resorts (especially for terminally ill patients), to empower themselves, for social support, to look for alternative providers, or for privacy and anonymity for extremely personal questions. They may also be looking at health information on the Internet to save money, due to lack of insurance, unavailability of their doctors or for information for friends or relatives.

Consumer health information websites

Cullen (2006) divides the broad world of health information into two distinct areas: clinical information and consumer health information. Clinical information consists of largely refers to evidence-based medicine and healthcare, and consists of clinical experiments and research published in peer-reviewed journals and other publications. The second area, and more relevant to this study, is the area of consumer health information. Consumer health information consists of both popular and academic literature, formatted and written for easy access and use without a heavy scientific jargon. According to Cullen, the volume of clinical information is much larger that of consumer health information.

As of May 2009, EBizMBA Inc., a web-based company offering e-commerce tools and solutions, ranked 20 most popular consumer health information websites based on Inbound Links, Google Page Rank, Alexa Rank, U.S. traffic data from Compete (a web analytics company) and Quantcast (an Internet ratings service) (“20 most popular,” 2009). Leading the pack is WebMD with over 19 million estimated monthly visits, followed by the National Institute of Health’s (NIH) website in second place with 8 million estimated monthly visits. The third place went to Medicinenet.com which is operated by WebMD, and has affiliated content
with 5 to 7 million visits. The Mayo Clinic website came in fourth attracting between 6 to 8 million visits monthly. Other websites in the top 20 range from general interest websites (e.g. everydayhealth.com, healthline.com) to specific information on prescription medicines (e.g. drugs.com, Rxlist.com), health living and lifestyles (e.g. RealAge.com, diet.com) or cater to special audiences (e.g. menshealth.com). WebMD, NIH and Mayo Clinic are fairly representative of the content of consumer health information websites, and therefore, a brief description of these three websites follows for a clearer understanding of the kind of information and formats of health content users generally access.

WebMD

Providing a gamut of information and personal health-management services, WebMD is one of the most prominent websites on the Internet; Time Magazine counts WebMD among the top 25 websites we cannot live without (“25 sites,” 2008). WebMD’s credibility and popularity comes from its independent medical review board that comprises MDs and MPHs and its affiliation with MedicineNet.com, a panel of U.S. Board Certified physicians and allied health professionals working to provide quality health information. Content on WebMD can be roughly divided into information and interactive content. The home page consists of multiple options that cater to a variety of audiences in print and audio-visual formats. The website features general health information, specific search options, information specific to men, women or children, a section on drugs and prescription and latest headlines from health and medicine world. Information content consists of current events, medicine, healthy living/lifestyle issues and general human interest stories. News related to health or disease in media promptly gets featured in the news section of WebMD along with comments from experts and implications for general public. The website clearly has a unique strategy in catering not only to specific information seekers, but also to those who are interested in health in general. Examples of a few include a
step-by-step breakdown of the presidential candidates’ health plans, a detailed explanation of Kawasaki disease (in light of actor John Travolta’s son Jett Travolta’s death), Patrick Swayze’s battle with pancreatic cancer and detailed updates on Salmonella and E-Coli contaminations.

On the interactive side, WebMD’s symptom checker allows users to graphically pick and choose symptoms and reach a diagnosis. Users can take quizzes related to topics on fitness/health, seek answers to their questions from experts, and access blogs/discussion boards from other community members discussing various health-related topics. WebMD also provides its users options of finding treatment facilities, a doctor/physician or health solutions from its sponsors. The WebMD Corporation manages other health websites besides WebMD.com like MedicineNet, Medscape, RxList, eMedicine and eMedicineHealth.

National Institute of Health Website

The National Institute of Health is part of U.S. Department of Health and Human Services, and is a federal agency that conducts and supports medical research. The NIH website features, in addition to consumer health information, information about clinical trials, highlights of cutting-edge research, information about grants and support, and a direct link to Medline Plus (Medline Plus is a service of National Library of Medicine and NIH to provide reliable health and medicine related information). The section on consumer health information has various navigation links for child and teen health, men’s health, women’s health, health information related to ethnic minorities, seniors’ health and healthy lifestyles. Users can browse the extensive NIH database by subject or by illness. Like many other websites, NIH has content in various formats: print, audio-visual and even features the NIH online radio.

Mayo Clinic Website

The Mayo Clinic is a not-for-profit medical practice ranked number two in the United States by U. S. News and World Report (“Best Hospitals Honor Roll,” 2009). MayoClinic.com is
a special web component of the Mayo Clinic that caters specifically to an audience looking for information to manage health and practice healthy lifestyles. Of the three web components of Mayo Clinic, MayoClinic.com supplies information on 35 disease and lifestyle categories. The other two are the hospital website, MayoClinic.org, and the research and education component, mayo.edu. The website allows users to browse information by disease, by symptoms, by subject or by interest. There is a first-aid guide to handle medical emergencies, and users can also direct their questions to Mayo Clinic professionals. MayoClinic.com offers its content in different media formats like print or audio-visual, and even allows its users to download podcasts, blog, post messages on discussion boards, or sign up for newsletters.

Most websites follow formats of the websites discussed above, offering content in multiple media formats, on a variety of health and wellness topics. Health information websites, particularly the credible and reliable ones, aim to promote healthy living as a lifestyle change targeted particularly at individuals who actively seek information. This echoes sentiments in literature about empowered patients and people taking responsibility for their own health status.

Health Information Seeking in the United States

The Pew Internet & American Life project, an initiative of the Pew Research Center has been conducting Internet related research in the United States (US) since 2000 to provide a current and clear picture of the online environment in the country. General demographics of Internet users reveal that around 71% of US adults use the Internet and about 87% 18-29 year olds are online. Ninety-one percent of those who make over $75,000, and over 91% of college graduates use the Internet (“Demographics of Internet Use,” 2007). Of the 71% US adults online, according to their February-March 2007 survey, 80% have looked for medical or health information online (“Internet Activities,” 2007). The Pew report puts health information seeking at the fifth place as the most typical activity to conduct online; email, search engines, maps and
directions, and information on hobbies/interest precede health information as the top four
activities respectively.

Based on the literature available, the profile of an American health seeker is that of an
educated, 20-40 year old woman with an interest for herself or her loved ones, and who is aware
of the pros and cons of online health information. Over the past decade or so, the number of e-
health seekers has been steadily rising in the US. A poll undertaken by Harris Interactive, a New
York based healthcare research company, which surveyed 1,015 US adults (aged 18 and over)
across the country reveals interesting results about the use of health information, frequency of
access and reliability of sources (“Number of Cyberchondriacs”, 2005). Six in 10 US adults say
they have looked for health information often or sometimes. Eighty-five percent of those who
have accessed health information online had done so in the preceding month, and the average
number of information searches amount to seven times a month. Nine in 10 cyberchondriacs—
US adults who go online for health information—believe that the information they found online
is very reliable or somewhat reliable. Users often bring up online health information in
discussion with their health-care providers, or supplement the online information with details
provided by their doctors.

Fox and Fallows’ (2003) report for Pew is based on an online survey of 2038 US adults
aged 18 and older describing Internet health behaviors. Their numbers suggest that 93 million
Americans have searched for at least one of the pre-set 16 health topics online. Health seekers go
online with specific queries related to health and medicine, surgeries, appointment preparation,
information sharing or offering support. Women (85%) and men (75%) are the primary
consumers of online health information. Although a popular activity, health information seeking
is not a frequent activity for most users. Health seekers report a positive relationship with their
healthcare providers, and find support in online groups. However, they report being dissatisfied
with the amount of relevant information they find online and tend to seek more information.
Current health status and personal situations largely determine the extent to which the Internet is considered a crucial resource for information (Madden & Fox, 2006). Around a fifth of US adults report suffering from a chronic illness or disability, and around half of those use the Internet regularly (Fox, 2007). Of the Internet users, 86% have looked for health information online, and are more likely to report that their online searches affect their treatment options, their prescription choices and their discussions with their doctors (Fox, 2007). A survey of 1,931 US adults asked the role Internet played if and when faced with a loved one’s illness (Madden & Fox, 2006). Twelve percent of the population identified themselves as e-caregivers (who found information or solace online to cope with a loved one’s health crisis). The study revealed that 58% of caregivers said that they found the most important piece of information online, as opposed to 36% who said they found it elsewhere.

Concerns of quality, access and use

Information seeking behavior may be immensely popular, but it does not come without its own share of controversies. Concerns of security, uneven quality of information on the Internet, varied laws and regulations, and lack of a clear message have led many a user to shy away from the process (Mittman & Cain, 2001). Physical access to technology, ICT skills and support feature as well as hindrances to the use of Internet technologies (Cullen, 2006). Cline and Haynes (2001) suggest that information overload is of concern within the medical and academic community, primarily because of the sheer volume of information that exists, and with no real indication of organization.

Murero and Rice (2006) recognize that not all users are aware of how to search for information or, at times, even what to search for. The Internet is a social space with different types of people, including those who seek sensationalism or take advantage of online resources to fulfill personal agendas. The Internet bazaar often becomes an easy venue to peddle
unregulated drugs, unverified alternative medicines and quack cures. There are instances where human interactions and interventions are crucial, as in the cases of suicidal tendencies or eating disorders, and online information may reinforce such thoughts. Overarching all these concerns is the general feeling of trepidation toward the quality of online information.

Echoing some of the same sentiments evident in the literature and adding some more, Benigeri and Pluye (2003) state that the Internet does not provide all that it promises. In addition to quality of information and all that it implies, the disparity of access to Internet and the logistics of information searches on the Internet all feature as prominent obstacles to use of Internet online. Disparity of access in particular, is an important barrier, because according to a study undertaken by Pew Internet, 57% of those who do not access Internet say they do not plan to ever log on (Lenhart, 2000).

Within the US, there are no federal or consumer laws that govern the content of health information websites (Charatan, 2002). The FCC defends the lack of regulation by pointing toward the dynamic nature of the Internet that is due to the lack of government or monopolies controlling the content. However, several health expert groups, the most prominent of which are Internet Health Coalition and the American Accreditation HealthCare Commission (URAC) have drafted guidelines to ensure the quality and integrity of information online. Charatan (2002, p. 566) informs:

   The Hi-Ethics code developed by the Internet Health Coalition calls for health websites to declare that they will:
* Clearly distinguish advertising from health information content
* Design their health websites to avoid confusion between advertising and health information content
* Clearly disclose significant relationships between commercial sponsors and health information content

Despite these regulations, *buyer beware* seems to be the policy in the United States, and with freedom of speech, it remains the responsibility of the users to search for and evaluate the health information they find online.
On the other hand, the government of United Kingdom (UK) has made provisions to ensure that the quality of information on the Internet is consistent and the technology is accessible to everyone through the National Health Service (NHS) Plan (Eaton, 2002). The UK Department of Health is beginning to focus on quality information as a necessary precursor to new partnerships between patients and health care providers (as cited in Henwood et al., 2004). Consumer health information is an important target area particularly in light of “eight minute consultations,” (p. 75), and the role of new media technologies, like Internet, and their potential for delivering and communicating health information, which is a significant consideration. Health and wellness experts recommend that the public should receive guidelines from the government regarding the quality of information online (Eaton, 2002). NHS Direct Online has monitored non-government websites linked to its site in the past and is in the process of developing a rating system. This system is one of a kind, and is in its earliest stages. However, experts claim that UK standards for information quality on UK websites are one of the highest in the world.

These considerations of policy changes indicate a move toward change in the structure of the online health knowledge system as it exists right now. They acknowledge the emergence of an informed health consumer instead of just a patient and the role that Internet and information technologies are playing in the arena of healthcare. Purcell, Wilson and Delamothe (2002) however, argue that the Internet varies largely as a medium, and owing to the differences in the use, content and needs of users of health information online, a uniform regulation policy is not the answer to consistent content on the Internet. In fact, according to the authors, medical content on the Internet scrutinized through systematic and scientific consideration is more apt to meet high journalistic standards. Such differences lead the authors to believe that education both on the part of producers and users and not regulation is the key to quality content on the Internet.
Insights from the literature

Literature in the field primarily discusses who seeks information on the Internet (based upon both demographic as well as need-based factors), how they seek information (insights about the actual search process) and why they seek online health information (factors that motivate online information searches). Finally, scholars are dedicated to dealing with questions of credibility and reliability.

Health seekers are generally aged between 25 and 54 (Dolan, Iredale, Williams, & Ameen, 2004), although Al-Shammary, Awan, Butt, & Yoo (2007) place users in an even narrower 30-40 age range, with most users being women, as does Larner (2006). Additionally, women turn to the Internet more frequently than men do, even if only marginally (Al-Shammary et al., 2007; Delic, Polasek, & Kern, 2006; Larner, 2006). Morahan-Martin (2004) suggests that having children under the age of 18 still living at home is a significant predictor of Internet use for health information. In addition, those with a chronic illness are also more likely to turn to the Internet for health information (Al-Shammary et al., 2007; Morahan-Martin, 2004). Harris and Wathen (2007) suggest that while those with an urgent health concern turn to their medical providers for assistance, those with a nagging health concern are more apt to look for clues online.

Scholars argue that seeking online health information is part of an emerging empowered patient (Iakovidis, Wilson, & Healy, 2004; Henwood, Wyatt, Hart, & Smith, 2004), and therefore users primarily access information for self-health management. Tang and Lee (2006) suggest that users who seek online health information do so specifically to obtain multiple views and considerable amounts of information that can help them to reach decisions themselves. Furthermore, health seekers often use the information they find online in discussions with their doctors and primary healthcare providers (Al-Shammary et al., 2007; Delic et al., 2006; Dolan et
al., 2004; Morahan-Martin, 2004). Current health status of users (disability, present state of health, a new diagnosis, general health awareness and so on) is identified as a significant motivation for online health information seeking according to studies conducted by Bundorf, Baker, Singer, & Wagner (2004), Goldner (2006) and Morahan-Martin (2004); in fact, the sick and disabled use Internet more frequently than their healthier counterparts (Goldner, 2006). Additionally, Bundorf et al. point to lack of insurance or underinsurance as a factor that motivates online information searches. Delic et al. (2006) suggest that most users seek online information after a diagnosis and to fill in information gaps after they visit their doctors/healthcare providers.

Akesson, Saveman, & Nilsson (2007) suggest that users turn to the Internet for not only for education and information through content, but also through support and help from other users. Support and help is also a significant motivator of Internet use according to Mittman and Cain (2001), who also predict changes in the structure of information with growing popularity of online information searches. Rice (2001) finds that the interactivity of the Internet is what attracts high-involvement users, while Hardey (2001) suggests that the medium allows users to be producers as well as consumers of health content, which motivates users to come to the Internet for information over and over again. According to Rains (2007), users turn to the Internet due to lack of trust in their healthcare providers, or because of inaccurate or inadequate information from other traditional sources of information.

As far as the actual search process is concerned, users tend to use search engines, use short phrases, and rarely check other than the first page of results (Eysenbach & Köhler, 2002; Morahan-Martin, 2004). Toms and Latter (2007) find that the formulation of the search query is a process of trial and error, and the study was conducted with participants familiar with the working of Internet search processes.
Internet emerges as a primary source of information for cancer patients in the United States (Mayer, Terrin, Kreps, Menon, McCance, Parsons, & Mooney, 2007) as well as for HIV/AIDS patients (Benotsch, Kalichman, & Weinhardt, 2004). However, research suggests that this population is especially vulnerable to misinformation or low quality information, particularly if patients are from a group with low income or low education. This, among other reasons, makes credibility of online content a growing concern.

An entire section of literature deals exclusively with the credibility and reliability of online health information. Specifically, scholars are especially concerned over the lack of clear indicators of reliable information (Eysenbach, Diepgen, Muir Gray, Bonati, Piero, Pandolfini, & Arunachalam, 1998; Lewis, 2006; Seale, 2004b) and over the general lack of desire to get quality information despite users reporting the contrary (“Vital signs,” 2002). Kim, Eng, Deering, & Maxfield (1999) found that of the 165 criteria they found on evaluation of health websites, 30 dealt with concepts of information quality and reliability.

Peng and Logan (2005) found that users often judge the quality of online information based upon what they know from past experiences or from previous perceptions. Eysenbach and Köhler (2002) reveal that none of the participants of their study checked the “About us” sections of their websites, and had little knowledge of the source of the information. In addition, they had little memory of where they accessed the information they did. The study conducted by Bates et al. (2004) yielded similar results where they found that the credibility of the websites chosen for the study was not really a concern for the users.

However, there might be more to the quality debate than just the quality of websites, Marton (2003) suggests that relevance of information may have something to do with why users access particular websites. The researcher suggests that demographics may play a more important role than just determining who uses the Internet for health information; they may also be helpful in providing information on why users use the websites they do.
While considerable work exists in the field, scholars are calling for more specific research examining not only what motivates users to look for online health information, but also what users are doing with this information and how it affects their health behaviors (Brown & Walsch-Childers, 2002; Napoli, 2001). Understanding that the Internet is one of many sources that users can go to, Rains (2007) calls for an assessment of source preference and motivations of Internet use in comparison with other sources of information, and particularly factors that affect user reliability and credibility in online information as opposed to information from other sources.

Theoretical framework

The theoretical framework of the study is provided by the popular theory of uses and gratifications. In the realm of audience analysis theories, uses and gratifications represented a major shift in perceptions of media consumption. Uses and gratifications changed the role of audiences from passive receivers to being active consumers of media. Katz, Blumler and Gurevitch (1974) first proposed that audience members generally use and select media to fulfill specific expectations and needs, and that these specific needs have particular social and psychological origins. Eventually, further research revealed that audience members are in between being active or passive, and this distinction is important to understand audience behavior and motivations (Rubin, 2002). In addition to research on audience motivations that determined selection of one medium over another that was the sole focus of initial research in the field, recent research also takes into consideration the appropriateness and effectiveness of the chosen medium, and how various media fulfill various expectations of audience members.

Scholars like Rubin (1993, 2002), Papacharissi & Rubin (2000), and Ruggiero (2000) have contributed significantly to the revival of uses and gratifications as an important framework to study new and emerging communication technologies. The interactive and user-oriented
nature of Internet (Ruggiero, 2000; Stafford et al., 2004) and the role of consumer motivation in study of health communication (Dutta-Bergman, 2006a) make compelling arguments for application of uses and gratifications in scholarship of health and Internet. Literature suggests studies that examine application of traditional media gratifications to Internet (Ko et al., 2005, Tewksbury & Althaus, 2000) as well as those that explore new gratifications for new communication technologies (Papacharissi & Rubin, 2000, Stafford et al., 2004). In both cases, the need for information appears as a significant gratification sought by Internet users.

An important part of uses and gratifications is the distinction between gratifications sought, and perceived gratifications obtained through media use. Gratifications sought are the motivations behind media use, whereas perceived gratifications obtained were the resulting outcomes of media use (Katz, Blumler & Gurevitch, 1974; Palmgreen, Wenner & Rosengren, 1985). Research shows that the perceived gratifications obtained may not be the ones that were originally sought, although they are highly correlated. This study seeks to explore gratifications sought through Internet, and provides a future opportunity to examine perceived gratifications obtained.

In addition to uses and gratifications, this study also looks at two constructs derived from the Social Cognitive Theory, perceived Internet self-efficacy and outcome expectancy, as factors in understanding information seeking behaviors. Bandura (1995) describes self-efficacy as confidence in one’s own ability to perform a given undertaking. Bandura (1997) suggests that different people with the same skills or the same person in different circumstances perform differently depending upon differences in their beliefs of personal efficacy. Eastin and LaRose (2000) found that self-efficacy plays an important role in determining Internet usage, where Internet as a technology may prove complicated for some people. Therefore Internet self-efficacy may play an important role in determining the motivations behind online health information seeking. On the other hand, outcomes are the consequences of the acts, and outcome expectancy
is the likely consequence people expect will occur as a result of their undertaking an act (Bandura, 1986). From a socio-cognitive perspective, behavior is determined by the outcomes expected. Positive outcomes encourage behavior, while negative outcomes deter it. Whether or not people look at online health information would, therefore, depend upon the outcomes they expect from their behavior.

How individuals interpret messages depends on the degree to which they are involved with the topic or issue (Chaffee & Roser, 1986). Hence involvement has been added as a theoretical construct. Involvement can be cognitive, affective, behavioral (Chaffee & Roser, 1986) or informational (Katz, Baum & Wideman, 1980). Rains (2008) suggests that individuals may vary their consumption of health information depending on how involved they are with their own health. For the purpose of this study, scales to measure involvement will be administered containing components of cognitive and behavioral involvement.

Objectives, Hypotheses and Research Questions of Study

In an effort to better understand the motivations behind Internet use for health information and the implications this would have on the larger healthcare agenda, this exploratory research project was the first step in a comprehensive web-based health service research agenda that will be useful for design and will further effective use of communication technology in the field of health. Based upon the background information, the insights from the literature, the theoretical assumptions, and gaps in current research as indicated by scholars and practitioners, the following were deemed objectives of the study:

First Objective

The first objective of the study was to examine relevant and important factors that are related to and/or predictive of access to websites for health information. Influential factors were identified as gratifications sought, Internet self-efficacy, involvement (cognitive and behavioral), outcome
expectancies and socio-demographic variables (current health status, insurance, age, ethnicity). The outcome was to provide research results on predictors of information-seeking behavior, which would consequently facilitate creation of relevant content that is consistent with information seeking practices.

First, an exploratory research question was posited to draw a list of perceived gratifications sought.

**RQ1:** What are the perceived gratifications sought by health seekers when accessing online health information?

Additionally, the following hypotheses were included:

**H1:** There will be a positive relationship between Internet self-efficacy of health seekers and access to online health information.

**Justification:** Confidence in one’s own abilities to deal with a technology is crucial to relevant and effective access and use of the medium. Therefore, Internet self-efficacy has been identified as an important element of online information seeking. In addition, it has been identified as a significant variable in determining health behavior changes and behavioral intentions. Eastin and LaRose (2000) suggest that Internet self-efficacy is positively correlated to Internet usage. Torkzadeh and Van Dyke’s (2001) 17 point self-efficacy scale reveals that information technology use is not a function of technology, but that of self-efficacy. Bass et al. (2006) revealed that health seekers with higher Internet self-efficacy used the Internet directly and indirectly (sharing results with other people). Roberto et al., (2007) suggest that with higher Internet self-efficacy, not only is rate of Internet usage higher, but the adoption of healthy behaviors is higher too. Stavrositu and Sunder (2008) state that as far as Internet searches for information are concerned; self-efficacy was related not only to Internet usage, but also the medium’s credibility.
**H2a:** People are more likely to access online health information if they suffer from a chronic disease or disability.

**H2b:** People are more likely to access online health information if they have loved ones who suffer from a chronic disease or disability.

**Justification:** Internet is a significant source of information for users with current health problems or for those who suffer from a disability (Madden & Fox, 2006). Users use this information in discussion with their doctors as far as their treatment plans or prescriptions are concerned. According to Bundorf et al. (2004), those who are chronically ill are more likely to turn to the Internet for health information. Morahan-Martin (2004) identifies chronically ill patients as a group that is vigilant about different health options and finds most of the information online. Goldner (2006) differentiates the frequency with which sick and healthy people use Internet for health purposes, in that sick and disabled users tend to use online health information sources more frequently. In addition, Madden and Fox (2006) suggest that users who are primary caregivers or have loved ones who are ill or chronically disabled are also more likely to turn to the Internet to fulfill their information needs.

**H3:** People are more likely to access online health information if they suffer from a nagging health concern.

**Justification:** As explained in an earlier section, websites often contain material that helps with self-diagnosis through symptom trackers and other self-diagnostic facilities on health websites. It could be argued that self-diagnosis is popular with users who have nagging health concerns where they can track their symptoms in their private settings. The study conducted by Harris and Wathen (2007) supports this argument in their study of women in rural Canada, and Fox (2008) also found similar results of health seekers in the United States. While urgent health concerns were mostly resolved by primary health care providers and medical professionals, persistent and nagging health concerns were frequently looked up on the Internet.
**H4:** Access to health websites by health seekers will be predicted by gratifications sought, Internet self-efficacy, involvement, outcome expectancies and socio-demographic variables like age, ethnicity and gender.

**Justification:** Various research studies have pointed toward the importance of predictive variables that facilitate access to the Internet for health information. Papacharissi and Rubin (2000) found that motivations like interpersonal utility, pass time, information seeking, convenience and entertainment were predictive of Internet use. In a study examining how people use the Internet for information, authors found that gratifications sought (entertainment, surveillance and passing time) were important predictors of Internet usage (Tewksbury & Althaus, 2000). Self-efficacy and expected outcomes also appeared to be important variables in prediction of Internet use (Schwarzer & Fuchs, 1995; Eastin & LaRose, 2000). Bundorf, Baker, Singer and Wagner (2004) suggest that health seekers who derive greater benefits from health information (i.e. higher outcome expectancy) are more likely to use the Internet. Users with high information motivations engage in higher information seeking/surveillance behavior (Ko, Cho & Roberts, 2005). Tang and Lee (2006) argue that information seekers go online to specifically obtain multiple views and significant volumes of information, suggesting a heightened awareness of the health scenario in generally, and thus a case could be made for involvement (cognitive and behavioral) to be tested as a significant predictor. Socio-demographic variables including, age and gender, have been known to play an important role as evidenced by studies like Bundorf et al. (2004), Madden and Fox, (2006), Goldner (2006), Al-Shammary et al. (2007), Delic et al. (2006), and Larner (2006).

**Second Objective**

In the study, use was defined on a cognitive level, and this differentiation allowed predicting use as a distinct variable. The second objective of the study was to examine relevant
factors that are relevant to and/or predictive of use of information accessed by health seekers. Factors thought to be influential as suggested by the literature were gratifications sought and outcome expectancies. The outcome of this objective was to provide cognitive predictors of Internet usage. These predictors will be helpful to administrators by providing research based results that will enable content creation that is not only easier to access but also appeal to thought-processes of health seekers.

**H5:** Use of online health information accessed by health seekers will be predicted by gratifications sought and outcome expectancies.

**Justification:** Studies have shown that health seekers use online sources of information to fulfill certain needs, like education, information, support and so on (Akesson et al., 2007). Gratifications sought like support and help are significant motivators for health seekers to use online information sources (Mittman & Cain, 2001). An expected outcome like the complexity/compatibility of the Internet as a medium is predictive of continued use for example, and the interactivity of Internet allows health seekers who access health information also become producers of content particularly through support groups and chat-rooms (Hardey, 2001). Rains (2007) suggests that often, health seekers turn to online sources to fill gaps in information they receive from their doctors or other healthcare providers. Online information to supplement insufficient information from healthcare providers is a significant predictor of use of online information according to Delic, Polasek and Kern (2006). In other words, use of online health information is primarily driven by specific targeted needs of health seekers (gratifications sought) and their expectations that they believe cannot be fulfilled through any other source but the Internet (expected outcomes).
Third Objective

The third objective of the study was to examine how health-related online information translates into modifications in behavior. The final outcome of information consumption is its subsequent transition into behavior modifications. Scholars like Seale (2004a, 2004b) and Napoli (2001) specifically call for research not only on how users seek health information, but also how this information translates into health behaviors. A research question was posed rather than a hypothesis, for not enough research exists to establish a hypothetical relationship.

**RQ2:** What is the relationship between access to online health information and health-related behavior modifications among health seekers?

Fourth Objective

The final objective of the study was to explore health seekers’ choice of health websites and examine the relationship between perceived credibility of online sources and choice of websites. Reliability and credibility of sources are causes for concern in both the academic and professional communities, particularly since the consequences of unreliable information can be potentially life-threatening. Hence, in order to gain a deeper understanding of website accessing behaviors of health seekers, two exploratory research questions were posed. First, a research question was posed to compile a list of health websites most frequently accessed. The findings of this question provided a valuable insight on choice of sources, which were then examined for an association with perceived credibility and reliability in the subsequent research question.

**RQ3:** Which health websites are most frequently accessed by health seekers?

**RQ4:** Is there an association between perceived credibility and reliability of online sources and their selection by health seekers?
Explanation of concepts and terms

Research in the field of Internet and health has previously defined and explained several terms used in this study (Cullen, 2006, Tang & Lee, 2006). Those definitions have been modified to fit the needs of the study.

*Health seekers* are defined as Internet users who may access and may use online health information.

*Health information* is defined as information related to medicine, healthcare and wellness; including but not limited to information related to (1) anatomy, physiology or pathology (2) treatment of a disease, and (3) maintaining good health.

*Access to online health information* is defined as health seekers actively seeking and physically retrieving information from online health websites.

*Use of online health information* is defined as a cognitive indication of use self-reported by health seekers, which may or may not translate into behavioral changes.

*Behavior modifications* are defined as the behavioral changes that health seekers undertake in their lifestyles to incorporate health changes they access online. These modifications should be externally manifested and, therefore, observable.

*Gratifications sought* are defined as the needs and wants health seekers expect may be fulfilled by the use of online health information.

*Internet self-efficacy* is defined as the confidence health-seekers have in themselves to navigate the Internet for health information.

*Outcome expectancies* are defined as the end results expected by health seekers as a consequence of their online health information seeking behavior.

*Involvement* is defined as the motivation that allows health seekers to pay attention to media messages. Cognitive involvement is defined as individuals’ cognitive involvement with
medical/health decisions related to their health conditions, and behavioral involvement is defined as the health-seekers’ desire toward engaging in self-treatment.

Perceived credibility and reliability are defined as the efforts users put in determining the credibility and reliability of online health information websites based upon their perceptions.

Socio-demographic factors in this study consist of current health status, place of access, gender, age, education level, ethnicity, and annual household income.

Organization of Study

Chapter 2 provides a comprehensive review of literature on several relevant aspects of Internet and health, and also includes an overview of the theoretical framework that guides the direction of the study.

Chapter 3 describes the methodology of the study including the population, sample, sampling framework, data collection instruments and a general description of data collection process and procedures.

Chapter 4 contains the analysis of data and results.

Chapter 5 provides the summary and conclusion, including the importance, implications and limitations of the current study.
CHAPTER 2. THEORETICAL FRAMEWORK & REVIEW OF LITERATURE

Previous research in the field has revealed several insights of concern to the research queries of the study. This literature review has been organized to examine several aspects of concern to online health information. I start with the discussion of the uses and gratification that provides the theoretical framework for this study, including research that deals specifically with uses and gratifications and Internet, followed by brief discussions on self-efficacy, involvement and outcome expectancy. I then go on to discuss health and media which is important particularly because of the similarities and differences between traditional and new media, and the implications they have on the field of health communication in general. The section on Internet and health follows next, followed by a review of research conducted with regard to quality of online health information. Finally, I wrap up the section with previous studies that incorporate uses and gratifications, health and the Internet.

Theoretical framework and constructs

Uses and gratifications

Uses and gratification rests on the premise that individuals use media to fulfill needs, interest and taste (McQuail, 2005) and these needs have psychosocial origins. Research in this line of thought revolves mostly around motivations of media use. Katz, Blumler and Gurevitch (1974) summarized the tenets of uses and gratifications as follows: “ (1) the social and psychological origins of (2) needs which generate (3) expectations of (4) the mass media or other sources which lead to (5) differential exposure (or engaging in other activities), resulting in (6) need gratification and (7) other consequences,”(p. 20).

The assumptions of uses and gratifications, according to Rubin (2002) “underscore the role of audience initiative and activity,” (pp. 528). The two basic premises of uses and gratifications are (Rubin, 1993) (1) Media audiences are active communicators (2) Audience
behaviors and motivations must be understood in order to explain effects. Communication by
individuals is goal-oriented and purposive; people assess their needs (relaxation, learning,
adrenaline, companionship, habit or escape) and subsequently use media that satisfies these
expectations. Media is not the only influence in people’s lives, and their expectations stem from
their own qualities, the social context and interactions. People can make subjective decisions and
interpretations, thus using this decision making process to select media and messages and these
specific media selections have specific outcomes on the individuals and the surrounding
ambience.

Contrary to the early assumptions of uses and gratifications, audiences are not merely
active or passive, but somewhere in between as explored by Rubin (1993). Of particular interest
is his discussion of media orientation differentiated into ritualized orientation and instrumental
orientation. Ritualized orientation refers to “utility, but less intention, attention and selection,”
whereas instrumental orientation “reflects utility (i.e. motivation), intention and selectivity,” (p.
99). Instrumental orientation leads to stronger outcomes and greater involvement with
communication messages. Internet as a medium requires a higher degree of intentionality and
involvement than other traditional media and consequently, as far as e-health seekers are
concerned, it is possible to assume more of an instrumental orientation than a ritualized one.

