Internet Use among Occupational Therapists in their Clinical Practice

by

Veronica Mun Wah Law

A thesis submitted in conformity with the requirements for the degree of Master of Science

Graduate Department of Rehabilitation Science
University of Toronto

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Abstract

This study investigated the extent to which occupational therapists (OT) use the Internet as a clinical resource and as a tool for communication with clients. It also identified barriers and facilitators associated with Internet use. A survey was mailed to all occupational therapists registered with the College of Occupational Therapists of Ontario. Our findings based on 1382 respondents show that a large percentage of occupational therapists currently use the Internet for clinical purposes. A majority of respondents reported using the Internet to meet their practice needs, primarily for looking up relevant clinical information, and less commonly as a communication tool with their clients. Greater Internet use was associated with younger age and fewer years of practice. Having a computer station, a work culture fostering Internet use, accessible technical support, paid time and credible ratings of websites were five most influential factors on Internet use in OTs’ clinical practice.
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Introduction

With the latest developments in information and communication technology, the Internet has become ubiquitous as increasing numbers of people use it to find information and to communicate (Fox, 2006; Statistics Canada, 2007). The Internet is recognized as a valuable therapeutic resource and provides practicing clinicians with continuing web-based educational opportunities (Bennett et al., 2003; Canadian Association of Occupational Therapists, 2004; Finalyson, 2008; Ishizuki & James Cotter, 2009; McCluskey, 2003). Clinicians’ acquisition and application of relevant scientific knowledge influences the quality of health care they deliver. Internet use may facilitate therapists with reviewing current research in a timely way (Finlayson, 2008; Lupiáñez-Villanueva, Hardey, Torrent, & Ficapal, 2010; McCluskey, 2003).

Professional bodies of occupational therapy, such as the College of Occupational Therapists of Ontario (COTO), the Ontario Society of Occupational Therapists (OSOT), and the Canadian Association of Occupational Therapists (CAOT) all have websites that are used to communicate information. Members of CAOT and COTO are given access to the practice guidelines and databases of major occupational therapy journals to update their knowledge, which is essential for best practice (Finlayson, 2008). Ongoing professional learning opportunities, such as the quality assurance modules and web-based courses, are also accessible from the CAOT website. However, the extent of occupational therapists’ Internet access and use for clinical information remain unknown.

“Registered occupational therapists are encouraged to increase their knowledge and use of technology in their work” (COTO, 2008b, p.23). The Canadian Association of Occupational Therapists (2004) has also acknowledged the Internet’s influence on the delivery occupational
therapy service. Occupational therapy practice focuses on empowering clients in their treatment; knowledge acquisition is a prerequisite to client empowerment as it helps clients make informed decisions and engage in activities to self-manage their chronic conditions. Health pamphlets and information binders are commonly given to clients and their caregivers when they are still in contact with a health care team member, but these information sources are frequently misplaced and cannot be found when the information is needed (Haigh, 2006). A number of researchers have recognized the Internet’s advantage as a therapeutic resource to promote clients’ self-directed learning and self-management of their health conditions by enabling efficient information access (Bright et al., 2005; Lorence & Greenberg, 2006; Rotondi, Sinkule & Spring, 2005; Rizo et al., 2005; Sharry & McKenna, 2001; Webb, Joseph, Yardley, & Michie, 2010; Yan, 2010). Rotondi and his colleagues found that the website about brain injury was used frequently by the female caregivers who used the information to cope with the care demands when the persons with brain injury were discharged home. In the study by Rizo and colleagues, 84% of Internet users expressed interest in using the Internet to learn about their health conditions through patient education materials, and 75% of them consulted with their healthcare professional about non-urgent matters. Based on this study, they proposed that the Internet could be used by health care professionals to provide clients with medical information and health promotion materials to facilitate continuity of care through self-management of their conditions (Rizo et al., 2005). However, like many who advocate using the Internet for patient education (Bright et al., 2005; Sharry & McKenna, 2001; Yan, 2010), Rizo and colleagues (2005) expressed concerns about the lack of quality assurance for information on the Web and the potential for patients to misunderstand the information, or be misguided by inaccurate data, in making health care decisions. In addition, Yan (2010) indicated that 40% of the respondents
were uncertain about the reliability of the health information found on the Web although “over 60% of them found online health information useful” (p.150).

“Health professionals need to be more responsive to the utilization of the Internet to deliver better health care for consumers” (Yan, 2010, p. 152). Owing to the increasing popularity of health and medical information on the Web, a new role is emerging for health care professionals: to help consumers understand the material on medical or health websites that may not be consistently monitored (Bright et al., 2005; Diaz, Sciamann, Evangelou, Stamp, & Ferguson, 2005; Eysenbach & Köhler, 2002; Lorence & Greenberg, 2006; Perocchia et al., 2005; Yan, 2010). As an increasing number of Internet users seek information to understand their health conditions and medical treatment, it is inevitable that occupational therapists also become educators who use the Internet (CAOT, 2004; Sharry & McKenna, 2001). Since occupational therapists often educate their clients about their medical conditions and provide adaptive strategies for their clients’ self-management of chronic conditions (CAOT, 2004), clinicians’ comfort level with information technology is an important first step towards reaping the potential benefits of Internet resources (Bennett et al., 2003; Cashen, Dykes, & Gerber, 2004; Ishizuki & James Cotter, 2009; Lupiáñez-Villanueva et al., 2010; McCluskey, 2003; McCluskey & Cusick, 2002).

Another important function of the Internet is email communication. Besides the Internet’s use as a source of health information, it provides the general public with an efficient communication system. As email use has grown, several professional organizations have adopted it as an alternative means of communication with clients and healthcare members. Similarly, email appears to be a cost-effective way for professional organizations to communicate with members; for example, messages from the College of Occupational
Therapists of Ontario, and the Ontario Society of Occupational Therapists’ newsletters, are now sent electronically.

A number of studies have been conducted that investigate the extent of email use among primary care providers. The findings indicate that a low percentage of physicians communicate with their patients through email. Several studies found that clients were more inclined to email their health care providers about non-urgent matters such as scheduling appointments or seeking laboratory results (Houston, Sands, Nash, & Ford, 2003; Leong, Gingrich, Lewis, Mauger, & George, 2005; Sittig, King, & Hazlehurst, 2001). To date, however, there is no broad research on the extent to which allied health professionals use email to communicate with clients (Ishizuki & James Cotter, 2009).

This study investigates the impact of two uses of the Internet on the clinical work of occupational therapists: 1) the adoption of the Internet for information searches in clinical practice, by looking at the extent to which occupational therapists embrace its use and by identifying the barriers and facilitators that they face therein; and 2) the use of email by rehabilitation professionals – specifically, occupational therapists – to communicate with colleagues and clients. Specific rehabilitation programs that are delivered via the Internet, such as online support group, are not captured by this study.
Literature Review

While there are a variety of Internet activities, such as online support groups (Rotondi, Sinkule & Spring, 2005; Scharer, 2005; Weinert, 2000) and web-based education modules (Perocchia & Rapkin, 2001; Rotondi, Sinkule & Spring, 2005), this literature review focuses on the clinical application of two Internet activities: information searches for clinically relevant information (e.g., community resources, health and medical information) and email use by care providers. These are the most commonly reported Internet activities in population surveys (Statistics Canada, 2007). Also, as consumers’ behaviours play an active role in shaping the service delivery of care providers, the clinical influence of the Internet should be appreciated from the perspectives of both health care consumers and providers. Thus, this literature review includes an overview of client Internet use as it has an influence on the clinical context in which care providers find themselves.

A literature search was conducted using the keywords “Internet”, “Internet use”, “health professionals”, “rehabilitation professional”, “rehabilitation”, “occupational therapists”, “information”, “information-seeking”, “information search”, “email”, email communication”, and “clinical practice”. The following criteria were adopted to guide the literature search:

1. Database searched: Medline and EMBASE
2. Manual search on cited references
3. Articles written in English
4. Articles published from 1998 and onwards
5. Inclusion of theoretical papers, non-randomized and qualitative studies
Since there was a dearth of information from peer reviewed research profiling current Internet use by rehabilitation professionals, the research focusing on the extent of Internet use by other health professionals (e.g., physicians and nurses) was examined in an attempt to infer some insights about Internet use in the practice of occupational therapy.

The Internet: The Source of Health and Medical Information

The extent of use among clients.

In June 2009, an estimated 27% of the world’s population had access to the Internet, with the highest utilization rate found in North America (76.2%) (Miniwatts Marketing Group, 2010). The number of American adults who went online to look for health-related or medical information markedly increased from 117 million to 160 million between 2005 and 2007 (Harris Interactive, 2007). There was a 16% increase in the number of persons who sought information about health topics in 2004 (Harris Interactive, 2007). A similar trend was observed in Fox’s study (2005) that reported 66% of 537 respondents used the Internet to search for information about specific diseases and health and medical topics. Health care was ranked among the most frequently searched topic by users of commercial search engines (Fox, 2005; Lorence & Greenberg, 2006).

In Canada, Internet access is also becoming more common in a typical household. In 2009, an estimated 21.7 million Canadian aged 16 and older (80%) had Internet access and a majority reported having a high-speed connection (Statistics Canada, 2010a). Internet searches for medical and health resources were identified as a growing trend (Statistics Canada, 2010a). Within four years, the percentage of all households using the Internet for health-related or medical searches rose from 58% in 2005 to 70% in 2009 (Statistics Canada, 2010b). The most
searched areas were diagnoses, as well as new research and treatment for specific diseases (Statistics Canada, 2010b). Searching for health information has become one of the most popular activities of people using the Internet (Harris Interactive, 2007; Statistic Canada, 2010b).

