Original Article

A qualitative study of health information-seeking behavior on the Internet among information technology professionals

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Abstract:

BACKGROUND: The motivation to seek health information on the Internet for individuals has been varied. The purpose of this paper was to explore the perspectives and experiences about online health information seeking in information technology (IT) professionals.

MATERIALS AND METHODS: A qualitative case study research design was employed to examine the behavior of 15 IT professionals from a state organization in the East Coast of the United States of America. Convenience sampling was used to identify the setting, and purposeful sampling was used to select the participants. A survey questionnaire was used as a recruitment tool, and in-depth individual interviews with standardized semi-structured questions were used to collect data.

RESULTS: Findings illustrated that the Internet was the first source of reference for wellness and prevention information to maintain a healthy lifestyle, and to alleviate and prevent work-related musculoskeletal disorders (WMSDs). The themes that emerged from the study were that the IT professionals searched the Internet for information to self-educate about medical conditions, to maintain fitness, communicate with health-care professionals, decide their treatment options, and to make lifestyle modifications such as ergonomic adjustment of their workstation, postural adjustments, and changing negative health behaviors.

CONCLUSION: The results of this study provide practical implications for organizations and health professionals in providing health education to prevent WMSDs as participants sought health information online to take actions and collaborate with their health-care professionals and actively contributed to their medical health decisions. This underscores a valuable opportunity for health-care providers and public health officials to become more proactive by providing their patients with quality health information outside their office through the Internet by referring them to credible website sources.

Keywords:
Health information-seeking behavior, information technology, internet, work-related musculoskeletal disorders

Introduction

Individuals seek health information on the Internet for health education and health promotion activities.[1,2] As per January 15, 2013, Health Online – Pew Internet and American Life Study, about 35% of the U. S. adults have accessed the Internet to seek health information, with one in three American adults seeking information about a medical condition.[3] Historically, the motivation for seeking health information on the Internet may be in response to a health event[4] and has been understudied among computer users related to work-related musculoskeletal disorders (WMSDs). Computer users are at an increased risk of neck and upper extremity MSDs.[5-7]

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Awkward postures and repetitive motions contribute to WMSDs that are a leading cause of occupational absenteeism and lost productivity in the workplace worldwide.[8]

Health information-seeking behavior on the Internet

Research indicates that the Internet is an added venue to search for health-care-related information with about 72% adults starting their inquiry at a search engine such as Google, Yahoo, or Bing.[3] About 13% adults searched at a medical site like WebMD, about 2% adults searched Wikipedia, and 1% adults at a social network like Facebook. WebMD, Mayo Clinic, National Institutes of Health, and Centers for Disease Control and Prevention (CDC) are popular health websites.[3] Many studies have assessed the health information-seeking behavior in a variety of health scenarios, ranging from HIV-positive women to different demographics such as socioeconomic status to older adults' behavior and adults' educational status.[2,4,9,10] Furthermore, a key finding was that there was a strong association between digital literacy and health status regardless of educational status.[11] Similarly, in their study analyzing older adult's Internet using behavior for health information, Chang and Im found that prior experience of using computers and the Internet led to perceived ease of use.[9]

This definitely suggests that computer professionals who are working in the information technology (IT) sector and possessing the skills and access will certainly benefit with online use and application for prevention of WMSD. Given the Internet's ability to reach beyond the clinical settings, it has the capacity of larger dissemination of knowledge. Internet-mediated wellness and prevention programs have been reported to be effective, with participant adherence and minimal attrition.[1,12,13]

The motivation to seek health information on the Internet include a health event, a diagnosis or when individuals are deciding to change their diet or exercise habits or to promote wellness.[2,13] It has been found that an individual's behavior in seeking health information on the Internet is related to their demand for health care.[14] Most of the literature on health information-seeking behavior has examined this behavior in certain illnesses such as cancer, cardiovascular diseases, diabetes or in general population, and not specifically in people with WMSDs.[9,15] Thus, there remains an opportunity to study health information-seeking behavior of IT professionals on the Internet and has implications for integrating online health education and ergonomic awareness to enhance employee health and prevent WMSDs as self-directed learning and education using the Internet lead to improved health outcomes.[16,17]