Katz, Blumler & Gurevitch (1974) preliminarily suggested five ways that societal factors
can affect individual needs. Individuals turn to media when social situations (1) produce tensions
and conflicts which lead to pressure to consume media (2) create awareness of problems that
demand attention, information about which is sought in different media (3) deprive real life
opportunities which media can satisfy (4) transmit specific value that can be obtained from
media and (5) provide familiarity which must be met to fulfill aspirations of social group norms.
Of particular interest to this research project is when the social situation creates awareness and
users turn to media for more information. Research on users accessing health information
substantiates this suggestion by revealing that people access information according to their current health status (Bundorf, Baker, Singer & Wagner, 2004; Goldner, 2006; Henwood, Wayatt, Hart & Smith, 2004).

Early research in uses and gratifications primarily studies “audience motives rather than media effects,” (Rubin, 2002, pp. 529). As time passed and the theory became more refined, the focus of uses and gratifications changed, where contemporary research focuses on what motivates people to use media and how it is associated with media attitudes. Additionally, current research looks at how media are appropriate and effective across different channels, how other factors affect media selection processes, what various gratifications are and how media fulfill them, how variations in background affect the results and finally, the method, reliability and validity of measurement (Rubin, 2002).

Crucial to theoretical assumptions of uses and gratifications is the understanding of what motivates users to consume media. In other words, what are the gratifications sought from consumption of a particular form of media? Katz, Blumler and Gurevitch suggest that McQuail, Blumler and Brown’s typology of gratifications sought provides a comprehensive idea of what these motivations are: diversion (escape from everyday problems), personal relationships (substitute for companionship), personal identity (reinforcement of personal values, morals), and surveillance. Alternatively, outcomes of media use are perceived gratifications obtained (Palmgreen, Wenner & Rosengren, 1985). Perceived outcomes are important in the sense that future media use and evaluation of media use depends upon the perceived fulfillment of gratifications sought.

Palmgreen, Wenner and Rosengren (1985) looked at studies over a decade and suggest that there are several reasons why conceptually, operationally and analytically, gratifications sought and gratifications obtained are different. Gratifications sought and perceived
gratifications obtained are highly correlated, but do not determine each other, their mean levels differ and they contribute differently to explaining variance in media consumption and effects.

As a theoretical paradigm, uses and gratifications for Internet has attracted considerable interest from scholars old and new. Dutta-Bergman (2006a) considers the role of consumer motivation central to scholarship of health and the Internet, and therefore identifies the uses and gratifications theoretical framework as an important media use theory to study health care. Stafford, Stafford and Schkade (2004) state that given the distinctness of Internet, particularly its interactive and user-directed nature, uses and gratifications as a user-level approach is well-suited to the study of content on the Internet. Ruggiero (2000), in his treatise on uses and gratifications for new media, suggests that the emergence of new media technologies has “revived it [uses and gratifications] from dormancy,” (p. 13). The author considers uses and gratifications as an excellent perspective to study new media from, particularly given at least three characteristics of data that new media possess not commonly associated with traditional media. In other words, interactivity (participants having control over communication processes), demassification (participant control over medium; individuality), and asynchronicity (messages staggered in time) of Internet as a medium change the perspective from which uses and gratifications of Internet are studied. Additionally, Ruggiero continues; when it comes to Internet communication, terms like active and audience have to change, and needs are to be looked at from a different point of view. Users with Internet experience make choices of sources and information differently and with more awareness, adding a degree of depth that research with traditional media did not allow for. Research with new media as well as traditional media will merit closer attention to details in light of the new advances.

One of the essential components of uses and gratifications is audience activity, and communication motives are central components of audience activity (Rubin, 1993). Motives are general dispositions that influence people’s actions which are taken to fulfill a specific need or
want. Papacharissi and Rubin (2000) closely examined predictors of Internet use with regard to uses and gratifications, and found that motives for Internet use consisted of (1) interpersonal utility (2) pass time (3) information seeking (4) convenience and (5) entertainment. Additionally, their findings were consistent with the informative and interactive capabilities of Internet. Internet is often used as a functional alternative for users for whom other channels are not as rewarding or satisfying, as implied by the relationship between Internet motives and social and psychological factors.

In response to the growing demand within the field to examine motivations for Internet use, Tewksbury and Althaus (2000) conducted a study that evaluated how well existing media gratifications applied to Internet use. In tandem with uses and gratifications research, the researchers examined gratifications as gratifications sought and obtained from media use. Tewksbury and Althaus looked at the audience’s expectations about the medium’s attributes as a predictor of the benefits audiences sought. Anxiety with computers, desirability of control (surveillance, course work and task accomplishment) and exposure to traditional media emerged as important variables. Considering that the gratifications one seeks and the gratifications one obtains follow a causal chain, the authors conducted a path analysis with data analyzed from written questionnaires filled out by 520 students. The results showed that computer anxiety has a substantial negative effect on gratifications obtained, suggesting that it is likely to influence gratifications when users have more choice in the media they use and the activities they indulge in (Tewksbury & Althaus, 2000). Variables that dealt with exposure to traditional media do not exert a considerable influence over the benefits audiences seek from use of a medium. Desirability of control is a weak predictor of the dependent variable (benefits sought), and researchers call for further study. Finally, beliefs and gratifications sought are both substantial predictors of how people use the Internet.
Additionally, Tewksbury and Althaus (2000) conducted an examination of the relationship between gratifications obtained and respondents’ reported behaviors to see whether the websites users visit provide the gratifications they sought. A factor analysis revealed that film, music and television related websites (entertainment/passing time) loaded heavily on the first factor, followed by business, employment and travel related websites. Online magazines and newspapers (surveillance) followed next, and finally online sports information appeared. The results of the study support the argument that gratifications typically associated with traditional media—entertainment, surveillance and passing time—prove to be significant predictors of website visits, suggesting that traditional gratification typologies are useful in understanding and predicting Internet use.

Stafford, Stafford and Schkade (2004) argue that recent research in uses and gratifications does not take into consideration Internet-specific gratifications. Using a two-stage research design, the authors developed a uses and gratifications profile for Internet usage. The first stage was seeking a list of descriptive terms depicting typical uses and gratifications sought, and a list was generated using an open-ended questionnaire generated using word probes. The second stage grouped the descriptive terms into profiles that represented the specific uses and gratifications sought for Internet. Additionally, the authors ran confirmatory and dimensionality analyses of the constructs to further validate its theoretical value.

At the end of the analyses, the authors (Stafford, Stafford & Schkade, 2004) identified three uses and gratifications profiles: content gratifications, process gratifications and social gratifications (Stafford, Stafford & Schkade, 2004). Content gratifications were characterized by terms like *education, information, knowledge, learning* and *research*. Process gratifications were characterized by terms like *resources, search engines, surfing, technology* and *web sites*, and finally, social gratifications were characterized by variables like *chatting, friends, interaction* and...
people. Looking at the content gratifications profile, it seems like most of the “Internet content serves consumer learning goals,” (p. 277).

Of the above-mentioned research traditions, those that are particularly relevant for the proposed research topic are the motivations for media use, in this case, seeking health information online, what gratifications are sought specifically by use of Internet.

**Self efficacy**

In addition to uses and gratifications, an important theoretical construct included in the study is Internet self-efficacy. An important element of the Social Cognitive theory by Albert Bandura, self-efficacy is the confidence people have in their own ability to perform a given task. Bandura (1995) defines perceived self-efficacy as “beliefs in one’s capabilities to organize and execute the courses of actions required to manage prospective situations,” (p. 2). How people think, feel, act or motivate themselves to act is influenced by self-efficacy.

Scholars have shown significant links to the role of self-efficacy in comprehension and application of uses and gratifications. Hofstetter, Zuniga and Dozier (2001) suggest that gratifications sought can be linked to self-efficacy in that people will turn to a particular medium with needs if they believe that their needs can be fulfilled through use of that medium. LaRose and Eastin (2004) suggest that the uses and gratifications can be understood in socio-cognitive terms, and that expectations are shaped through vicarious learning and self-efficacy.

Self-efficacy is closely related to health behavior changes and behavioral intentions (Schwarzer & Fuchs, 1995), even though how strongly they are related differ from situation to situation. As far as positive health behavior changes are concerned, Schwarzer and Fuchs draw upon Bandura’s Social Cognitive theory. Three groups of cognition contribute to behavior changes: risk perceptions, expected outcomes and perceived self-efficacy, though not necessarily in same order. When an action is undertaken, “self-efficacy determines the amount of effort
invested and the level of perseverance,” (p. 280). People with high levels of self-confidence are more likely to see their decisions through and succeed, while those in self-doubt are more likely to anticipate failure.

For the purpose of this study, Internet self-efficacy was closely considered. According to Bandura (1986) self-efficacy should be tailored to the domain of interest for maximum prediction. As far as Internet is concerned, self-efficacy has been particularly studied to see how it affects use of the medium, and vice versa. A survey was undertaken by Eastin and LaRose (2000) to develop a reliable operational measure of Internet self-efficacy. The authors developed and administered an eight item self-efficacy scale to 171 undergraduate students that questioned participants how confident they felt they were in understanding terms related to Internet hardware and software, describing terms related to the Internet, troubleshooting problems on the Internet, explaining why a task will not run on the Internet, using the Internet to gather data, learning advanced skills using the Internet and turning to online support groups for help. Results revealed that Internet self-efficacy was positively correlated to Internet usage, previous experience, and outcome expectancies, and negatively correlated to Internet stress and self-disparagement.

Bass et al. (2006) surveyed 498 patients who were newly diagnosed with cancer and had come to the Cancer Research Institute’s information center. The participants were identified as direct, indirect or non-users based upon the time and nature of Internet usage. Among important findings of the study were the increase in Internet usage by indirect and non-users, and the association of Internet usage with self-efficacy. A 14 item self-efficacy scale was administered, of which three were statistically significant: actively participating in treatment decisions, asking questions to physicians, and sharing feelings of concerns.

Internet based information has been extensively used in interventions for HIV/AIDS. A computer and Internet-based intervention was designed to prevent pregnancy, STDs and HIV,
among 326 10th grade males and females in two Appalachian public high schools by Roberto, Zimmerman, Carlyle and Abner (2007). The experiment revealed that those in the experimental school had greater condom negotiation self-efficacy (knowledge and confidence on how to use and handle a condom) and greater situational self-efficacy (how they would behave in a given situation when physically involved with someone).

Torkzadeh and Van Dyke (2001) constructed a 17 point Internet self-efficacy scale to measure individual’s self-perception and self-competency in their interactions with the Internet. The factor analysis revealed that use of information technology by individuals is more a function of self-efficacy than technology. In yet another study conducted by Stavrositu and Sunder in 2006, 1089 participants were surveyed through mail to examine the role of self-efficacy and supplemental role in the impact of Internet usage on credibility, as well use and utility of newspapers. The results revealed that increased Internet use leads to an increase in self-efficacy, which then leads to positive effects about the medium’s credibility. This finding was significant only in Internet searches for information and not for entertainment.

**Involvement**

Involvement emerges as an important variable while examining how different individuals interpret messages depending upon how involved they are with the topic or issue, which in turn will determine how much information they process (Chaffee & Roser, 1986). While there is a certain uncertainty around what involvement is and how it is to be measured, Chaffee and Roser agree that involvement is a personality trait and an internal state consisting of cognitive, affective and behavioral components. Therefore, conceptually, “involvement is motivation that allows people to pay attention to mass media content,” (p. 381). Operationally, involvement is a component of the medium or message topic.
Krantz, Baum and Wideman (1980) suggest that individual expectations for healthcare are important enough to develop measures that examine individual attitudes. The authors posit that the psychological effects of self-health management may be considered in terms of personal control, and that information can be conceptualized as a form of cognitive control. Individuals may want varying degrees of information, the authors continue, and direction from their health care providers. They identified the two most common types of psychological interventions as cognitive involvement and behavior involvement, and created scales for each of these components through several NIH grant sponsorships. Individuals more involved with medical decisions show a higher degree of desire for cognitive involvement, whereas behavioral involvement indicates the health-seekers’ desire toward engaging in self-treatment.

As far as Internet and involvement are concerned, Rains (2008) argues that health seekers with higher amounts of information and behavioral involvement, and an internal locus of control should have higher positive perceptions of and experiences with the Internet. The diversity of health information on the Internet might be more appealing to those who are actively involved in their own health. In the study, Rains looks at cognitive involvement, behavioral involvement, internal locus of control, and web experience as variables that are related to Internet self-efficacy, building the case that health seekers actively involved with their own health may be more confident in their abilities to navigate the Internet for health information because they feel that can have an effect on their health outcomes.

Dutta-Bergman (2005) frames an involved user as a health-conscious consumer engaging in activities that lead to better health, and results of his study found that individuals who are motivated toward health issues are more likely to search for health information online. Additionally, structural models are often viewed as a set of variables with powerful predictive power (Ruggiero, 2000), and thus the study undertaken by Ko, Cho and Roberts (2005) holds special relevance in this discussion. Although a model of interactive advertising, the authors
provide valuable insight into the world of interactive web surfing and user motivations in general. A sample of 385 students across United States and Korea using uses and gratifications as a theoretical framework revealed that users with high information motivations are more likely to engage in human message interaction (user interaction with messages; ability to change, modify or seek content), while those with low information motivations are more interested in a more social human-human interaction.

*Outcome Expectancy*

Eastin and LaRose (2004) suggest that Bandura’s Social Cognitive Theory provides an effective conceptual direction for study of models of media consumption within the realm of the Internet. According to this theoretical construct, then, health behavior is influenced by risk perception, self-efficacy and expected outcomes (Bandura, 1995). Therefore, the construct of outcome expectancy plays an essential part in examining predictors of online health information use and access.

An outcome is the consequence of an act, and outcome expectancy are the expectations that people believe will be fulfilled upon undertaking an act (Bandura, 1986). Expected outcomes determine behavior to a certain extent. Where self-efficacy is the confidence people have in their own abilities to perform a particular task, outcome expectancy is the expectation of the consequence of having performed a task. Perceived benefit from undertaking an action or a behavior is positive outcome expectancy, while negative outcome expectancy is cost or difficulty as a result of specific behaviors and becomes a psychological deterrent. Self-efficacy and outcome expectancy are significantly related (Bandura, 1986; Eastin & LaRose, 2000), in that people may believe they have the capability of undertaking a task, but may not do so for fear of negative consequences, and vice versa.
Zebracki & Drotar (2004) describe outcome expectancy in health-related research, as “individuals’ expectations with regard to effectiveness of the recommended treatment and relevant health-related behaviors,” (p. 134). A study undertaken by Owen, Klapow, Roth, Nabell and Tucker (2004) examined the feasibility of providing online support for psychological treatment of women with breast cancer. The first of the two phase study revealed that one of the significant variables in determining interest in online program participation was outcome expectancy. Additionally as mentioned earlier, outcome expectancy plays an important role in shaping gratifications sought (LaRose & Eastin, 2004).

Health and Media

Media have always played a crucial role in the field of health and wellness whether it is announcing the latest medical breakthroughs, reinforcing positive health behaviors or peddling prescription drugs. Seale (2007b) believes that the field of health and mass media are closely related because of the nature of mass media messages. Mass media messages in essence, Seale suggests, are partial truths capable of influencing and setting public agendas. Therefore, health researchers in the fields of both medicine and mass communication should be interested in examining which agendas appear or get suppressed as well as in understanding how media audiences interpret and respond to mediated messages. Lupton (1999) argues that for many a laypersons mass media serve as primary sources of information on health and wellness. Mass media contribute to the production and creation of knowledge and images of portrayal of health, healthy lifestyles, doctors, medicine, disease and illness.

Framing it in a broader perspective, Lewis (2006) points out that, within the field of media, seeking health content online is about more than just an element of the information revolution. It signifies a change in the role of media in people’s lives, the shifting and emerging onus of expertise from medical experts to laypersons, and the idea of responsible citizenship.
Lewis identifies this information seeking phenomenon embedded in an ambience that identifies health awareness as a social act.

Signorielli’s assessment of health coverage in mass media reveals that while news media are important sources of information regarding public health, the coverage is fairly superficial and sensationalized (1993). Most of the coverage relies upon medical experts and their expertise, though efforts are made to separate opinions from research and provide research methodologies along with the results. Media contents often revolve around the familiar health topics (like cancer), and stories often focus on latest technological breakthroughs. The author specifically calls for a dialogue in preventive medicine.

More recently, Kline (2006) reviewed a decade of health content in the media, and found that “popular media is not likely to facilitate understandings helpful to individuals coping with health challenges; at the same time, popular media is likely to perpetuate social and political power differentials with regard to health-related issues,” (p. 44). The extensive literature included two popular topics, current health status (depiction of health and illness), and public policy, controversies, health care and ideologies. Kline suggests that media images perpetuate stereotypes and stigmas, and tend to marginalize some voices while privileging others. Overall, the author continues, popular media have not only the informational agendas but also the ideological ones which are reflected in popular health communication and promotion campaigns.

Do viewers really learn from television? According to author Dutta-Bergman (2006b, 2007), those with a high motivation toward health information definitely do, and are consistent in retention and recall whether from entertainment-based television (soap-operas, prime-time television) or information-based television (news, talk shows). Studies undertaken by the author reveal that viewers who are health-oriented (involved in health issues and engaged in healthy lifestyles) are more likely to retain and recall health information content in soap operas. The author notes the key role played by motivation as a trigger for interest and action, indicating that
health orientation is indicated by four indicators: health consciousness, health information orientation, health beliefs and healthy activities. In yet another study undertaken by Whittier, Kennedy, Lawrence, Seeley and Beck (2005), the authors found that MSM (males who have sex with males) who followed the storyline about syphilis in MSM on a popular show reported a higher intention to get screened and persuade others to get screened.

A recent poll undertaken by Harris Interactive confirms the effectiveness of the new trend of direct to consumer advertising (DTCA) of prescription drugs (“Large number of people”, 2007). Consumers of the advertisements believe that DTCA increases their knowledge, makes them more aware and concerned, and they are more likely to ask questions. Additionally, substantial numbers of those surveyed admit to having a conscious opinion on using prescription drugs, or their physician’s judgments in prescribing medications.

However, Macias, Pashupati and Lewis (2007) find that most direct to consumer television advertisements (DTC-TV ads) do not meet the FDA’s fair balance requirement. A content-analysis of 106 DTC-TV commercials shows that contrary to popular perception they do tend to appeal to the rational side, information really isn’t a priority. Companies seem to be more focused on selling than educating. The risks and side-effects are not given enough time and attention, and depending on the medical conditions, the amount of information on symptoms and risks varies. The authors suggest that with the majority of the chunk of almost $4 billion spent on peddling prescription drugs on television, the medical community along with the FDA has the challenge of better regulating this content.

Broadly, literature on mass media and health communication brings to light two distinct streams of research: Health information as a part of entertainment-education, and the more recently visible trend of Direct-to-Consumer advertising of prescription medicines. The preceding discussion also reveals several key issues regarding health information within traditional media and Internet. The discourse of health and disease on the Internet is different
than that on traditional media sources because of the dynamism and interactivity of Internet; making it a vastly different information environment (Signorielli, 1993). However, key factors that affect information retention and selection with traditional media (current health status, a general awareness of health issues and actively seeking information on a need to know basis) are also visible with new communication technologies, albeit, with the Internet it seems much easier to spot the instrumentally oriented (motivated) user than with traditional media. However, a key difference that is visible is the very clear role of the active audience. Internet users actively search for health information online, different from a health message appearing within a soap opera or a prescription drug advertisement in the primetime television program. Additionally, the interactivity of Internet as a medium allows for a more involved process of information management. Finally, the asynchroneity of the Internet provides the added dimension of convenience for the Internet health seekers who can save, store and revisit information as and when they need; which is not always possible with other forms of mass media.

Internet and Health Care

Researchers in the field of Internet and health care have largely been interested in how information communication technology can be harnessed, and how information available through these websites is used and responded to within the field of health and wellness. More specifically, and of relevance here is literature in 3 areas, which are not always mutually exclusive: (1) the motivations behind use of Internet as a health information resource (2) the actual physical process of the Internet search (3) how health seekers use online information. A brief examination of abstracts and papers submitted for consideration for the edited volume *Health and Media* (Seale, 2004a) reveals interesting insights about ongoing research in the field of health and communication. Seale (2004b) states that of the 91 valid abstracts received, the majority dealt with analyses of media health representation followed by reception analyses and
finally analyses of production. Internet research is relatively new with only 9 of the 91 abstracts that focus on Internet as a medium. Most of those studies dealt with how people use health information on the Internet. In a similar light, Napoli (2001) calls for further research on how consumers seek health information and how it affects their health behaviors. It is important, the author continues, to study Internet to see how it fits with the more traditional sources of health communication. Additionally, it is essential to gain a deeper understanding of the behavior of the information seekers, their motivations and the processes by which they receive such information.

The Pew Internet and American Life Project (2000) has been conducting surveys on health information seeking behaviors and indicators since 2000, and their results suggest that online health information seeking is an extremely popular activity. Their survey results from 2003-2007 have shown that between 75% and 80% of Internet users have looked at health information online, and these numbers are growing (Fox, 2008). Findings from Fox’s study (2008) reveal a trend that indicates engaged and motivated patients. The results also suggest that users having high speed broadband connections, a disability and/or disease are significantly more likely to look at online health information. However, Fox continues, in addition to convenience, what keeps bringing health seekers back to online information resources are the positive experiences. Of the 2054 adults who participated in the study, 31% said that online health information had helped them or someone they knew, as opposed to 3% who said that they or someone they knew had been harmed by it.

Mittman and Cain (2001) suggest that as the number of Internet users accessing health and wellness information online steadily increases, there will also be an increase in regulated consumer health information services, an increase in online support groups, emergence of health care provider information services, rising use of patient-provider email, and more patients asking to access electronic medical records.
The numbers of online health information seekers are definitely rising and the impact is worldwide. A British study which looked at access to Internet and its use for health information reveals that increasingly, more and more patients were using online health information resources (Trotter & Morgan, 2008). The authors collected data in 2000 and then again in 2006 from patients at an ENT clinic about whether they had access to Internet, and if they had used the Internet for health-related information. 204 patients participated in 2000 and 209 patients participated in 2006. The authors found that access to Internet increased from 43% (88/204) to 70% (147/209) and use of Internet for health information increased from 16% (32/204) to 55% (114/209).

Above and beyond patient-doctor communication, physician-physician communication and patient-patient support communication, the interactivity and information offered on the Internet hold the highest implication for the field of health communication (Rice, 2001). Users bring in a variety of environmental and individual attributes while actively seeking online health and wellness information. Rice concludes that more and more health communication campaigns are using interactive online tools to appeal to high-involvement users.

Iakovidis, Wilson and Healy (2004) recognize that in addition to technical solutions for medical professionals or administrative tools for managers, a rapidly growing area of e-health are tools used by users to manage their own health. The authors pinpoint three areas where users are directly involved with e-health (1) dealing with health services administration (e.g. appointments) (2) facilitating homecare of patients through remote monitoring (3) avenues to access health-related information and advice. This last area is of particular relevance to the study, and effectively identifies the emergence of an empowered consumer.

Akesson, Saveman and Nilsson (2007) conducted a meta-analysis of 12 articles to appraise consumer experiences using ICT with relation to health and wellness. The articles were retrieved using CINAHL, Medline and Cochrane databases as well as manual searches. The
analysis revealed 3 broad themes: support and help, education and information, and telecommunication instead of onsite visits (computerized electronic applications-mostly telephones- that consumers could access assuring accessibility to healthcare independent of time and space). One study of particular interest was conducted by Gustafsson, Dellve, Edlund and Hagberg (2003) where use of information technology was examined among young adults, particularly their experiences, attitudes and health beliefs. Twenty-five thematic interviews were conducted with young adults (18-24) using grounded theory with a constructivist approach. The findings suggest that use of IT among young adults consequently results in a feeling of efficiency and independence. On the other hand, they have misgivings and perceive some dangers. Most of the time, IT use is only for satisfying the current need and has no implications for the future.

An analysis conducted by Hardey (2001) reveals that health seekers are not only consumers of online health information, but also the producers of health-related content on the Internet. The project looked at two studies: first a qualitative study of 10 households to find health information, and second, a survey administered to home page authors of websites where they posted accounts of ill-health along with an examination of the web pages. As far as consumption of information is concerned, users accessed health information online because of ease of access, anonymity, cost-effectiveness, user-centeredness, and diversity of information. On personal web-sites, support groups and chat rooms, consumers of health information in turn became producers of health-related content, where relevant resources interspersed with personal narratives.

Henwood, Wayatt, Hart and Smith (2004) interviewed 32 middle aged women in relation to their decision making regarding hormone replacement therapy (HRT). This study was conducted in the background of recent health policy changes in the United Kingdom (UK) that dictate the emergence of an informed and empowered patient facilitated by the Internet. The results of the study revealed three main constraints in the “informed patient” theory as
propagated by the UK Department of Health (Henwood et. al., 2004). First, most patients did not want to take responsibility for their own health problems and entrusted this responsibility to their doctors. Next, for those patients who did look for information online, their search was not systematic. Additionally, they were not aware of who the author was or what organization was publishing the information they were accessing. Finally, the researchers found that the information patients found online often clashed with the advice from their health care providers, leading to a certain degree of skepticism. Put together, these findings are obstacles that hinder the emergence of the empowered, informed patient. The authors are effectively questioning the emergence of an informed patient in the existing structures and relationships, especially in light of the difference between experts’ vs. laypersons’ knowledge.

In a survey of 851 people examining the use of Internet for health information in a primary care setting in South Wales, UK, authors Dolan, Iredale, Williams and Ameen (2004) found that online health information was the second most preferred source of information about an illness. The survey administered over a 3 month period in two general practice primary care facilities in low and high income areas revealed that over half the users in each setting (51%) had access to Internet and among these people, half of them had used it to access online health information. Under a quarter of the health seekers had used the information they obtained online in face-to-face discussions with their doctors. While the researchers found no significant difference in use due to gender differences, age did have a role to play. Health seekers aged 24-54 were twice as likely to access the Internet for health information. Consistent with the literature, only 7% of those surveyed said that they did not trust the Internet for health information.

Yet another study conducted by Larner (2006) among an outpatient population in the UK surveyed over a 1000 patients in 3 month periods from 2001 to 2005. The results revealed that close to 40% had access to Internet, and 114 patients had searched for online health information.
While the age group of 41-50 years had the highest access to Internet, usage was markedly more among patients aged 31-40 years. More women accessed online health information than men did (over 50%), and 45 patients actually accessed information that was contrary to their final diagnosis.

Delic, Polasek and Kern (2006) argue that the primary motivation behind use of Internet for health information is to supplement insufficient information or unanswered questions after face-to-face visits with their healthcare providers, as suggested through findings of a survey of 949 users over 2003 and 2004. The study, conducted in Croatia, suggests that 85% of the respondents went online to seek health information after a diagnosis, and half of those discussed this information with their doctors in a subsequent visit. Furthermore, the survey revealed that the majority of the respondents were women, who were also more likely to undertake information searches for friends and family.

In Saudi Arabia, 150 cancer patients were surveyed to examine their online health information seeking practices (Ibrahim & Boulos, 2006). Only 19 patients (around 13%) searched for cancer-related health information online. The barriers for access and use, according to the authors, were their inability to use computers, their lack of proficiency in English, and a general lack of awareness of where to look for information.

Morahan-Martin (2004) conducted a comprehensive review to determine how online health seekers find, use and evaluate online health information by examining data measuring differences in search and use among users from United States, France, Germany and Japan as well as observational data from various countries. Findings suggest that online health seekers seek specific health information about a disease or condition that they or someone they know has been diagnosed with. Users typically use general search engines, search with short phrases (often misspelled) and rarely search beyond the first page of the search. They do not follow the
indicators of credibility and reliability of websites, though they steer clear of websites with overt commercialism.

Data from the cross-cultural studies suggest that most health seekers who went online to find information found what they needed and were satisfied with it (Morahan-Martin, 2004). While they rarely check indicators of website credibility, they are aware of the limitations of online information. Users also report discussing online information with their primary health care providers. Particularly within the United States, two groups of health seekers are known to be more alert and vigilant: parents of children under 18 who live at home and those who are chronically ill. Based on the findings, the author recommends that health care professionals should (1) recommend websites (2) promote effective search and evaluative techniques and (3) get involved in developing uniform standards.

Current health status as a factor that appears to affect access and use of information is also visible in the study conducted by Bundorf, Baker, Singer and Wagner (2004). The authors examined consumer demand for health information on the Internet by surveying 12,878 members aged 21-64 years of age. The researchers tested two hypotheses using the theoretical framework of human capital model for health (1) Individuals with health concerns who obtain greater benefits in general from health information are more likely to turn to the Internet for health information and (2) Individuals facing higher costs in accessing health information from health care providers in traditional settings are more likely to use the Internet for health information. The results supported both hypotheses. Findings showed that despite having access to multiple sources of information, those who reported having one or more chronic illnesses were more likely to use the Internet for health information. The second hypothesis was also supported. Respondents’ insurance status revealed that those who face higher out-of-pocket costs for physician services were more likely to seek information on the Internet. Further support for the
proposition was highlighted through the difference in the information accessed between the insured and the uninsured.

Another study that echoes current health status as a theme is the multi-variate survey analysis undertaken by Goldner (2006). Goldner investigated how sick and healthy people differ in use of Internet and email for health purposes. The study revealed that sick and disabled respondents were not only more likely to access health information online, but also do it more frequently. This led the authors to ask interesting questions about reliability of sources and credibility of the information.

Bansil, Keenan, Zlot and Gilliland (2006) merged data from Health Styles surveys done in 2002 and 2003 by Center for Disease Control to examine types of health-related websites visited, how the online health information was shared with their healthcare providers and factors that encouraged them to visit online health information websites. Importantly, the researchers compared health information seeking patterns of people who did not suffer from any chronic diseases and people who did.

The results from 8432 respondents in the study (Bansil et al., 2006) suggested that women are more likely to seek health information than men, possibly because they considered themselves the caretakers. Prior experience of Internet browsing played an important part in determining online health information access and users with chronic diseases are more likely to access health information websites than those who do not. The authors suggest that this may be because users with chronic diseases want to better manage their disease and feel in control.

Urgency of health concerns also appeared to be an important factor. Harris and Wathen (2007) interviewed 40 women aged 20-82 years in rural Canada examining their sources of health information. Although digital divide featured prominently in the findings, an interesting insight was that if the health concern was urgent, hospitals/medical professionals emerged as the primary information providers. However if the health concern was nagging, most users relied on
the Internet as an information source. Other findings echo literature in the field that suggests that the proximity or ease of access of information through the Internet makes it a valuable information resource.

Using data from the National cancer Institute’s 2003 Health Information National Trends Survey, Mayer et al. (2006) examined use of online health information among cancer survivors. Around 65% of the 418 survivors looked for information online, and results showed that age (<65), gender (women), income (higher than US$25,000/annum) and having a regular health care provider were significant predictors of Internet use. Moreover, despite the fact that most survivors preferred getting information from their health care providers, they most frequently accessed the Internet when they needed it.

Toms and Latter (2007) observed the online search process of 48 users from Toronto and Vancouver looking for information on four health-related topics using Google. The findings were analyzed through transaction logs, video screen captures, retrospective verbal protocols and self-reported questionnaire. The participants were aged 18-65 years, well-educated and had been using the Internet for two years or more. Findings revealed that the keyword searches were trial and error processes, often taking multiple tries to get the required information. While the procured lists of results were deeply scrutinized, personal perceptions of awareness of the topic played a major role in selection of the web pages. The required information was found, but the researchers found it to be a hit-and-miss process. The process of query formulation and selection is central to the process of information searching, and the authors feel that the challenge is to structure the information without losing its intuitiveness.

Al-Shammary, Awan, Butt and Yoo (2007) surveyed patients to study how many patients accessed online information, and how prevalent information seeking was based on age, gender, health status and so on, and why they use the Internet as opposed to other media. 208 patients surveyed about their online health information practices revealed interesting results. Of the 208
patients, 44.7% had used the Internet for health information, of which a sizeable 89.2% used the Internet for information before consultation with their doctors and with whom they discussed this information. Patients with both acute and chronic illnesses accessed online health information, although those with acute conditions were 50% more likely to use the Internet than the other group. There were marginally more women health seekers (40.6%) than men (38.8%), and patients aged 30-40 years were the most active health seekers. Self-diagnosis was the most common reason for using the Internet over other media.