**Possible motivators for clients’ use of the Internet as a source of health information.**

What has made the Internet a popular source of health-related and medical information over other sources such as textbooks? First and foremost are speed and accessibility (Cooper et al., 2001; Eysenbach, 2001; Jennett et al., 2004; Rotondi, Sinkule & Spring, 2005; Walker & Whetton, 2002). Hart, Henwood & Wyatt (2004) also speculated that clients were more likely to perform online searches about potentially embarrassing conditions (e.g., menopause and erectile dysfunction) because of Internet anonymity. In addition, there was some evidence to suggest that Internet users not only seek information to increase their understanding of health conditions and medical treatments, but also to investigate ways to promote a healthy lifestyle (Yan, 2010).

**Concerns about clients’ use of Internet health information.**

While more educated clients may seek proper medical care when they are in doubt of their condition (Broom, 2005b; Fox, 2006; Hart et al., 2004), the potential risk for self-diagnosis and even self-treatment exists (Wilson, 1999) when health consumers rely solely on Internet sources. In fact, a client’s ability to use Internet information to manage their health condition is subject to many variables, such as their understanding or interpretation of the information, the quality of information, and the client’s search techniques. Some clinicians felt that Internet information was unreliable and inadequate (Eberhart-Phillips et al., 2000) and that clients were
not able to assess or interpret it accurately (Wilson, 1999). In 2006, Fox reported that only 15% of health information seekers stated that they had checked the source and date of the online data. Further, when researching online health and medical advice, 66% of Internet users had used only a general search engine, while just 27% used health-related websites such as the WebMD website (Fox, 2006). In fact, about 85 million Americans gathered health advice without consistently examining the quality indicators of the online information (Fox, 2006).

In a study by Eysenbach and Köhler (2002) 17 participants, three of whom were nurses and the others general health care consumers, took part in focus group discussions, naturalistic observation sessions, and interviews that examined the way health care consumers and nurses performed Internet searches. During the first phase of the study most participants were aware of the need to assess a website’s credibility by checking the source of the information. However, in the observational sessions, no participants checked the credibility of the websites by reading the “about us” sections or the websites’ disclaimers or disclosure statements. In interviews conducted after the observations of their Internet searches, very few participants remembered the websites where they had obtained information. These findings not only validate the need for more training and guidance for clients in carrying out informed data searches, but clearly signal an emerging role for health care professionals in guiding and aiding their clients’ understanding and assessment of the new information (Bright et al., 2005; Diaz et al., 2005; Eysenbach & Köhler, 2002; Lorence & Greenberg, 2006).

**Impact of clients’ use of Internet health information.**

As previously discussed, the general public is seeking online information with increasing frequency. As consumers become more health conscious, they are using online information to learn how to manage their health (Harris Interactive, 2007). The Internet provides information
that may be conducive to the development of a proactive attitude among clients when they interact with their care providers. In fact, it was estimated that 71% to 90% of physicians had clients who brought Internet information into the consultation (Cullen & Litt, 2000; Eberhart-Phillips et al., 2000; Koller, Grutter, Peltenburg, Fischer, & Steurer, 2001). In another study, 58% of 1010 Internet users indicated that they had shared their search outcomes with their physicians, while 55% reported that they had searched the Internet after their medical consultation (Harris Interactive, 2007). Lupiáñez-Villanueva et al. (2010) reported that over 50% of physicians reported having patients sharing about their Internet search in their clinical visits. In addition, the study reported that 35.2% of physicians considered that going online for health information may improve patients’ quality of life and their sense of autonomy. Overall, 57% felt that Internet information could “improve clients’ knowledge and facilitate their treatment” (p.481).

As searches of health-related topics on the Internet continue to increase, “the Internet is transforming health care” (Yan, 2010, p.152). Increased access to online information has a big impact on clients’ medical and health knowledge acquisition. Increased knowledge may help clients to shape their medical questions and have more sophisticated conversations with their physicians, but it also drives change in the practice of medicine. In Fox’s study (2006), 58% of the health consumers reported that their decisions about how to treat an illness or a condition had been influenced by the information they found in their Internet search and 55% of them said the information had changed how they maintained their health status. Consistent with Fox’s findings, Broom (2005b) found that some patients initiated medical contact and sought physician care after being informed by Internet health information. A more recent study by Yan (2010) also found that Internet health surfers would contact their health care providers for more information or improve their ways of taking care of their health.
A number of studies investigated the impact on clients and care providers after clients started using the Internet as a source of health and medical knowledge. Preliminary findings indicated that the Internet has transformed the relationship of care providers with their clients to the extent that care providers may need to develop skills to handle questions from Internet-informed clients (Broom, 2005a; Gerber & Eiser, 2001; Hart et al., 2004; Titus et al., 1999; Wilson, 1999). Some studies found that physicians felt their authority was challenged positively (Broom, 2005a; Hart et al., 2004), while others felt that their authority was threatened (Broom, 2005a; Hart et al., 2004; Titus et al., 1999). A minority of physicians (about 15%) had negative responses to clients’ Internet information. Some physicians said they would “ignore the information” or “try to explain the role of clinical experience in decision-making” (Cullen & Litt, 2000). As is evident from both the positive and negative responses of care providers to Internet-informed clients, the Web has contributed to the transformation of the relationship between clients and health care providers.

How have physicians been choosing to deal with the Internet information presented by clients? In a study by Eberhart-Phillips and colleagues (2000), 50% of physicians, after seeing an increased use of Internet health information, expressed concerns about inaccurate information and the effects of such on the trust patients placed on doctors. In Wilson’s study (1999), among physicians interacting with clients who had Internet health information, the response was generally positive. Sharing the information was seen to enhance client relationships by facilitating clinical discussion. In Cullen and Litt’s (2000) study, a majority of physicians took the Internet information into account when interacting with patients. They showed positive adaptation to clients’ presentations of Internet information by reading the material and discussing it with their clients during consultation sessions (Eberhart-Phillips et al., 2000). Some physicians reported that they were likely to refer clients to certain Internet resources when the
clients had not correctly interpreted the information they had searched about their medical issues (Wilson, 1999). Eberhart-Phillips and colleagues reported that 55.7% of physicians said they recommended websites to their clients as they realized that their clients and they did not seem to be using the same sources of information.

As health care professionals are no longer the exclusive gatekeepers of health and medical information (Hesse et al., 2005), it is likely to become essential for them to possess the clinical skills needed to handle questions from their more medically aware clients. In fact, few studies have provided findings that indicate physicians had begun to perform Internet searches of health resources for client care (Eberhart-Phillips et. al, 2000; Wilson, 1999). As clients increasingly use Internet health information, care providers need to keep pace with them on the latest medical research and educational health resources available online (Ishizuki & James Cotter, 2009; Yan, 2010). Thus, the impact of the Internet on the delivery of care is far-reaching and poses many questions. Do care providers have the clinical skills necessary to deal with the changing therapeutic relationship between them and their more medically educated clients? What concerns arise when care providers give “website” prescriptions? Do clinicians have the skills and time to engage in Internet searches? Are they using the Internet to better their clinical practice? And if so, are they proficient in searching the Web to be able to learn from enriched online resources?

The extent of Internet use among care providers.

The Internet offers “a new opportunity to overcome problems of access and provide clinically appropriate information to practitioners” (Cullen & Litt, 2000, p. 370) by providing rapid access to the most current health and medical information (Amtmann & Johnson, 1998; Haigh, 2006; Lupiáñez-Villanueva et al., 2010). Research evidence indicated that clinicians
sought information related to their daily practice, such as the need to make diagnoses and
treatment decisions (Amtmann & Johnson, 1998; Cullen & Litt, 2000; Haigh, 2006; Ishizuki
& James Cotter, 2009). As noted previously, health professionals such as physicians have begun
to do Internet searches and to recommend websites to their clients in order to avoid
misunderstandings of Internet information (Eberhart-Phillips et. al, 2000; Wilson, 1999).

In fact, recent research has provided evidence that physicians now search the Internet to
obtain clinical information (Cullen & Litt, 2000; Eberhart-Phillips et al., 2000; Kerse, Arrol,
Lloyd, Yound, & Ward, 2001; Lupiáñez-Villanueva et al., 2010; Young & Ward, 1999). In
Wilson’s study (1999), approximately 70% of all physicians looked to the Internet for health
care information. In Cullen and Litt’s survey study of 363 family physicians, 49% reported
using the Internet to search for clinical information. Most of the searches were for information
related to rare diseases, current updates on common diseases, and educational material for
patients.

The Internet as a source of clinical information.

As Internet use became more common in clinical settings, attempts have been made to
evaluate its popularity as a clinical information resource compared with more traditional
resources (Bennett et al., 2003; Cullen & Litt, 2000; Koller et al., 2001). Cullen and Litt found
that 49% of the physicians used the Internet for clinical information. Only 14% reported finding
useful information on the Internet and the most often used sources were MEDLINE, online
journals, and the Cochrane Library. Koller et al. and Cullen and Litt reported that textbooks,
specialists, and colleagues were the most preferred and used sources of information. Bennett and
her colleagues reported that when occupational therapists made their clinical decisions, they
relied on clinical experiences (96%), information from continuing education (82%) and their
colleagues (80%) instead of accessing the Internet for current research evidence (56%). In a recent study of social workers’ use of Internet, Ishizuki & James Cotter (2009) found that 50% used the Internet to locate clinical resources and 80% of respondents found that Internet information was useful in their clinical practice.