Knowles describes the basic assumption for self-directed learning to include a problem-centered approach requiring internal motivation and utilizing individual experiences as resources for learning with self-directedness being an essential part of adult learners and that it is a highly deliberate effort to gain certain knowledge or skill.[18] Readiness to learn is dependent on immediacy of application. Papen found that when adults seek health-care information on the Internet, they focus on specific tasks in response to particular needs; learning is through practice and often by trial and error and is fully embedded in the process of dealing with a health issue.[19] Exploring the perspectives and experiences about online health information seeking of IT professionals will aid in garnering a greater understanding of the feasibility of the Internet to deliver intervention to prevent WMSDs.[16] Since WMSDs are a leading cause of occupational morbidity, and lost productivity in the workplace, organizations would benefit from such preventive measures to reduce the incidence of WMSD.

Materials and Methods

Ethical consideration

The study was approved by the researcher's institute review board. The approval code number was ID: HM20009856. The purpose and procedures of this study were explained to all the participants and informed consent was obtained before data were collected.

Study design and setting

A qualitative case study was used to study this phenomenon. This approach is apt to explore the research questions as they call for a rich and descriptive data.

Study participants and sampling

The participants in this study are the IT professionals from a public organization in the East Coast of the United States. Fifteen IT professionals participated in this study. The participants ranged in age from 30 to 60 years. Eight participants were males and seven participants were females. Most of them worked using computers for more than 40 h a week while some worked between 30 and 40 h on the computer. All of them used the Internet to search for health-related information.

A survey questionnaire was used as a recruitment tool to purposefully identify participants for the study. Purposeful sampling is defined as selecting participants who are best suited to answer the research questions.[20] Since qualitative research focuses on recruiting participants who have the most knowledge and the most experience with the phenomenon being studied, to begin purposeful sampling, the researcher has to determine the selection criteria that directly reflect the

purpose of the study and also guide in the identification of information-rich cases.[20] Thus, the survey questionnaire collected demographic information such as age, gender, average number of hours they work on the computer in a week, number of years as a computer professional, presence of chronic illness related to muscle or joints, and history of pain related to any fall, slips, or accident. The usage of the Internet for seeking health information was also assessed. The framework adopted in this study for selection of participants requires some variance for organizing relationships among them, and is based on previous studies on health information-seeking behavior on the Internet of general population. The participants were IT professionals who have used the Internet to find health information. It was emphasized that participation in the survey and the study was voluntary and was explicitly for research purposes and had no bearing toward their organization in any way.

Data collection tool and technique

In-depth individual interview with standardized semi-structured questions was used to collect data from 15 participants. Some of the interview questions were as follows, "How often do you use the Internet to find health information?" "What motivates you to search for health information online and what wouldn't you search online?" Prompt: Symptoms such as pain, a diagnosis, doctor's visit, any new medications, conversation with colleagues/friends/family, "Have you used videos sites such as YouTube or read or commented on Blogs? Can you describe your experience? Was the information helpful? Did it help answering your problems and did you act on it?" and "Besides the Internet, where do you get health information?" A pilot test was carried out with two participants, and the questionnaire was modified based on the pilot test. Once the interviews were completed, they were transcribed and imported into Atlas.ti qualitative data analysis software, where the data were coded based on common patterns, themes, and categories.[20,21] The themes were organized based on the hierarchy of the codes and the relationships between the codes.

Research questions

1. What are the sources of health information that the IT professionals have experienced?
2. What health information do IT professionals seek from the Internet?
3. How has health information seeking on the Internet affected health care and behavior change?
4. What barriers do IT professionals experience when seeking online health information?

Results

Fifteen IT professionals participated in this qualitative study exploring health information-seeking behavior on the Internet. Several themes emerged from this study and the prominent finding that emerged was that the IT professionals were self-directed in their health care and sought out various resources of health information for both wellness and illness management, and perceived their health information seeking on the Internet as positively affecting their health care. Following are the findings of the research questions.