Credibility and Reliability of Quality of Online Health Information

Owing to its very nature, the quality and sources of health information on the Internet is a major area of concern among health communication professionals and the medical community at large. Without the barriers of censorship or adequate monitoring of content online, non-valid and unsubstantiated information has no way of standing apart from valid, helpful and scientifically substantiated medical knowledge (Cullen, 2006). Lewis (2006) states that in this day and age of do-it-yourself (DIY) health, the medical community at large is anxious about what counts as legitimate health information. Seale (2004b) notes that concern for the quality, credibility or reliability of information found on the Internet is glaringly missing. “Misinformation could be a matter of life and death,” (Eysenbach et al., 1998, p. 1496) and thus low quality information is a serious threat that users may or may not realize. Eysenbach et al. identify that information on the Internet can be deficient: (a) due to lack of quality control in production (b) if neither the author nor target audience may be indicated (c) because of lack of contextual or technical background, or (d) specificity of availability of treatment options. While labeling and filtering systems are being developed, they are still a long way from being practically implemented. Moreover, Leung (2007) adds that those who go often to the Internet for health information and have higher
expectations in terms of reliability, relevance and quality of health information, tend to perceive
the Internet as playing an important role in other arenas of their lives as well.

The Pew Internet and American Life Project’s national survey showed that around 73
million people sought health information online (“Vital signs,” 2002); of which only a quarter
followed general guidelines of thoroughly checking the source or timeliness of the information.
Half the users indicated that they “only sometimes,” “hardly ever,” or “never” checked the
sources of their information. Furthermore, health seekers rarely went online with a definite
research plan and tended to be reassured by the same or similar statements about health
information that were in keeping with their personal perceptions.

Authors Benotsch, Kalichman and Weinhardt (2004) suggest that while online
information is a powerful resource that can be an important tool in self-health management, the
accuracy of information may have consequences on current physical or mental state of patients,
or vice versa. In a survey of 324 adults with HIV, patients with a low income or low education
level were more vulnerable to misinformation. Since HIV/AIDS is more prominent among
disadvantaged groups, this can have considerable effects on patients’ coping strategies,
particularly since participants rate the AIDS cure site as highly as they rate the Journal of
American Medical Association (JAMA) website. On a positive note, users tend to have a high
level of trust in their physicians, and discuss this information with them frequently.

In addition to reliable sources, getting accurate information also requires a certain degree
of familiarity with the medical condition and advanced Internet searching skills, according to the
study conducted by Atkinson et al. (2008). The authors suggest that most users looking for
information on cancer clinical trials wade through complex terminology, medical jargon and
complicated web navigation to get to the information they need. The study also found that users
expected that the best trial matches to their conditions would show up first, which is not always
the case. The authors suggest that clinicians get involved with their patients when performing these searches to help them navigate the information better.

A survey of 374 users of the Genetics Home Reference website (GHR) explored the predictive characteristics of consumers’ affective evaluations and the independent variables that predict overall user satisfaction (Peng & Logan, 2005). GHR is an online consumer resource developed and maintained by the national Library of Medicine and the Lister Hill National Center for Biomedical Communications. The authors developed indices that measured content (reliable, accurate, pertinent, and up-to-date), usability (ease of navigation, ease of search and access) and affective (emotional aspect of judgment-making) dimensions and found that content and aesthetics were of primary importance to users, followed by usability. More importantly, the findings suggested that consumers tended to evaluate online information based on their own personal perceptions of quality and credibility.

Eysenbach and Köhler (2002) undertook a qualitative study to understand how consumers search for and appraise health information on the Internet. Twenty-one respondents who participated in focus groups, were observed in usability tests and gave in-depth interviews to assess techniques used to search for information and evaluate the quality of information they searched. The findings of the study, though admittedly from a small sample, provided interesting insight on information search and assessment behavior (Eysenbach & Köhler, 2002). The researchers found that the average time for each search was 5 minutes and 42 seconds. Additionally, observations revealed that participants rarely looked at links beyond the first page of search results, and chose to modify their word choice instead of going to the second page of results. None of the participants checked the ‘about us’ sections, considered the look of the page, the design or the technical terms as an assessment of its credibility. Overall, they found that participants had very little awareness of the source of the information they were accessing. This was contrary to their focus group responses. Very few participants later remembered where they
got information from. An interesting insight in the article (Eysenbach & Köhler, 2002) is the finding that the nurses in their study did not perform any better than other users, and the authors call for further study involving the information search practices of health care providers versus laypersons.

Kim, Eng, Deering, and Maxfield reviewed published criteria used to evaluate health websites (1999) to find areas that overlap and indicate direction. The authors examined 29 published rating tools and journal articles and found that of the 165 criteria identified, 30 fell under the quality of content (which also included concepts of information quality and reliability) suggesting that quality of content is an important indicator of how credible the health website is. Some research in consumer awareness also suggests that source credibility is not really a concern for a lot of users despite self-reports of the contrary as suggested by Bates, Romina, Ahmed and Hopson (2004) in a survey conducted with 519 participants. Aged 18-80 years with varying levels of education the authors examined the effects of source credibility. The participants were assigned six messages on lung cancer: three from the websites of highly credible organizations and three from generic websites. Literature suggests that when a highly credible source is named, participants should evaluate the quality higher. The results of the survey showed otherwise with no significant effect on the differences in attribution of the source. Authors say that either users were not invested in high quality information or were vary of highly credible sources because of their affiliations and vested interests (e.g. lung cancer organizations advocating smoke-free workplaces).

To this discussion of overall quality assessment, Canadian researcher Marton (2003) adds the attribute of relevance as revealed by a web-survey component of a multi-method study of 265 Canadian women. Aged 25-45 years, single and well educated, participants answered Likert-scale type questions as well as provided open-ended comments about the relevance (measured in terms of comprehensiveness, timeliness and usefulness) and reliability (measured in terms of
authoritativeness, credibility and dependability) of health information websites as compared to other information sources (health-care practitioners, electronic media, print media and so on). The results of the survey revealed that overall, health information websites were “generally perceived as offering highly relevant and fairly reliable health information when compared to other sources of health information,” (p. 204). More importantly, the study revealed that not only reliability but also relevance was an important attribute of quality assessment. A health seeker may or may not find health information relevant according to health status, age, geographical location, gender, sexual orientation and cultural and religious beliefs about health and illness. Information can be reliable but irrelevant without this added aspect (Marton, 2003).

Regardless of the quality of health information online, Brown and Walsch-Childers (2002) concur that the amount of information being accessed is steadily increasing. What users are doing with the information they access, is not yet clear. According to the authors, little research exists on how people use this information and to what consequence, despite the quality. Online health information can contribute to users getting a sense of empowerment, motivating them to seek healthcare they need or improve their ability to deal with their existing health status. The authors suggest that it is important to take a closer look at how online health information contributes to decision-making regarding users’ overall health.

**Uses and Gratifications, Internet and Health Care**

Tang and Lee (2006) examined motivation, perception of information of sources and self-efficacy by assessing users’ health information searches in Singapore. Through the uses and gratifications approach, the authors differentiated 38 Internet users into e-health seekers and non-e-health seekers depending upon whether they did or did not access health information online. Data were gathered around questions of differences between e-health seekers and non-seekers uses of various information sources, motivations to search for health information, their
perceptions of the information quality and source credibility of various information sources including the Internet, and the role of self-efficacy in determining e-health seekers and non-seekers. Through focus-groups, the researchers found that e-health seekers tend to enjoy a multitude of views, large quantities of information and reach specific decisions themselves. Furthermore, the study revealed that people actively seek information on health, thus supporting the assumptions of uses and gratifications theory. Additionally, in support of the meta-analysis conducted by Akesson et al. (2007), information/education and support emerged as important themes within the study.

To closely examine the relationship between perceptions of traditional media and the use of the World Wide Web to seek health information, Rains (2007) analyzed data from the Health Information National Trends Survey (N = 3982). Using the uses and gratifications approach, the purpose of the study was to explore the use of Internet to seek health information in a contemporary information-media environment. Findings revealed that distrust in one’s healthcare provider and entertainment-oriented media sources motivated users to seek information online. Additionally, distrust in information-oriented media increased the likelihood of turning to the Web before any other information source. The author raised several questions of perceptions of quality of information online. Most importantly, Rains’ findings raise the issue of a closer examination of the order in which information sources are sought, and what the role of online health information is.

Yoo and Robbins (2008) took a theoretical approach to understanding middle-aged women’s online health information seeking habits, incorporating the theoretical framework of uses and gratifications, and the theory of planned behavior. The authors surveyed 354 women between the ages of 35 and 60 to examine the relationship between behavioral intention, gratifications sought, attitude toward behavior and perceived behavioral control (which is very similar to the construct of self-efficacy). The respondents were selected from a directory of
middle and high school students of the city. The authors created a model suggesting behavioral intention is a predictor of behavior, and perceived behavioral control (PBC), attitude toward behavior (A), and gratifications sought (GS) are determinants of behavioral intention in addition to behavioral beliefs and control beliefs being determinants of PBC, A and GS. Finally they posit that past experience with health information seeking is an important construct which influences future use of the medium.

The results revealed that middle-aged women tend to go online more often if they have a positive attitude (A), strong motivations (GS) and more confidence regarding their abilities to navigate the web environment (PBS). The significant findings of the study have several implications, an important one being the incorporation of theoretical frameworks when practically creating health-related websites for a particular user group. Replication of the study with different populations would allow for a deeper understanding of particular motivations and online information seeking practices.
CHAPTER 3. METHODOLOGY AND DESIGN

This chapter discusses the methodology and design of the study. It begins with a restatement of research questions and hypotheses. The research design, population and sample selection procedures of the study are discussed next. This is followed by a detailed description of the development of the questionnaire and description of data collection and compilation procedures. Finally, this chapter provides a description of the data analysis procedures in this study.

Restatement of Research Questions and Hypotheses

**RQ1:** What are the perceived gratifications sought by health seekers when accessing online health information?

**RQ2:** What is the relationship between access to online health information and health-related behavior modifications among health seekers?

**RQ3:** Which health websites are most frequently accessed by health seekers?

**RQ4:** Is there an association between perceived credibility and reliability of online sources and their selection by health seekers?

**H1:** There will be a positive relationship between Internet self-efficacy of health seekers and access to online health information.

**H2a:** People are more likely to access online health information if they suffer from a chronic disease or disability.

**H2b:** People are more likely to access online health information if they have loved ones who suffer from a chronic disease or disability.

**H3:** People are more likely to access online health information if they suffer from a nagging health concern.

^ Definitions of all terms are provided in Chapter 1.
**H4:** Access to health-related websites by health seekers will be predicted by gratifications sought, Internet self-efficacy, involvement, outcome expectancies and socio-demographic variables like age, ethnicity and gender.

**H5:** Use of online health information accessed by health seekers will be predicted by gratifications sought and outcome expectancies.

**Research Design, Population and Sample**

The study utilized a survey design to collect data, generate results, answer research questions and test hypotheses. Survey research has unique advantages that make it one of the most popular scientific research tools in social scientific research, especially in terms of policy planning and assessment (Singleton & Straits, 1999). Surveys are used extensively for their ability for both description and explanation of ongoing phenomena, and are effective in providing detailed information about large heterogeneous populations. Most importantly, particularly for this study, survey research allows for an examination of several factors at the same time.

The data collection instrument was a structured questionnaire. Data collection for this project was conducted as part of my Graduate Learning Fellowship at the Cleveland Clinic Office of Civic Education Initiatives. The population comprised a sampling frame of 45,000 Internet users of 21 counties in Northeast Ohio. The 21 counties where these individuals reside are Ashland, Ashtabula, Carroll, Columbiana, Crawford, Cuyahoga, Erie, Geauga, Holmes, Huron, Lake, Lorain, Mahoning, Medina, Portage, Richland, Stark, Summit, Trumbull, Tuscarawas, and Wayne. All Internet users in the sampling frame were 18-64 years old.

The Cleveland Clinic Division of Marketing, Communications and Planning facilitated the data collection for this study, and it engaged an online survey organization called “E-
Rewards” to distribute the questionnaire using a non-probability sample. For this study, individuals in the sampling frame received the questionnaire. A total of 521 completed surveys were returned and used in the study. Completed surveys were compiled into a data file, which was then loaded on SPSS for inspection and analysis.

**Questionnaire**

The questionnaire used to collect data and test the hypotheses and research questions is described next. The different items on the questionnaire were developed based upon Eastin & LaRose (2004) and Torkzadeh & Van Dyke (2001), who each examined self-efficacy among Internet users. Information and behavioral involvement factors were measured using a modified version of the scale developed by Krantz, Baum and Wideman (1980). Items for uses and gratifications were developed using specific insights from Papacharissi and Rubin (2000), Tewksbury and Althaus (2000), Stafford, Stafford and Schkade (2004), Mittman and Cain (2001), Morahan-Martin (2004) and Rice (2001). Items for use of health information were developed using insights from Akesson et al. (2007), Al-Shammary et al. (2007), Bundorf et al., (2004), Henwood et al. (2004), Iakovadis et al. (2004), Mittman and Cain (2001), Morahan-Martin (2004), and Rice (2001). Finally, items related to health information credibility and reliability were developed using insights from Eysenbach and Kohler (2002), Kim et al. (1999), and Marton (2003).

Items examining access, use, and behavior modifications formed the first part of the questionnaire. Next, items sought information about gratifications sought, Internet self-efficacy, behavioral and information involvement, outcome expectancy and credibility/reliability. Finally,

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E-Rewards is an online survey company that has partnered with various corporate organizations to recruit survey takers by invitation. Survey takers are distributed surveys that match their own interest and the client company’s requirement. By completing surveys, members earn points which are redeemed for different products and/or services offered by the company’s member organizations.
demographic information was gathered, which consisted of information about current health status, gender, education, ethnicity and total household income.

Access to online health information. The first few items in the survey questionnaire addressed access to online health information. Access is defined as users actively seeking and physically retrieving information from online health websites. Respondents answered five close-ended questions and one open-ended question.

- In a typical week, how many hours do you spend on the computers? (Item measured using a scale that consisted of the following responses: 31 hours or more; 21 to 30.99 hours; 11 to 20.99 hours; 5 to 10.99 hours; 1 to 4.99 hours; Less than 1 hour)
- In a typical week, how many hours do you spend on the Internet (including time spent visiting websites, email etc.)? (Item measured using a scale that consisted of the following responses: 31 hours or more; 21 to 30.99 hours; 11 to 20.99 hours; 5 to 10.99 hours; 1 to 4.99 hours; Less than 1 hour)
- Have you ever looked for health information on the Internet? (Item measured using “yes/no” responses)
- In a typical week, how many hours do you spend visiting websites related to health information? (Item measured using a scale that consisted of the following responses: 31 hours or more; 21 to 30.99 hours; 11 to 20.99 hours; 5 to 10.99 hours; 1 to 4.99 hours; Less than 1 hour)
- List three websites in order that you visit most frequently to obtain online health information. Rank the order with 1-being most frequently accessed, 2-second most frequently accessed and so on.
- Do you subscribe to or access any email lists regarding health and wellness? (e.g. RealAge.com, webmd.com) (Item measured using “yes/no” responses)
Use of online health information. Next, use of online health information was measured, where use is a cognitive indication of use reported by health seekers which may or may not translate into behavioral changes. There were eight items in the scale developed to measure use. A five-point scale was used that consisted of responses: “Strongly Agree,” “Agree,” “Don’t know/Can’t say,” “Disagree,” and “Strongly disagree” and were coded with numerical values from 5 to 1 with 5 being “Strongly Agree” and 1 being “Strongly Disagree.”

I would like to…

- …spend time determining the significance of online health information I get before making health-related decisions.
- …spend time thinking about information I get from the Internet before making health-related decisions.
- …frequently go back to the Internet for follow-up information on health-related issues.
- …discuss information I find online with my doctor/healthcare provider.
- …discuss information I find online with my family and friends.
- …save/store/print health-related information.
- …get information to better my health and prevent health-related risks.
- … get information that helps me understand better what I can and cannot handle on my own as far as my health is concerned.

Behavior modification. Behavior modifications are defined as the behavioral changes that health seekers undertake in their lifestyles to incorporate health changes they access online. These modifications should be externally manifested, and therefore, observable. Nine items measured behavior modification using a five point scale consisting of responses: “Strongly Agree,” “Agree,” “Don’t know/Can’t say,” “Disagree,” and “Strongly disagree” and were coded
with numerical values from 5 to 1 with 5 being “Strongly Agree” and 1 being “Strongly Disagree.”

Based upon online health information I get, understand, and put thought into, I…

- …have made changes in my lifestyle (example: taking the stairs instead of the elevator, parking farther away)
- …have purchased/ordered healthy diet alternatives (example: at the grocery store, at a restaurant).
- …got additional medical/health-related tests relevant to my family history.
- …got additional medical/health-related tests relevant to my demographic profile.
- …got additional medical/health-related tests relevant to my personal needs.
- …have altered my eating habits.
- …exercised/undertook physical activity more frequently.
- …have made changes to my prescription and/or supplement use (example: vitamin use, fish oil etc.)
- …got medical attention promptly when needed.

**Gratifications sought.** Gratifications sought were measured using a 20 point scale developed using insights from the literature. Responses were measured using a five-point scale consisting of responses: “Strongly Agree,” “Agree,” “Don’t know/Can’t say,” “Disagree,” and “Strongly disagree” and were coded with numerical values from 5 to 1 with 5 being “Strongly Agree” and 1 being “Strongly Disagree.” Gratifications sought are defined as the needs and wants health seekers expect may be fulfilled by the use of online health information.

I seek online health information because it allows me to…

- …comprehend information at my own time.
- …evaluate/assess information at my own time.
• …comprehend information at my own pace.
• …evaluate/assess information at my own pace.
• …get a variety of information from different sources.
• …get information in the privacy of my own home.
• …instantly retrieve information as and when I need it.
• …retrieve information anonymously.
• …save money and other resources by self-treating minor ailments.
• …research specific diseases/ailment/disease.
• …get viewpoints of people in similar health contexts/ailments.
• …supplement information I get from my doctor/healthcare provider.
• …keep up with the developments in the field of healthcare.
• …customize information for my specific situation/needs.
• …get a preliminary online diagnosis through self-diagnostic applications on websites.
• …feel more self-sufficient about my health and body.
• …feel better prepared to discuss my health with my doctor/healthcare provider.
• …retrieve information related to a healthier lifestyle.
• …get support, help and advice other people in similar health contexts from online communities.
• …offer support, help and advice to other people in similar situations.
• …feel better prepared to deal with health issues of family and friends.
• …look at alternative options of medical and health-related treatment.

Internet self-efficacy: Internet self-efficacy was developed by combining and modifying two separate scales developed by Eastin & LaRose (2004) and Torkzadeh & Van Dyke (2001). A total of 16 items measured Internet self-efficacy. Self-efficacy is defined as the confidence health
seekers have in themselves to navigate the Internet for information. Responses were measured on a five-point scale consisting of responses: “Strongly Agree,” “Agree,” “Don’t know/Can’t say,” “Disagree,” and “Strongly disagree” using the following questions. The responses were coded with numerical values from 5 to 1 with 5 being “Strongly Agree” and 1 being “Strongly Disagree:”

- I can understand terms/words related to Internet hardware (Ex. processors, memory, modem, wireless technology, etc.)
- I can understand terms/words related to Internet software (Ex. web browser, email software, etc.)
- I can describe words and terms related to the Internet
- I understand what the Internet can or cannot be used for
- I am confident gathering data and information on the Internet
- I can troubleshoot Internet problems
- I am comfortable learning advanced skills within specific Internet programs
- I turn to online groups for help when I need it
- I feel confident looking for general information the web
- I feel confident looking for specific information the web
- I am confident in sending and receiving information on the Internet
- I can comfortably send email messages
- I can comfortably receive email messages
- I can scan pictures to save on my computer
- I am familiar with private file-sharing websites (e.g. Flickr, Yahoo pictures)
- I can upload scanned pictures onto a private file-sharing website to share with family/friends
I can comfortably download material from the Internet (e.g. buy songs, pictures for private/academic use)

Involvement: is defined as the motivation that allows health seekers to pay attention to media messages. Cognitive involvement is defined as individuals’ cognitive involvement with medical/health decisions related to their health conditions, and behavioral involvement is defined as the health-seekers’ desire toward engaging in self-treatment.

The scale that measured involvement was adapted from Krantz, Baum and Wideman (1980). Responses were measured on a five-point scale: “Strongly Agree,” “Agree,” “Don’t know/Can’t say,” “Disagree,” and “Strongly disagree” and were coded with numerical values from 5 to 1 with 5 being “Strongly Agree” and 1 being “Strongly Disagree.” Cognitive involvement is measured using the following 10 items. Items marked with an asterisk (*) were reverse coded during analysis.

- I usually don’t ask the doctor/nurse many questions about what they are doing during a medical examination*
- I’d rather have doctors/nurses make the best treatment decision for me rather than give me a whole lot of choices*
- Instead of waiting for them to tell me, I usually ask the doctor or nurse immediately after the exam about my health
- I usually ask the medical personnel a lot of questions about the procedure during or before the medical exam
- Before undergoing specific tests, I look up information about the tests from different sources
- I feel it’s better to trust the doctor/nurse in charge of the medical procedure than to question what they are doing*
• I’d rather be given many choices about what is best for my health than to have a doctor make decisions for me

• I pay attention to health information relevant for my age even when I do not have health problems

• I pay attention to health information relevant for my race even when I do not have health problems

• I pay attention to health information relevant for my gender even when I do not have health problems

• I frequently look up fitness/lifestyle/diet information from different sources

• I usually wait for the doctor/nurse to tell me the results of a medical exam than asking them immediately*

Behavioral involvement is measured using the following 8 items:

• Except for serious illness or in an emergency, I self-treat my ailments.

• I rely on experts (doctors) than relying on “common sense” in treating myself*

• I go to clinics and hospitals because they are good places to go for medical treatment*

• I have been learning how to treat some of my health problems without contacting a doctor.

• I go to doctors to seek professional help rather than to try to treat myself.*

• I rarely self-medicate or treat my illness myself.*

• If it costs the same, I have a doctor or nurse treat me than do the treatments myself*

• I treat myself more often than relying on experts to treat me.

Outcome expectancy: Outcome expectancy is defined as the end results expected by health seekers as a consequence of their online health information seeking behavior. Outcome expectancy was measured using a five point scale consisting of responses: “Strongly Agree,”
“Agree,” “Don’t know/Can’t say,” “Disagree,” and “Strongly disagree” and were coded with numerical values from 1 to 5 with 1 being “Strongly Agree” and 5 being “Strongly Disagree.” Items marked with an asterisk (*) were reverse coded during analysis. The scale consisted of the following 14 items:

- I become overwhelmed with information concerning my health.
- I get concerned about protection of privacy of my health-related information.
- I get concerned about credibility of online information sources.
- Online health information was too complex to understand.
- Self-treatment might lead to a life-threatening situation.
- I am concerned that some information online is biased because it caters to vested interest of drug companies and other health-related organizations.
- Understanding information was difficult with the large volume of information.
- I was concerned about how online health information fits with my specific health context.
- I was concerned about how online health information fits with the specific health context of my family and friends.
- Difficulty of treatment is an important factor I look at while seeking online health information.
- I am satisfied with use of Internet as an information tool for health information. *
- I am satisfied with use of Internet as a learning tool for health information. *
- I am satisfied with use of Internet as a networking tool for health information. *

Perceived credibility and reliability: Twelve items measured the perceived credibility and reliability on a five-point scale consisting of responses: “Strongly Agree,” “Agree,” “Don’t know/Can’t say,” “Disagree,” and “Strongly disagree” and were coded with numerical values from 5 to 1 with 5 being “Strongly Agree” and 1 being “Strongly Disagree.” Perceived
credibility and reliability are defined as the efforts users put in determining the credibility and reliability of online health information websites based upon their perceptions. Items marked with an asterisk (*) were reverse coded during analysis.

- I almost always check the author of the health website I visit.
- I only visit websites belonging to reputed health organizations.
- I do not care what the credibility of the source is as long as the information makes common sense.*
- I only visit websites recommended by my doctor/healthcare provider. *
- I recommend websites I find reliable to family and friends.
- I visit websites recommended by my family and friends.
- If the website is sponsored by an organization or an institution, I check its credentials.
- I frequently check how a website is rated among online health communities.
- I almost always check the ‘About us’ section of the health website I visit.
- I rarely check websites sponsored by health organizations because of their biased interest.*
- I believe it is important to know where my health information is coming from.
- The information on websites I frequently visit is credible.

**Socio-demographic factors:** The last section of the survey examined socio-demographic factors such as current health status, whether they have insurance or not, gender, age, education level, total household income and ethnicity. The scales for respondents’ education level and household income were adapted from the questionnaire used in US census.

- Do you currently have health insurance?
- Do you suffer from a chronic disease or disability?
• Do you have a loved one or a family member who suffers from a chronic disease or disability?

• Do you have or have you had a nagging health concern? (A persistent backache, pain that comes and goes)

• Where do you most frequently access the Internet?
  □ Home
  □ Work/School
  □ Other (Specify):

• Are you male or female?

• Enter the last two digits of your birth year

• What is your education level? (Check one)
  □ Less than 9th grade
  □ 9th to 12th grade, no diploma
  □ High school graduate (includes equivalency)
  □ Some college, no degree
  □ Associate degree
  □ Bachelor’s degree
  □ Graduate or professional degree
  □ Other

• What is your total household income? (Check one)
  □ Less than $10,000
  □ $10,000 to $24,999
  □ $25,000 to $49,999
  □ $50,000 to $74,999
  □ $75,000 to $99,999
  □ Over $100,000

• What is your ethnicity?
  □ African/African American
  □ American Indian/Alaska Native
  □ Asian/Asian American
  □ Hispanic
  □ Native Hawaiian/Pacific Islander
  □ White/Caucasian
  □ Other
Data Collection

The research project proposal, along with the information sheet for the respondents with a description of the study and their rights, the questionnaire and research procedures, were submitted for review and approval to Human Subjects Review Board (HSRB) at Bowling Green State University and the (IRB) Institutional Review Board at Cleveland Clinic. Once HSRB/IRB approvals were received, the questionnaire was sent to the Cleveland Clinic Division of Marketing, Communications and Planning, who programmed the questionnaire in *QuestionPro*, a software program used to distribute electronic questionnaires.

The questionnaire was programmed to ensure the highest quality of data possible, taking into account respondent fatigue. The questions about access in section one (questions 1-6) and the questions on demographic information in section two (questions 108-117) remained the same for all respondents. However, for all other questions, the order of different scales would change for different respondents, and the questions within the scales would also rotate. The researcher ensured that while the scales and questions randomly rotated, the questions belonging to each scale remained intact. For example, all questions that were a part of the scale that measured involvement would remain together no matter what order they appeared in within the scale. The questionnaire was once again checked for spelling and grammar errors, and once the relevant corrections were made, the link with the questionnaire was sent to E-rewards for distribution to participants.

The questionnaire was electronically distributed to 18-64 year old Internet users in Northeast Ohio within the E-Rewards database. An information letter explaining the purpose of the study and the respondents’ rights as a participant preceded the questionnaire in accordance with HSRB protocol. E-rewards began the data collection with a *soft launch*, sending the questionnaire out to a limited number of participants. This is standard protocol of the company to
ensure that the questionnaire is programmed properly and the data appear in the database properly. Once the researcher and the market research team verified the data, E-rewards proceeded to a *full launch* of the questionnaire.

The first 521 completed surveys were compiled into a data set by E-Rewards. Data were cleaned for errors before loading on to Statistical Program for Social Sciences (SPSS) for analyses. All variables were named and given descriptive labels. The data were checked for further errors by running frequency distributions. The final data set was ready in SPSS for further analysis.

*Limitations of Data Collection Method*

The researcher chose the database suggested by the market research team of Cleveland Clinic as a reasonable and accessible way to obtain the necessary sample. The sampling method for the study is volunteer sampling, and hence has all the limitations of a non-probability sample, primarily the inability of being able to generalize the findings of the study to a larger population.

This study is exploratory in nature, and the researcher believes that the sample size allows for useful insights which may be helpful in understanding the online health information seeking behavior of Internet users in general, particularly with lesser studied variables like behavior modifications.

*Data Compilation*

*Factor Analysis*

Data were subjected to factor analyses, a statistical method used to reduce data into a small number of factors that are closely related. Factor analysis is a multivariate statistical method used to reduce a large number of variables into specific categories which then make up the factors of the factor analysis. (Agresti & Finlay, 2009). It is an objective technique used to
make dimensions of constructs more concise. This method allows researchers to know which variables could be collapsed into a single variable for further data analysis. The principal component analysis method and varimax rotation were used to condense the number of variables in the following seven sections of the questionnaire: use of online health information, behavior modifications, gratifications sought, Internet self-efficacy, cognitive and behavioral involvement, outcome expectancy and credibility/reliability of Internet sources. Specific results of the analysis are listed below.

*Use of Online Health Information*

Participants were questioned on their cognitive indication of Internet use through 8 items in the questionnaire. Factors analysis resulted in one factor with eigenvalue of 1 or greater. The factor is labeled as: Use of Online Information. The results of the factor analysis are presented in Table 1. Items having factor loadings of .50 or greater were included in the resulting factor.

*Behavior modifications*

Behavior modifications were measured through 9 items in the questionnaire, and factor analysis yielded 2 factors with eigenvalues of 1 or greater. The 2 factors are 1) Getting Preventive Medical Tests, and 2) Modifications to Lifestyle. The results of the factor analysis are presented in Table 2 and consist of only items having factor loadings of .50 or greater.

*Gratifications sought*

There were 22 items in the questionnaire that measured gratifications sought by participants, which resulted into 4 factors with eigenvalues of 1 or greater through factor analysis. The 4 factors are 1) Ease of Information Seeking, 2) Empowerment, 3) Self-health Management & Privacy, and 4) Online social networking. The results of the factor analysis, which only consist of items having factor loadings of .50 or greater are presented in Table 3.
### Table 1: Factor Analysis of Use of Online Health Information Items

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use of Online Information:</td>
<td></td>
</tr>
<tr>
<td>I would like to…</td>
<td></td>
</tr>
<tr>
<td>• get information to better my health and prevent health-related risks</td>
<td>.78</td>
</tr>
<tr>
<td>• spend time thinking about information I retrieve from the Internet before making health-related decisions</td>
<td>.76</td>
</tr>
<tr>
<td>• get information that helps me understand better what I can and cannot handle on my own as far as my health is concerned</td>
<td>.74</td>
</tr>
<tr>
<td>• discuss information I find online with my doctor/healthcare provider</td>
<td>.72</td>
</tr>
<tr>
<td>• frequently go back to the Internet for follow up information on health-related issues</td>
<td>.71</td>
</tr>
<tr>
<td>• spend time determining the significance of online health information I get before making health-related decisions</td>
<td>.70</td>
</tr>
<tr>
<td>• save/store/print health-related information</td>
<td>.62</td>
</tr>
</tbody>
</table>

Eigenvalue 1=3.87
Variance explained 48.34
(Total variance explained by factor = 48.34%)

### Table 2: Factor Analysis of Behavior Modifications Items

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items</td>
<td></td>
</tr>
<tr>
<td>1. Getting Preventive Medical Tests</td>
<td></td>
</tr>
<tr>
<td>Based upon online health information I get and think about, I…</td>
<td></td>
</tr>
<tr>
<td>• got additional medical/health-related tests relevant to my family history</td>
<td>.86</td>
</tr>
<tr>
<td>• got additional medical/health-related tests relevant to my demographic profile</td>
<td>.85</td>
</tr>
<tr>
<td>• got additional medical/health-related tests relevant to my personal needs</td>
<td>.80</td>
</tr>
<tr>
<td>• got medical attention promptly when needed</td>
<td>.62</td>
</tr>
</tbody>
</table>

Eigenvalue 1=4.19 2=1.51
Variance explained 46.52 16.77
(Total variance explained by two factors = 63.29%)
Internet Self Efficacy

The Internet self efficacy scale consisted of 17 items in the questionnaire and the factor analysis of these items resulted into 2 factors with eigenvalues of 1 or greater. These factors are 1) Confidence In Messaging and Retrieving Information, and 2) Confidence in Internet Navigation and File Sharing. All the items represented in Table 4 are factors that loaded at 0.50 or greater.

Involvement

The questionnaire consisted of 20 items that measured the participants’ involvement in their health decisions. These items resulted in 5 factors after factor analysis that have eigenvalues of 1 and greater. These 5 factors are 1) Cognitive Involvement Related with Pertinent Health Information, 2) Reliance on Experts, 3) Self-treatment of Ailments, 4) Information Seeking from Experts, and 5) Involvement with Medical Options. These factors are represented in Table 5 and consist only of items that loaded at 0.50 or greater.