Although preliminary findings suggested that the Internet may not be the most preferred or used source of information, its advantages were recognized by a number of researchers (Bennett et al., 2003; Cullen & Litt, 2000; Koller et al., 2001). Assuming that the work setting is technologically-equipped, the Internet has a potential role in improving work efficiency by presenting relevant information quickly to care providers making clinical decisions (Cullen & Litt, 2000; Haines & Donald, 1998; Koller et. al, 2001; Wyatt, 2001). In a recent study by Lupiáñez-Villanueva et al., (2010), more than 55% of participants reported using the Internet everyday as part of their clinical practice. In their study, physicians reported that “the most used Internet resources were information in academic journals, clinical practice databases and web pages” (p.480). A large proportion of participants (75%) considered the information from the Internet relevant to their practice.

**Factors related to care providers’ Internet use.**

In clinical practice a lack of Internet access and unavailability of information used to be consistently recognized as barriers faced by care providers (Bennett et al., 2003; Cullen, 2000; McCluskey, 2003; Wilson, 1999). Internet access has now become more common in clinical settings. Koller and colleagues (2001) reported an increase in physicians’ access to and use of the Internet from 45% to 75% over a 3-year period. Internet access among physicians was also found to be high: 98.6% of them had home access and 48.6% had work access (Cullen & Litt, 2000). Thus, the technical infrastructure no longer presented a major barrier to Internet use in
clinical practice. In fact, a lack of time and technical skills were the most common barriers identified by clinicians as reasons for not using the Internet (Bennett et al., 2003; Cullen, 2000; Dubouloz, Egan, Vallerand, & von Zweck, 1999; Gerber & Eiser, 2001; Hart et al., 2004; Lupiáñez-Villanueva et al., 2010; McCluskey, 2003; Wilson, 1999).

Looking specifically at the availability of online information and clinicians’ search techniques, McCluskey (2003) found that occupational therapists did not often access online journals even though they had Internet access. Of all the participants in McCluskey’s study, 79% reported a low level of knowledge about electronic databases for occupational therapy research, although over 50% reported having moderate to high level of knowledge and skills in the use of the Internet and the computer (McCluskey, 2003). Bennett et al. (2003) found that 55% of occupational therapists thought they were not proficient in locating research evidence. They also found that 63% of the occupational therapists did not perceive having adequate research evidence in the field of occupational therapy while 45% of them thought they lacked the skills to understand the research (Bennett et al., 2003). Cullen and Litt (2000) found that some physicians were confused by general search engines (e.g., Yahoo) and medical databases (e.g., PUBMED and MEDLINE). They found that many physicians had accessed medical journal abstracts but not the full-text journal articles. Although care providers were encouraged to incorporate high quality scientific evidence in their practice, not all of them were aware of the Cochrane database. According to Young et al.’s (1999) findings, only 22% of their participants who were physicians were aware of the Cochrane Library and only 4% of them had used it. In another study, Haigh (2006) took an active research approach by meeting with clinicians frequently to investigate how the information needs of allied health professionals were met. Haigh’s interview results showed that speed and ease of Internet access were crucial factors as the clinicians “wanted to have fast, easy access to resources” (p. 44). Despite the time saving
aspects of fast online access, Haigh found that the physicians were not aware of websites that provided the best current information, thus highlighting a need for improved search techniques.

Because many clinicians expressed difficulty in performing information searches and accessing online databases for research evidence, Cullen & Litt (2000) and Haigh (2006) identified an urgent need for care providers to learn Internet search techniques so that they could evaluate search outcomes for sound research evidence. To simplify the search process for care providers, some researchers recommended listing websites with high quality information and full-text access to medical journals (Bennett et al., 2003; Haigh, 2006). In particular, reliable portals that are clinically relevant (i.e., a database of medical and health information) should be made available for easy reference (Amtmann & Johnson, 1998; Cullen & Litt, 2000; Haigh, 2006; Wyatt, 2001; Koller at al., 2001). Haigh (2006) further recommended including clinical librarians in health care teams so they could “provide quality-filtered case-specific information directly to health professionals to support clinical decision-making” and “promote a more academic approach to patient management and provide evidence to support practices which improve patient care” (p. 41).

All in all, it is obvious that the swift retrieval of clinical information from Internet resources can facilitate service delivery by enabling quick dissemination of information essential for clinicians’ best practice. As seen in Bennett and colleagues’ study, it took as little as twenty seconds to look up electronic information to answer a clinical question compared with an average of two minutes using traditional sources of information, such as textbooks (Bennett, Casebeer, Kristofco, & Collins, 2005). Clearly, the Internet offers the advantage of timely retrieval of clinical information that is vital for practice. It therefore appears essential that information specialists should tailor their databases to meet the specific needs of medical care
providers in different disciplines (Koller et al., 2001). Databases should be set up to shorten search time and simplify the retrieval process of relevant and current information. These measures would maximize Internet-supported advantages, such as more timely electronic distribution of international health and medical research, compared to using paper journals and textbooks.

**The Internet: The New Communication Route**

**The extent of email use for communication.**

In the last twenty years, the Internet has become a popular route for communication. In Canada, individual Internet users spent an average of 7.4 hours a week, averaging more than one hour a day, online (Sciadas, 2006). Among all users, email has surfaced as the number one Internet activity. Among those who use the Internet regularly, 93% engaged in email communication when going online in 2009 (Statistics Canada, 2010a). Email communication for many people has become an essential daily activity.

**The extent of email communication between clients and their care providers.**

Although statistics suggested that email was a popular communication tool, the studies may not reflect email use in clinical contexts. Thus, researchers examined the extent of email communication between clients and care providers. Sittig and colleagues (2001) first established that clients were familiar with email communication since nearly 85% of participants sent at least one email message a day; however, only 6% of clients sent email messages to their care providers. In another study, Moyer and colleagues found that 70% of participants were willing to use email with their care providers, although only 10.5% of them had done so to communicate with their family physician (Moyer, Stern, Dobias, Cox, & Katz, 2002). Hobbs et
al. (2003) reported that physician responses to client email ranged from not replying to providing detailed information. More recently, the utilization rate of email communication between physicians and clients (23%) was found to be higher (Lupiáñez-Villanueva et al., 2010). However, when comparing the utilization rate of email between physicians and other health professionals, email remained less commonly used between clients and their care providers, when compared to personal use with friends and relatives.

**Possible motivators for clients’ email communication with their care providers.**

Preliminary research (Harris Interactive, 2002; Hobbs et al., 2002; Sittig et al., 2001) attempted to identify the reasons behind consumer interest in email communication with their physicians. A number of studies showed that patients emailed their physicians primarily for prescription refills, non-urgent consultations, and to obtain laboratory test results (Houston et al., 2003; Leong et al., 2005; Sittig et al., 2001).

Other studies provided findings about client satisfaction with email exchanges with care providers. In Sittig and colleagues’ (2001) study, those who received email correspondence from their physicians were significantly more contented; 86% were satisfied that their questions had been answered. In fact, the Harris Interactive (2002) newsletter stated that 90% of adults who use the Internet in the United States would like to use email to communicate with their physicians. In addition, 37% of clients were willing to pay for time spent by their physicians on email communication. Similarly, in Sittig and colleagues’ study, 38% of participants said that they were willing to pay five to ten dollars for each email consultation with their physicians.

To identify future success in the use of email between clients and care providers, knowledge of both parties’ perspectives is essential. From the client perspective, barriers to
email use included not knowing the physician’s email address and the concern that their email was a bother to the physician. These barriers were the two major reasons for low email communication with care providers (Moyer et al., 2002; Sittig et al., 2001).

**The extent of email use among care providers.**

Some studies established evidence for physicians’ use of email in clinical settings. Eberhart-Phillips and his colleagues (2000) reported 81% of physicians used email for work-related purposes. Hobbs et al. (2003) observed that 75% of physicians exchanged emails with their colleagues. Lately, Lupiáñez-Villanueva et al. (2010) found a large proportion of the respondents engaged in email communication with other health professionals and felt email use improved communication with others (90% and 81%, respectively). They also reported that 80% of them felt email communications with other professionals improved their efficiency and productivity at work.

While consumers appear to accept email as an innovative communication tool, past studies have revealed a low level of enthusiasm among care providers. When investigating the satisfaction level of email use among physicians, Houston and colleagues (2003) found that 25% of participants, who were frequent users of email, reported dissatisfaction with doctor-patient email correspondence because of time demand concerns and medico-legal risks, and they did not encourage their colleagues to use email with their patients. In other studies, most participants regarded email as a rapid, inexpensive, simple, and timely communication tool with distinct benefits that could result in a reduction in non-urgent telephone calls to the office and in increased patient participation in medical decision-making; additionally, email communication could provide a convenient link to patient education materials (Sittig et al., 2001; Houston et al., 2003; Leong et al., 2005). Thus, on a positive note, those who were satisfied with email use said
that the most important reasons for their satisfaction were that it "saved time" (33%) and
"helped in the delivery of better care" (28%) instead of just meeting patient requests (Houston et
al., 2003).

Factors related to care providers’ use of email to communicate with clients.