R.Q.1 – What are the sources of health information that the computer professionals have experienced?

Three sources emerged from the analysis: the Internet and other media, individuals, and workplace initiatives. The participants used multiple sources, and complemented or supplemented the information obtained from one source with other sources. Table 1 displays the main sources and the related quotes.

R.Q. 2 – What health information do computer professionals seek from the Internet?

The themes that emerged from the interview data regarding the type of health information that the IT professionals sought from the Internet are as follows: wellness and prevention information, information to self-educate about medical conditions, and information to decide their treatment options. All the participants recognized the importance of maintaining their health and considered the Internet a reliable source for disease prevention and health promotion. As part of the wellness and prevention information, the main categories that emerged were fitness, prevention of MSDs, and information to maintain a healthy lifestyle. Techniques and strategies to adjust their workstation based on ergonomics to prevent MSDs were one of the types of information that the participants sought from the Internet. The participants also needed information to make sense of their symptoms, understand the medical conditions, understand the likely treatment solutions and their effects and outcomes, learn how to prevent further illness, and improve their understanding of the condition so that they can better communicate with their health-care professionals. Participants sought information from the Internet to help them make decision about their treatment option, and to decide whether they should seek treatment from their health-care professional in the first place. Table 2 displays the themes with the relevant quotes.

R.Q. 3 – How has health information seeking on the Internet affected health care and behavior change?

Five themes emerged from the analysis of the interview transcripts of the participants. They were as follows: being proactive in fitness, modifying contextual factors, making lifestyle modifications, being more confident

Table 1: Sources of health information

Sources	Key quotes
Internet and other media	
Hospital websites, Mayo Clinic	"The knowledge is at your fingertips. I can't even imagine as a matter of fact, what we would do without the Internet"
WebMD	"I did my first level search on the internet, and that's what I feel like I do for almost everything"
YouTube	"Watching someone else do (on YouTube) the same exercises was useful"
Government health websites	"If it's an organization like the CDC, I will trust them"
Wikipedia	"There is some wellness stuff there, there is a program where if they track your biometric numbers that you can cut dollars"
Insurance company website	"If I hear about something on TV or radio, I say let me go look that"
Reference websites	
Blogs	
Individuals	
Health-care providers	"I have a general practitioner; they are usually my go to, when I have a real deep question"
Doctors	"He (Chiropractor) gave me a sheet of things neck exercises that would help strengthen because of the way my neck was out of position"
Chiropractors	
Physical therapists	"I will ask our parents, since we know that they have raised children, and probably saw a lot of the similar things we did"
Massage therapists	
Family	"My friends that are doctors in medical field, I get free advice from them"
Friends	"A lot of it (information) was talking to people who suffer from carpal tunnel syndrome"
Colleagues	"Well my boss and I talk a lot and so talking about stretching and different things with neck and so yeah, between her and I, so she is my supervisor, so she's very understanding and that's why she says, okay we need to get a different chair"
Workplace initiatives	"They have wellness program from the DHRM, down in the conference room, they have someone coming in to talk to you"

DHRM=Department of Human Resource Management, CDC=Centers for Disease Control and Prevention