Outcome expectancy

The participants answered 13 items on the outcome expectancy scale, which were then subjected to a factor analysis, yielding 3 factors of eigenvalues of 1 or greater. These factors are 1) Outcomes of Information Seeking 2) Anxiety Related to Credibility and Reliability and 3) Positive Outcomes Related to Networking and Learning. The factors that loaded at a value of 0.50 or higher are represented in Table 6.
Table 3: Factor Analysis of Gratifications Sought Items

<table>
<thead>
<tr>
<th>Items:</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>I seek online health information because it allows me to...</td>
<td></td>
</tr>
<tr>
<td>1. Ease of Information Seeking</td>
<td></td>
</tr>
<tr>
<td>• evaluate/assess information at my own pace</td>
<td>.79</td>
</tr>
<tr>
<td>• comprehend information on my own time</td>
<td>.78</td>
</tr>
<tr>
<td>• evaluate/assess information on my own time</td>
<td>.76</td>
</tr>
<tr>
<td>• comprehend information at my own pace</td>
<td>.76</td>
</tr>
<tr>
<td>• instantly retrieve information as and when I need it</td>
<td>.76</td>
</tr>
<tr>
<td>• research specific diseases/ailment</td>
<td>.61</td>
</tr>
<tr>
<td>2. Empowerment</td>
<td></td>
</tr>
<tr>
<td>• feel better prepared to discuss my health with my doctor/healthcare provider</td>
<td>.74</td>
</tr>
<tr>
<td>• keep up with the developments in the field of healthcare</td>
<td>.69</td>
</tr>
<tr>
<td>• supplement information I get from my doctor/healthcare provider</td>
<td></td>
</tr>
<tr>
<td>• get a variety of information from different sources</td>
<td>.67</td>
</tr>
<tr>
<td>3. Self-health Management &amp; Privacy</td>
<td></td>
</tr>
<tr>
<td>• save money and other resources by self-treating minor ailments</td>
<td>.56</td>
</tr>
<tr>
<td>• get a preliminary online diagnosis through self-diagnostic applications on websites</td>
<td>.76</td>
</tr>
<tr>
<td>• get information in the privacy of my own home</td>
<td>.67</td>
</tr>
<tr>
<td>• retrieve information anonymously</td>
<td></td>
</tr>
<tr>
<td>4. Online Social Networking</td>
<td></td>
</tr>
<tr>
<td>• get support help and advice from other people in similar health contexts from online communities</td>
<td>.83</td>
</tr>
<tr>
<td>• get viewpoints of people in similar health contexts/ailments</td>
<td></td>
</tr>
<tr>
<td>• offer support help and advice to other people in similar situations</td>
<td>.79</td>
</tr>
</tbody>
</table>

Eigenvalue  
1=8.245  2=1.969  3=1.351  4=1.001
Variance explained  
37.48  8.95  6.14  4.55
(Total variance explained by four factors = 57.120%)
### Table 4: Factor Analysis of Internet Self-efficacy scale

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Confidence in Messaging and Retrieving Information</strong></td>
<td>1</td>
</tr>
<tr>
<td>- I can comfortably receive email messages</td>
<td>.87</td>
</tr>
<tr>
<td>- I can comfortably send email messages</td>
<td>.83</td>
</tr>
<tr>
<td>- I feel confident looking for specific information on the web</td>
<td>.83</td>
</tr>
<tr>
<td>- I feel confident looking for general information on the web</td>
<td>.82</td>
</tr>
<tr>
<td>- I am confident gathering data and information on the Internet</td>
<td>.76</td>
</tr>
<tr>
<td>- I am confident in sending and receiving information on the Internet</td>
<td>.73</td>
</tr>
<tr>
<td>- I can describe words and terms related to the Internet</td>
<td>.66</td>
</tr>
<tr>
<td>- I can understand terms/words related to Internet software Ex web browser email software etc</td>
<td>.63</td>
</tr>
<tr>
<td>- I can comfortably download material from the Internet (for e.g. buy songs, pictures for private/academic use etc.)</td>
<td>.59</td>
</tr>
<tr>
<td>- I understand what the Internet can or cannot be used for</td>
<td>.59</td>
</tr>
<tr>
<td><strong>2. Confidence in Internet Navigation and File Sharing</strong></td>
<td>2</td>
</tr>
<tr>
<td>- I can upload scanned pictures onto a private file-sharing website</td>
<td>.78</td>
</tr>
<tr>
<td>- I am familiar with private file-sharing websites eg Flickr Yahoo pictures etc</td>
<td>.75</td>
</tr>
<tr>
<td>- I can troubleshoot Internet problems</td>
<td>.67</td>
</tr>
<tr>
<td>- I turn to online groups for help when I need it</td>
<td>.64</td>
</tr>
<tr>
<td>- I am comfortable learning advanced skills within specific Internet programs</td>
<td>.59</td>
</tr>
<tr>
<td>- I can understand terms/words related to Internet hardware (for e.g. processors, memory, modem, wireless technology etc.)</td>
<td>.59</td>
</tr>
<tr>
<td>- I can scan pictures to save on my computer</td>
<td>.55</td>
</tr>
</tbody>
</table>

Eigenvalue 1=9.251 2=1.572

Variance explained 54.42 9.25

(Total variance explained by two factors = 63.67%)
Table 5: Factor Analysis of Involvement scale

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cognitive Involvement Related with Pertinent Health Information</td>
<td></td>
</tr>
<tr>
<td>• I pay attention to health information pertinent for gender even when I do not have health problems</td>
<td>.89</td>
</tr>
<tr>
<td>• I pay attention to health information pertinent for my age even when I do not have health problems</td>
<td>.85</td>
</tr>
<tr>
<td>• I pay attention to health information pertinent for my race even when I do not have health problems</td>
<td>.79</td>
</tr>
<tr>
<td>2. Reliance on Experts</td>
<td></td>
</tr>
<tr>
<td>• I rely on experts doctors rather than relying on common sense in treating myself</td>
<td>.70</td>
</tr>
<tr>
<td>• I rarely self-medicate or treat my illness myself</td>
<td>.59</td>
</tr>
<tr>
<td>• I go to doctors to seek professional help rather than try to treat myself</td>
<td>.58</td>
</tr>
<tr>
<td>• If it costs the same I’d have a doctor or nurse treat me than do the treatments myself</td>
<td>.56</td>
</tr>
<tr>
<td>• I go to clinics and hospitals because they are good places to go for medical treatment</td>
<td>.54</td>
</tr>
<tr>
<td>3. Self-treatment of Ailments</td>
<td></td>
</tr>
<tr>
<td>• Except for serious illness or in an emergency I self-treat my ailments</td>
<td>.71</td>
</tr>
<tr>
<td>• I treat myself more often than relying on experts to treat me</td>
<td>.71</td>
</tr>
<tr>
<td>• I have been learning how to treat some of my health problems without contacting a doctor</td>
<td>.71</td>
</tr>
<tr>
<td>4. Information Seeking from Experts</td>
<td></td>
</tr>
<tr>
<td>• Instead of waiting for them to tell me I usually ask the doctor or nurse immediately after the exam about my health</td>
<td>.75</td>
</tr>
<tr>
<td>• I usually wait for the doctor/nurse to tell me the results of a medical exam than asking them immediately</td>
<td>.73</td>
</tr>
<tr>
<td>• I usually ask the medical personnel a lot of questions about the procedure during or before the medical exam</td>
<td>.63</td>
</tr>
<tr>
<td>• I usually don’t ask the doctor/nurse many questions about what they are doing during a medical examination</td>
<td>.59</td>
</tr>
<tr>
<td>5) Involvement with Medical Options</td>
<td></td>
</tr>
<tr>
<td>• I’d rather have doctors/nurses make the best treatment decision for me rather than give me a whole lot of choices</td>
<td>.79</td>
</tr>
<tr>
<td>• I’d rather be given many choices about what is best for my health than to have a doctor make decisions for me</td>
<td>.75</td>
</tr>
</tbody>
</table>

Eigenvalue 1=3.610 2=3.236 3=1.985 4=1.292 5=1.175
Variance explained 18.05 16.18 9.93 6.46 5.88
(Total variance explained by 5 factors = 56.49%)
Table 6: Factor Analysis of Outcome Expectancy scale

<table>
<thead>
<tr>
<th>Items</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Outcomes of Information Seeking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I become overwhelmed with information concerning my health</td>
<td>.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Online health information is too complex to understand</td>
<td>.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Understanding information was difficult with the large volume of information</td>
<td>.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I am concerned about how online health information fits with my specific health context</td>
<td>.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I am concerned about how online health information fits with the specific health context of my family and friends</td>
<td>.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. Anxiety Related to Credibility and Reliability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I get concerned about credibility of online information sources</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I am concerned that some information online is biased because it caters to vested interest of drug companies and other health-related organizations</td>
<td>.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I get concerned about protection of privacy of my health-related information</td>
<td>.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3. Positive Outcomes Related to Networking and Learning</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I am satisfied with use of Internet as an information tool for health information</td>
<td>.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I am satisfied with use of Internet as a learning tool for health information</td>
<td>.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I am satisfied with use of Internet as a networking tool for health information</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Eigenvalue 1=3.366 2=2.144 3=1.335

Variance explained 25.89 16.49 10.27

(Total variance explained by three factors = 52.66%)

Perceived Credibility & Reliability

Perceived credibility and reliability of health information were measured through 12 items on a scale, and the factor analysis yielded 3 factors with eigenvalues of 1 or greater. The 3 factors are 1) Credibility of Online Sources 2) Peer-Network Influence on Online Source Credibility 3) Passive Approach to Credibility. These factors with loadings of 0.50 or higher are represented in Table 7.
Table 7: Factor Analysis of Online Information Credibility and Reliability Scale

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1. Credibility of Online Sources</td>
<td></td>
</tr>
<tr>
<td>• If the website is sponsored by an organization or an institution I check the credentials of the same</td>
<td>.76</td>
</tr>
<tr>
<td>• I almost always check the author of the health website I visit</td>
<td>.72</td>
</tr>
<tr>
<td>• I frequently check how a website is rated among online health communities</td>
<td>.67</td>
</tr>
<tr>
<td>• I almost always check the About us section of the health website I visit</td>
<td>.64</td>
</tr>
<tr>
<td>• I only visit websites belonging to reputed health organizations</td>
<td>.57</td>
</tr>
<tr>
<td>2. Peer-Network Influence on Online Source Credibility</td>
<td></td>
</tr>
<tr>
<td>• I recommend websites I find reliable to family and friends</td>
<td>.80</td>
</tr>
<tr>
<td>• I visit websites recommended by my family and friends</td>
<td>.78</td>
</tr>
<tr>
<td>• The information on websites I frequently visit is credible</td>
<td>.57</td>
</tr>
<tr>
<td>3. Passive Approach to Credibility</td>
<td></td>
</tr>
<tr>
<td>• I do not care what credibility of the source is as long as the information makes common sense</td>
<td>.68</td>
</tr>
<tr>
<td>• I rarely check websites sponsored by health organizations because of their biased interest</td>
<td>.68</td>
</tr>
<tr>
<td>• I only visit websites recommended by my doctor/healthcare provider</td>
<td>.65</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>1=3.438</td>
</tr>
<tr>
<td>Variance explained</td>
<td>28.65</td>
</tr>
<tr>
<td>(Total variance explained by three factors = 53.71%)</td>
<td></td>
</tr>
</tbody>
</table>

Reliability Analysis

All the items that loaded on the respective factors of the constructs – use of information, behavior change, gratifications sought, self-efficacy, involvement, outcome expectancy and credibility of information, represented in Tables 1 to 7, were combined to construct summative scales. These scales were then subjected to a reliability analysis, the results of which are presented in Table 8. Reliability was determined through the scores of Cronbach alpha, which determines the internal consistency of the scale. Cronbach alpha is a coefficient of reliability and
measures how consistently the items in the scale measure the given construct. Only factors with Cronbach scores of 0.50 or higher were retained for further analysis. One scale was dropped from the analysis for having a low alpha score, as shown in Table 8.

Table 8: Reliability Analysis of Factors

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Factors/Scales</th>
<th>Alpha Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Internet</td>
<td>Use of Online Information</td>
<td>.84</td>
</tr>
<tr>
<td>Behavior Modifications</td>
<td>Getting Preventive Medical Tests</td>
<td>.83</td>
</tr>
<tr>
<td></td>
<td>Modifications to Lifestyle</td>
<td>.82</td>
</tr>
<tr>
<td>Gratifications Sought</td>
<td>Ease of Information Seeking</td>
<td>.87</td>
</tr>
<tr>
<td></td>
<td>Empowerment</td>
<td>.76</td>
</tr>
<tr>
<td></td>
<td>Self-health Management &amp; Privacy</td>
<td>.66</td>
</tr>
<tr>
<td></td>
<td>Online Social Networking</td>
<td>.79</td>
</tr>
<tr>
<td>Internet Self-efficacy</td>
<td>Confidence in Messaging and Retrieving Information</td>
<td>.94</td>
</tr>
<tr>
<td></td>
<td>Confidence in Internet Navigation and File Sharing</td>
<td>.85</td>
</tr>
<tr>
<td>Involvement</td>
<td>Cognitive Involvement related with Pertinent Health Information</td>
<td>.82</td>
</tr>
<tr>
<td></td>
<td>Reliance on Experts</td>
<td>.69</td>
</tr>
<tr>
<td></td>
<td>Self-treatment of Ailments</td>
<td>.68</td>
</tr>
<tr>
<td></td>
<td>Information Seeking from Experts</td>
<td>.66</td>
</tr>
<tr>
<td></td>
<td>Involvement with Medical Options</td>
<td>.58</td>
</tr>
<tr>
<td>Outcome Expectancy</td>
<td>Outcomes of Information Seeking</td>
<td>.77</td>
</tr>
<tr>
<td></td>
<td>Anxiety Related to Credibility and Reliability</td>
<td>.58</td>
</tr>
<tr>
<td></td>
<td>Positive Outcomes Related to Networking and Learning</td>
<td>.77</td>
</tr>
<tr>
<td>Perceived Credibility and Reliability</td>
<td>Credibility of Online Sources</td>
<td>.76</td>
</tr>
<tr>
<td></td>
<td>Peer-Network Influence on Online Source Credibility</td>
<td>.62</td>
</tr>
<tr>
<td></td>
<td>Passive Approach to Credibility</td>
<td>.49*</td>
</tr>
</tbody>
</table>

* This factor had Cronbach alpha level below .50 and was not used in subsequent analyses
Data Analyses and Procedures

Descriptive statistics relating to respondent profile (for example: sex, age, ethnicity, household income, educational level, and so on) were generated using frequency distributions. Next, the distribution of scores and a summary of mean responses to the different scales (access, use, behavior modifications, gratifications sought, Internet self-efficacy, involvement, outcome expectancy and information credibility/reliability) are described using the mean, standard deviation, range of scale and averaged mean ranks (see Chapter 4).

A typology of gratifications was generated to answer Research Question 1, and Research Question 2 was explored using a Kendall’s Tau-c correlation analysis. Frequency distributions of frequently visited health-related websites were generated and subsequently, one-sample chi square tests were run to answer Research Question 3. Research Question 4 was answered using correlation tests between the first choice of health websites and perceived credibility and reliability constructs.

The default significance level for all hypotheses tests and research questions was set \( p \leq 0.05 \). Hypothesis 1 was tested using correlation analysis (Kendall’s Tau-c). Hypotheses 2a, 2b and 3 were tested using Pearson’s Chi-square. Hypotheses 4 and 5 were tested by running multiple regression analyses. Relevant data were subjected to residual analysis such as tests for multicollinearity, linearity, normality and homoscedasticity. All these results are reported in Chapter 4.
CHAPTER 4. RESULTS

This chapter will present results of all the data analyses and hypotheses tests for this study and comprises three major sections. The first section will present the socio-demographic profile of respondents. Then, the distribution of scores and a summary of mean responses to the different scales (access, use, behavior modifications, gratifications sought, Internet self-efficacy, involvement, outcome expectancy and information credibility/reliability) are described. The final section will comprise results of tests of hypotheses and research questions.

Respondent Profile

Sex of respondents

The sample comprises 18-64 year old Internet users in Northeast Ohio. The respondents’ sex was slightly unequally distributed with 53.9% of Internet users being males. All 521 respondents answered this question and the results are presented in Table 9 and Figure 1.

Table 9: Sex of Respondents

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>281</td>
<td>53.9</td>
<td>53.9</td>
<td>53.9</td>
</tr>
<tr>
<td>Female</td>
<td>240</td>
<td>46.1</td>
<td>46.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>521</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Sex of respondents
Age of respondents

The respondents’ year of birth ranged from 1945 to 1991. The mean age was 42.32 years, the median age was 42 years and the mode for the data was 23 years. The standard deviation was 13.18. These results are presented in Table 10 and Figure 2.

Respondents’ ethnicity

As evident in Figure 3 and Table 11, the respondents’ ethnic background is overwhelmingly uneven with 93.5% of the population being White/Caucasians. Africans/African American respondents formed 3.1% of the total distribution, while Asians/Asian Americans formed 1.9%. There were .08% Hispanics and .02% American Indian/Alaskan natives among the respondents, while the rest classified themselves under ‘Other’.

![Figure 2: Age of Respondents in Years](image)

(Mean = 42.32 years, Median = 42 years, Std. Dev = 13.18)
Table 10: Age of Respondents (in Years)

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.00</td>
<td>1</td>
<td>.2</td>
<td>.2</td>
<td>.2</td>
</tr>
<tr>
<td>19.00</td>
<td>11</td>
<td>2.1</td>
<td>2.1</td>
<td>2.3</td>
</tr>
<tr>
<td>20.00</td>
<td>7</td>
<td>1.3</td>
<td>1.3</td>
<td>3.7</td>
</tr>
<tr>
<td>21.00</td>
<td>6</td>
<td>1.2</td>
<td>1.2</td>
<td>4.8</td>
</tr>
<tr>
<td>22.00</td>
<td>9</td>
<td>1.7</td>
<td>1.7</td>
<td>6.5</td>
</tr>
<tr>
<td>23.00</td>
<td>21</td>
<td>4.0</td>
<td>4.0</td>
<td>10.6</td>
</tr>
<tr>
<td>24.00</td>
<td>8</td>
<td>1.5</td>
<td>1.5</td>
<td>12.1</td>
</tr>
<tr>
<td>25.00</td>
<td>4</td>
<td>.8</td>
<td>.8</td>
<td>12.9</td>
</tr>
<tr>
<td>26.00</td>
<td>3</td>
<td>.6</td>
<td>.6</td>
<td>13.5</td>
</tr>
<tr>
<td>27.00</td>
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<td>3.1</td>
<td>16.5</td>
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<td>28.00</td>
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<td>1.9</td>
<td>1.9</td>
<td>18.5</td>
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<td>29.00</td>
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<td>2.1</td>
<td>2.1</td>
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<td>2.1</td>
<td>40.6</td>
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<td>2.9</td>
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<td>2.3</td>
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<td>48.3</td>
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<td>1.9</td>
<td>50.2</td>
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<td>2.1</td>
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<td>85.8</td>
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<td>89.4</td>
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<td>92.9</td>
</tr>
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<td>3.1</td>
<td>96.0</td>
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<td>1.9</td>
<td>97.9</td>
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<td>63.00</td>
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<td>64.00</td>
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<td>1.0</td>
<td>1.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>520</td>
<td>99.8</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>521</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 11: Respondents’ Ethnicity

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>African/African American</td>
<td>16</td>
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<td>3.1</td>
<td>3.1</td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>1</td>
<td>.2</td>
<td>.2</td>
<td>3.3</td>
</tr>
<tr>
<td>Asian/Asian American</td>
<td>10</td>
<td>1.9</td>
<td>1.9</td>
<td>5.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4</td>
<td>.8</td>
<td>.8</td>
<td>6.0</td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>487</td>
<td>93.5</td>
<td>93.5</td>
<td>99.4</td>
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<tr>
<td>Other</td>
<td>3</td>
<td>.6</td>
<td>.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>521</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3: Respondents’ Ethnicity

Household income

As far as total yearly household income is concerned, 26.7% of the respondents’ yearly income was over $100,000. Respondents whose total annual incomes were between $75,000 and $99,999, consisted of 22.3% of the respondents. These were followed by 21.7% of respondents whose total annual incomes were between $50,000 and $74,999 and 20.5% of respondents whose
total annual incomes were between $25,000 and $49,999. Respondents whose total annual incomes were between $10,000 and $24,999, and under $10,000 constituted of 5.2% and 3.6% of total respondents respectively. (See Table 12 and Figure 4).

Table 12: Total Household Annual Income of Respondents

<table>
<thead>
<tr>
<th>Income</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $10,000</td>
<td>19</td>
<td>3.6</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>$10,000 to $24,999</td>
<td>27</td>
<td>5.2</td>
<td>5.2</td>
<td>8.8</td>
</tr>
<tr>
<td>$25,000 to $49,999</td>
<td>107</td>
<td>20.5</td>
<td>20.5</td>
<td>29.4</td>
</tr>
<tr>
<td>$50,000 to $74,999</td>
<td>113</td>
<td>21.7</td>
<td>21.7</td>
<td>51.1</td>
</tr>
<tr>
<td>$75,000 to $99,999</td>
<td>116</td>
<td>22.3</td>
<td>22.3</td>
<td>73.3</td>
</tr>
<tr>
<td>Over $100,000</td>
<td>139</td>
<td>26.7</td>
<td>26.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>521</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4: Total Household Annual Income in US Dollars
**Place of access of Internet**

Figure 5 shows that 78.1% of the respondents indicated that they access the Internet from home, while 20.7% access Internet from work or school. The rest (1.2%) indicated that they access the Internet from other locations. (See also Table 13).

**Health Insurance**

Of the 521 survey respondents, 94.4% currently have health insurance, and 5.6% do not. This is represented in Table 14 and Figure 6.

<table>
<thead>
<tr>
<th>Place of Access</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>407</td>
<td>78.1</td>
<td>78.1</td>
<td>78.1</td>
</tr>
<tr>
<td>Work/School</td>
<td>108</td>
<td>20.7</td>
<td>20.7</td>
<td>98.8</td>
</tr>
<tr>
<td>Other specify</td>
<td>6</td>
<td>1.2</td>
<td>1.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>521</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

![Figure 5: Place of Access of Internet](chart.png)
Table 14: Access to Health Insurance

<table>
<thead>
<tr>
<th>Health Insurance</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>492</td>
<td>94.4</td>
<td>94.4</td>
<td>94.4</td>
</tr>
<tr>
<td>No</td>
<td>29</td>
<td>5.6</td>
<td>5.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>521</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Figure 6: Access to Health Insurance

Education level of respondents

The distribution of responses for education level is shown in Figure 7 and Table 15, which indicate that 32.1% of respondents have at least a bachelor’s degree. Another 24.6% have some college education but no degree. Graduate or professional degree holders make up 21.3% of respondents, and 11.1% have a high school diploma. Associate degree holders form 9.4% of total respondents. One percent of respondents have been to high school but have no diploma, while 0.6% indicated ‘other’.
Table 15: Education level of respondents

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th to 12th grade (no diploma)</td>
<td>5</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>High school or equivalent</td>
<td>58</td>
<td>11.1</td>
<td>11.1</td>
<td>12.1</td>
</tr>
<tr>
<td>Some college (no degree)</td>
<td>128</td>
<td>24.6</td>
<td>24.6</td>
<td>36.7</td>
</tr>
<tr>
<td>Associate degree</td>
<td>49</td>
<td>9.4</td>
<td>9.4</td>
<td>46.1</td>
</tr>
<tr>
<td>Bachelors degree</td>
<td>167</td>
<td>32.1</td>
<td>32.1</td>
<td>78.1</td>
</tr>
<tr>
<td>Graduate or professional degree</td>
<td>111</td>
<td>21.3</td>
<td>21.3</td>
<td>99.4</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>.6</td>
<td>.6</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>521</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Figure 7: Education Level
Results

Access to online health information

Access to online health information was defined as users actively seeking and physically retrieving information from online health websites. Respondents self-reported their levels of access by answering the following two questions in the questionnaire.

Have you ever looked for health information on the Internet? Of the 521 respondents, 441 (84.6%) respondents responded that they had looked at online health information.

To further understand the extent of access, the question was asked: In a typical week, how many hours do you spend visiting websites related to online health information? On average in a week, 0.2% of respondents responded that they visited health websites for 31 hours or more while 0.5% responded that they visited health websites from 21 to 30.99 hours. Another 1.2% of the respondents spent between 11 and 20.99 hours looking at online health information, whereas 6.6% spent 5 to 10.99 hours. Respondents who spent 1 to 4.99 hours were 38.1% of the respondents while more than half the respondents (53.3%) spent less than one hour looking at online health information (see Table 16).

Table 16: Access to Health Information

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 hour</td>
<td>235</td>
<td>45.1</td>
<td>53.3</td>
</tr>
<tr>
<td>1 to 4.99 hours</td>
<td>168</td>
<td>32.2</td>
<td>38.1</td>
</tr>
<tr>
<td>5 to 10.99 hours</td>
<td>29</td>
<td>5.6</td>
<td>6.6</td>
</tr>
<tr>
<td>11 to 20.99 hours</td>
<td>6</td>
<td>1.2</td>
<td>1.4</td>
</tr>
<tr>
<td>21 to 30.99 hours</td>
<td>2</td>
<td>.4</td>
<td>.5</td>
</tr>
<tr>
<td>31 hours or more</td>
<td>1</td>
<td>.2</td>
<td>.2</td>
</tr>
<tr>
<td>Total</td>
<td>441</td>
<td>84.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Missing</td>
<td>80</td>
<td>15.4</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>521</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
In addition, the respondents also answered whether they actively subscribed to any email lists from health-related websites. Around 25% respondents responded that they did subscribe to email lists (see Table 17).

Table 17: Respondents Who Access Email Lists from Health-Related Websites

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>330</td>
<td>63.3</td>
<td>74.8</td>
<td>74.8</td>
</tr>
<tr>
<td>Yes</td>
<td>111</td>
<td>21.3</td>
<td>25.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>441</td>
<td>84.6</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>80</td>
<td>15.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>521</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 8: Hours of access by respondents
Current health status of respondents

Three questions were asked to indicate the current health status of respondents: if they suffer from a chronic disease or disability, if they have a loved one who suffers from a chronic disability, and if they have or have ever had a nagging health concern. As shown in Table 18, approximately 22.5% respondents indicated that they suffer from a chronic disease or disability. Table 19 shows almost 42% of the respondents have a loved one or a family member suffering from a chronic disease or disability. Forty-four percent respondents indicated that they suffer or have suffered from a nagging health concern (for e.g. a persistent backache, pain that comes and goes etc.) (see Table 20).

### Table 18: Respondents who suffer from a chronic disease or disability

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>404</td>
<td>77.5</td>
<td>77.5</td>
</tr>
<tr>
<td>Yes</td>
<td>117</td>
<td>22.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>521</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### Table 19: Respondents who have a loved one or a family member who suffers from a chronic disease or disability

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>303</td>
<td>58.2</td>
<td>58.2</td>
</tr>
<tr>
<td>Yes</td>
<td>218</td>
<td>41.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>521</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### Table 20: Respondents who have or have had a nagging health concern

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>290</td>
<td>55.7</td>
<td>55.7</td>
</tr>
<tr>
<td>Yes</td>
<td>231</td>
<td>44.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>521</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Results

Use of Online Health Information

The responses to the scale “Use of Online Health Information” along with the mean score, standard deviation and range of scale are presented in Table 21 and Figure 9.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean Score</th>
<th>Std. Dev</th>
<th>Possible Range of Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Online Health Information</td>
<td>26.68</td>
<td>3.95</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>35</td>
</tr>
</tbody>
</table>

Figure 9: Spread of Scores for Use of Online Information

The lower end of the scale in Figure 9 represented low levels of use and the upper end of the scale was indicative of high levels of use of online information. The mean score in Table 21 indicates that there was a moderately high level of use of online health information among the respondents. In addition, there was a negative skew of the distribution of scores which indicates
that a large number of respondents had scores towards the higher end of the scale measuring use of online information.

Behavior Modifications

The responses to the behavior modifications questions were collapsed into the two scales 1) Getting Preventive Medical Tests, and 2) Modifications to Lifestyle, which are presented in Table 22 along with the mean scores of the scales, standard deviation, range of scale and averaged mean. They are then each ranked accordingly. The first rank is given to the scale with the highest averaged mean score.

Table 22: Summary of Mean Responses to Behavior Modifications Scales

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean Score</th>
<th>Std. Dev</th>
<th>Possible Range of Scale</th>
<th>Avg. Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting Preventive Medical Tests</td>
<td>12.55</td>
<td>3.36</td>
<td>4</td>
<td>20</td>
<td>3.14</td>
</tr>
<tr>
<td>Modifications to Lifestyle</td>
<td>14.09</td>
<td>3.27</td>
<td>4</td>
<td>20</td>
<td>3.52</td>
</tr>
</tbody>
</table>

In Table 22, on each of the behavior modifications scales, the lower end of the scale signifies a lesser degree of behavior modification and the upper end of the scale signifies a higher degree of behavior modification. The last column in the Table shows the rank for each scale. The scale for Modifications to Lifestyle has the higher rank and scale for Getting Preventive Medical Tests has the lower rank.

According to the data presented in Table 22, both scales show moderate levels of behavior modifications. There is a slight negative skew for Getting Preventive Medical Tests scale and a more noticeable negative skew for Modifications to Lifestyle scale (see Figures 10, 11) indicating a concentration of scores at the higher end of the respective scales.
Gratifications Sought

The mean responses of the scales related to gratifications sought by respondents 1) Ease of Information Seeking 2) Empowerment 3) Self-health Management & Privacy, and 4) Online Social Networking are exhibited in Table 23. The Table also shows the mean scores of the constructs, standard deviation, range of scale, averaged mean, and the rank of each construct.
Table 23: Summary of Mean Responses to Gratifications Sought

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean Score</th>
<th>Std. Dev</th>
<th>Possible Range of Scale</th>
<th>Avg. Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gratifications sought</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ease of Information Seeking</td>
<td>24.73</td>
<td>2.91</td>
<td>6</td>
<td>30</td>
<td>4.12</td>
</tr>
<tr>
<td>Empowerment</td>
<td>15.59</td>
<td>2.45</td>
<td>4</td>
<td>20</td>
<td>3.89</td>
</tr>
<tr>
<td>Self-health Management &amp; Privacy</td>
<td>14.75</td>
<td>2.62</td>
<td>4</td>
<td>20</td>
<td>3.69</td>
</tr>
<tr>
<td>Online Social Networking</td>
<td>10.02</td>
<td>2.59</td>
<td>3</td>
<td>15</td>
<td>3.34</td>
</tr>
</tbody>
</table>

For all scales shown in Table 23, scores toward the upper end of the scale indicates a higher degree of gratifications sought from online health information. The last column shows the rank for each construct based upon averaged mean. Ease of Information Seeking ranks the highest, followed by Empowerment. Self-health Management & Privacy and Online Social Networking follow with the third and fourth rank respectively.

Data in Table 23 show fairly high mean scores for all scales. Also, data show a negative skew for all four scales indicating that the scores are bunching up toward the higher end of the scales (see Figures 12, 13, 14, 15).

Figure 12: Spread of Scores of Ease of Information Seeking Scale
Figure 13: Spread of Scores of Empowerment Scale

Figure 14: Spread of Scores of Gratifications related to Self-health Management Scale
Internet self-efficacy

The mean responses for Internet self-efficacy scales 1) Confidence in Messaging and Retrieving Information, and 2) Confidence in Internet Navigation and File Sharing are shown in Table 24 along with the mean scores of the constructs, standard deviation, range of scale, averaged mean and the rank of each scale.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean Score</th>
<th>Std. Dev</th>
<th>Possible Range of Scale</th>
<th>Avg. Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet self-efficacy</td>
<td>43.32</td>
<td>6.08</td>
<td>10</td>
<td>50</td>
<td>4.33</td>
</tr>
<tr>
<td>Confidence in Messaging and Retrieving Information</td>
<td>26.22</td>
<td>5.60</td>
<td>7</td>
<td>35</td>
<td>3.74</td>
</tr>
</tbody>
</table>

In Table 24, on each of the Internet self-efficacy scales, the lower end of the scale signifies a lower Internet self-efficacy and the upper end of the scale signifies higher Internet self-efficacy. The last column in the Table shows the rank for each scale. The construct with the
higher averaged mean received the first rank and the construct with the lower average mean was assigned the second rank. The construct of Confidence in Messaging and Retrieving Information has the higher rank and construct of Confidence in Internet Navigation and File Sharing scored the lower rank.

According to the mean scores presented in Table 24, both scales show high levels of Internet self-efficacy. There is a negative skew for Confidence in Messaging and Retrieving Information with scores bunching up at the upper end of the scale, signifying a higher Internet self-efficacy among a large number of respondents. There is a noticeable negative skew for Confidence in Internet Navigation and File Sharing, also signifying a high level of Internet self-efficacy for the majority of respondents (see Figures 16, 17).