Which factors need to be addressed in order to facilitate care providers’ use of email
with clients? Clinicians’ concern about confidentiality was one reason for the limited use of
emails between clients and care providers (Cooper et al., 2001; Ishizuki & James Cotter, 2009;
Jennette et al., 2004). A few studies reported that while patients and physicians had the same
concerns about email privacy and security, the physicians also worried about medical liability,
the potential for increased workload, reimbursement mechanisms, and inappropriate email use
for acute serious illness (Hobbs et al., 2002; Houston et al., 2003; Leong et al., 2005; Sittig et
al., 2001). In Sittig and colleagues’ study, physicians were “worried that opening such lines of
communication will inundate them with vast quantities of email from their patients” (p. 72). On
the other hand, Leong and colleagues (2005) asked whether physicians’ concerns regarding time
consumption had been overstated, as increased email use may be offset by decreased phone
enquiries. Over time, effort was not made to overcome the perceived barriers to clinicians’ email
use with clients. Lupiáñez-Villanueva et al. (2010) reported that lack of time, concerns about
security and confidentiality, lack of training, slow Internet speed, as well as lack of Internet
access at work were still reported by their participants as main barriers to their Internet use.
These findings signaled the need for new reimbursement systems, technological training and
practice guidelines which may encourage care providers to adopt email use for client
communication (Ishizuki & James Cotter, 2009; Sittig et al., 2001).
As a response to increased email use between consumers and care providers, the American Medical Informatics Association (1998) outlined essential guidelines for email communication. These guidelines addressed the expectation of a timeline for physician email responses and ethical and privacy issues, such as the risk of disclosing a patient’s personal identity should their emails be read by others with access to the computer. Once similar guidelines are adopted in accordance with the privacy and confidentiality legislations in Canada, email will be able to yield the maximum gains to both clients and care providers by making it possible to address non-urgent health care questions within flexible clinical hours.

While there are studies that investigate the extent of email use among primary care providers, the extent of use among rehabilitation professionals is unknown. It may be logically inferred that rehabilitation professionals have the same concerns as primary care providers about confidentiality, privacy, and time reimbursement. For occupational therapists specifically, not using email means not only a failure to take advantage of electronic communication, but also contradicts the professional tenet of client-centred practice, as they would be failing to comply with clients’ preferences to communicate using email. Also, there is some evidence that email exchanges between physicians and patients seems to improve the doctor-patient relationship by enhancing the patient’s satisfaction when their medical concerns are addressed (Sittig et al., 2001). By not using email occupational therapists may miss out on an opportunity to improve their service delivery.
Theoretical Framework

Rogers’ Diffusion of Innovation.

There are many theories of adoption, utilization and innovation that potentially would have been useful to provide a theoretical framework for this study. The Rogers’ Diffusion of Innovation, a well-known, widely used theoretical framework that guides the understanding of the process of adopting an innovation, was chosen as it includes aspects of both innovation and utilization. An innovation could be regarded as a technology, an idea, a product or a service (Rogers, 1995). Diffusion is defined as “the process by which an innovation is adopted and gains acceptance by members of a certain social system or community” (Rogers, 1995, p.5). Thus, Rogers’ Diffusion of Innovation framework serves as a reference for the grouping of the independent variables of the study and the interpretation of the results.

Figure 1 presents Rogers’ model, which illustrates the relationships between the key factors that interact to influence the adoption of an innovation. These are the innovation itself, how information about the innovation is communicated, the time factor, and the nature of the social system into which the innovation is being introduced (Rogers, 1995).

Rogers regards diffusion as “a process that occurs over time” (p.5). This process is characterized by five distinct stages: “knowledge,” “persuasion,” “decision,” “implementation,” and “confirmation”. In the beginning, potential adopters of an innovation must learn about the innovation (the “knowledge” stage). Once the potential adopters become knowledgeable about the innovation, they will need to be convinced of its merits (the “persuasion” stage). Subsequently, they will decide whether or not to adopt the innovation (the “decision” stage). After deciding to adopt the innovation, they begin to use it (the “implementation” stage).
Finally, they will need to rethink their decision and decide if they will continue to adopt the innovation or to reject it (the “confirmation” stage).

Figure 1. Conceptual Model of Diffusion of Innovation (Rogers, 1995).

In applying Rogers’ model to this study, Internet use is identified as the innovation. This study focuses primarily on the Internet as a clinical resource of health and medical information, although respondents were also asked about their experience with other Internet activities (e.g., email with clients).

As shown in Figure 1, some important components of Rogers’ model involve understanding characteristics of the ‘receiver’ variable, which in our study are occupational therapists. This involves examining social characteristics of the occupational therapists, such as the geographical area that the therapists work in. In addition, the model includes social system
variables; in our study, the practice setting. Another important component involves examining the perceived characteristics of the innovation. Rogers postulates that an innovation will experience an increased rate of diffusion if potential adopters perceive that the innovation: 1) has an advantage relative to other innovations (or the status quo); 2) is compatible with existing practices and values of the user group; 3) is not overly complex; 4) can be tried on a limited basis before adoption; and 5) offers observable results. In our study, we focus primarily on the first 3 characteristics.

This thesis drew upon these elements primarily to understand the utilization of Internet among occupational therapists. Therefore using Rogers’ Diffusion of Innovation framework, we examined personal factors of occupational therapists, such as age, gender, residential location, work location and education, with respect to Internet use. Social variables were operationalized in terms of the practice setting, such as presence of ethical and practice guidelines, clinical groups that clinicians work with, and funding sources of service. Third, innovation characteristics, which are necessary for Internet use for information and email (i.e., availability of computers, Internet speed, perceived difficulty with Internet searches, perceived usefulness of Internet information), were studied. The examination of the entire Model of Diffusion of Innovation, however, was beyond the scope of the study. Therefore not all aspects of the model were used. The study focused on the elements describing the “receiver variables”, the “social system variables”, the “perceived characteristics of innovations”, and the process of which the innovation was adopted through time from the “knowledge” phase to the “confirmation” phase (see Figure 1).
Aims of Study

This study investigated the extent to which occupational therapists use the Internet as a clinical resource and as a tool for communication with clients. It also identified barriers and facilitators associated with Internet use. Specifically, the following objectives were studied:

1. To describe the nature of Internet use by occupational therapists in terms of
   a) the type of use: personal use, direct clinical use and other work-related use
   b) the nature of Internet access and Internet speed
   c) the extent to which the Internet is used for sources of clinical information
   d) occupational therapists’ encouragement of Internet use among their clients (frequency distributions were used to measure the therapists’ response as to whether they have ever encouraged clients’ Internet use for information)
   e) the current situation of Internet use within the therapists’ clinical context

2. To describe occupational therapists’ perceived difficulties and usefulness of the Internet for information searches and emails

3. To describe the types of Internet applications (e.g., emails with clients) that occupational therapists regard as useful for their practice

4. To describe factors perceived to influence occupational therapists’ Internet use

5. To assess the personal, social and innovation factors related to higher levels of Internet use by occupational therapists
Methods

Subjects

As of November 2006, all potential respondents were occupational therapists enrolled in the registrant database of the College of Occupational Therapists of Ontario (subsequently referred to as the “College”). The member lists of other occupational therapy organizations (e.g., Canadian Association of Occupational Therapists and Ontario Association of Occupational Therapists) were not used because not all practicing occupational therapists are obligated to register with them. As all practicing occupational therapists are required to register with the College annually and to update any address changes within a three-month period, the College registrant list was regarded as the most current and complete database of potential respondents. To observe the confidentiality of the mailing addresses, the registrants’ work addresses were used as specified by an agreement with the College. The recruitment took place in May 2007.

Inclusion criteria.

Occupational therapists were recruited in the sample if they met the following criteria:

1. engaged in direct contact with clients (i.e., face-to-face interaction) or indirect contact with clients (i.e., treatment provided by telephone consultation or other means not involving face-to-face interaction),

2. worked more than 0 hours a week providing direct and/or indirect contact with clients, and

3. Provided a valid work address to the College of Occupational Therapists of Ontario.
Exclusion criteria.

In the interest of investigating whether or not occupational therapists were using the Internet in their clinical practice, those fulfilling the following criteria were excluded from the sample:

1. those who were retired or not working

2. those who identified themselves as working in areas that did not involve in direct or indirect client contact (e.g., “academic faculty” and “research”).

Procedures

In May 2007, packages were mailed by post to the registered work addresses of all potential respondents. The mailing package (see Appendix A) included a postcard, a covering letter, a survey, a ballot-draw form, and a stamped envelope addressed to the researchers. The postcard provided a brief introduction to the study and captured the attention of the potential respondents before they read the covering letter. The purpose of the study, a confidentiality statement about the completed survey, instructions on how to complete it, and contact information for the researchers were outlined in the covering letter. As well, there was a slogan on the ballot-draw form that reminded potential respondents to return the survey as soon as possible and encouraged them to invite their colleagues to participate in the study.

Potential respondents were not offered any formal reward for completing the survey, but they were given the chance to enter a ballot draw for an MP3 player or one of three $25 gift certificates from a local bookstore. To further encourage participation, the survey was brief: it was designed to be completed within a ten-minute time frame.
Respondents’ informed consent was indicated by their voluntary submission of the completed surveys. A stamped envelope was provided for the respondents to return the survey. There was no fixed deadline for submission of the surveys, but potential respondents were encouraged to return them as soon as possible or before June 30, 2007. An official deadline was intentionally not set, so that potential respondents would not be discouraged from submitting their surveys even if they were late.

The mailing list from the College was protected from external access in a locked cabinet and stored in a password-protected computer. Because the survey was completed anonymously, the researchers were blinded to the identity of the respondents. A separate ballot-draw form, which collected basic personal information (i.e., respondents’ name and contact number), was provided if persons volunteered to enter their names in the draw. The personal identities of those who completed surveys cannot be traced. The received surveys were securely placed in a locked cabinet and data were stored in a password-protected computer.

This research was approved by the Ethics Review Board of the University of Toronto.

Measure

The construction of the study survey.

As there had been no prior attempts to study the extent of Internet use among occupational therapists, questions were adapted from questionnaires that had been used to examine Internet use of physicians, nurses, and consumers (Fox, 2005; Fox & Fallow, 2003; Gagnon, Cloutier, & Fortin, 2004; Wilson, 1999). The modified survey questions were based on the summarized findings of the reviewed literature (Broom, 2005a; Cooper et al., 2001; Gerber & Eiser, 2001; Hart et al., 2004; Scott, Jennett, Hebert, & Rush, 2004). The construction of the
Content validity.