Table 2: Types of health information sought on the internet

Themes	Key quotes
Wellness and prevention information	
Fitness	"I look up on YouTube for various exercises. Like with kettle bells, I try to learn techniques on how to exercise with them, so that I don't hurt myself, so I use them in the right way"
Prevention of musculoskeletal disorders	"If I feel pain after running, and it's not going away with regular stretches, so I just want to make sure what other kinds of stretches are there"
Information to maintain a healthy lifestyle	"If I could set up my desk a little bit better, what's the proper way? I have done some research on that and I have found some things that I should do. They have these little foot things for your feet, so I found some options"
	"I have done research on the pros and cons of having a standing desk"
	"A lot more of examples of eating healthy habits, and organic products are there"
Information to self-educate about medical conditions	
Symptoms	"So now I wanted to go out there (Internet) and find out, what if your heart rate keeps changing?"
Medical conditions	"If I am hurting I will try to Google my symptoms, and then if I go to my chiropractor, so this is saying that this and I will kind of talk to him about it"
Communication with health-care provider	"I have Hashimoto for my thyroid. So I go out there (Internet) and learn more about thyroid"
	"One of our sons' had tubes, so we did lot of research when he had that pain, we weren't really familiar with it and they recommended the tube. We did a lot of research just to see how dangerous the surgery was"
	"Any type of medicine the doctor gives me, I am going out there (Internet), I am always looking up what the medicine does, for the side-effects"
	"Sometimes when I have to go to the doctor, I look up before I have the appointment, if I have the questions to ask, or sometimes following the appointments"
	"Because, I am like, what do you (doctor) think about this, what is your opinion?"
Information to decide treatment options	"So I recently went out there (Internet) and looked up, before I went to the doctor, I wanted to know, and should I even go to the doctor? So it helps to make a decision"
	"I had a muscle pull; I went to Google and searched about what kind of things we have to do. I didn't go to the doctor; I felt that it needs to make sense when I am going to the doctor, if I have to go"

in their treatment decisions, and better management of health conditions. The Internet provided an effective channel for health promotion and disease prevention activities by encouraging the participants to be more proactive. The contextual factors that the IT professionals modified in their environment, related to ergonomic adjustment strategies and posture correction, to treat and prevent MSDs that most of them suffered due to their occupation. Participants informed that they were able to make informed ergonomic adjustments and alterations either to their seating arrangements or their workstation. Preventing diseases by making lifestyle modifications such as practicing good nutrition and diet management and overcoming negative habits were cited as an important outcome of seeking health information from the Internet.

Many participants identified that the self-directed learning that they employed in searching health information, gave them more confidence in deciding their options. Sometimes, the participants reported that they self-diagnosed their condition, but most of the times, whatever information they found needed to be confirmed by their health-care professional. Participants reported that the main aim in learning was gaining maximum knowledge about their specific conditions, and set of treatments which, in turn, improved their ability to discuss with their health-care professionals and also aided in having a feeling of control over their health. Their outcomes also included getting more information or double-checking or clarifying the information provided by the health-care professionals, and thus better manages their condition. Table 3 displays the themes and the key quotes.

R.Q.4 – What barriers do computer professionals experience when seeking online health information?

The factors that emerged as barriers to seeking health information on the Internet are as follows: issues of trust, volume of information, and distractions. It was evident that they viewed the Internet information with caution and trusted government or known medical websites, but reported at times being overwhelmed with the volume of the information. Most of the participants were looking for relevant, succinct information, and found the overload of information a detriment in keeping them engaged. Table 4 displays the themes and the relevant quotes.

Discussion

Much of the information seeking in this study was informal, self-directed, and self-managed.[19] Knowles stated that self-directed learning was the ability to learn on one's own based on their immediate need.[18] This was clearly demonstrated by each of the participants in

this study. All the participants used multiple sources of information to inform their health-care choices and decisions, ranging from information from the Internet, other media, their workplace, or discussion with other individuals. The predominant source of information was the Internet, where the participants sought wellness and prevention information as well as information related to specific medical conditions and treatment options. The participants were able to overcome the barriers of trust, volume of information, and distractions by making good decisions based on their experience.[18] It is interesting to note that all the participants valued the health information provided by the Internet, even after interaction with their health-care providers. The participants of this study had a definite goal that they needed to fulfill learning more about prevention strategies for MSDs, any specific health conditions, or an aim to lead a better lifestyle. Several studies documented that change in the health status was the triggering event for a learning episode in older adults.[4,11,15] However, in this study, the findings revealed that along with a specific health event, learning was also triggered by the motivation to prevent illness and to maintain a healthy lifestyle.

Most of the information related to the participant's working environment was gleaned through their interaction in their workplace, including their colleagues and information sessions provided by their organization. Information related to prevention of MSDs was discussed among their colleagues, as many of them suffered from WMSDs. For example, two of the participants often discussed possible solutions for their MSD.