Figure 16: Spread of Scores on Confidence in Messaging and Retrieving Information Scale
Figure 17: Spread of Scores on Confidence in Internet Navigation and File Sharing Scale

![Histogram showing the spread of scores with mean, standard deviation, and sample size](image)

**Involvement**

The mean responses to the involvement constructs 1) Cognitive Involvement Related with Pertinent Health Information 2) Reliance on Experts 3) Self-treatment of Ailments 4) Information Seeking from Experts, and 5) Involvement with Medical Options are exhibited in Table 25. The Table also shows the mean scores of the constructs, standard deviation, range of scale, averaged mean, and the rank of each construct.

**Table 25: Summary of Mean Responses to Involvement Scales**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean Score</th>
<th>Std. Dev</th>
<th>Possible Range of Scale</th>
<th>Avg. Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Involvement Related with Pertinent Health Information</td>
<td>10.68</td>
<td>2.43</td>
<td>3</td>
<td>15</td>
<td>3.56</td>
</tr>
<tr>
<td>Reliance on Experts</td>
<td>13.90</td>
<td>3.44</td>
<td>5</td>
<td>25</td>
<td>2.78</td>
</tr>
<tr>
<td>Self-treatment of Ailments</td>
<td>9.54</td>
<td>2.44</td>
<td>3</td>
<td>15</td>
<td>3.18</td>
</tr>
<tr>
<td>Information Seeking from Experts</td>
<td>13.95</td>
<td>2.93</td>
<td>4</td>
<td>20</td>
<td>3.48</td>
</tr>
<tr>
<td>Involvement with Medical Options</td>
<td>6.76</td>
<td>1.74</td>
<td>2</td>
<td>10</td>
<td>3.38</td>
</tr>
</tbody>
</table>
For all constructs shown in Table 25, scores toward the upper end of the scale signify a higher degree of involvement. Higher scores, therefore, indicate higher involvement and lower scores indicate lower involvement. The last column shows the rank for each construct based upon averaged mean. Cognitive Involvement Related with Pertinent Health Information ranks the highest, followed by Information Seeking from Experts and Involvement with Medical Options. Self-treatment of Ailments and Reliance on Experts follow with the fourth and fifth rank respectively.

Figure 18: Spread of Scores of Cognitive Involvement Related with Pertinent Health Information Scale

![Figure 18](image1)

Figure 19: Spread of Scores of Reliance on Experts Scale

![Figure 19](image2)
Data show a slight negative skew on Cognitive Involvement Related with Pertinent Health Information, Information Seeking from Experts and Involvement with Medical options (see Figures 18, 21, 22). This shows that the scores tend to be concentrated toward the upper end of the scales. However, for Self-treatment of Ailments and Reliance on Experts, the data suggest a slight positive skew, indicating that respondents’ scores are more toward the middle and lower end of the scale. The man scores are 13.9 and 9.5 respectively indicating average levels of involvement with online media. These scales had the lowest averaged mean among the 5 scales (see Figures 19 and 20).

Figure 20: Spread of Scores of Self-treatment of Ailments Scale

Figure 21: Spread of Scores of Information Seeking from Experts Scale
Outcome expectancy

The responses to the outcome expectancy construct resulted in three scales 1) Outcomes of Information Seeking 2) Anxiety Related to Credibility and Reliability, and 3) Positive Outcomes Related to Networking and Learning, which are presented in Table 26 along with the mean scores of the scales, standard deviation, range of scale and averaged mean. They are then each ranked accordingly.

Table 26: Summary of Mean Responses to Outcome Expectancy Scales

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean Score</th>
<th>Std. Dev</th>
<th>Possible Range of Scale</th>
<th>Avg. Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome expectancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcomes of Information Seeking</td>
<td>16.53</td>
<td>3.37</td>
<td>5</td>
<td>3.31</td>
<td>2</td>
</tr>
<tr>
<td>Anxiety Related to Credibility and Reliability</td>
<td>7.73</td>
<td>2.31</td>
<td>3</td>
<td>2.58</td>
<td>3</td>
</tr>
<tr>
<td>Positive Outcomes Related to Networking and Learning</td>
<td>11.34</td>
<td>1.89</td>
<td>3</td>
<td>3.78</td>
<td>1</td>
</tr>
</tbody>
</table>

In Table 26, for each of the outcome expectancy constructs, the lower end of the scale signifies lower or negative outcome expectancy and the upper end of the scale signifies higher or positive outcome expectancy. The last column in the Table shows the rank for each scale. The
construct with the higher averaged mean received the first rank and constructs with the subsequent lower averaged means were assigned the subsequent lower ranks. The construct of Positive Outcomes Related to Networking and Learning was assigned the first rank, Outcomes of Information Seeking was assigned the second rank, and Anxiety Related to Credibility and Reliability was assigned the third rank.

Figure 23: Spread of Scores of Outcomes of Information Seeking Scale

Figure 24: Spread of Scores of Anxiety Related to Credibility and Reliability Scale
According to the data presented in Figures 23 and 25, there is a slight negative skew for Outcomes of Information Seeking and a more pronounced negative skew for Positive Outcomes Related to Networking and Learning. This indicates for both these scales there is a tendency for the scores to be concentrated toward the upper end of the scales indicating positive outcome expectancy.

There is a noticeable positive skew for the distribution of scores on the scale of Anxiety Related to Credibility and Reliability, which means that the scores are bunched up toward the middle and lower end of the scale indicating slightly negative outcome expectancy (See Figure 24).

Figure 25: Spread of Scores on Positive Outcomes Related to Networking and Learning Scale

Perceived Credibility and Reliability

The mean responses to the scales on perceived credibility and reliability of respondents, 1) Credibility of Online Sources, and 2) Peer-Network Influence on Online Source Credibility, are exhibited in Table 27. The Table also shows the mean scores of the scales, standard deviation, range of scale, averaged mean, and the rank of each scale.
Table 27: Summary of Mean Responses to Perceived Credibility and Reliability Scales

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean Score</th>
<th>Std. Dev</th>
<th>Possible Range of Scale</th>
<th>Avg. Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived credibility and reliability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credibility of Online Sources</td>
<td>15.64</td>
<td>3.77</td>
<td>5</td>
<td>25</td>
<td>3.13</td>
</tr>
<tr>
<td>Peer-Network Influence on Online Source Credibility</td>
<td>11.00</td>
<td>1.89</td>
<td>3</td>
<td>15</td>
<td>3.67</td>
</tr>
</tbody>
</table>

For all scales shown in Table 27, scores toward the upper end of the scale signify a higher degree of perceived credibility and reliability. Higher scores, therefore, indicate higher perceived credibility and reliability and lower scores indicate lower perceived credibility and reliability. The last column shows the rank for each construct based upon averaged mean. Peer-Network Influence on Online Source Credibility ranks first, followed by Credibility of Online Sources.

Figure 26: Spread of Scores of Credibility of Online Sources Scale

The distribution of scores in Figure 26 shows a slight negative skew, indicating a bunching up of scores toward the middle and the higher end of the scale. The scores indicate a
moderate to moderately high levels of perceived credibility and reliability health information websites.

Figure 27: Spread of Scores of Peer-Network Influence on Online Source Credibility Scale

The distribution of scores in Figure 27 shows a negative skew thus indicating a concentration of scores toward the upper end of the scale. The score distribution shows a high credibility of peer networks on online source credibility.

Results: Research Questions

Research Question 1

What are the perceived gratifications sought by health seekers when accessing online health information?

The communication motives behind the selection of a particular medium is at the center of any audience activity, and therefore particularly interesting in this study which has a theoretical foundation in uses and gratifications. Consequently, this research question was
posited to explore the various perceived gratifications sought by health seekers from accessing online health information. A scale consisting of 22 items was constructed based on insights based upon studies conducted by Papacharissi and Rubin (2000), Tewksbury and Althaus (2000), Stafford, Stafford and Schkade (2004), Mittman and Cain (2001), Morahan-Martin (2004) and Rice (2001). Data were subjected to a factor analysis that yielded four factors: 1) Ease of Information Seeking 2) Empowerment 3) Self-health Management & Privacy 4) Online Social Networking (see Table 3).

**Ease of Information Seeking:** Items related to convenience of time, space and availability of information were grouped under this construct. It can be assumed that the ease of searching for and understanding online health information at one’s own time and pace, and the ready availability of information is an important motivation for health seekers.

**Empowerment:** There is a growing discourse of patient empowerment and individual health responsibility (Lewis, 2006) within the arena of health communication. Data from this study showed that health-seekers go to the Internet for tools to feel more in charge of their own health including getting information from various sources, feeling better prepared to discuss problems with their doctors and keeping up with developments in the field of healthcare.

**Self-health Management & Privacy:** This construct consists of items that indicated health-seekers’ motivations to either self-diagnose or get a preliminary diagnosis and retrieve information anonymously. Some websites offer diagnostic tools for users, which health seekers use for preliminary diagnosis and self-diagnosis for minor ailments, allowing them to save money and resources. One of the greatest attributes of online information seeking is privacy and anonymity. Data suggested that these are powerful motivations for health-seekers.

**Online Social Networking:** Finally, online social networking emerges as a strong motivation for health-seekers as is evident in this last construct. Items related to online support, both giving and receiving, are included in this factor. Hardey (2001) suggests that a unique
characteristic of Internet as a medium is that it allows consumers of content to also be producers of content. Health-seekers frequently offer or seek advice from other people in similar contexts or situations, or even get viewpoints on similar health concerns.

Research Question 2

What is the relationship between access to online health information and health-related behavior modifications among health seekers?

Literature in the field (Seale, 2004a; Seale 2004b; Napoli, 2001) suggests that the relationship between online health information and behavior modifications should be better examined since one of the goals of imparting information and raising awareness is that people change unfavorable behavior into favorable behavior. Access is defined as health seekers actively seeking and physically retrieving information from online health websites, and was measured using a scale. A scale with 9 questions was developed to measure self-reported changes in behavior of respondents. This scale was then subject to a factor analysis, which resulted in two factors 1) Getting Preventive Medical Tests, and 2) Modifications to Lifestyle (see Table 2). Kendall’s Tau-c correlation test was used to test the relationship between access to online health information and health-related behavior modifications. Table 28 shows the Kendall’s Tau-c values along with significance levels for a two-tailed test.

Table 28: Correlations between Behavior Modifications and Access to Online Health Information

<table>
<thead>
<tr>
<th></th>
<th>Access to Online Health Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting Preventive Medical Tests</td>
<td>.153*</td>
</tr>
<tr>
<td>Modifications to Lifestyle</td>
<td>.225*</td>
</tr>
</tbody>
</table>

*(p ≤ .0009)
Data in Table 28 show that there is an extremely high level of significance for both relationships between behavior modifications and access to online health information (p ≤ .0009). Therefore, there is a significant relationship between Access to Online Health Information and Getting Preventive Medical Tests and there is also a significant relationship between Access to Online Health Information and Modifications to Lifestyle.

Table 29: Correlation between Access to Online Health Information and Getting Preventive Medical Tests

<table>
<thead>
<tr>
<th>Behavior Modifications:</th>
<th>Access to Online Health Information</th>
<th>Less than 1 hour</th>
<th>1-4.99 hours</th>
<th>5-10.99 hours</th>
<th>More than 11 hours</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting Preventive Medical Tests</td>
<td>4 - 10</td>
<td>Count</td>
<td>86</td>
<td>40</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>70.9</td>
<td>50.7</td>
<td>8.7</td>
<td>2.7</td>
<td>133.0</td>
</tr>
<tr>
<td></td>
<td>% within Row</td>
<td>64.7%</td>
<td>30.1%</td>
<td>2.3%</td>
<td>3.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% within Column</td>
<td>36.6%</td>
<td>23.8%</td>
<td>10.3%</td>
<td>44.4%</td>
<td>30.2%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>19.5%</td>
<td>9.1%</td>
<td>.7%</td>
<td>.9%</td>
<td>30.2%</td>
</tr>
<tr>
<td>11 - 12</td>
<td>Count</td>
<td>50</td>
<td>24</td>
<td>9</td>
<td>0</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>44.2</td>
<td>31.6</td>
<td>5.5</td>
<td>1.7</td>
<td>83.0</td>
</tr>
<tr>
<td></td>
<td>% within Row</td>
<td>60.2%</td>
<td>28.9%</td>
<td>10.8%</td>
<td>.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% within Column</td>
<td>21.3%</td>
<td>14.3%</td>
<td>31.0%</td>
<td>.0%</td>
<td>18.8%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>11.3%</td>
<td>5.4%</td>
<td>2.0%</td>
<td>.0%</td>
<td>18.8%</td>
</tr>
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<td>52.8%</td>
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</tr>
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<td>1.9</td>
<td>92.0</td>
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<tr>
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<td>.9%</td>
<td>.2%</td>
<td>20.9%</td>
</tr>
<tr>
<td>16 - 20</td>
<td>Count</td>
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<td>10.4%</td>
<td>2.0%</td>
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<td>22.0%</td>
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<tr>
<td>Total</td>
<td>Count</td>
<td>235</td>
<td>168</td>
<td>29</td>
<td>9</td>
<td>441</td>
</tr>
<tr>
<td></td>
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<td>168.0</td>
<td>29.0</td>
<td>9.0</td>
<td>441.0</td>
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<tr>
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<td>6.6%</td>
<td>2.0%</td>
<td>100.0%</td>
</tr>
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<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
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<td>% of Total</td>
<td>53.3%</td>
<td>38.1%</td>
<td>6.6%</td>
<td>2.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Table 29 and 30 illustrate the cross-tabulation results for behavior modification scales and access to online health information. Data suggest for both behavior modification scales, that among respondents with higher levels of access to online health information, there is a tendency for higher scores on the behavior modification scales. Hence, according to the data it can be assumed that higher the levels of access, higher the likelihood that users will modify behaviors related to additional medical tests and those pertaining to lifestyle changes.

Table 30: Correlation between Access to Online Health Information and Behavior Modification related to Lifestyle Changes

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<th>5-10.99 hours</th>
<th>More than 11 hours</th>
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</tr>
<tr>
<td>11 - 13</td>
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<td>34.3</td>
<td>5.9</td>
<td>1.8</td>
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<td>14.9%</td>
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<tr>
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<td>5.7%</td>
<td>1.1%</td>
<td>.0%</td>
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<tr>
<td>14 - 15</td>
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<td>1</td>
<td>91</td>
</tr>
<tr>
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<td>34.7</td>
<td>6.0</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>% within Row</td>
<td>54.9%</td>
<td>38.5%</td>
<td>5.5%</td>
<td>1.1%</td>
</tr>
<tr>
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<td>20.8%</td>
<td>17.2%</td>
<td>11.1%</td>
</tr>
<tr>
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<td>7.9%</td>
<td>1.1%</td>
<td>.2%</td>
</tr>
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<td>43.8</td>
<td>7.6</td>
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</tr>
<tr>
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<td>11.6%</td>
<td>1.1%</td>
<td>1.1%</td>
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<tr>
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<td>12</td>
<td>2</td>
<td>73</td>
</tr>
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<td>Expected Count</td>
<td>38.9</td>
<td>27.8</td>
<td>4.8</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>% within Row</td>
<td>27.4%</td>
<td>53.4%</td>
<td>16.4%</td>
<td>2.7%</td>
</tr>
<tr>
<td></td>
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<td>23.2%</td>
<td>41.4%</td>
<td>22.2%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>4.5%</td>
<td>8.8%</td>
<td>2.7%</td>
<td>.5%</td>
</tr>
<tr>
<td>Total</td>
<td>235</td>
<td>168</td>
<td>29</td>
<td>9</td>
<td>441</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>235.0</td>
<td>168.0</td>
<td>29.0</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>% within Row</td>
<td>53.3%</td>
<td>38.1%</td>
<td>6.6%</td>
<td>2.0%</td>
</tr>
<tr>
<td></td>
<td>% within Column</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>53.3%</td>
<td>38.1%</td>
<td>6.6%</td>
<td>2.0%</td>
</tr>
</tbody>
</table>
**Research Question 3**

Which health websites are most frequently accessed by health seekers?

This research question aimed to explore the sources of health information most frequently accessed by health-seekers. To answer this research question, respondents were asked to name their top 3 choices of websites they most frequently visited, with 1 being the most frequently accessed, 2 being the next most frequently accessed and 3 being the next most frequently accessed. Tables 31, 32 and 33 show the frequency distributions for the three choices respectively. Responses for all three choices were classified into different categories as explained below:

**Gender-specific information websites:** Websites that catered to specific gender-related health issues (for e.g. www.menopause.com) or catered to a primarily gender-specific audience (for e.g. www.menshealth.com, www.womenshealthmag.com) were included in this category.

**General health and lifestyle websites:** This category consisted of websites that catered to a broad audience, and talked about general health and wellness. Examples include www.realage.com, www.healthcentral.com, www.preventionweekly.com, and so on. (Note: Because of unique content and format characteristics of WebMD, it was not included in the general health and lifestyle category).

**Government or government sponsored websites:** These websites contain general health information provided by government organizations and health-related agencies. Websites that were included in this category include www.cdc.gov, www.fda.gov, www.medlineplus.gov, and www.nih.gov.

**Health concern specific websites:** Websites that cater to health-seekers with a particular health concern, and provide information on the disease or problem were included in this category.

**Hospital websites:** This category consisted of websites belonging to hospitals and medical facilities. Examples include websites like www.clevelandclinic.org, www.mayoclinic.org, www.uhhospitals.org, and www.akrongeneral.org.


**Search engines:** A popular method of information retrieval is key-word searches in search engines. Included in this category are popular search engines like Google, Yahoo!, msn, AOL, Ask, and Wikipedia.

**WebMD:** WebMD is unique in format and content, as explained earlier in Chapter 1, which makes it difficult to include in any one of the above mentioned categories, and thus constitutes of a category by itself.

**Other:** This category includes websites that are not technically health websites but may carry health-related content. Examples of websites include media websites like www.foxnews.com, www.cnn.com, www.nytimes.com, www.oprah.com, and so on.

Table 31 shows the frequency distribution for the first choice of health websites for health-seekers. Of the 441 respondents who look for information on the Internet, an overwhelming 237 (45.5%) respondents indicated that WebMD was their first website of choice, followed by key word searches in search engines (41; 7.9%) and Insurance websites (38; 7.3%). Twenty-six respondents (5%) identified websites containing general health and lifestyle
information as their first choice and 24 respondents (4.6%) went to hospital websites first. Pharmacy related websites follow next (11; 2.1%), and gender specific websites and government websites have an equal number of respondents (10; 1.9%).

**Table 31: Frequency Distribution of First Choice of Health Websites**

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender specific info</td>
<td>10</td>
<td>1.9</td>
<td>2.3</td>
<td>2.3</td>
</tr>
<tr>
<td>General health</td>
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<td>5.0</td>
<td>5.9</td>
<td>8.2</td>
</tr>
<tr>
<td>Govt websites</td>
<td>10</td>
<td>1.9</td>
<td>2.3</td>
<td>10.4</td>
</tr>
<tr>
<td>HCS website</td>
<td>11</td>
<td>2.1</td>
<td>2.5</td>
<td>12.9</td>
</tr>
<tr>
<td>Hospital websites</td>
<td>24</td>
<td>4.6</td>
<td>5.4</td>
<td>18.4</td>
</tr>
<tr>
<td>Insurance comp.</td>
<td>38</td>
<td>7.3</td>
<td>8.6</td>
<td>27.0</td>
</tr>
<tr>
<td>Pharmacy related</td>
<td>11</td>
<td>2.1</td>
<td>2.5</td>
<td>29.5</td>
</tr>
<tr>
<td>Search engine</td>
<td>41</td>
<td>7.9</td>
<td>9.3</td>
<td>38.8</td>
</tr>
<tr>
<td>WebMD</td>
<td>237</td>
<td>45.5</td>
<td>53.7</td>
<td>92.5</td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>3.3</td>
<td>3.9</td>
<td>96.4</td>
</tr>
<tr>
<td>Missing</td>
<td>16</td>
<td>3.1</td>
<td>3.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>441</td>
<td>84.6</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

The frequency distribution of websites that appear as second choice of respondents is illustrated in Table 32, according to which, general health and lifestyle websites appear as the top preference for 84 respondents (16.1%), followed by key word searches in search engines for 81 respondents (15.5%). WebMD appears next with the choice of 65 respondents (12.5%), and 46 respondents (8.8%) go to insurance websites. Thirty-five respondents chose hospital websites (6.7%), 17 respondents chose government websites (3.3%) and 16 respondents (3.1%) chose health concern specific websites as their second alternative respectively. Pharmacy websites were preferred by 13 respondents (2.5%), and gender specific information was chosen by 9 respondents (1.7%). Other websites (25) and invalid, incomplete or missing responses (51) make up the remainder of the sample.
Table 32: Frequency Distribution of Second Choice of Health Websites

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender specific information</td>
<td>9</td>
<td>1.7</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>General health and lifestyle</td>
<td>84</td>
<td>16.1</td>
<td>19.0</td>
<td>21.1</td>
</tr>
<tr>
<td>Government websites</td>
<td>17</td>
<td>3.3</td>
<td>3.9</td>
<td>24.9</td>
</tr>
<tr>
<td>Health concern specific website</td>
<td>16</td>
<td>3.1</td>
<td>3.6</td>
<td>28.6</td>
</tr>
<tr>
<td>Hospital websites</td>
<td>35</td>
<td>6.7</td>
<td>7.9</td>
<td>36.5</td>
</tr>
<tr>
<td>Insurance company websites</td>
<td>46</td>
<td>8.8</td>
<td>10.4</td>
<td>46.9</td>
</tr>
<tr>
<td>Pharmacy related websites</td>
<td>13</td>
<td>2.5</td>
<td>2.9</td>
<td>49.9</td>
</tr>
<tr>
<td>Search engines/topics search</td>
<td>81</td>
<td>15.5</td>
<td>18.4</td>
<td>68.3</td>
</tr>
<tr>
<td>WebMD</td>
<td>65</td>
<td>12.5</td>
<td>14.7</td>
<td>83.0</td>
</tr>
<tr>
<td>Other</td>
<td>24</td>
<td>4.6</td>
<td>5.4</td>
<td>88.4</td>
</tr>
<tr>
<td>Missing/Invalid/Incomplete</td>
<td>51</td>
<td>9.8</td>
<td>11.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>441</td>
<td>84.6</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Finally, as the third choice of websites, 87 respondents indicated that they go to search engines (16.7%), while 83 respondents (15.9%) frequent general health and lifestyle websites (see Table 33). Thirty-four respondents (6.5%) indicated WebMD and 28 respondents (5.4%) indicated hospital websites as their third websites of choice. Insurance company websites were preferred by 24 respondents (4.6%). Nineteen respondents (3.6%) each went to government and health concern-specific websites. Pharmacy websites and gender specific websites were the choices of 13 (2.5%) and 8 (1.5%) respondents respectively. Other websites (27) and invalid, incomplete or missing responses (99) make up the remainder of the sample.

Once the frequency distributions were generated, each of the three choice variables was subject to a one-sample chi-square test. A one-sample chi-square tests the distribution of values for a single variable (Norušis, 2004). The Chi-square test results for all three choices are shown in Tables 34, 35 and 36 followed by the Pearson Chi-square values and significance levels for a two-tailed test.
In Table 34, the expected counts for the first choice of health websites are specified by the null hypothesis, which is that all responses for the first choice of websites are equally likely to occur. The results of the one-sample chi-square test reveal that $\chi^2 = 1093.84$, $df = 10$, $p = .0009$, thus rejecting the null hypothesis. There is an overwhelming tendency for health seekers to choose WebMD as the first choice for their health information needs.
The null hypothesis for the second choice of health websites is that all responses for the second choice of websites are equally likely to occur. Table 35 shows the one-sample chi-square test results, which show that \( \chi^2 = 186.45, df = 10, p = .0009 \). Therefore, the null hypothesis is rejected. There is a tendency for health seekers to choose General health and lifestyle, Search engines and WebMD as the second choice for their health information needs.

Table 35: Chi-Square test for Second Choice of Health Websites

<table>
<thead>
<tr>
<th>Category</th>
<th>Observed N</th>
<th>Expected N</th>
<th>Residual</th>
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</thead>
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<td>40.1</td>
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</tr>
<tr>
<td>General health and lifestyle</td>
<td>84</td>
<td>40.1</td>
<td>43.9</td>
</tr>
<tr>
<td>Government websites</td>
<td>17</td>
<td>40.1</td>
<td>-23.1</td>
</tr>
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<td>Health concern specific website</td>
<td>16</td>
<td>40.1</td>
<td>-24.1</td>
</tr>
<tr>
<td>Hospital websites</td>
<td>35</td>
<td>40.1</td>
<td>-5.1</td>
</tr>
<tr>
<td>Insurance company websites</td>
<td>46</td>
<td>40.1</td>
<td>5.9</td>
</tr>
<tr>
<td>Pharmacy related websites</td>
<td>13</td>
<td>40.1</td>
<td>-27.1</td>
</tr>
<tr>
<td>Search engines/topics search</td>
<td>81</td>
<td>40.1</td>
<td>40.9</td>
</tr>
<tr>
<td>WebMD</td>
<td>65</td>
<td>40.1</td>
<td>24.9</td>
</tr>
<tr>
<td>Other</td>
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<td>40.1</td>
<td>-16.1</td>
</tr>
<tr>
<td>Missing/Invalid/Incomplete</td>
<td>51</td>
<td>40.1</td>
<td>10.9</td>
</tr>
<tr>
<td>Total</td>
<td>441</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 36: Chi-Square test for Third Choice of Health Websites

<table>
<thead>
<tr>
<th>Category</th>
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<th>Expected N</th>
<th>Residual</th>
</tr>
</thead>
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<tr>
<td>Government websites</td>
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<td>40.1</td>
<td>-21.1</td>
</tr>
<tr>
<td>Health concern specific website</td>
<td>19</td>
<td>40.1</td>
<td>-21.1</td>
</tr>
<tr>
<td>Hospital websites</td>
<td>28</td>
<td>40.1</td>
<td>-12.1</td>
</tr>
<tr>
<td>Insurance company websites</td>
<td>24</td>
<td>40.1</td>
<td>-16.1</td>
</tr>
<tr>
<td>Pharmacy related websites</td>
<td>13</td>
<td>40.1</td>
<td>-27.1</td>
</tr>
<tr>
<td>Search engines/topics search</td>
<td>87</td>
<td>40.1</td>
<td>46.9</td>
</tr>
<tr>
<td>WebMD</td>
<td>34</td>
<td>40.1</td>
<td>-6.1</td>
</tr>
<tr>
<td>Other</td>
<td>27</td>
<td>40.1</td>
<td>-13.1</td>
</tr>
<tr>
<td>Missing/Invalid/Incomplete</td>
<td>99</td>
<td>40.1</td>
<td>58.9</td>
</tr>
<tr>
<td>Total</td>
<td>441</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Finally, the null hypothesis is that all responses for the third choice of websites are equally likely to occur. The results of the one-sample chi-square test illustrated in Table 36 reveal that $\chi^2 = 268.87$, $df = 10$, $p = .0009$, thus rejecting the null hypothesis. There is a tendency for health seekers to choose General health and lifestyle, and Search engines as the third choice for their health information needs.

**Research Question 4**

Is there an association between perceived credibility and reliability of online sources and their selection by health seekers?

The aim of this question was to explore an association, if any, between the sources of online health information health seekers select and their level of perceived credibility and reliability. Perceived credibility and reliability of health information was measured through 12 items on a scale, and then subject to factor analysis which yielded 2 scales 1) Credibility of Online Sources 2) Peer-Network Influence on Online Source Credibility. The choices with the top two highest frequencies for the first and second choice of websites along with the perceived credibility and reliability scales were then subject to correlation tests (point bi-serial). The top two sources for the first choice of websites were WebMD and search engines respectively, while the top two sources for the second choice of websites were General Health and Lifestyles and search engines respectively.

A significant positive correlation was obtained between the top 2 first choice of websites and Credibility of Online Sources scale ($r_{pb} = .193$, $p \leq .001$) and between the top 2 first choice websites and Peer-Network Influence on Online Source Credibility ($r_{pb} = .186$, $p \leq .002$). This indicates that health seekers choose WebMD for its high level of credibility on both scales, Credibility of Online Sources and Peer-Network Influence on Online Source Credibility. There was no significant relationship between Credibility of Online Sources and second choice of
websites (top 2) (p ≥ .05), nor between Peer-network Influence on Online Source Credibility and the second choice of websites (top 2) (p ≥ .05).

Results: Hypotheses

**Hypothesis H1**

The first hypothesis stated that there will be a relationship between Internet self-efficacy of health seekers and access to online health information. Access is defined as health seekers actively seeking and physically retrieving information from online health websites, and was measured using a scale. Table 37 shows the relationship between both Internet self-efficacy scales and access to online health information. Kendall Tau-c correlation values along with the levels of significance for a two-tailed test are presented.

Table 37: Correlation between Internet Self-efficacy and Access to Online Health Information

<table>
<thead>
<tr>
<th>Scales</th>
<th>Access to Online Health Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence in Messaging and Retrieving Information</td>
<td>.070*</td>
</tr>
<tr>
<td>Confidence in Internet Navigation and File Sharing</td>
<td>.094**</td>
</tr>
</tbody>
</table>

*p ≥ .05; **p ≤ .01

Data in Table 37 show that the hypothesis was supported for Confidence in Internet Navigation and File Sharing and access to online health information (p ≤ .01). There was no significant relationship between Confidence in Messaging and Retrieving Information and access to online health information (p ≥ .05).

Table 38 illustrates the cross-tabulation results for Confidence in Internet Navigation and File Sharing with access to online health information. Data show that a majority of respondents with higher levels of access to online information also score higher on the self-efficacy scale of Confidence in Internet Navigation and File Sharing (p ≤ .01).
Table 38: Correlation between Confidence in Internet Navigation and File Sharing and Access to Online Health Information

<table>
<thead>
<tr>
<th>Confidence in Internet Navigation and File Sharing</th>
<th>Access to Online Health Information (per week)</th>
<th>Less than 1 hour</th>
<th>1-4.99 hours</th>
<th>5-10.99 hours</th>
<th>More than 11 hours</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 (7-20) Count</td>
<td>37</td>
<td>24</td>
<td>1</td>
<td>1</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>33.6</td>
<td>24.0</td>
<td>4.1</td>
<td>1.3</td>
<td>63.0</td>
<td></td>
</tr>
<tr>
<td>% within Row</td>
<td>58.7%</td>
<td>38.1%</td>
<td>1.6%</td>
<td>1.6%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>% within Column</td>
<td>15.7%</td>
<td>14.3%</td>
<td>3.4%</td>
<td>11.1%</td>
<td>14.3%</td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>8.4%</td>
<td>5.4%</td>
<td>2%</td>
<td>2%</td>
<td>14.3%</td>
<td></td>
</tr>
<tr>
<td>2.00 (20-25) Count</td>
<td>74</td>
<td>42</td>
<td>10</td>
<td>1</td>
<td>127</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>67.7</td>
<td>48.4</td>
<td>8.4</td>
<td>2.6</td>
<td>127.0</td>
<td></td>
</tr>
<tr>
<td>% within Row</td>
<td>58.3%</td>
<td>33.1%</td>
<td>7.9%</td>
<td>8%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>% within Column</td>
<td>31.5%</td>
<td>25.0%</td>
<td>34.5%</td>
<td>11.1%</td>
<td>28.8%</td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>16.8%</td>
<td>9.5%</td>
<td>2.3%</td>
<td>2%</td>
<td>28.8%</td>
<td></td>
</tr>
<tr>
<td>3.00 (26-30) Count</td>
<td>74</td>
<td>45</td>
<td>9</td>
<td>4</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>70.3</td>
<td>50.3</td>
<td>8.7</td>
<td>2.7</td>
<td>132.0</td>
<td></td>
</tr>
<tr>
<td>% within Row</td>
<td>56.1%</td>
<td>34.1%</td>
<td>6.8%</td>
<td>3%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>% within Column</td>
<td>31.5%</td>
<td>26.8%</td>
<td>31.0%</td>
<td>44.4%</td>
<td>29.9%</td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>16.8%</td>
<td>10.2%</td>
<td>2.0%</td>
<td>9%</td>
<td>29.9%</td>
<td></td>
</tr>
<tr>
<td>4.00 (30-35) Count</td>
<td>50</td>
<td>57</td>
<td>9</td>
<td>3</td>
<td>119</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>63.4</td>
<td>45.3</td>
<td>7.8</td>
<td>2.4</td>
<td>119.0</td>
<td></td>
</tr>
<tr>
<td>% within Row</td>
<td>42.0%</td>
<td>47.9%</td>
<td>7.6%</td>
<td>2.5%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>% within Column</td>
<td>21.3%</td>
<td>33.9%</td>
<td>31.0%</td>
<td>33.3%</td>
<td>27.0%</td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>11.3%</td>
<td>12.9%</td>
<td>2.0%</td>
<td>7%</td>
<td>27.0%</td>
<td></td>
</tr>
<tr>
<td>Total Count</td>
<td>235</td>
<td>168</td>
<td>29</td>
<td>9</td>
<td>441</td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td>235.0</td>
<td>168.0</td>
<td>29.0</td>
<td>9.0</td>
<td>441.0</td>
<td></td>
</tr>
<tr>
<td>% within Row</td>
<td>53.3%</td>
<td>38.1%</td>
<td>6.6%</td>
<td>2%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>% within Column</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>53.3%</td>
<td>38.1%</td>
<td>6.6%</td>
<td>2%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

Kendall’s Tau C = .09 (p ≤ .01).