All questions were reviewed by three expert researchers to ensure content validity and relevance. The expert researchers had a wide range of clinical backgrounds as well as substantial experience with survey methods. One of them researched on Internet use in health care practice and studied the efficacy of web sites for clients’ and care-givers’ education. The other two had research foci on technology and health. The survey was tested with five occupational therapists that had no knowledge of the research objectives. Their feedback was used to improve the wording and to clarify the relationship between the survey questions and research objectives. The time needed to complete the survey was estimated through this test. The occupational therapists were known to one of the researchers and had been selected based on the inclusion and exclusion criteria. They were instructed not to disclose the details of the study to other occupational therapists.

Independent variables.

Personal variables.

In applying Rogers’ Theory of Diffusion of Innovation (Rogers, 1995) as a conceptual framework for this study, we hypothesized that the tendency to use the Internet may be influenced by personal demographic factors, such as age and education level. In addition, the respondents’ residential and work locations may cast an influence on the therapists’ Internet use exposure to technology is related to these environmental factors. The following variables were categorized as characteristics that may predispose occupational therapists, or Rogers’
“receivers”, to use the Internet in their clinical practice. These variables were also used to describe the study population.

**Age:** Age was reported as a continuous variable.

**Gender:** Gender was coded as a dichotomous (male or female) categorical variable.

**Highest Level of Education:** The respondents were asked to select from the following options: diploma in physiotherapy and occupational therapy, bachelor’s degree in occupational therapy, master’s degree in occupational therapy, other master’s degree, and doctoral degree.

**Rurality of Home Location:** Respondents were asked to provide the first three digits of their residential postal code. Rural residence was determined by Canada Post’s 2007 coding system. Home locations were categorized as “urban” or “rural” areas (Canada Post, 2007).

**Perceived Rurality of Workplace:** Respondents were asked to indicate the location of their clinical workplace(s) by using the options “urban,” “rural,” or “both.”

**Experience of Other Internet Activities in Clinical Practice:** Other clinical uses for the Internet have been identified in addition to retrieval of clinical information. The respondents were asked to select which of the Internet applications they had used in their practice. A list of Internet applications was formulated with reference to past research describing applications that had been used in health professionals’ clinical practice (Anderson, 2004; Titus et. al., 1999). The list includes “searches for rehabilitation and/or medical knowledge (e.g., intervention or assessments, prognoses),” “searches for community resources (e.g., stroke support groups),” “email communication with clients,” “email communication with clinical partners (e.g., other health professionals),” “leaving and reading messages on bulletin boards,” “engaging in
conversation via online chat rooms,” “using a microphone for audio conversation,” “using a web-camera for video conferencing,” and “it is not useful - I do not use the Internet in my practice.”

**Social Variables.**

According to the Rogers’ framework, it was hypothesized that the work culture and clinical contacts occupational therapists experience may encourage them to use Internet resources in their practice. In different clinical fields, access to electronic databases and other online resources may vary. The funding source for work settings may also influence the resources available to support the use of technology for occupational therapists. The following variables were used to characterize respondents’ social and work contexts.

**Years of Practice:** Years of practice were self-reported by the respondents and were coded as a continuous variable. Where respondents indicated a period of less than a year, their answer was calculated proportional to a 12-month period. For example, 6 months were entered as 0.5 for data analysis.

**Clinical Hours:** Respondents were categorized into three groups according to the number of clinical hours they worked. Casual or part-time workers were assigned to the group with “less than 18 hours” a week. Full-time workers were divided into groups of “18 to 37.5 hours” and “37.5 hours or more” a week.

The number of clinical hours involving client contact was used to screen for the inclusion of respondents in the study. Respondents who were not involved in any clinical contact with health consumers were asked to answer “zero” clinical hours and did not need to complete the survey.
Clinical Areas: The clinical areas were generically defined as “adult physical medicine,” “adult mental health,” “pediatric,” “geriatric,” and “other.” There was space for respondents to provide a more precise description of their clinical area if they wished. Given the brief ten-minute time allotted to encourage completion of the survey, a long list of clinical areas was not provided.

Perceived Role of Occupational Therapist: Numerous roles may be assumed by an occupational therapist when in clinical contact with health consumers. Respondents were asked to select the role description that most represented their work. The options were “therapist delivering direct and/or indirect care (understood as contact with or without physical presence),” “educator,” “consultant,” “case manager,” “researcher,” “sales,” and “other.”

Clientele: Clientele categories were broadly defined as “adults,” “pediatrics,” “geriatrics,” and “other”. Only a few pre-defined categories were defined to facilitate ease of completion. Space was provided for respondents to give a more precise description of their clinical area if they wished.

Clinical Setting: Clinical setting was defined as “hospital,” “community,” “long-term care facility,” “private industry,” “government organization” (e.g., Worker Safety Insurance Board), and “other.” Space was provided for respondents to elaborate on their work setting.

Funding Source: Funding source was broadly defined as “public,” “private,” “not-for-profit,” and “other.” Space was provided to allow respondents to elaborate on the funding sources for their services.

Individuals Who Used the Internet within the Clinical Context: Respondents were asked to answer “yes” or “no” as to whether or not they knew about others’ Internet use. The list consisted of people they might encounter in a clinical setting, namely “adult clients with
diagnoses of physical illness,” “adult clients with mental health diagnoses,” “geriatric clients,” “pediatric clients,” “family and/or friend caregivers,” “other health care professionals,” and “other.” Space was provided for respondents to expand their answers.

Respondents were also asked if they ever encouraged their clients to use the Internet to look for information and resources. They were asked to give a “yes” or “no” answer.

Other Social Factors Influencing Internet Use: A list of factors that could potentially influence Internet use in clinical practice was generated based on findings from past studies (Cullen, 2000; Gerber & Eiser, 2001; Hart et al., 2004; Hobbs et al., 2002; Houston et al., 2003; Leong et al., 2005; Sittig et al., 2001; Wilson, 1999). Respondents were asked to reply “yes” to each factor if they thought it influenced their Internet use. The factors were “paid time,” “having clients who use health information from the Internet,” “having clients who use email to communicate with me,” “a work culture that depends on and fosters Internet use (e.g., working with occupational therapy colleagues who use email and/or perform Internet searches),” “seeing other health care professionals (e.g., nurses) using the Internet in their practice,” “and regulatory guidelines regarding Internet use in clinical practice (e.g., email communication with clients).” Space was provided for respondents to expand their answers.

**Innovation variables.**

Internet Access: Internet access was coded as a dichotomous, categorical variable requiring a “yes” or “no” answer.

Location of Internet Access: The categorical options provided were work, home, public places (e.g., “library”). Space was provided for respondents to expand their answers.
**Internet Speed**: Respondents were asked to classify speed according to the following options: “high-speed Internet,” “I do not know the exact speed but it is good enough for me to do my Internet search,” “I do not know the exact speed but it is slow,” “I don’t know,” and “other.” More technical terms were avoided in the event respondents were not familiar with more technical properties to define Internet speed.

**Other Uses of Information and Communication Technology**: In order to establish a baseline measure of respondents’ familiarity with the technology in their clinical practice, participants were asked to list their use of a list of technological devices and software. The total number of devices and software applications used by respondents was coded as an ordinal variable.

To examine the extent to which a workplace was supported by technology, respondents were asked to list the type of technological devices and software they had been provided with at work. The total number of devices and software applications provided in the workplace was also coded as an ordinal variable.

**Other Innovation Factors Influencing Internet Use**: Based on findings from past studies, a list of factors that could potentially influence Internet use in clinical practice was generated (Cullen, 2000; Gerber & Eiser, 2001; Hart et al., 2004; Hobbs et al., 2002; Houston et al., 2003; Leong et al., 2005; Sittig et al., 2001; Wilson, 1999). Respondents were asked to reply “yes” to each factor if they thought it influenced their Internet use. The factors were “quicker Internet connection speed,” “having a computer station readily accessible for my clinical practice,” “credibility rating of websites,” “having technical support at work,” “training regarding the use of Internet applications (e.g., how to provide consultation in an online chat room),” “training to perform Internet searches (e.g., how to perform an effective Internet search).” Space was provided for respondents to expand their answers.
Dependent variables.

Internet Use: Internet use was measured in terms of personal use, direct clinical use (e.g., providing information about treatment and community resources), and other work-related use (e.g., email with colleagues and for professional development). To describe the frequency of use on a weekly basis these options were presented: “I do not use,” “less than 1 day a week (e.g., weekly, biweekly and monthly),” “1 to 2 days,” “3 to 4 days,” “5 to 6 days,” “every day.”

Respondents were asked if they used the Internet in their clinical practice with clients and if they have ever encouraged their clients to use the Internet. Those who indicated non-use of Internet information in this context were asked to project if they would use it either within or beyond the next 12 months.

Clinical Use of Internet Information: Clinical use of Internet information was measured in terms of the information source from which respondents sought answers to clinical questions. The options were “ask a colleague,” “search textbook,” “look up answers in journal articles,” “do an Internet search,” and “other.” Space was provided for respondents to expand their answers. To elicit more detail from those who had indicated that they used Internet information in their clinical practice, two more probing questions were asked: 1) the degree of perceived difficulty of the Internet search, and 2) the perceived usefulness of the information gathered. Both questions were rated on a 4-point Likert scale; the options offered were “most of the time,” “sometimes,” “neutral,” and “not at all.”