Contrary to previous research, only a few of the participants in this study referred to other media such as television, radio, print advertisement, brochures, and magazines for their health information.[1,15] Most of the participants used multiple sources for their health information, with the most prominent being the Internet. This may be because they are computer professionals who have constant access to the Internet. The information from each source, however, was either complemented or supplemented or verified by other sources.[1]

Most of the participants mentioned using the Internet for behavior modification in terms of lifestyle and maintain their fitness. As previous research had suggested, the study participants searched the Internet for health information on fitness regimes, diet, exercises, alternative treatments, and specific diseases and treatments.[3,4,10] The participants reported searching for preventive care and healthy lifestyle choices including diet, nutrition, vitamin supplements, and organic food, consistent with previous research.[13] Participants in this study searched for health information based

Table 3: Outcome of health information seeking on the internet

Themes	Key quotes
Being proactive in fitness	"It's definitely helped. There were times when I have gone on there (Internet) and looked for exercises, and I was able to see how they do them. And so I was able to either correct the way that I was doing it or add something new to the way that I was doing"
Modifying contextual factors	
Ergonomic adjustment	"For 30 years plus, I have been doing the same sort of thing, where I have been at a desk, in front of a computer for a long time like the stand-up desk that I found after researching on the Internet"
Postural adjustments	"I used the internet to try to determine, do the symptoms that I have match the symptoms of carpal tunnel. I found that I could attribute to the chair getting lower, so instead of resting my arms horizontal on the desk, it was resting at an angle, so I corrected that"
Making lifestyle modifications	"I smoked for a couple of years and after reading the ingredients in cigarettes and getting more information online and seen pictures of cancerous lungs, so it was enough to scare me into not smoking anymore. Yeah, there have definitely been some drastic effects, I guess, to a point where I was, I am not gonna smoke anymore once I actually did some research on it. That was enough for me to walk away"
Being more confident in their treatment options	"I go there on the internet and then I go to the doctor, because doctors are humans too and they might forget something. Maybe unaware of some new treatment or they may be able to dispel something that I see, where this expert may say it's great, this expert may say- no that treatment is awful I can at least educate myself to have that discussion"
	"A lot of times I will read certain things and it will impact whether I make an appointment with the doctor, or it will make me more aware of what I should do"
	"I definitely changed my routine and sometimes I might decide not to go to a doctor based on what I read online"
Better management of health conditions	"The first thing I do is to go out there (Internet) and find out what it is because a lot of times doctors don't tell you anything. They will give you something and they don't tell you why they are giving it to you"
	"I will go to a site, if I see something that doesn't look correct; I will go to other sites that get those same hits that I trust, to see if perhaps I am wrong or perhaps the site is wrong. And I will look to see what type of consensus there is and I will look for three or four opinions from trusted sites"
	"I check the internet even though I went to the doctor." "I want their (healthcare professionals) feedback, but I did my first level search on the Internet"

Table 4: Barriers in seeking health information online

Themes	Key quotes
Issues of trust	"I feel the hardest part of it is figuring out whom to trust, that's why I look at the Mayo Clinic or the NIH or other medical professional institutions"
	"The internet is a great resource with just being cautious of understanding that not everything out there is completely accurate"
	"We have to look at the source where it's coming from"
Volume of information	"If I have to sit there and read a huge two page document or something, I am not going to. I need quick, to the point the best ones because that's what gets you drawn"
	"Sometimes, you try to get something, and then it shows 1000 pages, and you go first page, second page, and third page and still you don't find it!"
	"Mostly I want a paragraph, not like the page or two pages, if it's where I have keep scrolling down and reading this huge article, and then trying to find what I need just out of that, I am just gonna abandon it"
Distractions	"It's a little annoying because you got to sit there and wait for the ad and all that"

NIH=National Institutes of Health

on their symptoms and medical conditions. Their search was also before and after consultation with their health-care professional. This indicates that these participants were very much self-motivated and wanted more say and control of their personal health and wellness. Findings that relate to the outcome of health information seeking on the Internet are consistent with previous research.[13,14,22-24] The resultant information has led to knowledge change, attitude change, and behavior change and maintenance for the participants of this study.[25] Many of the participants have remained proactive in maintaining their fitness and exercise regimes. One of the participants had made a life-changing behavior change and credits the Internet to help to stop smoking indicating that health literacy and awareness are important for changing behaviors.[26]