**Hypothesis H2a**

The second hypothesis related to current health status and access to online health information, was divided into two parts. This hypothesis stated that people are more likely to access online health information if they suffer from a disability or a chronic health problem.

Table 39 exhibits the cross-tabulation results between health seekers who suffer from a chronic
disease or disability and whether they access online health information or not. Next, Chi-square values are reported along with the level of significance for a two tailed test.

**Table 39: Cross-Tabulation between Health Seekers Who Suffer from a Chronic Disease or Disability and Access to Online Health Information**

<table>
<thead>
<tr>
<th>Do you suffer from a chronic health problem or disability</th>
<th>Have you ever looked for health information on the Internet</th>
<th>Count</th>
<th>Expected Count</th>
<th>% within Row</th>
<th>% within Column</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>71</td>
<td>62.0</td>
<td>17.6%</td>
<td>88.8%</td>
<td>13.6%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>333</td>
<td>342.0</td>
<td>82.4%</td>
<td>75.5%</td>
<td>63.9%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>404</td>
<td>404.0</td>
<td>100.0%</td>
<td>77.5%</td>
<td>77.5%</td>
</tr>
<tr>
<td>No</td>
<td>Count</td>
<td>9</td>
<td>18.0</td>
<td>7.7%</td>
<td>11.3%</td>
<td>1.7%</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>108</td>
<td>99.0</td>
<td>92.3%</td>
<td>24.5%</td>
<td>20.7%</td>
</tr>
<tr>
<td></td>
<td>% within Row</td>
<td>117</td>
<td>117.0</td>
<td>100.0%</td>
<td>22.5%</td>
<td>22.5%</td>
</tr>
<tr>
<td></td>
<td>% within Column</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>80</td>
<td>80.0</td>
<td>15.4%</td>
<td>100.0%</td>
<td>15.4%</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>441</td>
<td>441.0</td>
<td>84.6%</td>
<td>100.0%</td>
<td>84.6%</td>
</tr>
<tr>
<td></td>
<td>% within Row</td>
<td>521</td>
<td>521.0</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% within Column</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chi Square = 6.82 (p = 0.009)

From these results, there is a significant relationship between health seekers who suffer from a chronic disease or disability and access to online health information, $\chi^2 = 6.82$, $df = 1$, $p = 0.009$. Data in Table 39 show that a large majority of people who access online health information suffer from a chronic health problem or disability versus those who do not (88% vs. 11.3%). Therefore, the hypothesis is supported.

**Hypothesis H2b**

This hypothesis stated that people are more likely to access online health information when they have loved ones who suffer from a chronic disease or disability. The cross-tabulation results between health seekers who have loved ones suffering from a chronic disease or disability
and whether they access online health information or not are presented in Table 26 along with Chi-square values and the level of significance for a two tailed test.

The results indicated in Table 40 suggest a significant relationship between health seekers whose loved ones suffer from a chronic disease or disability and access to online health information, \( \chi^2 = 20.71, df = 1, p = .0009 \). Data in Table 40 show that a significant majority of people who access online health information have loved ones who suffer from chronic health problems or disability. Therefore, the hypothesis is supported.

Table 40: Cross-Tabulation between Health Seekers Who Have Loved Ones Suffering from a Chronic Disease or Disability and Access to Online Health Information

<table>
<thead>
<tr>
<th>Do you have a loved one or a family member who suffers from a chronic health problem or disability</th>
<th>Have you ever looked for health information on the Internet</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Count</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>46.5</td>
</tr>
<tr>
<td></td>
<td>% within Row</td>
<td>21.5%</td>
</tr>
<tr>
<td></td>
<td>% within Column</td>
<td>81.3%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>12.5%</td>
</tr>
<tr>
<td>No</td>
<td>Count</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>33.5</td>
</tr>
<tr>
<td></td>
<td>% within Row</td>
<td>6.9%</td>
</tr>
<tr>
<td></td>
<td>% within Column</td>
<td>18.8%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>2.9%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>% within Row</td>
<td>15.4%</td>
</tr>
<tr>
<td></td>
<td>% within Column</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>15.4%</td>
</tr>
</tbody>
</table>

Chi Square = 20.71; p = 0.0009
Hypothesis H3

The third hypothesis states that people are more likely to access online health information if they have nagging health concerns. The results of cross-tabulation are presented in Table 41, along with the Chi-square value and the level of significance for a two-tailed test.

Based upon the results indicated in Table 41, there is a significant relationship between health seekers who have nagging health concerns and access to online health information, \( \chi^2 = 9.35, df = 1, p = .002 \). Data in Table 44 show that a majority of people who access online health information have nagging health problems. Therefore, the hypothesis is supported.

Table 41: Cross-Tabulation between Health Seekers Who Suffer from a Nagging Health Concern and Access to Online Health Information

<table>
<thead>
<tr>
<th>Do you have or have you had a nagging health concern</th>
<th>Count</th>
<th>Expected Count</th>
<th>% within Row</th>
<th>% within Column</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>57</td>
<td>233</td>
<td>44.5</td>
<td>19.7%</td>
<td>10.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>245.5</td>
<td>80.3%</td>
<td>44.7%</td>
</tr>
<tr>
<td></td>
<td>290.0</td>
<td>290.0</td>
<td>290.0</td>
<td>100.0%</td>
<td>55.7%</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>208</td>
<td>35.5</td>
<td>10.0%</td>
<td>4.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>195.5</td>
<td>90.0%</td>
<td>39.9%</td>
</tr>
<tr>
<td></td>
<td>231.0</td>
<td>231.0</td>
<td>231.0</td>
<td>100.0%</td>
<td>44.3%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>441</td>
<td>80.0</td>
<td>15.4%</td>
<td>15.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>441.0</td>
<td>84.6%</td>
<td>84.6%</td>
</tr>
<tr>
<td></td>
<td>521.0</td>
<td>521.0</td>
<td>521.0</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Have you ever looked for health information on the Internet

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>57</td>
<td>233</td>
<td>290.0</td>
</tr>
<tr>
<td>Expected Count</td>
<td>44.5</td>
<td>245.5</td>
<td>290.0</td>
</tr>
<tr>
<td>% within Row</td>
<td>19.7%</td>
<td>80.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% within Column</td>
<td>71.3%</td>
<td>52.8%</td>
<td>55.7%</td>
</tr>
<tr>
<td>% of Total</td>
<td>10.9%</td>
<td>44.7%</td>
<td>55.7%</td>
</tr>
</tbody>
</table>

Chi Square = 9.35; p = 0.002
Hypothesis H4

Hypothesis H4 stated that access to health-related websites by health seekers will be predicted by gratifications sought, Internet self-efficacy, involvement, outcome expectancies and socio-demographic variables. This hypothesis was modeled using multiple regression analysis, which was used to determine the predictive power of gratifications sought, Internet self-efficacy, involvement, outcome expectancies and socio-demographic variables (gender, age, health insurance, education level, annual household income, ethnicity) on access to online health information. Insights from previous research in the area (Al-Shammary et al., 2007; Delic et al., 2006; Larner, 2006; Ko, Cho & Roberts, 2005; Bundorf, Baker, Singer, & Wagner, 2004; Eastin & LaRose, 2000; Papacharissi & Rubin, 2000; Tewksbury & Althaus, 2000; Schwarzer & Fuchs, 1995) were used to select the predictor variables.

To build a regression model that predicts access to online health information well, the backward elimination method was used. According to Norušis (2004), irrelevant variables in a model do not improve prediction, and instead increase the standard errors of the regression coefficients. With the backward elimination method, the analysis began with all the independent variables. At each step, the variables with the largest observed significance levels were removed from the model (those which affected R² the least; default criterion was set at an observed significance level of 0.1 or higher. This resulted in the following multiple regression model that predicted access to online health information:

Predicted $Y = \text{Constant} + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$, where

$Y =$ Access to online health information

$x_1 =$ Empowerment

$x_2 =$ Online Social Networking

$x_3 =$ Cognitive involvement with pertinent health information
\[ x_4 = \text{Age (in Years)} \]

\[ b_1, b_2, b_3, b_4 = \text{Partial regression coefficients} \]

The results of the regression analysis (F test) are presented in Table 42. The test of the null hypothesis was based upon the ratio of regression mean square to the residual mean square. This ratio, called the F-ratio, is 11.09 (\( p = 0.009 \)). Considering that the observed significance level is less than 0.05, the null hypothesis that there is no linear relationship between access to online health information and the predictor variables of Empowerment, Online Social Networking, Cognitive Involvement with Pertinent Health Information, and Age is rejected. Therefore, the four independent variables are significant predictors of access to online health information.

Data from the analysis indicate that the correlation coefficient between the observed value of ‘access to online health information’ and the predicted value, the multiple R, is 0.305. The R square value suggests that 9.3% variability in the dependent variable of ‘access to online health information’ is explained by the independent variables of Empowerment, Online Social Networking, Cognitive Involvement with Pertinent Health Information, and Age. How well this model would fit another data set from the same population is estimated by the adjusted R square value (8.4%).

**Table 42: Multiple Regression ANOVA Table for Access to Online Health Information regressed on Empowerment, Online Social Networking, Cognitive Involvement Related with Pertinent Health Information, and Age**

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>22.690</td>
<td>4</td>
<td>5.673</td>
<td>11.088</td>
<td>.009</td>
</tr>
<tr>
<td>Residual</td>
<td>222.025</td>
<td>434</td>
<td>.512</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>244.715</td>
<td>438</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple R = 0.305; R square = 0.093; Adjusted R Square = 0.084; Std. Error of Estimate = 0.715
According to the data in Table 43, the null hypothesis that the coefficients for Empowerment, Online Social Networking, and Age are zero, are rejected ($p < .05$). It is not possible to reject the null hypothesis that the coefficient for Cognitive Involvement with Pertinent Health Information is zero ($p > .05$). However, this does not mean that Cognitive Involvement with Pertinent Health Information is not a good predictor of access to online health information when considered alone. The Pearson’s $R$ value between Cognitive Involvement with Pertinent Health Information and access to online health information is 0.178 ($p = .0009$). The data are not multicollinear as evident by the tolerance statistics in Table 43 which are all much higher than the required 0.1. Tolerance is the proportion of variability of a variable that is not explained by its linear relationship with the other independent variables in the model.

Using the coefficients in Table 43, the estimated multiple regression line is: $\hat{Y} = 0.576 + 0.046x_1 + 0.036x_2 + 0.027x_3 - 0.008x_4$, where $\hat{Y}$ = predicted value of access to online health information, $x_1$ = Empowerment, $x_2$ = Online Social Networking, $x_3$ = Cognitive Involvement with Pertinent Health Information and $x_4$ = Age. The predicted value of access to online health information increases by .05, .04 and .03 units for 1 unit increase in the scales of Empowerment, Online Social Networking and Cognitive Involvement with Pertinent Health Information, and decreases by .008 units for 1 unit increase in the scale of Age.
Multiple Regression Diagnostic Tests

Multiple regressions tests require certain assumptions to be met. These are a) there should be a linear relationship between the dependent and independent variables, and b) for each combination of values of the independent variables, the distribution of dependent variable should be normal, and have a constant variance (also known as homoscedasticity). Therefore, diagnostic tests to check for linearity, normality and homoscedasticity were performed.

Partial Regression Plots: Partial regression plots were drawn to check for linearity (see Figures 28, 29, 30, and 31). These are plots of the residual on the vertical axis against the value of the independent variable in the horizontal axis. If the assumptions of linearity are met, as is evident in these plots, there is no curvy pattern around the horizontal line. Figures 28, 29, 30, and 31 indicate that the assumptions of linearity are met for all the independent variables.

Figure 28: Scatter Plot of Studentized Deleted Residual and Empowerment
Figure 29: Scatter Plot of Studentized Deleted Residual and Online Social Networking

![Scatter Plot of Studentized Deleted Residual and Online Social Networking](image)

Figure 30: Scatter Plot of Studentized Deleted Residual and Cognitive Involvement with Pertinent Health Information

![Scatter Plot of Studentized Deleted Residual and Cognitive Involvement with Pertinent Health Information](image)
Examining Normality

Normality was ascertained through two different graphs. First, a stem-and-leaf plot of Studentized deleted residuals was drawn to examine normality. With a sample size of $N = 521$, the distribution should be approximately normal. The plot, as shown in Figure 32, indicates a single dominant peak with most of the values clustered around 0. (Note: Assumptions of normality are particularly important if $N \leq 50$, which is not the case in this study).

Figure 32: Stem-and-leaf plot of Studentized Deleted Residuals

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Stem &amp; Leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.00</td>
<td>-1 . 5&amp;</td>
</tr>
<tr>
<td>33.00</td>
<td>-1 . 001123&amp;</td>
</tr>
<tr>
<td>147.00</td>
<td>-0 . 5555555666666777777777788888899999</td>
</tr>
<tr>
<td>56.00</td>
<td>-0 . 0122334444444</td>
</tr>
<tr>
<td>66.00</td>
<td>0 . 001122223344444</td>
</tr>
<tr>
<td>86.00</td>
<td>0 . 5555555666666777777777788888899999</td>
</tr>
<tr>
<td>17.00</td>
<td>1 . 0123&amp;</td>
</tr>
<tr>
<td>15.00</td>
<td>1 . 677&amp;</td>
</tr>
<tr>
<td>7.00</td>
<td>2 . 2&amp;</td>
</tr>
<tr>
<td>9.00 Extremes</td>
<td>(=2.7)</td>
</tr>
</tbody>
</table>

Stem width: 1.00000
Each leaf: 4 case(s)
Next, Figure 33 shows a box plot of residuals. The box plot suggests a fairly symmetrical distribution with the median falling in the middle of the plot. The quartiles for a normal distribution are -0.68 and + 0.68. For this sample, the middle half of the residuals are between 0.50 and -0.75 so the distribution matches fairly well. As expected from a normal population, the whiskers extend from +2 to -2.

Figure 33: Box Plot of Studentized Deleted Residuals

*Homoscedasticity*

Finally, the residuals and the predicted values of access to online health information were plotted to examine homoscedasticity. For each predicted value for access to online health information, there is a range of residual values. If the assumption of equal variances is met, most of the residuals fall in a horizontal band around 0. In Figure 34, we see that the residuals are falling either above or below the horizontal line in a horizontal band. However, since the data for the dependent variable are presented in an ordinal scale, the horizontal band is difficult to decipher.
Figure 34: Scatter Plot of Studentized Deleted Residual and Unstandardized Predicted Values of Access to Online Health Information

Hypothesis H5

The fifth hypothesis stated that use of online health information by health seekers will be predicted by gratifications sought and outcome expectancy. This hypothesis was modeled using multiple regression analysis, which was used to determine the predictive power of gratifications sought and outcome expectancy on use of online health information. Insights from previous research in the area (Rains, 2007; Delic, Polasek & Kern, 2006; Hardey, 2001; Mittman & Cain, 2001) were used to select the predictor variables.

To build a regression model that predicts use of online health information well, the backward elimination method was used. According to Norušis (2004), irrelevant variables in a model do not improve prediction, and instead increase the standard errors of the regression coefficients. With the backward elimination method, the analysis began with all the independent variables. At each step, the variables with the largest observed significance levels were removed.
from the model (those which affected $R^2$ the least; default criterion was set at an observed significance level of 0.1 or higher). This resulted in the following multiple regression model that predicted use of online health information:

Predicted $Y = \text{Constant} + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$, where

$Y = \text{Use of online health information}$

$x_1 = \text{Ease of Information Seeking}$

$x_2 = \text{Empowerment}$

$x_3 = \text{Online Social Networking}$

$x_4 = \text{Positive Outcomes Related to Networking and Learning}$

$b_1, b_2, b_3, b_4 = \text{Partial regression coefficients}$

The results of the regression analysis (F test) are presented in Table 44. The test of the null hypothesis was based upon the ratio of regression mean square to the residual mean square. This ratio, called the F-ratio, is 57.88 ($p = 0.0009$). Considering that the observed significance level is less than 0.05, the null hypothesis that there is no linear relationship between use of online health information and the predictor variables of Ease of Information Seeking, Empowerment, Online Social Networking, and Positive Outcomes Related to Networking and Learning is rejected. Therefore, the four independent variables are significant predictors of use of online health information.

Data from the analysis indicate that the correlation coefficient between the observed value of ‘use of online health information’ and the predicted value, the multiple $R$, is 0.589. This is a moderately high value which indicates that the linear regression model predicts well. The $R^2$ square value suggests that 34.7% variability in the dependent variable of use of online health information is explained by the independent variables of Ease of Information Seeking, Empowerment, Online Social Networking, and Positive Outcomes Related to Networking and
Learning. The adjusted R square value (34.1%) explains how well this model would fit another data set from the same population.

Table 44: Multiple Regression ANOVA Table for Use of Online Health Information Regressed on Ease of Information Seeking, Empowerment, Online Social Networking, and Positive Outcomes Related to Networking and Learning.

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2383.091</td>
<td>4</td>
<td>595.773</td>
<td>57.884</td>
<td>.0009</td>
</tr>
<tr>
<td>Residual</td>
<td>4477.252</td>
<td>435</td>
<td>10.293</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6860.343</td>
<td>439</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple R = 0.589; R square = 0.347; Adjusted R Square = 0.341; Std. Error of Estimate = 3.21

Table 45 presents the regression coefficients. According to the data, the null hypothesis that the coefficients for Ease of Information Seeking, Empowerment, Online Social Networking, and Positive Outcomes Related to Networking and Learning are zero, is rejected (p < .001). The data are not multicollinear as evident by the tolerance statistics in Table 45 which are all much higher than the required 0.1. Tolerance is the proportion of variability of a variable that is not explained by its linear relationship with the other independent variables in the model.

Using the coefficients in Table 45, the estimated multiple regression line is: \( \hat{Y} = 7.187 + 0.282x_1 + 0.446x_2 + 0.221x_3 + 0.295x_4 \), where \( \hat{Y} \) = predicted value of use of online health information, \( x_1 \) = Ease of Information Seeking, \( x_2 \) = Empowerment, \( x_3 \) = Online Social Networking and \( x_4 \) = Positive Outcomes Related to Networking and Learning. Therefore, the predicted value for use of online health information increases by .282 units for every 1 unit increase in Ease of Information Seeking, .446 for every 1 unit increase in Empowerment, .221 units for every 1 unit increase Online Social Networking, and .295 units for every 1 unit increase in Positive Outcomes Related to Networking and Learning.
<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>7.187</td>
<td>1.387</td>
<td>5.182</td>
<td>.0009</td>
<td></td>
</tr>
<tr>
<td>Ease of Information Seeking</td>
<td>.282</td>
<td>.069</td>
<td>.208</td>
<td>4.067</td>
<td>.0009 .574</td>
</tr>
<tr>
<td>Empowerment</td>
<td>.446</td>
<td>.084</td>
<td>.277</td>
<td>5.305</td>
<td>.0009 .550</td>
</tr>
<tr>
<td>Online Social Networking</td>
<td>.221</td>
<td>.066</td>
<td>.145</td>
<td>3.349</td>
<td>.001 .800</td>
</tr>
<tr>
<td>Positive outcomes related to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>networking and learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Multiple Regression Diagnostic Tests**

Multiple regressions tests require certain assumptions to be met. These are a) there should be a linear relationship between the dependent and independent variables, and b) for each combination of values of the independent variables, the distribution of the dependent variable should be normal, and have a constant variance (also known as homoscedasticity). Therefore, diagnostic tests to check for linearity, normality and homoscedasticity were performed.

Figure 35: Scatter Plot of Studentized Deleted Residual and Ease of Information Seeking
Partial Regression Plots: These are plots of the residual on the vertical axis against the value of the independent variable in the horizontal axis. If the assumptions of linearity are met, as is evident in these plots, there is no curvy pattern around the horizontal line. Figures 35, 36, 37 and 38 indicate that the assumptions of linearity are met.

Figure 36: Scatter Plot of Studentized Deleted Residual and Empowerment

![Figure 36: Scatter Plot of Studentized Deleted Residual and Empowerment](image)

Figure 37: Scatter Plot of Studentized Deleted Residual and Online Social Networking

![Figure 37: Scatter Plot of Studentized Deleted Residual and Online Social Networking](image)
Examining Normality

Normality was ascertained through two different graphs. First, a stem-and-leaf plot of Studentized deleted residuals was drawn to examine normality. With a sample size of N = 521, the distribution should be approximately normal. The plot, as shown in Figure 38, indicates a single dominant peak with most of the values clustered around a single point. (Note: assumptions of normality are particularly important if N ≤ 50, which is not the case in this study).

Next, Figure 39 shows a box plot of residuals. The box plot suggests a fairly symmetrical distribution with the median toward the middle of the plot. The quartiles for a normal distribution are -0.68 and + 0.68. For this sample, the middle half of the residuals are between 0.60 and -0.70 so the distribution matches very well. As expected from a normal population, the whiskers extend from +2 to -2.
Figure 39: Stem-and-leaf plot of Studentized Deleted Residuals

Frequency Stem & Leaf
14.00 Extremes \((=\leq -2.2)\)
  2.00 -1 . 8
  6.00 -1 . 67
  6.00 -1 . 45
  8.00 -1 . 233
19.00 -1 . 00000111
  14.00 -0 . 888899
19.00 -0 . 666677777
32.00 -0 . 44444445555555
35.00 -0 . 22223333333333
44.00 -0 . 00000000000000111111
41.00 0 . 00000000000001111111
62.00 0 . 2222222222223333333333
43.00 0 . 44444444455555555555
23.00 0 . 66667777777
19.00 0 . 888899999
16.00 1 . 00001111
18.00 1 . 22223333
  4.00 1 . 46
  3.00 1 . 7
  3.00 1 . 8
9.00 Extremes \((\geq 2.0)\)

Stem width: 1.00000
Each leaf: 2 case(s)

Figure 40: Box Plot of Studentized Deleted Residuals
**Homoscedasticity**

Finally, the residuals and the predicted values of use of online health information were plotted to examine homoscedasticity. For each predicted value for use of online health information, there is a range of residual values. If the assumption of equal variances is met, most of the residuals fall in a horizontal band around zero. In Figure 41, we see that the residuals are falling either above or below the horizontal line in a horizontal band.

Figure 41: Scatter Plot of Studentized Deleted Residual and Unstandardized Predicted Values of Use of Online Health Information
CHAPTER 5: DISCUSSION AND CONCLUSION

This final chapter restates the purpose of the study, summarizes the theoretical and conceptual framework of this study followed by discussions of the findings and how they compare with past research. The last part of this chapter outlines implications of the findings for research and practice of health communication in this area and proposes recommendations for further research in the area of online health information.

Purpose of the Study

The purpose of this study was to explore the patterns of access and use of online health information among Internet users using constructs such as gratifications sought, Internet self-efficacy, cognitive and behavioral involvement, and outcome expectancy. In addition, the study examined the relationship between behavior modifications and access to online health information, an area that has been understudied. Past research reveals that it is important to understand what users do with the information they access and process from online sources and what impact it has on their health behaviors (Brown & Walsch-Childers, 2002; Napoli, 2001). The study also looked at choice of sources of online health information and their credibility and reliability. Within an online environment where health information is freely and abundantly available, the study is particularly relevant in light of the absence of set guidelines of online health information content and its growing popularity among Internet users. On a broader level, the study examines what the implications of access and use of online health information are on the overall healthcare environment.

The results of this study provide an insight into why and how Internet users access and use online health information. The Internet being one of the many choices of media, Rains (2007) suggests looking into what motivates users to specifically choose online health information as a source. Kim and Chang (2007) suggest that there is a distinct need in the
literature to understand factors that will facilitate creation of health-related content as much as its consumption. The findings of this study, particularly with regard to the predictors of access and use, may be helpful in creation of web content that is structured in a user-friendly and an efficient manner, and which is consistent with information seeking and processing motives of health seekers.

Four research questions were included in the study:

**RQ1:** What are the perceived gratifications sought by health seekers when accessing online health information?

**RQ2:** What is the relationship between access to online health information and health-related behavior modifications among health seekers?

**RQ3:** Which health websites are most frequently accessed by health seekers?

**RQ4:** Is there an association between perceived credibility and reliability of online sources and their selection by health seekers?

The study also tested six hypotheses:

**H1:** There will be a positive relationship between Internet self-efficacy of health seekers and access to online health information.

**H2a:** People are more likely to access online health information if they suffer from a chronic disease or disability.

**H2b:** People are more likely to access online health information if they have loved ones who suffer from a chronic disease or disability.

**H3:** People are more likely to access online health information if they suffer from a nagging health concern.

**H4:** Access to health-related websites by health seekers will be predicted by gratifications sought, Internet self-efficacy, involvement, outcome expectancies and socio-demographic variables like age, ethnicity and gender.
**H5:** Use of online health information accessed by health seekers will be predicted by gratifications sought and outcome expectancies.

**Conceptual framework**

For this exploratory study, the research questions and hypotheses were based upon information from existing literature, and gaps in current research as indicated by scholars and practitioners within the field. Information on patterns of access and use of online health information of Internet users was understood through the lens of different constructs from theories such as uses and gratifications, and Bandura’s Social Cognitive Theory. In accordance with the tenets of uses and gratifications theory, the study hopes to show that health seekers choose online health information over other sources based upon specific needs and wants that have social and psychological origins. There were two constructs from Bandura’s Social Cognitive Theory that were instrumental in the conceptual context of this study, i.e. self-efficacy and outcome expectancy. Internet self-efficacy, which is the confidence a health seeker possesses in his or her ability to navigate the medium, determines the extent to which online health information is accessed and used. Social Cognitive Theory also posits that expected outcomes determine whether or not a behavior is undertaken, which means that the outcomes expected from seeking online health information determine whether health seekers will perform future searches. Lastly, the construct of involvement was included. Chaffee & Roser (1986) and others have written extensively on involvement as an important variable in access and use of different media. This study looked at cognitive and behavioral involvement of users which would determine how much attention health seekers will pay to media messages, and how it affected their interest in online health information.
Overview of the Research Process

The data collection and the subsequent analysis for this study were conducted as part of my Graduate Learning Fellowship at the Cleveland Clinic Office of Civic Education Initiatives. The study used a non-random sample. The participants of the study are 18-64 year old Internet users from 21 counties in Northeast Ohio (Ashland, Ashtabula, Carroll, Columbiana, Crawford, Cuyahoga, Erie, Geauga, Holmes, Huron, Lake, Lorain, Mahoning, Medina, Portage, Richland, Stark, Summit, Trumbull, Tuscarawas, and Wayne). The Cleveland Clinic Division of Marketing, Communications and Planning facilitated the data collection by engaging a survey company called E-Rewards. E-rewards has around 43,000 participants in its database from the 21 counties. The survey was sent out to randomly selected members of the database and the first 521 complete surveys were included in the study. All participants that completed the survey online on Question Pro, a web-based survey software used by the Cleveland Clinic market research team, for easier accessibility.

The questionnaire developed for this study was structured in three parts. The first part confirmed whether or not Internet users were health seekers or not. Health seekers (Internet users who look at online health information) completed the entire questionnaire whereas non health-seekers only went on to complete the third section with demographic information including current health status, gender, age, education level, household income and ethnicity. The second part consisted of scales on which the health seekers’ use, behavior modifications, gratifications sought, involvement, Internet self-efficacy, outcome expectancy, and perceived credibility/reliability of websites were measured. Participants provided demographic information in the third part.

The design of the questionnaire incorporated questions that addressed gaps indicated in past research, and consisted of a combination of aspects of previous studies and theories that
have been useful in understanding online health information seeking behavior. Items on the questionnaire included questions on access (in terms of number of hours), and the websites users most frequently visit to access online health information. Items on Internet self-efficacy were based on research conducted by Eastin and LaRose (2004), and Torkzadeh and Van Dyke (2001) who each examined self-efficacy among Internet users. A modified version of the scale developed by Krantz, Baum and Wideman (1980) was used to measure involvement. Other sources included Papacharissi and Rubin (2000), Morahan-Martin (2004) and Rice (2001) who have conducted detailed research on online gratifications sought by Internet users.

**Statistical Analysis**

Once the data collection was completed, the data were cleaned for errors and entered in an SPSS file. Next, frequency distributions were checked to ensure that the data from the questionnaire were transcribed correctly, and that all missing values were accounted for. The data were now ready for further analysis.

Using the varimax rotation technique, principal component factor analyses were run on the scales used to measure use, behavior modifications, gratifications sought, Internet self-efficacy, involvement, outcome expectancy and perceived credibility/ reliability. Reliability tests were run on all the factors, and only those that had a Cronbach alpha score of 0.50 or higher were retained for further analysis. The hypotheses were tested using correlation and multiple regression analyses. The research questions were examined using correlation tests and chi-squares.

**Summary of Main Findings**

1. Of the 521 respondents, 441 (84.64%) respondents have looked at online health information. Over half the respondents (53%) access online health information for less
than an hour, and another sizeable percentage (38%) access online health information between 1 and 4 hours.

2. Demographic information was collected for all 521 respondents, of which 492 (94.4%) respondents have health insurance. The sample consisted of 53.9% males. The mean age of the respondents was 42 years, their median age was 42 years and an overwhelming majority of the population was White/Caucasian (93.5%). Over half the respondents had at least an associate’s degree or higher (63%) and had annual household income of $50,000 to $100,000.

3. Use of online health information was measured using a scale that had a range from 7 to 35. Higher scores on the scale indicated a high level of cognitive use. The mean score on this scale was 26.68 that indicated that there was high level of use of online health information among the respondents.

4. The factor analysis of the behavior modification items resulted in 2 factors which are Getting Preventive Medical Tests and Modifications to Lifestyle. The range of scores on both factors was from 4 to 20. Higher scores indicated a higher likelihood of modifications in behavior. The mean score was moderately high for Modifications to Lifestyle having the first rank (mean = 14.09) and about average for Getting Preventive Medical Tests having the second rank (mean = 12.55).

5. Factor analysis was also used to collapse the gratifications sought construct into 4 factors which are Ease of Information Seeking, Empowerment, Self-health Management & Privacy, and Online Social Networking. Higher scores on all factors indicate higher degree of gratifications sought. The mean scores for factors indicated a moderately high to high degree of gratifications sought with Ease of Information Seeking factor having the highest rank followed by the Empowerment factor. Self-health Management obtained the third rank and Online Social Networking received the fourth rank. These results
indicate that respondents look at online health information because it is convenient, it allows them privacy, it empowers them to feel better equipped to manage their own health and they can participate actively on the online social networks.

6. Internet self-efficacy was measured using a scale that yielded two factors when subject to factor analysis which are Confidence in Messaging and Retrieving Information and Confidence in Internet Navigation and File Sharing. High scores on the scales denoted a high level of self-efficacy. The mean score of Confidence in Messaging and Retrieving Information was high and the mean score of Confidence in Internet Navigation and File Sharing was moderately high. On the construct of Internet self-efficacy, the factor Confidence in Messaging and Retrieving Information has the higher rank followed by Confidence in Internet Navigation and File Sharing.

7. The involvement construct was collapsed into five factors and were ranked thus: 1 - Cognitive Involvement with Pertinent Health Information 2 - Information Seeking from Experts 3 - Involvement with Medical Options 4 - Self-treatment of Ailments, and 5 - Reliance on Experts. Higher scores on the involvement scales indicated a higher level of involvement. All the factors except Reliance on Experts had a moderately high mean score indicating that the respondents are fairly involved on the respective scales.

8. Outcome expectancy was measured on a scale where higher scores meant positive outcome expectancy and lower scores meant negative outcome expectancy. The construct was divided into three factors which were Outcomes of Information Seeking, Anxiety Related to Credibility and Reliability, Positive Outcomes Related to Networking and Learning. The factor of Positive Outcomes Related to Networking and Learning had the highest rank followed by Outcomes of Information Seeking. Anxiety Related to Credibility and Reliability secured the third rank. The mean score of Positive Outcomes Related to Networking and Learning was high, while the mean score for Outcomes of
Information Seeking was moderately high suggesting that respondents expected positive outcomes related to networking, learning and information seeking. The mean score of Anxiety Related to Credibility and Reliability was relatively lower indicating lack of support for positive outcomes related to credibility and reliability.