Data Analysis

Statistical analyses were performed using the SPSS 17.0 package for Windows (SPSS, 2008). Descriptive statistics in the form of frequency distributions, percentages, means, standard
deviations, and medians were used to first describe the study sample. In addition, descriptive statistics were used for most objectives to examine factors related to Internet use. Bivariate analyses were performed to identify any relationships between variables in explaining Internet use. A significance level of 0.05 was used for each inferential analysis.

Specifically, the following analyses were performed:

- For Objective 1 which described the nature of Internet use by occupational therapists in terms of:

  a) type of use (i.e., personal use, direct clinical use and other work-related use): frequency distributions of each type of Internet use was examined in relation to days per week (an ordinal variable), Wilcoxon analyses were generated to compare days per week of clinical use versus work related use.

  b) nature of Internet access and Internet speed: frequency distributions of each level of Internet speed (an ordinal variable) and location of Internet access (a categorical variable) were examined.

  c) the extent to which the Internet was used for sources of clinical information: frequency distributions of each information source (nominal variables) were examined.

  d) occupational therapists’ inclination to promote Internet use among their clients: frequency distributions were used to measure the therapists’ response as to whether they have ever encouraged clients’ Internet use for information.

  e) the current situation of Internet use within the therapists’ clinical context: frequency distributions were used to measure if therapists knew if other people they came across in their clinical context (a nominal variable) also used the Internet as an information source.
For Objective 2 which described the perceived difficulty and usefulness of Internet for information searches, emails, and other clinical information: frequency distributions of each level of perceived difficulty (an ordinal variable) and usefulness of Internet use (an ordinal variable) were examined respectively.

For Objective 3 which described the types of Internet applications (e.g., email with clients) occupational therapists regarded as useful in their practice: frequency distributions of each application (a nominal variable) was examined.

For Objective 4 which described the factors perceived by occupational therapists as an influence on their Internet use: frequency distributions of each factor were examined (a nominal variable).

For Objective 5 which assessed the personal, social and innovation factors related to higher levels of Internet use by occupational therapists, chi-square tests were used to identify the relationship between Internet use and respondents’ characteristics. A significance level of 0.05 was used for each inferential analysis.
Results

A total of 4050 survey packages were mailed out. Of these, 255 (6%) were returned due to invalid addresses, leaves of absences, and job changes. After a 4-week period of data collection, a response rate of 38.7% was achieved. There were 1382 surveys that met the inclusion criteria for data analyses. Occupational therapists who failed to meet the inclusion criteria returned the survey and indicated that they were not involved in any form of clinical care because of retirement or involvement in administrative and/or academic positions (n = 82).

Respondents’ Characteristics

Of all the respondents, 94% were female (see Table 1). The mean age was 39 years (SD 9.7) and the median age was 38 years. Ninety percent of respondents lived in urban areas and 10% lived in rural areas according to the postal code reference of Canada Post (2007). Most of the respondents (69%) had a B. Sc. (OT) degree, 19% with a clinical master’s degree in occupational therapy, 7% had an additional master’s degree or a doctoral degree, and 5% had a diploma in physical and occupational therapy.

Ninety-six percent of respondents identified themselves as direct service providers. In addition, other roles were identified: 47% as consultants, 38% as educators, 15% as case managers, and 12% as researchers where they engaged in client contact (see Table 2). The average years of practice was fourteen (SD 9.9) and the median years of practice was twelve. Most respondents had less than five years of work experience, and most had worked full-time — between 18 and 37.5 hours a week (56%) — or more than 37.5 hours a week (30%); 14% worked less than 18 hours a week.
Most respondents (61%) worked in the clinical area of physical medicine, followed by geriatrics (46%) and pediatrics (32%). A majority held only one job, worked in the community (57%) or in a hospital (51%). Among other work settings, 14% worked in a long-term care facility, 16% worked in private industry (e.g., auto insurance), and 7% worked for the government.

A majority of respondents (89%) indicated that their clinical service was supported by public funding and 30% reported that their service was privately funded. Five percent indicated that their funding source was from not-for-profit organizations and 6% reported receiving other funding for their service.

Table 1  Personal Variables of the Study Sample

<table>
<thead>
<tr>
<th>Personal Characteristics</th>
<th>Age (mean years, SD)</th>
<th>n</th>
<th>%</th>
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<tbody>
<tr>
<td>Age (mean years, SD)</td>
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<td>0 – 25</td>
<td>34</td>
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<td>56 – 60</td>
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<td>60 +</td>
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<td>(The Highest Level Achieved)</td>
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<td>M. Sc. (OT)</td>
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<tr>
<td>Other Master’s &amp;/or Ph.D</td>
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Figure 2.  Age Distribution of the Respondents

Percentage (%)

Figure 3.  Years of Experience of the Respondents

Percentage (%)
Table 2  Social Variables of the Study Sample

<table>
<thead>
<tr>
<th>Social Characteristics</th>
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<tr>
<td><strong>Years of Practice</strong></td>
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<tr>
<td>&lt; 5 years</td>
<td>337</td>
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<td>6 – 10 years</td>
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<td>16 – 20 years</td>
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<tr>
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<td>&gt;37.5 hrs per week</td>
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<td>Both</td>
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<td>19</td>
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<td><strong>Self-Identified Role as an OT</strong></td>
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<td>Direct Service Provider</td>
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<tr>
<td>Consultant</td>
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<td>Educator</td>
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<td>Case Manager</td>
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<td>Researcher</td>
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<td>12</td>
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<tr>
<td>Other</td>
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<td><strong>Work Setting</strong></td>
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<td>Long-Term Care Facility</td>
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<td>Government</td>
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<td>Other</td>
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<tr>
<td>Other</td>
<td>191</td>
<td>14</td>
</tr>
</tbody>
</table>

Remarks: The percentages do not necessarily add up to 100% because some answers were not chosen on a mutually exclusive basis.
The Provision of Information and Communication Technology (ICT)

A majority (70.3%) of respondents indicated that a desktop computer was provided at work, while 78% had access to a printer and 70% to a fax machine. Telecommunication devices, such as BlackBerry® smartphones (2%) and cellular phones (18.4%) were not commonly provided to occupational therapists. A minority of respondents (10%) reported that no ICT devices were provided.

The Use of Information and Communication Technology

Most respondents used typical office devices, such as printers (99%), fax machines (95.5%), and desktop computers (91%). Almost half of the respondents used cellular phones, laptop computers, scanners, and digital cameras in their clinical practice. Personal digital assistants (12.8%), computer microphones (8%) and web cameras (5%) and BlackBerry® smartphones (2.5%) were less commonly used in a work context.

Of the software applications, email (96%) was the most commonly used communication technology. Documentation software (43%), assessment software (22%), and online billing systems (20%) were used less in clinical practice.

Objective 1a: The Nature and Frequency of Internet Use

Respondents were asked about the frequency of their Internet use (i.e., days a week) in terms broadly defined as “personal use” (personal email), “other work-related use” (e.g., email communication with colleagues), and “clinical use” (e.g., looking up community resources). For personal use, 67% (n = 972) said they used the Internet at least 5 days a week (51% reported using it every day and 20% reported using it 5 to 6 days a week). Sixty-one percent of
respondents (n = 833) reported using the Internet at least 5 days a week (33% used it daily and 27% used it 5 to 6 days a week) for other work-related activities. For clinical purposes, only 14% of respondents (n = 186) reported Internet use for at least 5 days a week (6% reported daily use and 8% reported using it 5 to 6 days a week). In relation to their clinical practice, 30% reported using the Internet “less than 1 day a week (e.g., weekly and monthly)” in their clinical practice (See Figure 4).

Figure 4. Nature & Frequency of Internet Use

<table>
<thead>
<tr>
<th>Number of days per week</th>
<th>Clinical</th>
<th>Other Work-Related</th>
<th>Personal</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1-2</td>
<td>10%</td>
<td>10%</td>
<td>80%</td>
</tr>
<tr>
<td>3-4</td>
<td>20%</td>
<td>20%</td>
<td>60%</td>
</tr>
<tr>
<td>5-6</td>
<td>30%</td>
<td>30%</td>
<td>40%</td>
</tr>
<tr>
<td>7</td>
<td>40%</td>
<td>40%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Internet use for personal purposes was significantly more frequent than for clinical (Wilcoxon Signed Ranks Test, Z = -27.9, p < 0.01) and work-related uses (Wilcoxon Signed Ranks Test, Z = -8.2, p < 0.01). The frequency of Internet use for other work-related purposes was significantly greater than for clinical use (Wilcoxon Signed Ranks Test, Z = -26.1, p < 0.01). In summary, the respondents did not use the Internet as frequently for direct clinical
objectives (e.g., looking up health information) as they did for personal and other work-related purposes (e.g., emailing colleagues).

**Objective 1b: Internet Access and Internet Speed**

Almost all the respondents (99.6%) reported having Internet access and only five persons said they did not. Most had Internet access at home (97%) and at work (94%), while some accessed the Internet in public places (18%) or other locations (14%). A majority reported going to more than one place to obtain access. Among all respondents who reported using the Internet at other locations, many gained access wherever there was a wireless connection, such as at a client’s or friend’s home. A majority of respondents (93%) reported an Internet connection speed fast enough to support their use.

**Objective 1c: Internet as a Source of Clinical Information**

There were 1306 respondents (95%) who indicated that they used information gained from the Internet in their clinical practice. Of those who said they did not use the Internet (n = 67) in their practice, 55% indicated that they planned to start doing so within the next 12 months, while 61% stated that they would do so after 12 months. All respondents indicated that they asked colleagues for clinical information (99.6%). They reported the Internet (98.3%) as the next most common source for clinical information and used it more than other sources, such as textbooks (76.5%) and paper-based journal articles (68%). Other information sources, such as materials from workshops and seminars, were reported (10.2%).
Objective 1d: OTs’ Encouragement of Internet Use among Their Clients

Of all the respondents, 76% reported that they had encouraged their clients to use the Internet to look for information during their clinical encounters.