Participants were also more confident in the available treatment options. Similar to previous research, some of the participants in this study self-diagnosed their symptoms while some deliberated their options whether to consult their health-care provider.[3] A major theme that came out of this study was that the study specifically found that participants were able to make modifications in their contextual factors. Many of the participants suffered from WMSD, which propelled them to search for feasible modification of their workstation. Many participants made changes based on ergonomics to

their desk, chair, or computer monitors, based on the information that they obtained from various sources on the Internet. Participants used these modifying options both to treat and prevent MSD. This was specifically mentioned by the participants who were aware that they went into awkward postures while working on the computer. Participants who were not of average height, found modifications and solutions to alter or modify their workstations on the Internet. The findings emphasized the way the participants were able to make informed ergonomic adjustments and alterations either to their seating arrangements or their workstation based on their search on the Internet. As one of the participants was short in stature, she faced particular difficulty in adjusting her workstation to her body in spite of all possible solutions known to her and getting treatment from her chiropractor. Researching on the Internet helped her inform about better options to ergonomically adjust her computer monitor. Another advantage of this study is the qualitative design that helped in getting a deeper understanding of the participant's perspectives about applications of health information from the Internet.

Findings from this study echoed those themes that have been predominant in literature on online health information seeking.[3,16,22] All of the participants were cautious in their use of the Internet for health information, and used reputed websites such as CDC and Mayo Clinic as credible sources. With the increasing availability of health information online, it is important to be able to access trustworthy and reliable information and the information may need to be verified by health-care professionals.[2,16,23]

The findings of this study point to an opportunity for health-care providers, public health officials, and adult educators/health educators to become more proactive by providing quality health information outside their office through the Internet by referring them to credible websites.[2,27] Participants have changed their negative habits such as ceasing smoking and incorporated healthy lifestyle changes of diet, nutrition, and exercises. Using the Internet to promote positive attitude may predict a specific positive behavior. Based on the findings of this study, the content needs to be engaging and short, so that the learners are kept engaged. The study results present important implications for the future development of more effective prevention programs that will empower computer users to maintain their health and be proactive in preventing MSD. Findings from this study point to a need for reliable and credible health information that the employees can trust.

This study has several limitations. The sample of 15 participants may not represent the entire population of IT professionals and the nature of the context and

its participants may limit the generalizability of the findings. Based on the results of this study, a survey study is recommended to analyze the positive effects of searching online health information with a larger sample and varying demographics. The perceptions of health-care professionals who are one of the sources of health information should be explored to gather additional information about the impact of health information-seeking behavior online. Replication of this study in other geographic areas would contribute additional information on health information-seeking behavior in IT professionals.

Conclusion

This study provides a deeper insight into the perceptions, experiences, and attitudes of IT professionals and their health information-seeking behavior on the Internet. The IT professionals obtained health information from multiple sources such as the Internet, other people, their workplace, and other media and complemented or supplemented the information obtained from one source with other sources. As the participants were aware about the credibility of information from the Internet, they used it with caution. Individuals utilizing self-directed learning to gather health-care information, from any source, and using it to make informed decisions have the potential to be more in control of their health care. The IT professionals were self-directed in seeking preventive strategies to help alleviate their MSDs. Finding more about their symptoms and medical conditions helped to keep them more informed about their health conditions and treatment options and better interact with their health-care providers. They were also able to make significant lifestyle modifications including their diet, nutrition, and habits based on the information they gained on the Internet. The use of technology and easy availability of health information on the Internet has made the self-directed learners more informed, and better capable of interacting with the health-care system, make modifications to their lifestyle or contextual factors, be proactive, and manage their own health with the impetus to learn being their health condition or a need for prevention and wellness.

Conflict of interest
There are no conflicts of interest.

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