9. Variables included in the online information credibility and reliability scale yielded two factors after factor analysis, which are Credibility of Online Sources, and Peer-Network Influence on Online Source Credibility. The factor of Peer-network Influence on Online Source Credibility had the higher rank, with a mean score that was moderately high indicating a moderate support for inter-personal credibility. Credibility of Online Sources had the second rank and had an above average mean score indicating a moderate support for credibility related to the author of the website, the sponsoring institutions and the source of information.

Summary of Results of Research Questions

1. The first research question explored the gratifications sought by health seekers with regard to online health information. The responses collected from the scale revealed that ease of information seeking is a powerful motivator for people to access online health information, as is the empowerment they feel about dealing with their own health. Health seekers also indicated that they accessed online health information for the privacy it offered and the self-health management aspect. An important motivator that was revealed was the ability to communicate and network with other members of the online community.

2. The second research question examined the relationship between access to online health information and health-related behavior modifications among health seekers. For both scales of the behavior modifications construct, Getting Preventive Medical Tests and
Modifications to Lifestyle, data suggest that among respondents with higher levels of access to online health information, there is a tendency for higher scores on the behavior modifications scales. This means that higher the levels of access of online health information, higher the likelihood that health seekers will get preventive medical tests or modify their lifestyles.

3. Websites that health seekers frequently visit were explored through Research Question 3. A typology of the websites was generated to answer this research question. Data revealed the following categories of health websites: gender-specific websites, general health and lifestyle websites, government websites, health concern-specific websites, hospital websites, insurance websites, pharmacy websites, search engines, WebMD and other websites. There was an overwhelming tendency to choose WebMD as the first choice of websites, followed by General health and lifestyle websites, search engines and WebMD respectively as top three avenues as the second choice of websites. General health and lifestyle websites and search engines were the third choice for health seekers.

4. The fourth research question examined the association between choice of websites and credibility of online sources. Results revealed a significant positive correlation between the top two sources of the first choice of websites (WebMD and search engines) and both Credibility of Online Sources and Peer-Network Influence on Online Source Credibility scales. This indicates that health seekers choose WebMD for its high level of credibility on both scales, Credibility of Online Sources and Peer-Network Influence on Online Source Credibility.

Summary of Results from Hypotheses Tests

1. The first hypothesis stated that there will be a positive relationship between Internet self-efficacy of health seekers and access to online health information. This hypothesis was
supported for a positive relationship between Confidence in Internet Navigation and File Sharing and access to online health information \( (p \leq .01) \). The relationship indicates that higher levels of Internet self-efficacy are positively correlated with higher levels of access to online health information; particularly the confidence Internet users have in their ability to navigate the Internet and share files.

2. Hypothesis 2a stated that people are more likely to access online health information if they suffer from a chronic disease or disability. This hypothesis was supported. People are more likely to access online health information if they suffer from a chronic disease or disability \( (p \leq .01) \).

3. Hypothesis 2b stated that people are more likely to access online health information if they have loved ones who suffer from a chronic disease or disability. This hypothesis was also supported \( (p \leq .01) \). Therefore, people are more likely to access online health information if they have loved ones who suffer from a chronic disease or disability.

4. The third hypothesis states that people are more likely to access online health information if they suffer from a nagging health concern. This hypothesis was supported \( (p \leq .01) \). The data suggested that health seekers are indeed more likely to access online health information if they suffer from nagging health concerns.

5. The fourth hypothesis stated that access to health-related websites by health seekers will be predicted by gratifications sought, Internet self-efficacy, involvement, outcome expectancies and socio-demographic variables (age, gender, annual household income, ethnicity, and insurance status). This hypothesis was modeled using multiple regression analysis, which was used to determine the predictive power of gratifications sought, Internet self-efficacy, involvement, outcome expectancies and socio-demographic variables on access to websites by health seekers. The final set of predictor variables was chosen using the backward elimination method, and consisted of Empowerment, Online
The null hypothesis that there is no linear relationship between access to online health information and the predictor variables of Empowerment, Online Social Networking, Cognitive Involvement with Pertinent Health Information, and age was rejected ($p \leq .01$). Therefore the four independent variables are significant predictors of access to online health information. The correlation coefficient between the observed value and the expected value, multiple $R$, was 0.305 and the $R$ square value suggests that 9.3% variability in the dependent variable of ‘access to online health information’ is explained by the four independent variables independent variables. The estimated multiple regression line is: $\hat{Y} = 0.576 + 0.046x_1 + 0.036x_2 + 0.027x_3 - 0.008x_4$, where $\hat{Y}$ = predicted value of access to online health information, $x_1$ = Empowerment, $x_2$ = Online Social Networking, $x_3$ = Cognitive Involvement with Pertinent Health Information and $x_4$ = age. The predicted value of access to online health information increases by .05, .04 and .03 units for 1 unit increase in the scales of Empowerment, Online Social Networking and Cognitive Involvement with Pertinent Health Information respectively, and decreases by .008 units for 1 unit increase in the scale of Age.

6. The fifth hypothesis stated that use of online health information by health seekers will be predicted by gratifications sought and outcome expectancy. It was modeled using multiple regression analysis to determine the predictive power of gratifications sought and outcome expectancy among survey respondents on use of online health information. The final set of predictor variables was chosen using the backward elimination method, and consisted of Ease of Information Seeking, Empowerment, Online Social Networking and Positive Outcomes Related to Networking and Learning. The null hypothesis that there is no relationship between use of online health information and the four aforementioned predictor variables of Ease of Information Seeking, Empowerment,
Online Social Networking, and Positive Outcomes Related to Networking and Learning is rejected \((p \leq .001)\). The correlation coefficient between the observed value and the expected value, multiple R, was 0.589. This is a moderately high value which indicates that the linear regression model predicts well. The R square value suggests that 34.7% variability in the dependent variable of ‘use of online health information’ is explained by the independent variables. The estimated multiple regression line is 
\[
\hat{Y} = 7.187 + 0.282x_1 + 0.446x_2 + 0.221x_3 + 0.295x_4,
\]
where \(\hat{Y}\) = predicted value of use of online health information, \(x_1\) = Ease of Information Seeking, \(x_2\) = Empowerment, \(x_3\) = Online Social Networking and \(x_4\) = Positive Outcomes Related to Networking and Learning. The predicted value for use of online health information increases by .282 units for every 1 unit increase in Ease of Information Seeking, .446 for every 1 unit increase in Empowerment, .221 units for every 1 unit increase Online Social Networking, and .295 units for every 1 unit increase in Positive Outcomes Related to Networking and Learning.

Discussion and Implications of Main Findings

Access to Online Health Information

A large majority of Internet users who participated in this study look at online health information with some regularity. Approximately 85% (441) of respondents of this study have looked at online health information at some point in their information seeking experience. However, around 46% of the sample access between one and 20 hours a week. The popularity of online health information seeking among this group suggests that people are increasingly becoming aware of health as a priority in their lives. It is also indicative of the ‘empowered patient’ discourse, where more and more people are taking responsibility for their own health by being better informed. This finding is consistent with the results of several studies, such as Fox (2008) who indicates that the Pew Internet Project estimated health information seekers between
75% and 80% of Internet users and Harris Interactive’s (“Number of Cyberchondriacs,” 2005) latest poll on online health information seeking that places health seekers at 81% of Internet users. The large percentage of Internet users accessing online health information as indicated in this study and in the literature in general is a promising sign for health communicators, educators and designers of health-related content.

However, while online information seeking may be a popular online activity, it certainly isn’t one that many respondents spend a lot of time on. In fact, of the 441 respondents who access online health information, over half spend less than an hour a week looking for health-related information, and another 168 (38%) respondents spend between 1 and 4 hours a week. One explanation for less time spent may be that health seekers are looking for answers to specific concerns, and tend to look for online information on a need-to-know basis rather than habitual practice. In fact, Fox and Rainie (2000) suggest that health seekers tend to look at online health information specific to disease than for general health-related subjects. This may cause access of incorrect or partial information which may not present a clear picture of the health query presented by the health seekers. It is important to ensure that partial information does not lead health seekers to excessively worry, or ask their healthcare providers for unnecessary tests.

For communicators, the implications are two-fold: first, Internet users should be directed to quality information from reliable sources by their doctors and/or health educators so that reliable information can be received in a short amount of time. Second, and we have begun to see more of this in recent years, self-health management should be promoted as a life-long endeavor. Future research should include examining closely the reasons behind the amount of time spent on online health information.
Use of Online Health Information

While access of online health information can be looked at as information gathering, use of online health information can be perceived as information management, a cognitive and communicative process where health seekers appraise and interpret the information they receive from online sources (Brashers, Goldsmith & Hsieh, 2002).

In addition to physical retrieval of information, the study also looked at the cognitive processing of online health information accessed by health seekers. The mean score for the use of online information was moderately high on the scale, indicating that respondents took the opportunity to process the information they received. Health seekers reported their wish to discuss information with their healthcare providers, share it with their family and friends, and take the time to understand the information they were accessing and consider what the implications could be.

A large number of respondents scored high on the use of online information scale, indicating a high cognitive level of use. This finding is consistent with the general discourse of health consumers where Internet users are no longer only passive recipients but instead are active participants in their health-related decisions. Lewis (2006) promotes the emergence of aware and empowered individuals who give thought to the health-related decisions in their lives. Brown and Walsch-Childers (2002) insist that researchers examine more closely how online health information contributes to decision-making about overall health, and this finding lends itself to that specific need by indicating that not only do users frequently access online health information they also spend time processing its applications and implications in their everyday lives.

High scores on the use of online health information scale bode well for health communication in general and online health information in particular. Health communicators and practitioners would do well to appeal to the intellect and thought-processes of consumers who
are interested in their own health and aware of the resources available to them. We have already seen this in part as communicators and health information producers have started encouraging consumers to think more about health as a lifestyle component in addition to illness-management. Direct-to-consumer advertising (DTCA) is an example of how pharmaceutical and health-related companies are trying to involve people in decision-making about their own health. A recent study conducted by Polen, Khanfar and Clauson (2009) revealed that over half the survey respondents believed that DTCA on television allowed them to have more control over their health management. While more research of such messages on consumers is imminent, it does indicate that interventions and information that treats health seekers as partners instead of patients could be valuable to get health messages effectively communicated. These ideas should ideally be included in future research and practice.

Behavior Modifications

The logical next step to getting health-related information and evaluating it is its application into everyday life. Internet users self-reported behavior modifications on two factors: Getting Preventive Medical Tests, and Modifications to Lifestyle. The mean scores on both scales were fairly high indicating that based on the information they find online, health seekers have made modifications to their treatment options, self-care, diet and fitness.

Not only is this finding encouraging for producers of health content, health communicators, and health educators, but it also addresses a very specific need in literature about studying the practical implications of accessing online health information. Scholars like Seale (2004a, 2004b), and Napoli (2001) specifically call for more research on how health seekers seek information and what impact it has on their health behaviors. According to the results of this study, respondents reported behavior modifications off of online health information, especially in terms of preventive care and healthy lifestyle choices. The moderately high mean score on the
construct of Getting Preventive Medical Tests shows that Internet users are responding to benefits of preventive care like information about early screenings and getting regular annual tests. High mean score on Modifications to Lifestyle is further indication of the growing trend of individuals adopting good health practices into their everyday lives.

Producers of health content should take heart in the indication that access to and use of online health information may contribute to promotion of healthy behaviors. This calls for health content producers to take the necessary precautions and self-regulate the quality and accuracy of online health information accessed by Internet users. For communicators and health educators, the current online environment and motivated users provide the perfect opportunity to promote the importance of early detection and advantages of healthful lifestyle choices.

**Self-Efficacy and Outcome Expectancy**

Two constructs derived from Bandura’s Social Cognitive Theory were included as part of the theoretical framework of the study: Internet self-efficacy, the confidence people have in their own abilities to navigate the Internet and outcome expectancy, the end results expected by health seekers as a consequence of their information seeking behavior. Eastin and LaRose (2004) believe that Social Cognitive Theory has much to offer considering the interactivity of Internet and the cognitive processing that goes behind the use of such a medium. It is, in general, a highly applicable framework to understand the motivations behind the use of online health information.

The results of the factor analysis of the Internet self-efficacy construct showed that the respondents had high mean scores on both the Confidence in Messaging and Retrieving Information scale and the Confidence in Internet Navigation and File Sharing scale. The high levels of Internet self-efficacy indicate that health seekers are confident in their abilities to navigate the Internet in terms of sharing information, transfer of files and giving/receiving support from the online community.
Self-efficacy is an important construct for this study. In fact, Torzadeh and Van Dyke (2001) insist that use of information technology is more a function of self-efficacy than technology. High levels of Internet self-efficacy would lead to increase in use of the medium, which would further increase confidence in Internet navigation. This finding is echoed in studies done by Eastin and LaRose (2000) and Stavrositu and Sunder (2006). Further relationship between Internet self-efficacy and access to online health information is discussed later in this chapter.

Another construct closely related to self-efficacy is outcome expectancy. Where self-efficacy is a judgment of one’s capability to accomplish a certain task, outcome expectancy is the likely consequence that one’s behavior will produce (Bandura, 1986). Respondents scored high on scales of Positive Outcomes Related to Networking and Learning, and Outcomes of Information Seeking. Positive expected outcomes should encourage consumption whereas negative outcomes would deter it. Findings show that health seekers expect good results about networking and learning from their online health information seeking behaviors. Fox (2008) suggests that most people have had positive experiences with online health research, and have found the information helpful. The high scores for the respondents in this study seem to indicate that their experiences have been most likely in a similar vein. Other implications of positive outcome expectancy are discussed in context of hypothesis testing later in the chapter.

On the other hand, respondents scored lower on Anxiety Related to Credibility and Reliability, signifying a negative outcome expectancy, which shows that they are aware of the pitfalls of online health information. A significant number of respondents polled by the Pew Internet Project in 2007 acknowledged that the Internet had misinformation and that not all information available on the Internet was reliable (Fox, 2008). In fact, Fox believes that most people are smart about the place of Internet in their lives, and considered medical professionals their first resources for urgent health concerns.
The findings of this study may be particularly significant in light of the discussion about guidelines to regulate online health content. There is a growing sentiment among scholars that argues that regulation of online health information is necessary to protect against misinformation and that the public should have specific guidelines provided by public agencies (Eaton, 2002). However, in light of this finding, barring health information for vulnerable populations (HIV/AIDS and cancer patients for example), the question that arises is to what extent do public resources need to be utilized for regulating general health content, if health seekers appear to know to take the information they find online with a pinch of salt? For health communicators, the most important task is to ensure that awareness and education become priority both for content providers and users of online health information.

Involvement

Internet users scored high on Cognitive Involvement with Pertinent Health Information, Information Seeking from Experts and Involvement with Medical options, three of the five scales from the Involvement construct. These scores suggest that health seekers have a high level of both cognitive and behavioral involvement. These include cognitive involvement with information pertinent to age, race, and gender, and behavioral involvement with decision making about medical tests and treatment options.

High levels of involvement are indicative of higher levels of interest in and attention to health information, which in turn signify that health seekers may want more of a say and more control of their personal health and wellness. In addition, respondents indicated moderate levels of involvement with regard to Self-Treatment of Ailments and Reliance on Experts, echoing once more the sentiment that health seekers cautiously use online health information and most often do not intend it as a replacement for medical professionals.
These results also reaffirm findings from studies conducted by Rains (2008), Dutta-Bergman (2005), and Ko, Cho, and Roberts (2005) who suggest that health seekers who are involved in their own health, utilize the Internet more often for their health information needs. Rains (2008) attributes the heightened interest to the diversity of options available on the Internet, and their belief that online health information can actually help them make decisions that may have an effect on their health outcomes.

Health communicators and educators will find that involved users are already their most engaged and captive audience, and allies in the creation of user-generated content. The challenge lies in coming up with new and innovative ways to keep this audience interested in online health information, and to keep misinformation in check.

Online Information Credibility and Reliability

Respondents of the study scored high on both online information credibility and reliability scales: Credibility of Online Sources and Peer-Network Influence on Online Source Credibility, suggesting that these users are conscious of the sources of online information from websites belonging to reputable institutions as well as websites recommended by friends and family. In fact, the users reported that they check the author and the “About Us” section of the websites they visit, and refer to ratings of health websites among the online community.

Contrary to literature in the field (Eysenbach and Kohler, 2002; “Vital Signs,” 2002; Kim, Eng, Deering & Maxfield, 1999) respondents of this study scored high on both the scales of the credibility construct, indicating that health seekers are sensitive to the source of information. One explanation for this disparity is the lapse of time between the former studies and this one. The general health environment has changed considerably, the use of Internet has increased and both of these factors may have implications on how health seekers look for online health information. These results denote that there is an increasing body of consumers who are aware of
various sources of online health information and their authenticity, a positive sign for health communicators and educators.

This finding also lends itself to the earlier discussion on regulation of online health content, and involvement of public agencies in providing guidelines. By no means does this mean that the mere existence of authentic information will ensure that health seekers will find it, but it does indicate that health seekers are aware of what credible sources look like. For one thing, according to Fox (2008), online health information has definitely done more good than harm, and positive experiences with the medium lead to increased use of the medium as an information resource (Leung, 2008). Future research should focus on motivations behind the selection of certain websites over another, and a deeper look at the cognitive process behind the health-seekers’ selection of sources.

Discussion and Implications of Findings from Research Questions

**Gratifications sought by health seekers**

Uses and gratifications has been a popular media theory for decades. It has focused on what motivates people to use media, and what gratifications they seek from the use of media (Rubin, 2002). The research question that explored gratifications sought by health seekers, was an assessment of source preference as well as motivations behind use of online health information. All four gratifications sought as revealed in the results, i.e. Ease of Information Seeking, Empowerment, Self-health Management & Privacy, and Online Social Networking, build upon traditional as well as new media gratification typologies as evident in existing literature.

Findings of this study are validated in themes echoed throughout literature. Health seekers are drawn to online health information because of how easy and convenient it is to search for information (Peterson & Merino, 2003; Freeman & Spyridakis, 2004). Information is
available easily to be assessed, evaluated and comprehended at the health seekers’ own time and
pace. Empowerment (of the user) is another theme that emerges as a gratification. The growing
number of people interested in their own health who are becoming part of the empowered patient
discourse who want more information so they can participate in health-related decisions (Lewis,
2006; Murero & Rice, 2006) and use information they find in discussions with their healthcare
providers. Brashers, Goldsmith and Hsieh (2002) suggest that online health information may be
increasing in popularity because it allows people to deal with illness related uncertainty as
evidenced by the Self-health Management & Privacy gratification. Online health information
fulfills their need to have multiple views for better decision-making (Tang & Lee, 2006), all with
an added aspect of anonymity and privacy for sensitive health issues (Murero & Rice, 2006).

Tewksbury and Althaus (2000) argue that traditional typologies of gratifications may be
useful in understanding and predicting Internet use, however, the characteristics of Internet as a
medium are different from those of traditional media. Hence, there is distinct need to look at
Internet-specific gratifications. One such characteristic of the Internet is interactivity.
Interactivity of online information sources allows for a medium-user interface that was not
available with traditional media. The gratification of Online Social Networking is perhaps one of
the more interesting gratifications found, since the interactivity of Internet allows users to go
online for support and help and to network with other users. The Web offers an opportunity for
involvement with both content and medium in a manner not possible with traditional media
sources. Giving/receiving support from other health seekers is a powerful motivator for many
users; a finding supported by Akesson et al. (2007), Mittman and Cain (2001) and Hardey

On a larger scale, the importance of Online Social Networking signifies the changing
arena of public health. Internet allows users to be not only consumers of online content, but also
contribute to the growing body of knowledge (Hardey, 2001). This opens up opportunities for
health communicators and educators to mobilize health seekers for online education and prevention efforts. Designing education and prevention campaigns that utilize user generated content may be effective in conveying information.

Some of the gratifications sought by users of online health information are more detailed versions of the traditional surveillance gratification such as ease of information seeking and self-health management/privacy. The gratifications typology that resulted from this study also matches the typologies of Internet use found by Stafford, Stafford and Schkade (2004), who classified gratifications sought as content (education, information, knowledge, learning and research), process (resources, search engines, surfing, technology and web sites), and social (chatting, friends, interaction and people) gratifications. Recurring themes are found in the study conducted by Papacharissi and Rubin (2000) whose typology included interpersonal utility, pass time, information seeking, convenience and entertainment. The typology of gratifications sought found in this study builds further on Internet-specific gratifications by generating gratifications that are unique to online health information seeking.

Obviously, understanding the motivations behind access and use of online health information will be useful in designing appealing and relevant content. However, on a conceptual level, these findings indicate that as a theoretical framework, uses and gratifications is still highly relevant and helpful in understanding motivations behind media use. As rightly pointed out by Ruggiero (2000), the theory is definitely well suited and easily adaptable to a new medium with new characteristics. As technology evolves, it is important to understand what motivates users to use new forms of media and how they utilize these media to fulfill their needs. Information communication technology in particular has characteristics that are different from traditional media and which are appealing to the new media users. More importantly, with increasing medium-message-user interactivity, content providers will have to rethink media and
audience relationships. This is where a theoretical framework like uses and gratifications would be useful in reorganizing the way messages are structured to cater to new media audiences.

At the same time, it is important to keep in mind the limitations of uses and gratifications such as narrow explanations of typologies, the reliance on self-reported data, the extent to which the role of the audience is assumed and the lack of clarity attached to how central constructs of the theory like motivations, uses, and gratifications are understood (Rubin, 2002). Eastin and LaRose (2004) specifically suggest a concern toward the ambiguity of constructs of gratifications sought and gratifications obtained by indicating that the former is an indication of needs fulfilled in the future and the latter an indication of needs already fulfilled. By not contextualizing needs and wants in the present, the authors suggest that the traditional approach to uses and gratifications is lacking in explaining audience use of new media technologies. Eastin and LaRose call for a new model of media usage by bringing outcome expectations, a construct from Social Cognitive Theory, into consideration. Outcome expectations are based on current expectations resulting from engaging in a behavior, and are derived from personal experiences or observations of experiences of others. As media evolves, so do theories, and future research exploring the possibilities of new models of audience engagement would be beneficial to those interested in further understanding the audience’s role in media selection.

Behavior Modifications and Access to Online Health Information

The research question seeking the relationship between access to online health information and health-related behavior modifications revealed a positive relationship for both behavior modifications constructs (Getting Preventive Medical Tests and Modifications to Lifestyle). Findings suggest that among respondents, there is a tendency to score higher on both the behavior modification constructs with higher levels of access to online health information.
Higher scores on the constructs indicate a higher likelihood of users integrating online health information into their preventive care and lifestyle choices.

Of all the variables under study for this project, the extent of behavior modifications among health seekers has been understudied, and scholars in the field have called for more research in the field (Seale, 2004a; Seale, 2004b; Brown & Walsch-Childers, 2004; Napoli, 2001). Not only do these findings address the gap in literature, but they also build upon existing literature by establishing a relationship between high levels of access and high likelihood of behavior modifications.

While more research is needed to further confirm these findings, it is already evident that these results have important implications for health communicators and educators in terms of impacting behavior modifications. First, health communicators need to take the opportunity to keep the interested individuals engaged by including content that keeps them coming back for more and for longer periods of time, keeping in mind that interactivity both with the medium and other interested individuals may be strong selling points. Next, health communication professionals should take the opportunity to further promote online the importance of preventive care and early detection, and market health information from reliable sources to make the maximum possible impact. Finally, in light of this finding, health communicators and medical professionals should come together to promote healthy dialogue between health seekers, educators, and health professionals.

The indication of an association between behavior modifications and access to online health information is especially encouraging for communicators and educators, particularly those working for prevention of certain diseases, de-stigmatization etc through modifications in behavior. Of importance here is increasing access to educate users about preventable diseases like HIV/AIDS. Designing health communication strategies by combining traditional and online resources may be useful not only in spreading prevention information about HIV/AIDS but also
influence behavior modifications among the users such as safe sex behavior, lifestyle changes etc. For educators and content providers, there is an opportunity to advocate preventive testing and lifestyle modifications for those who are most at risk of contracting HIV/AIDS and have limited means to access health information from other sources. Increased access will enable more patients to utilize online health information to research different sources of information, and peruse different viewpoints, which may lead to health seekers modifying their behavior and better managing their health options.

Online sources allow for a larger reach to a vast audience at a relatively low cost, and transfer of information may be easier and cheaper than traditional sources, an important consideration to encourage changes in behavior through use of new media technology. The Internet is a medium that appeals to the younger generation, with private and anonymous access to information resources on sensitive topics like HIV/AIDS. Using the Internet to encourage safe sex behavior and a preventive lifestyle is crucial because there may be a tendency to overlook HIV/AIDS awareness and prevention efforts due to decreasing media attention toward this health issue. However, with online sources, the same message of preventive behavior can be sent through a new medium in a new format. Additionally, online sources may allow for peer support which might be an important motivator because of the stigma attached to HIV/AIDS.

Choice of Health Websites

In this discussion of online health information, an exploration of the sources people most frequently visit for their health information needs is definitely of academic and practical interest. For their first choice of websites, health seekers overwhelmingly chose WebMD, followed by general health and lifestyles as their dominant second choice. In addition to these sources, search engines featured as a prominent source for the third choice.
Previous studies like Morahan-Martin (2004) and Eysenbach and Kohler (2002) suggest that when health seekers tend to look at online health information they mostly tend to use search engines with short phrases. While the phraseology of search terms was not examined in this study, findings reveal that most users go to a specific health website rather than doing a more general search. Search engines do not appear as a significant resource until the third choice.

Results of this study indicate that health seekers prefer specific websites rather than general resources for their health information needs. Health seekers distinctly chose WebMD as their first choice of websites, which underscores the reputation of this particular website as a consistent source of health information. One reason for the popularity of WebMD among health seekers may be its ability to cater to a wide variety of people with different abilities and interests. These characteristics and the increased interactivity along with the opportunity to network with other users appeal universally to health seekers at different levels of access and use. Some aspects of WebMD definitely worth replicating include the ability to involve more users with use of multi-media and interactive features, frequently updated information and perhaps most important of all, pulling current events of relevance and tying it to health issues, making health information an ingrained feature of people’s everyday lives.

Another important issue communicators and educators need to address is the popularity of access to online health information on WebMD versus access to online health information on government websites. Future research should examine why health seekers prefer to go to a corporate website like WebMD rather than government websites (like www.cdc.gov for example) that also provide credible information.

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C The characteristics of WebMD and a detailed description of the content of the website are discussed in Chapter 1.
Source Credibility & Reliability and Choice of Health Websites

The discourse of credibility of online resources is very different than those about other media, primarily due to the lack of professional gatekeepers (Cline & Haynes, 2001). While this study does not focus on information seeking patterns with specific regard to credibility of online resources, no discussion of online health information can be complete without the consideration of credibility and reliability of the health information health seekers find online. The results of this study show health seekers choose WebMD for its high level of credibility on both scales, Credibility of Online Sources and Peer-Network Influence on Online Source Credibility.

Earlier discussions have revealed that the findings of this study are somewhat different than the findings of other such studies conducted in the past, where the general consensus was that health seekers are not generally aware of the sources of online health information they access, and tend to rely on general sources of information like search engines instead of specific ones (Eysenbach and Kohler, 2002; “Vital Signs,” 2002; Kim, Eng, Deering & Maxfield, 1999). Results of this study indicate an association between choice of websites and perceived credibility and reliability in addition to indicating a tendency toward increased perceived credibility.

With the increasing availability of online health information, the importance of access to trustworthy and reliable information cannot be emphasized enough. Ensuring universal access to credible online health information is challenging because of several issues some of which include the lack of set guidelines for health content providers, lack of set indicators to help steer health seekers toward reliable information, and the potential dangers of false or misleading information for vulnerable populations. On the other side, an argument can be made that users may be aware of what constitutes as reliable information or how to determine if the information presented to them is from a reliable source, and frequently share that knowledge among their personal network. According to the results of this study, health seekers who choose online health
information websites that are generally considered to be reliable report their vigilance about the source of information and authors of websites they access. Additionally, they give and take recommendations of health-related websites considered credible and reliable to/from their family and friends.

Communicators and educators can do their part to promote access to credible and reliable online sources in several ways 1) encouraging health seekers to be conscious of the source of information they access, and 2) increasing awareness of what constitutes reliable information and how to recognize it. Increased alertness among users will definitely help as more users will automatically give thought to their information sources. However, this is also a good opportunity to call to action health content providers to create and maintain the standards of information they post online. Simply put, it may be said that a fair compromise to ensure access to credible and reliable online health information could be increased vigilance on part of the health seekers and increased self-regulation on part of content providers. Most importantly, vulnerable populations must be protected, and considering the influence of peer support, the online community in general should be conscious of what they are posting about health-related topics on blogs, discussion and message boards, and online support groups.

Discussion and Implications of Findings from Hypotheses

*Self-efficacy and Access to Online Health Information*

The hypothesis posited about the relationship between Internet self-efficacy of health seekers and access to online health information was supported. There is a significant positive relationship between the Internet self-efficacy construct of Confidence in Internet Navigation and File Sharing and access to online health information. This finding signifies that most respondents with higher levels of access to online health information also score higher on the self-efficacy scale of Confidence in Internet Navigation and File Sharing, which includes
scanning and uploading pictures, troubleshooting Internet problems, and understanding the way
Internet hardware and software work.

There are several studies in literature that establish the relationship between level of
access and Internet self-efficacy, and some support strongly the results of this study. Increased
usage of Internet was associated with increase in Internet self-efficacy in the study conducted by
Bass et al. (2006). Torkzadeh and Van Dyke (2001) suggest that for new technologies, users who
use the technology more, tend to have higher levels of self-efficacy. The survey undertaken by
Eastin and LaRose (2000) showed a positive relationship between Internet self-efficacy and
Internet usage. Stavrositu and Sunder (2006) surveyed over a 1000 participants on online
information seeking and found that increased access to the Internet was associated with increase
in Internet self-efficacy.

This result underlines the importance of understanding the patterns of media consumption
among Internet users, as well as the interactivity of Internet as a medium by identifying an
association between access to online health information and users’ confidence in navigating the
Internet and sharing information. The findings of this study indicate that the more health seekers
continue to access the medium, the higher their self-efficacy will be with regard to navigating the
Internet and sharing files with other users and/or family and friends. This will in turn motivate
them to use the Internet more often for their health information needs. Eastin and LaRose (2004)
posit that self-efficacy ultimately affects continued use of the medium. Therefore, the
confidence users have in their ability to navigate the Internet will determine their future use of
the Internet for their information needs.

Educators, policy makers, and content providers should also encourage more access to
the Internet, keeping in mind those factors that affect access the most. For example, age is
inversely related to access (Dolan et al., 2004), and there is an aging population in the United
States that is going to need effective skills and consequently higher levels of Internet self-
efficacy. With the increasing likelihood of health records going online in the future, effective
Internet users stand to benefit enormously from file sharing services that medical community has
to offer, like remote second opinions, online consultations and online monitoring of blood
pressure, blood sugar and so on.

Policy-makers, communicators, producers of online content and health educators have a
challenge to fulfill in increasing access to online health information across society. Issues of
access have become a pressing issue for our society particularly for vulnerable and marginalized
groups. The digital divide keeps online health information resources from socio-economically
disadvantaged groups, those who perhaps have the least access to resources to begin with. Low
income users have limited access to computers and Internet (Lorence & Park, 2008), and
therefore have limited opportunities to explore online information sources. Kreps (2005)
suggests that those who have limited access to technological resources are also people who are at
a disadvantage socially and economically, and while information and knowledge do not
guarantee a change in behavior, they definitely contribute to it. By not having access to online
health information, people in vulnerable positions are denied opportunities that may provide
them the tools to better manage their health and make healthier lifestyle choices with limited
means.

Morey (2008) suggests that in the United States the issues of digital divide include not
only physical access to computers and Internet, but also concerns of quality. The vast array of
information leaves inexperienced or less experienced users vulnerable to unreliable or
misleading information. Increased access should be accompanied by increased awareness of
what constitutes as reliable information. Increasing awareness among health seekers may lead to
positive information seeking experiences, which in turn will lead to more confidence in using the
Internet more often. Policy makers and educators can design strategies and interventions to
increase awareness or to educate health seekers to recognize reliable information, which is
relatively easier to conceive and implement compared to increasing physical access, which is a challenge due to economic, spatial, literacy and other barriers. Logistically, increasing physical access to information communication technology is a difficult undertaking, but definitely one that policy makers will have to undertake to bridge the digital gap, which may adversely affect any efforts that aim to create a public health environment that aims to benefit people in all strata of society.