Objective 1e: The Current Situation of Internet Use within the OTs’ Clinical Context

Overall, occupational therapists reported knowing that the Internet was used by others as a clinical resource. Among the respondents, 86% indicated that they knew about other health professionals’ Internet use in their practice, 84% indicated that family and friends of clients used the Internet for information searches. In particular, 65% of therapists indicated that their adult physical medicine adult clients used the Internet to look for information.

Objective 2: Perceived Difficulties in Internet Searches and Usefulness of Information

Among those who reported using information accessed/found using the Internet in their clinical practice, 5% reported having difficulty finding information most of the time, 13% remained neutral about their search skills, 62% reported “sometimes” experiencing difficulty in performing Internet searches, and only 20% indicated having no difficulty at all (see Figure 5). A majority of respondents agreed that this information was useful (see Figure 6); thirty-seven percent reported that it was useful “most of the time” and 58% reported that it was useful “sometimes.” Only 0.3% of respondents said that the information accessed/found using the Internet was not useful and 5% were neutral.
Figure 5. Level of Perceived Difficulties in Internet Search

Figure 6. Level of Perceived Usefulness of Information gained through the Internet
Objective 3: Types of Internet Applications that are regarded as Clinically Useful

Ninety-six percent of respondents reported that Internet searches for health and medical information were useful in clinical practice. To a lesser degree, 87% of respondents regarded Internet searches for community resources as useful to their clinical work. A majority (94%) reported that email was a useful application for communicating with other health professionals, while 43% said that using email with their clients was useful. Only a minority of respondents indicated that they found the following applications useful: reading and leaving messages on bulletin boards (25%), using video conferencing (14%), engaging in audio conversation (5%), and participating in online chat rooms (5%) (see Figure 7).

Figure 7. Perceived Usefulness of Different Types of Internet Applications
Objective 4: Factors perceived as Influential on OTs’ Internet Use

“Having a computer station readily accessible for clinical practice” (89.3%) is an innovation variable which was ranked as the most influential factor on the respondents’ Internet use (see Figure 8 below). Two other innovation variables, “having technical support at work” (83.6%) and “credibility rating of websites” (80.5%), were also highly recognized as influential factors on Internet use. Many respondents provided verbal comments on the technical aspects of the Internet which may facilitate their clinical Internet use and their professional development, such as “having online access to university journal collections and medical databases” and “having a topic-specific online database (e.g., coping skills for family members with acquired brain injury)”. Other innovation factors, specifically “funding for computer and Internet access” and “having exclusive use of a computer”, may influence on some respondents’ clinical use or non-use of the Internet. Others said “librarian’s training in how to perform searches would encourage their Internet use”.

Among the social variables, “a work culture which depends on and fosters Internet use” (87.2%) was rated as the second most influential factor affecting the respondents’ Internet use. Other social variables, namely “paid time” (81.9%), and “regulatory guidelines regarding the use of the Internet in clinical practice” (79.5%) were among the top 5 influential factors. Particularly, a large number of respondents reported that security issues were a concern when engaging in email communication with their clients.

Other factors were regarded as influential factors by more than 50% of the respondents. “Training regarding performing Internet searches” (73.9%), “quicker Internet connection speed” (71.2%), “training regarding the use of Internet applications” (64.4%), and “seeing other health
Care professionals using the Internet in their clinical practice” (60.4%) were considered by more than half of the respondents as determinants of their use. “Having clients who use health information from the Internet” (54.2%) and “having clients who use email to communicate with the care providers” (47.4%) were the least rated as important influential factors.

Figure 8. Frequency of Factors Influencing Internet Use

Factors influencing OTs’ Internet Use
Objective 5: Relationship of Personal, Social and Innovation Factors with OTs’ Frequency of Internet Use

To examine for any relationships between respondents’ personal characteristics and their Internet use for clinical purposes, their responses were classified as “frequent user” and “non-frequent user” groups. Respondents who used the Internet more than 2 days a week were categorized as frequent users; non-frequent users were recognized as those who used the Internet “1 to 2 days a week or less” (See Table 3). Overall, there were 482 frequent users (35%) and 890 non-frequent users (65%).

Table 3  Nature & Frequency of Internet Use according to Different Purposes

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<tr>
<th></th>
<th>Clinical Use</th>
<th>Non-Frequent Users</th>
<th>Frequent Users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td></td>
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<tr>
<td>I do not use</td>
<td>129</td>
<td>9.3</td>
<td>Non-Frequent</td>
</tr>
<tr>
<td>Less than 1 day a week</td>
<td>419</td>
<td>30.3</td>
<td></td>
</tr>
<tr>
<td>1 – 2 days</td>
<td>342</td>
<td>24.7</td>
<td></td>
</tr>
<tr>
<td>3 – 4 days</td>
<td>296</td>
<td>21.4</td>
<td></td>
</tr>
<tr>
<td>5 – 6 days</td>
<td>110</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>Everyday</td>
<td>76</td>
<td>5.5</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>1382</td>
<td>100</td>
<td></td>
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</tbody>
</table>
**Personal variables and frequency of Internet use.**

Non-frequent Internet use was associated with older age. There was a remarkable growth in the number of non-frequent users beyond the age of 31 (chi-sq = 20.3, df = 8, p < 0.01). Education was a significant factor associated with frequent users (chi-sq = 12.3, df = 4, p = 0.02). There were 9% more frequent users than non-frequent users among respondents with higher education levels (i.e., master degree and/or above). There were 9% more non-frequent users among the respondents with diplomas and bachelor’s degrees in occupational therapy. There was no significant difference in the number of frequent and non-frequent Internet users based on gender, work and home locations (See Table 4 on p.53).

**Social variables and frequency of Internet use.**

Overall, the percentage of frequent Internet users decreases with increasing years of work experience (chi-sq = 23.1, df = 10, p = 0.01). Among the frequent users, 32% had less than 5 years of practical experience, 18% had 6 to 10 years of experience, and 5% had over 30 years of experience. Working fewer clinical hours was a significant characteristic of non-frequent clinical Internet users (chi-sq = 20.4, df = 2, p < 0.01). There were 8% fewer frequent users than non-frequent users among the respondents working less than 18 hours; however, the number of frequent users was 9% higher among the respondents working more than 37.5 hours (p = 0.01) (see Table 5 on p.54).

Funding sources for occupational therapy services was significantly associated with Internet use (see Table 5). In the private funding sector (e.g., insurance-funded services), there were 8% more frequent users than non-frequent users (chi-sq = 9.3, df = 1, p < 0.01). For those OT services funded by not-for-profit agencies, there were 3% more frequent users than non-
frequent users (chi-sq = 6.3, df = 1, p = 0.01). On the other hand, there were 4% more non-frequent users than frequent users in the public funding sector (chi-sq = 5.6, df = 1, p < 0.02).

Also, there were significantly more frequent Internet users found in different clinical settings (see Table 5). Among respondents working in the community, government and private settings (e.g., insurance industry), more frequent users were found. The number of frequent users among those working in the community was 10% higher than non-frequent users (chi-sq = 12.1, df = 1, p < 0.01). The number of frequent users was 4% higher than non-frequent users among those working in the private (chi-sq = 4.5, df = 1, p = 0.03). Among those working in hospitals, the number of frequent users was 2% lower than the non-frequent users. There was no significant difference between frequent and non-frequent users among therapists working in long-term care facilities.

Among all respondents, there were significantly more frequent Internet users working in the geriatric and pediatric area (see Table 5). There were 29% more frequent users among geriatric therapists and 12% more frequent users among pediatric therapists compared to other clinical areas (chi-sq = 5.9, df = 1, p = 0.02). On the contrary, frequent users were found less among those who worked in the adult physical medicine and adult mental health areas. The number of frequent users was 50% lower among those working in adult physical medicine compared to other fields (chi-sq = 3.7, df = 1, p = 0.05). There were 13% fewer frequent users in the adult mental health clinical group compared to other therapists who did not practice in this area (chi-sq = 8.5, df = 1, p < 0.01).

There was no significant difference found between non-frequent and frequent users among the direct service providers (see Table 5). Frequent users tended to be associated with the clinical roles of consultant (chi-sq = 18.0, df = 1, p < 0.01), educator (chi-sq = 7.7, df = 1, p <
0.01), case manager (chi-sq = 32.8, df = 1, p < 0.01). Compared to other roles, there were 53% more frequent users in the consultant role, and 30% more frequent users in the educator role. On the contrary, there were significantly fewer frequent users (22%) found for the respondents who assumed the case manager role. Analyses of other roles (i.e., researchers and sales) were not performed because of a low percentage of respondents belonging to these groups.

**Innovation variables and frequency of Internet use.**

The location of Internet access and the Internet connection speed of the respondents’ computer were not analyzed in terms of frequency of use because virtually all of the respondents had Internet access and the same level of Internet connection speed.