Current Health Status and Access to Online Health Information

Current health status is known to be a significant factor in determining access to online health information. This study included hypotheses that looked at respondents who suffer from chronic disease or disability, who have loved ones who suffer from chronic disease or disability and respondents who have nagging health concerns, and their association with access to online health information. All three hypotheses were supported for significant associations between the access to online health information sites and health status.

These findings are also echoed throughout in the literature. Internet is an important source of information for people who suffer from chronic health and disability, and for people who have loved ones who suffer from chronic disease and disability (Madden & Fox, 2006). The authors also estimated from their findings that around half of those who suffer from chronic disease access online health information. The study conducted by Bundorf, Baker, Singer and Wagner (2004) suggests that individuals who stand to obtain greater health benefits are more likely to access online health information. Health seekers who are chronically ill are attentive about their health options and find most of the information online (Morahan-Martin, 2004). Bansil, Keenan, Zlot and Gilliland (2006) suggest that for both people who themselves suffer or have loved ones who suffer from chronic disease or disabilities Internet is a significant source of health information. Several other studies also indicate that health seekers with nagging health
concerns tend to turn to the Internet as their information source (Harris & Wathen, 2007; Fox, 2008).

Indications from this study are important because of all the choices of health information that health seekers have, they choose to go online for their health needs. Some possible explanations could be that those who suffer from chronic health problems want better treatment options, and second opinions from other sources. They may not be getting enough information from their healthcare providers and would like more information. Brashers, Goldsmith and Hsieh (2002) indicate that online health information may help to deal with illness-related uncertainty. What these reasons may be, future research should explore them in detail.

These findings are particularly significant because the Pew Internet Project estimates around 20% Americans suffer from some form of chronic health concern or disability that prevents them from performing everyday activities (Madden & Fox, 2006). Results of the study revealed that the majority of people who access the Internet suffer from chronic disease or disability and/or have nagging health concerns. The findings also suggest that the majority of people who access the Internet have loved ones suffer from chronic disease or disability suggesting that online health information seeking is popular not only for self-health management but also to understand or cope better with health issues of loved ones.

Results of this study and discussions in this field illustrate the importance of information in modern society and its abundant availability. Today’s society is defined by information, its easy accessibility and people seeking it to fulfill their requirements in a vast array of subjects. The Internet is a vast collection of information from different sources, with different viewpoints, and is available without national or geographic constraints. The world is quite literally at people’s fingertips. It is evident from the findings of this study that there is an overwhelming interest among people with specific health needs to access online health information. For health educators, communicators and policy makers, the challenge is to determine opportunities that can
utilize information technology to better people’s lives while ensuring reliability and privacy of health seekers. Particularly challenging is increasing online health information access to the neediest and most vulnerable populations of society, and policy-makers will have to face considerable economic and social barriers to overcome.

Future directions for medical informatics point toward digital health records, electronic health management systems and national medical record databases. In this technologically advanced information scenario there come up concerns of quality of information, misinformation and issues of identity theft. Those seeking relief from chronic conditions or terminal illnesses may fall victim to misinformation. Those with limited experience and technical ability may not have the means to navigate a complex online health record system or protect themselves against those who seek to take advantage of the loopholes. Therefore, for educators and policy makers to consider, an additional dimension is added to increasing access and awareness, which is increasing health and technical literacy.

In addition to questions of increased access, health communicators, educators and providers need to consider some important concerns: Does increased access to online health information always work in favor of health seekers? Is partial information better than no information? What impact can information overload or misinformation have on the overall health scenario, particularly in light of increasing health costs and expensive preventive tests? And what role can healthcare providers play in ensuring a balance between online health information seeking and communicating with health professionals. For an effective public health system to work, healthcare shall have to be a collaboration between health providers, health seekers and educators, where individual self-health plans would include an information flow consisting of a dialogue between health professionals and patients.
Predictors of Access to and Use of Online Health Information

The study showed that gratifications sought (Empowerment and Online Social Networking), Involvement (Cognitive Involvement with Pertinent Health Information) and age were significant predictors of access to online health information among Internet users. The findings indicate that access to online health information increases with increases in scores of Empowerment, Online Social Networking and Cognitive Involvement with Pertinent Health Information and decreases with an increase in the age of health seekers.

Results also indicated that gratifications sought (Ease of Information Seeking, Empowerment and Online Social Networking) and outcome expectancy (Positive Outcomes Related to Networking and Learning) were significant predictors of use of online health information among Internet users. In fact, almost 35% variance in Internet use was explained by these four factors. The use of online health information increases with increases in scores of Ease of Information Seeking, Empowerment, Online Social Networking, and Positive Outcomes Related to Networking and Learning.

Gratifications Sought

Uses and gratifications theory suggests that users of media make choices based upon the ability of those media to gratify their needs. Rubin (1993) argues that audience motivations behind selection and use of media should be closely examined to understand the impact of the media. This study in particular, looks at gratifications sought by Internet users of online heath information, and the results indicate that Empowerment and Online Social Networking are two important factors that explain both access to online health information and use of online health information. Additionally, Ease of Information Seeking (along with the above two gratification factors) is an important factor that explains use of online health information.
One of the most appealing aspects of the Internet is its easy accessibility and its adaptability to suit the users’ needs. Results indicate that these characteristics allow more and more health seekers to process information efficiently, at their own time and pace. The convenience and ease of online health information seeking is appealing to Internet users, as evident in a recent study conducted by Fox (2008). Other studies that support this finding include Murero and Rice (2006), Freeman and Spyridakis (2004), Peterson and Merino (2003), and Mittman and Cain (2001).

The increasing popularity of online health information and the escalating prominence of empowered health consumers have been constant underlying ideas in this study. Feeling empowered about dealing with one’s own health is a significant motivation both in terms of accessing information and information processing and use. Research has indicated that the responsibility for personal health has shifted from health professionals to individuals (Bannerjee & Leong, 2006; Lewis, 2006). This resulting empowerment is an important motivation for access to and use of the Internet, which a vast repository of health information and treatment options.

Lastly, the gratification sought of Online Social Networking has appeared as a significant predictor for both access and use of online health information. The importance of the interactive nature of Internet cannot be emphasized enough, both in terms of drawing an audience and keeping them engaged. Signorielli (1993) indicates that the participation of the audience is a key difference that affects information retrieval and retention, and findings of this study reveal that the ability to connect with others in similar situations and conditions is, therefore, a definite draw for many health seekers. Results suggest that health seekers go online to get and give support to other health seekers with similar health concerns. Tang and Lee (2006) and Akesson, Saveman and Nilsson (2007) conducted studies that looked at motivations of online health information, and both studies found that support and help from the online community were strong motivations for health seekers. A similar theme was revealed in the study conducted by Hardey (2001).
McCullan (2006) suggests that using online technologies enables users to develop a “virtual support network,” (p.26).

The results pertaining to access to online health information and gratifications sought may have a significant impact on how online health information is presented and managed by communicators as well as other stakeholders. In addition, these findings may contribute to the increasing body of knowledge that will enable creation of content that is relevant, easy to use, consistent with current information seeking practices, and keeps the motivated users accessing more, and more often. Having more information will enable health seekers to better understand their health concerns and/or general lifestyle choices, leading to a better synergy between health consumers, health professionals and health services.

With more and more people accessing online health information, it is important to understand what it is about the medium and the content that appeals to health seekers. This has implications for a new theoretical understanding of media use and effects. As mentioned earlier, new media have characteristics that allow for a medium-audience interaction that was not seen with traditional media. Along with the medium, the message and the audience have also changed. Content is interactive, user-generated, and includes many different choices for media consumers. Users are interested in more information, and they need or want it to make important decisions about their health and lifestyle. In addition to information from experts, users are interested in opinions and viewpoints of other users. Technology is bringing people together in new and different ways, which may be useful for policy makers and campaign managers to know when mobilizing people for advocacy efforts. Strategies for planning should take into consideration the gratification needs of health seekers and cater to those needs as much as possible to generate effective results.
Involvement

Involvement is a key concept for this study because of the personal nature of health information and the personal preferences of health seekers. Results of this study suggest that Cognitive Involvement with Pertinent Health Information is predictive of access to online health information, indicating that people who pay attention to pertinent health information regarding age, race, and gender are more likely to access online health information. Having information relevant to their demographic profile, even without having health problems, may appeal to health seekers who may want an increased amount of control over their current lifestyle choices and possibly future treatment options.

As a theoretical construct, involvement deals with the extent to which media consumers take interest in the topic or issue under discussion. Krantz, Baum and Wideman (1980) indicate that different people want different levels of information, and want different degrees of control over their own health and health-related decision-making. Internet as a medium has made it easy for interested individuals to be involved in self-health management. The findings of this study reveal that health seekers with high levels of cognitive involvement, who want more control over their health alternatives, draw on the Internet as a significant source of information. Literature supports the findings of this study, particularly Rains (2008) who suggests that cognitive involvement is a significant motivator of access to online health information and that diversity of online health information is more appealing to actively involved health seekers. Dutta-Bergman (2005) argues that individuals interested in health issues are more likely to access online health information. As motivated, interested individuals, health seekers with high levels of cognitive involvement are the most engaged audience for communicators and health educators alike. Hence, from the perspective of content providers, it is important to keep this audience engaged and motivated by offering diverse and interesting content.
So far, several factors that affect access to online health information have come into discussion, however on a practical level, socio-economic variables like age and income cannot be manipulated effectively to be included in health based interventions and campaigns. Involvement, unlike socio-demographic variables, can be manipulated to provide a direction to health educators, policy makers, campaign managers, and health communicators to increase access to online health information. According to this study, people who are cognitively involved with pertinent health information are more likely to access online health information. Health educators can use this information to design campaigns that are geared towards health seekers who are involved in their health, by including information geared toward people of all ages, ethnic profiles and genders. Equally important is to reinforce the importance of prevention and promotion of healthy behaviors.

**Outcome Expectancy**

Expected outcomes influence health behaviors (Bandura, 1995), and positive outcome expectancy leads to increase in media consumption. Findings suggest that positive expected outcomes about networking and learning from the online environment is predictive of use of online health information. These results mean that users who expect positive experiences from their health seeking behavior, look toward the Internet as a tool for networking and learning. In other words, health seekers expect positive experiences of information seeking and of help and support from the online community, and they are seek out the Internet as a source of information they can rely on.

Information evaluation and management is an important part of the health information seeking process. Use of online health information by health seekers involves processing of the information and making a plan to integrate it into a health plan for themselves or their loved ones. Positive outcome expectancy about networking and learning will lead to more online health information being integrated into their plan. This has great implications for future discussions
with healthcare providers, or sharing information among family or friends or for potential use in the future.

In a recent study on breast cancer conducted by Owen et al. (2004), outcome expectancy was found to be a significant predictor of use of online health information. The Pew Internet Project found that most Internet users expect positive outcomes of their information seeking behaviors, and for most health seekers, their experiences have shown that online health information has been generally helpful (Fox, 2008). From a theoretical standpoint, these results support the findings of the study conducted by Eastin and LaRose (2004) who suggest that the results obtained by integrating gratifications sought are enhanced by the addition of outcome expectancy. According to the authors, where gratifications are somewhat static, expected outcomes are constantly updated by self-observation and observations of others. Outcome expectations are unambiguous because they reflect current beliefs about the outcomes of behavior undertaken.

Access is constrained by economic and demographic factors, many of which cannot be manipulated. However, like involvement, outcome expectancy is a variable that can be manipulated. It can be integrated in health communication campaigns that encourage health seekers to actively think about and evaluate information they access. Information management and information processing is an important consideration, particularly in light of the evolving health scenario. There is a perceptible shift in thought with more people making health a personal priority and giving due importance to healthy lifestyle behaviors and preventive healthcare. With the amount of information that exists, evaluating information that health seekers retrieve will contribute positively to decision-making about their own health. Positive expectations from Internet can encourage more and more people to intelligently and effectively integrate online health information into their health management plans.
Age

One of the predictive factors that appeared in this study was the age of health seekers. Age had an inverse relationship with access to online health information in this study, corroborating the findings of several studies that have examined access to online health information. The results of a study conducted by Mayer et al. (2006) reveal that health seekers tend to be younger, and Dolan et al. (2004) suggested that younger health seekers were twice as likely to access online health information. Access of online health information should be encouraged in older age groups in light of the fact that the advantages of online health information may stand to benefit them significantly. This study reinforces this finding.

In the United States, aging baby boomers will require considerable healthcare resources in the next few decades; however, they are also more likely to be passive consumers and not access online information as much (Hesse et al., 2005). In a recent study conducted by Campbell (2008), the author lists five reasons why increasing access to online health information is essential for older adults. They tend to have high medical expenditures, they are more susceptible to functional decline due to chronic illnesses and disabilities, the field of geriatrics is on the decline which means older adults must get involved in their own health, care for seniors for chronic, terminal or degenerative conditions falls below par and if they belong to an ethnic minority, they may be more susceptible to cardiovascular disease and cancer.

Increasing access among older adults is a challenge for communicators and educators. A separate study done by Chu, Mastel-Smith and Cesario (2009) showed that older adults were enthusiastic learners, and were willing to undertake the task of learning how to access the Internet and seek health information. The authors promote the need to increase health literacy among older adults so that they can have access to critical resources about self-health management. Authors also discussed the need to have greater usability in terms of design of web
content to suit the functional needs of older adults (like font sizes, patterned and busy backgrounds, too many clicks on one page etc.)

For policy makers and health educators, the changing healthcare scenario and the changing health consumer profile are creating opportunities to integrate people of diverse backgrounds and needs into public health arena. Having access to online health information will give older adults the tools they may be able to use to explore their health options, manage their illnesses, deal with prescriptions and generally feel more in control of their health. Additionally, it might allow them to have access to resources that will enable them to lead a better quality of life by incorporating healthy and preventive behaviors into their lifestyle, possibly increasing their independence and their longevity.

Limitations of the Study and Future Directions

Being exploratory in nature, this research project examined the role of several variables in determining the patterns of access and use of online health information among Internet users. The findings as suggested by some hypotheses tests and research questions should be considered heuristic as results of statistical tests were significant but the variances explained were relatively low. For future research, these variables should be studied on their own, in greater depth and with greater focus.

Data collection for this study was conducted as part of my fellowship at Cleveland Clinic Office of Civic Education Initiatives, and the E-rewards database was selected as a reasonable and accessible way to collect the data. Based upon the database, an overwhelming majority of the respondents for this study were Caucasians and had health insurance. The majority of respondents also had an annual income between $50,000 and $100,000. These demographic markers meant high consistency in terms of the results of the study, but no diversity in the sample. In addition, the sample was non-random which means that these results are not
generalizable to the population of Northeast Ohio. Rather, this study should be considered a case study of Internet users in Northeast Ohio.

The field of health and communication technology is growing exponentially, and with it the prospect of studying the impact of online health information on health seekers. Future research should examine in detail the relationship between online health information and behavior modifications. The social cognitive angle of uses and gratifications, as proposed by LaRose and Eastin (2004) is another intriguing aspect definitely worth examining further. Finally, once the strong predictive variables of access and use are identified, there is the opportunity to develop models that will assist in further understanding how and why people look at the Internet for health information.
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About Cleveland Clinic:
Located in Cleveland, Ohio, Cleveland Clinic is a nonprofit, multispecialty academic medical center that integrates clinical and hospital care with research and education. Cleveland Clinic was founded in 1921 by four renowned physicians with a vision of providing outstanding patient care based upon the principles of cooperation, compassion and innovation. Today, with more than 1,000 beds, Cleveland Clinic is one of the largest and most respected hospitals in the country. In addition to a state of the art main hospital campus occupying 166 acres and 50 buildings, Cleveland Clinic comprises eight community hospitals, a children’s hospital for rehabilitation, 15 family health centers, and has a presence in Florida, Canada and Abu Dhabi. (Source: Cleveland Clinic Facts & Figures, 2009)

About the Office of Civic Education Initiatives:
Recognizing that education is the key to the future, the Office of Civic Education Initiatives (OCEI) was established to fulfill the Cleveland Clinic’s commitment to promote education throughout Northeast Ohio. In partnership with regional schools, local businesses, and fellow nonprofit organizations, the Office creates innovative programs designed to enhance children’s education in the areas of math, science, health and wellness, the arts, and innovation. The goal is to intensify students’ experience with science and to strengthen their interest in scientific and medical careers. This is achieved through interdisciplinary learning and use of creativity and technology.
(Source: www.clevelandclinic.org/CivicEducation)
APPENDIX B: QUESTIONNAIRE

SECTION 1:
Please check mark your answer:
1. In a typical week, how many hours do you spend on the computers?
   - □ 31 hours or more
   - □ 21 to 30.99 hours
   - □ 11 to 20.99 hours
   - □ 5 to 10.99 hours
   - □ 1 to 4.99 hours
   - □ Less than 1 hour

2. In a typical week, how many hours do you spend on the Internet (including time spent visiting websites, email etc.)?
   - □ 31 hours or more
   - □ 21 to 30.99 hours
   - □ 11 to 20.99 hours
   - □ 5 to 10.99 hours
   - □ 1 to 4.99 hours
   - □ Less than 1 hour

3. Have you ever looked for health information on the Internet?
   Yes ( ) No ( ) IF NO, PLEASE SKIP AHEAD TO SECTION 2 ON THE LAST PAGE.

4. In a typical week, how many hours do you spend visiting websites related health information?
   - □ 31 hours or more
   - □ 21 to 30.99 hours
   - □ 11 to 20.99 hours
   - □ 5 to 10.99 hours
   - □ 1 to 4.99 hours
   - □ Less than 1 hour

5. List three websites that you visit most frequently to obtain online health information. Rank the order with 1-being most frequently accessed, 2-second most frequently accessed and 3—third most frequently accessed website.
   1) _________________
   2) _________________
   3) _________________

6. Do you subscribe to or access any email lists regarding health and wellness? (e.g. RealAge.com, webmd.com, etc.)
   Yes ( ) No ( )
Please check mark your answer to the following statements: (Please indicate SA=Strongly Agree; A= Agree; DK= Don’t know/Can’t say; D=Disagree; SD=Strongly disagree)

I would like to…

7. …spend time determining the significance of online health information I get before making health-related decisions. ( ) ( ) ( ) ( ) ( )
8. …spend time thinking about information I retrieve from the Internet before making health-related decisions. ( ) ( ) ( ) ( ) ( )
9. …frequently go back to the Internet for follow-up information on health-related issues. ( ) ( ) ( ) ( ) ( )
10. …discuss information I find online with my doctor/healthcare provider. ( ) ( ) ( ) ( ) ( )
11. …discuss information I find online with my family and friends. ( ) ( ) ( ) ( ) ( )
12. …save/store/print health-related information. ( ) ( ) ( ) ( ) ( )
13. …get information to better my health and prevent health-related risks. ( ) ( ) ( ) ( ) ( )
14. …get information that helps me understand better what I can and cannot handle on my own as far as my health is concerned. ( ) ( ) ( ) ( ) ( )

Based upon online health information I get and think about, I…

15. …have made changes in my lifestyle (example: taking the stairs instead of the elevator, parking farther away) ( ) ( ) ( ) ( ) ( )
16. …have purchased/ordered healthy diet alternatives (example: at the grocery store, at a restaurant). ( ) ( ) ( ) ( ) ( )
17. …got additional medical/health-related tests relevant to my family history. ( ) ( ) ( ) ( ) ( )
18. …got additional medical/health-related tests relevant to my demographic profile. ( ) ( ) ( ) ( ) ( )
19. …got additional medical/health-related tests relevant to my personal needs. ( ) ( ) ( ) ( ) ( )
20. …have altered my eating habits. ( ) ( ) ( ) ( ) ( )
21. …exercised/undertook physical activity more frequently. ( ) ( ) ( ) ( ) ( )
22. …have made changes to my prescription and/or supplement use (example: vitamin use, fish oil etc.) ( ) ( ) ( ) ( ) ( )
23. …got medical attention promptly when needed. ( ) ( ) ( ) ( ) ( )

I seek online health information because it allows me to…

24. …comprehend information at my own time. ( ) ( ) ( ) ( ) ( )
25. …evaluate/assess information at my own time. ( ) ( ) ( ) ( ) ( )
26. …comprehend information at my own pace. ( ) ( ) ( ) ( ) ( )
27. … evaluate/assess information at my pace. (   ) (   ) (   ) (   ) (   )
28. …get a variety of information from different sources. (   ) (   ) (   ) (   ) (   )
29. …get information in the privacy of my own home. (   ) (   ) (   ) (   ) (   )
30. …instantly retrieve information as and when I need it. (   ) (   ) (   ) (   ) (   )
31. …retrieve information anonymously. (   ) (   ) (   ) (   ) (   )
32. …save money and other resources by self-treating minor ailments. (   ) (   ) (   ) (   ) (   )
33. …research specific diseases/ailment/disease. (   ) (   ) (   ) (   ) (   )
34. …get viewpoints of people in similar health contexts/ailments. (   ) (   ) (   ) (   ) (   )
35. …supplement information I get from my doctor/healthcare provider. (   ) (   ) (   ) (   ) (   )
36. …keep up with the developments in the field of healthcare. (   ) (   ) (   ) (   ) (   )
37. …customize information for my specific situation/needs. (   ) (   ) (   ) (   ) (   )
38. …get a preliminary online diagnosis through self-diagnostic applications on websites. (   ) (   ) (   ) (   ) (   )
39. …feel more self-sufficient about my health and body. (   ) (   ) (   ) (   ) (   )
40. …feel better prepared to discuss my health with my doctor/health care provider. (   ) (   ) (   ) (   ) (   )
41. …retrieve information related to a healthier lifestyle. (   ) (   ) (   ) (   ) (   )
42. …get support, help and advice other people in similar health contexts from online communities. (   ) (   ) (   ) (   ) (   )
43. …offer support, help and advice to other people in similar situations. (   ) (   ) (   ) (   ) (   )
44. …feel better prepared to deal with health issues of family and friends. (   ) (   ) (   ) (   ) (   )
45. …look at alternative options of medical and health-related treatment. (   ) (   ) (   ) (   ) (   )

Please check mark your answer to the following statements: (Please indicate SA=Strongly Agree; A= Agree; DK= Don’t know/Can’t say; D=Disagree; SD=Strongly disagree)

46. I can understand terms/words related to Internet hardware (Ex. processors, memory, modem, wireless technology, etc.) (   ) (   ) (   ) (   ) (   )
47. I can understand terms/words related to Internet software (Ex. web browser, email software, etc.) (   ) (   ) (   ) (   ) (   )
48. I can describe words and terms related to the Internet (   ) (   ) (   ) (   ) (   )
49. I understand what the Internet can or cannot be used for (   ) (   ) (   ) (   ) (   )
50. I am confident gathering data and information on the Internet (   ) (   ) (   ) (   ) (   )
51. I can troubleshoot Internet problems (   ) (   ) (   ) (   ) (   )
52. I am comfortable learning advanced skills within specific Internet programs (   ) (   ) (   ) (   ) (   )
53. I turn to online groups for help when I need it (   ) (   ) (   ) (   ) (   )
54. I feel confident looking for general information on the web (   ) (   ) (   ) (   ) (   )
55. I feel confident looking for specific information on the web (   ) (   ) (   ) (   ) (   )
56. I am confident in sending and receiving information on the (   ) (   ) (   ) (   ) (   )
Internet

57. I can comfortably send email messages ( ) ( ) ( ) ( ) ( )
58. I can comfortably receive email messages ( ) ( ) ( ) ( ) ( )
59. I can scan pictures to save on my computer ( ) ( ) ( ) ( ) ( )
60. I am familiar with private file-sharing websites (e.g. Flickr, Yahoo pictures, etc.) ( ) ( ) ( ) ( ) ( )
61. I can upload scanned pictures onto a private file-sharing website ( ) ( ) ( ) ( ) ( )
62. I can comfortably download material from the Internet (e.g. buy songs, pictures for private/academic use, etc.) ( ) ( ) ( ) ( ) ( )

Please check mark your answer to the following statements: (Please indicate SA=Strongly Agree; A= Agree; DK= Don’t know/Can’t say; D=Disagree; SD=Strongly disagree)

63. I usually don’t ask the doctor/nurse many questions about what they are doing during a medical examination ( ) ( ) ( ) ( ) ( )
64. I’d rather have doctors/nurses make the best treatment decision for me rather than give me a whole lot of choices ( ) ( ) ( ) ( ) ( )
65. Instead of waiting for them to tell me, I usually ask the doctor or nurse immediately after the exam about my health ( ) ( ) ( ) ( ) ( )
66. I usually ask the medical personnel a lot of questions about the procedure during or before the medical exam ( ) ( ) ( ) ( ) ( )
67. Before undergoing specific tests, I look up information about the tests from different sources ( ) ( ) ( ) ( ) ( )
68. I feel it’s better to trust the doctor/nurse in charge of the medical procedure than to question what they are doing ( ) ( ) ( ) ( ) ( )
69. I’d rather be given many choices about what is best for my health than to have a doctor make decisions for me ( ) ( ) ( ) ( ) ( )
70. I pay attention to health information pertinent for my age even when I do not have health problems ( ) ( ) ( ) ( ) ( )
71. I pay attention to health information pertinent for my race even when I do not have health problems ( ) ( ) ( ) ( ) ( )
72. I pay attention to health information pertinent for gender even when I do not have health problems ( ) ( ) ( ) ( ) ( )
73. I frequently look up fitness/lifestyle/diet information from different sources ( ) ( ) ( ) ( ) ( )
74. I usually wait for the doctor/nurse to tell me the results of a medical exam than asking them immediately ( ) ( ) ( ) ( ) ( )
75. Except for serious illness or in an emergency, I self-treat my ailments. ( ) ( ) ( ) ( ) ( )
76. I rely on experts (doctors) rather than relying on “common sense” in treating myself ( ) ( ) ( ) ( ) ( )
77. I go to clinics and hospitals because they are good places to go for medical treatment. ( ) ( ) ( ) ( ) ( )
78. I have been learning how to treat some of my health problems without contacting a doctor. ( ) ( ) ( ) ( ) ( )
79. I go to doctors to seek professional help than to try to treat ( ) ( ) ( ) ( ) ( )
myself.

80. I rarely self-medicate or treat my illness myself ( ) ( ) ( ) ( ) ( )

81. If it costs the same, I’d have a doctor or nurse treat me than do the treatments myself ( ) ( ) ( ) ( ) ( )

82. I treat myself more often than relying on experts to treat me. ( ) ( ) ( ) ( ) ( )

Please check mark your answer to the following statements: (Please indicate SA=Strongly Agree; A= Agree; DK= Don’t know/Can’t say; D=Disagree; SD=Strongly disagree)

83. I become overwhelmed with information concerning my health. ( ) ( ) ( ) ( ) ( )

84. I get concerned about protection of privacy of my health-related information. ( ) ( ) ( ) ( ) ( )

85. I get concerned about credibility of online information sources. ( ) ( ) ( ) ( ) ( )

86. Online health information is too complex to understand. ( ) ( ) ( ) ( ) ( )

87. Self-treatment might lead to a life-threatening situation. ( ) ( ) ( ) ( ) ( )

88. I am concerned that some information online is biased because it caters to vested interest of drug companies and other health-related organizations. ( ) ( ) ( ) ( ) ( )

89. Understanding information was difficult with the large volume of information. ( ) ( ) ( ) ( ) ( )

90. I am concerned about how online health information fits with my specific health context. ( ) ( ) ( ) ( ) ( )

91. I am concerned about how online health information fits with the specific health context of my family and friends. ( ) ( ) ( ) ( ) ( )

92. Difficulty of treatment is an important factor I look at while seeking online health information. ( ) ( ) ( ) ( ) ( )

93. I am satisfied with use of Internet as an information tool for health information. ( ) ( ) ( ) ( ) ( )

94. I am satisfied with use of Internet as a learning tool for health information. ( ) ( ) ( ) ( ) ( )

95. I am satisfied with use of Internet as a networking tool for health information. ( ) ( ) ( ) ( ) ( )

Please check mark your answer to the following statements: (Please indicate SA=Strongly Agree; A= Agree; DK= Don’t know/Can’t say; D=Disagree; SD=Strongly disagree)

96. I almost always check the author of the health website I visit. ( ) ( ) ( ) ( ) ( )

97. I only visit websites belonging to reputed health organizations. ( ) ( ) ( ) ( ) ( )

98. I do not care what credibility of the source is as long as the information makes common sense. ( ) ( ) ( ) ( ) ( )

99. I only visit websites recommended by my doctor/healthcare provider. ( ) ( ) ( ) ( ) ( )

100. I recommend websites I find reliable to family and friends. ( ) ( ) ( ) ( ) ( )
101. I visit websites recommended by my family and friends. ( ) ( ) ( ) ( ) ( )
102. If the website is sponsored by an organization or an institution, I check the credentials of the same. ( ) ( ) ( ) ( ) ( )
103. I frequently check how a website is rated among online health communities. ( ) ( ) ( ) ( ) ( )
104. I almost always check the ‘About us’ section of the health website I visit. ( ) ( ) ( ) ( ) ( )
105. I rarely check websites sponsored by health organizations because of their biased interest. ( ) ( ) ( ) ( ) ( )
106. I believe it is important to know where my health information is coming from. ( ) ( ) ( ) ( ) ( )
107. The information on websites I frequently visit is credible. ( ) ( ) ( ) ( ) ( )

SECTION 2:
Please check mark your answer:

108. Do you currently have health insurance? ( ) ( )
109. Do you suffer from a chronic disease or disability? ( ) ( )
110. Do you have a loved one or a family member who suffers from a chronic disease or disability? ( ) ( )
111. Do you have or have you had a nagging health concern? (Ex. A persistent backache, pain that comes and goes, etc.) ( ) ( )

112. Where do you most frequently access the Internet?

☐ Home
☐ Work/School
☐ Other (Specify):

113. Are you? ( ) male ( ) female

114. Enter the last two digits of your birth year ______________

115. What is your education level? (Check one)

☐ Less than 9th grade
☐ 9th to 12th grade, no diploma
☐ High school graduate (includes equivalency)
☐ Some college, no degree
☐ Associate degree
☐ Bachelor’s degree
☐ Graduate or professional degree
☐ Other

116. What is your total household income? (Check one)

☐ Less than $10,000
☐ $10,000 to $24,999
☐ $25,000 to $49,999
☐ $50,000 to $74,999
☐ $75,000 to $99,999
☐ Over $100,000

117: What is your ethnicity?
☐ African/African American
☐ American Indian/Alaska Native
☐ Asian/Asian American
☐ Hispanic
☐ Native Hawaiian/Pacific Islander
☐ White/Caucasian
☐ Other
Hello! My name is Rucha Kavathe and I am doctoral student at Bowling Green State University. If you are between the ages of 18-64, you are asked to participate in this study that examines the health information gathering habits of people. The findings from this study will help researchers to better understand the utility of online health information and serve the Internet population better by designing websites that cater to users.

Your participation in this study is completely anonymous and no identifying information (names, SSN numbers, addresses, locations, phone numbers etc) is collected from you at any point. Some questions may seem personal but the anticipated risks to you are no greater than those you encounter through your normal web-surfing practices. Your participation is completely voluntary, and you may choose to not continue at any time.

It should take you approximately 30 minutes to answer the questionnaire. If you wish to continue, please begin answering the questions. By submitting the completed questionnaire you are agreeing to take part in the study and are stating that you are above 18 years old. Please take normal precautions of protecting your confidentiality (clearing browser’s cache and page history) if you are completing this survey from a non-domestic computer. If you have questions or concerns, please feel free to contact me at the address listed below.

Thank you for your time and consideration,

Sincerely,

Rucha Kavathe

Contact Information:
Rucha Kavathe
302 West Hall
Bowling Green, OH 43403
ruchak@bgsu.edu

You can also contact my advisor Dr. Srinivas Melkote or the Chair of the Human Subjects Review Board at Bowling Green State University.

<table>
<thead>
<tr>
<th>Dr. Srinivas Melkote</th>
<th>The Chair</th>
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<tbody>
<tr>
<td>School of Communication Studies</td>
<td>Human Subjects Review Board</td>
</tr>
<tr>
<td>316 West Hall</td>
<td>Bowling Green State University</td>
</tr>
<tr>
<td>Bowling Green OH 43403</td>
<td>Bowling Green, OH 43403</td>
</tr>
<tr>
<td><a href="mailto:melkote@bgsu.edu">melkote@bgsu.edu</a>; 419.372.9324</td>
<td><a href="mailto:hsrb@bgsu.edu">hsrb@bgsu.edu</a>; 419.372.7716</td>
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