More frequent internet users were among those who identified “Quicker Internet connection speed” (chi-sq = 12.4, df = 1, p < 0.01) as a factor influencing Internet use. Other innovation factors that were found as significantly associated with frequent Internet users were “having a computer station readily accessible for the respondents’ clinical practice,” (chi-sq = 5.26, df = 1, p = 0.02) and the “credibility rating of websites,” (chi-sq = 4.47, df = 1, p = 0.03). However, having “training regarding the use of Internet applications,” and “training regarding performing Internet search” were not significantly linked to the frequency of Internet use.
Table 4  Distribution of Frequent and Non-Frequent Users by Personal Factors

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<tr>
<th></th>
<th>Internet Use for Clinical Purposes</th>
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<td>Frequent Users</td>
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</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
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<td>**Age * **</td>
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<tr>
<td>&lt; 25 yrs</td>
<td>17</td>
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</tr>
<tr>
<td>26 – 30 yrs</td>
<td>123</td>
<td>25.8</td>
<td>162</td>
<td>18.4</td>
<td>285</td>
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<td>31 – 35 yrs</td>
<td>85</td>
<td>17.9</td>
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<td>36 – 40 yrs</td>
<td>59</td>
<td>12.4</td>
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<td>18.1</td>
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<tr>
<td>41 – 45 yrs</td>
<td>57</td>
<td>12.0</td>
<td>122</td>
<td>13.9</td>
<td>179</td>
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<tr>
<td>46 – 50 yrs</td>
<td>72</td>
<td>15.1</td>
<td>123</td>
<td>14.0</td>
<td>195</td>
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<tr>
<td>51 – 55 yrs</td>
<td>39</td>
<td>8.2</td>
<td>69</td>
<td>7.8</td>
<td>108</td>
</tr>
<tr>
<td>&gt; 56 yrs</td>
<td>24</td>
<td>5.1</td>
<td>58</td>
<td>6.6</td>
<td>82</td>
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<tr>
<td><strong>Gender</strong></td>
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<td></td>
</tr>
<tr>
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<td>446</td>
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<td>834</td>
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<td>86</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>43</td>
<td>9.0</td>
<td>85</td>
<td>9.7</td>
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<tr>
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<td>431</td>
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<td>783</td>
<td>89.7</td>
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<td></td>
</tr>
<tr>
<td>Rural</td>
<td>40</td>
<td>8.4</td>
<td>94</td>
<td>10.6</td>
<td>134</td>
</tr>
<tr>
<td>Urban</td>
<td>341</td>
<td>71.3</td>
<td>635</td>
<td>71.9</td>
<td>976</td>
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<tr>
<td>Both</td>
<td>97</td>
<td>20.3</td>
<td>154</td>
<td>17.4</td>
<td>251</td>
</tr>
<tr>
<td><strong>Education #</strong></td>
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<td>46</td>
<td>5.2</td>
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<td>Bachelor</td>
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<td>635</td>
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<td>Masters in OT</td>
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<td>23.1</td>
<td>151</td>
<td>17.0</td>
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<tr>
<td>Other Masters &amp; Ph.D</td>
<td>42</td>
<td>8.7</td>
<td>56</td>
<td>6.3</td>
<td>98</td>
</tr>
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</table>

Note: * denotes p < 0.01; # denotes p < 0.05
Table 5  Distribution of Frequent and Non-Frequent Users by Social Factors

<table>
<thead>
<tr>
<th></th>
<th>Internet Use for Clinical Purposes</th>
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<tbody>
<tr>
<td></td>
<td>Frequent Users</td>
<td>Non-Frequent Users</td>
<td>Total (N)</td>
<td>chi-sq p-value</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>**Years of Practice ***</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 5 yrs</td>
<td>149</td>
<td>31.5</td>
<td>188</td>
<td>21.6</td>
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<tr>
<td>6 – 10 yrs</td>
<td>83</td>
<td>17.5</td>
<td>167</td>
<td>19.2</td>
<td>250</td>
</tr>
<tr>
<td>11 – 15 yrs</td>
<td>49</td>
<td>10.4</td>
<td>127</td>
<td>14.6</td>
<td>176</td>
</tr>
<tr>
<td>16 – 20 yrs</td>
<td>56</td>
<td>11.8</td>
<td>128</td>
<td>14.7</td>
<td>184</td>
</tr>
<tr>
<td>21 – 25 yrs</td>
<td>56</td>
<td>11.8</td>
<td>93</td>
<td>10.7</td>
<td>149</td>
</tr>
<tr>
<td>26 – 30 yrs</td>
<td>40</td>
<td>8.5</td>
<td>68</td>
<td>7.8</td>
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<tr>
<td>31 – 35 yrs</td>
<td>15</td>
<td>3.2</td>
<td>30</td>
<td>3.5</td>
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<tr>
<td>36 – 40 yrs</td>
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<td>1.1</td>
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<td>1.3</td>
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<tr>
<td>&gt; 41 yrs</td>
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<td>0.2</td>
<td>8</td>
<td>0.8</td>
<td>9</td>
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<tr>
<td>**Clinical Hours ***</td>
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</tr>
<tr>
<td>&lt; 18 hrs</td>
<td>44</td>
<td>9.3</td>
<td>147</td>
<td>16.8</td>
<td>191</td>
</tr>
<tr>
<td>18 – 37.5 hrs</td>
<td>261</td>
<td>55.2</td>
<td>494</td>
<td>56.5</td>
<td>755</td>
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<tr>
<td>&gt; 37.5 hrs</td>
<td>168</td>
<td>35.5</td>
<td>233</td>
<td>26.7</td>
<td>401</td>
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<tr>
<td><strong>Clinical Setting</strong></td>
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<tr>
<td>Hospital</td>
<td>238</td>
<td>34.2</td>
<td>457</td>
<td>65.8</td>
<td>695</td>
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<tr>
<td>Community *</td>
<td>305</td>
<td>63.5</td>
<td>478</td>
<td>53.8</td>
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<td>Private Industry #</td>
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<td><strong>Funding Types</strong></td>
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<td>800</td>
<td>66.0</td>
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<td>Private *</td>
<td>173</td>
<td>41.0</td>
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<td>59.0</td>
<td>422</td>
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</table>

Note: * denotes p < 0.01; # denotes p < 0.05.
Table 5 (cont) Distribution of Frequent and Non-Frequent Users by Social Factors

<table>
<thead>
<tr>
<th>Clinical Areas</th>
<th>Internet Use for Clinical Purposes</th>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Frequent Users</td>
<td>Non-Frequent Users</td>
<td>Total (N)</td>
<td>chi-sq</td>
<td>p-value</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td></td>
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<tr>
<td>Clinical Areas</td>
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<td>Pediatric #</td>
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<td>47.4</td>
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<td>Areas other than Pediatric</td>
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<tr>
<td>Adult Physical Medicine</td>
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<td>75</td>
<td>570</td>
<td>80.2</td>
<td>837</td>
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<tr>
<td>Areas other than Adult Physical Medicine</td>
<td>89</td>
<td>25</td>
<td>141</td>
<td>19.8</td>
<td>230</td>
</tr>
<tr>
<td>Adult Mental Health *</td>
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<td>46.5</td>
<td>184</td>
<td>35.9</td>
<td>315</td>
</tr>
<tr>
<td>Areas other than Adult Mental Health</td>
<td>151</td>
<td>53.5</td>
<td>329</td>
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<td>480</td>
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<td>Geriatric #</td>
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<td>431</td>
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<td>Educator *</td>
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<td>308</td>
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<td>515</td>
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<tr>
<td>Other roles</td>
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<td>34.9</td>
<td>249</td>
<td>44.5</td>
<td>358</td>
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<td>Consultant *</td>
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<td>636</td>
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<td>Other roles</td>
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<tr>
<td>Case Manager *</td>
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<td>98</td>
<td>20.0</td>
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<td>Other roles</td>
<td>176</td>
<td>61.1</td>
<td>392</td>
<td>80.0</td>
<td>568</td>
</tr>
</tbody>
</table>

Note: * denotes p <0.01; # denotes p < 0.05
Discussion

Internet Use

This is the first study to our knowledge that examined Internet use among rehabilitation professionals and among occupational therapists in particular. Our findings show that a large percentage of occupational therapists currently use the Internet for clinical purposes. A majority of respondents reported using the Internet to meet their practice needs, primarily for looking up relevant clinical information, and less commonly as a communication tool with their clients. However, the frequency of Internet use for clinical purposes was notably lower than that for personal purposes (e.g., emailing friends and online banking). Respondents used the Internet most commonly two days a week for clinical purposes, a much lower rate when compared with daily use for personal or other work-related purposes.

Given the high frequency of Internet use for personal purposes, the lower frequency of Internet use for clinical purposes cannot be explained by the therapists’ lack of basic technical knowledge. In addition, as all respondents reported having Internet access at home and/or work with a sufficiently fast Internet speed, these two factors were unlikely causes of the low frequency of their Internet use in clinical practice, for both information seeking and communication activities.

In general, the respondents appeared to have a positive attitude towards the use of Internet resources. After consultations with their colleagues, they identified the Internet as their next best source of information. As this study is more recent than past findings about health professionals’ Internet use as their clinical resources (Cullen & Litt, 2000; Wilson, 1999), these findings suggest an increasing acceptance of the Internet as an information source among other
health care providers in general (Bennett et al., 2003; Cullen & Litt, 2000; Eberhart-Phillips et al., 2000; Kerse et al., 2001; McClusky, 2003; Young et al., 1999). Nevertheless, the higher acceptance level of the Internet as a source of clinical knowledge and information indicated by this study may be explained by the professional background of this study’s participants (i.e., occupational therapists). There may be differences between occupational therapists’ information needs and those as of participants from previous studies who were mainly physicians (Cullen & Litt, 2000; Koller et al., 2001; Wilson, 1999).

According to the Rogers’ Diffusion of Innovation (1995), the findings from this study may indicate that occupational therapists in Ontario were progressing from the “implementation” to the “confirmation” stage in their use of the Internet for information searches, based on their regular and high usage in seeking information from Internet sources. As more therapists adopt the Internet as their essential clinical resource for their access to online journals, clinical knowledge databases and research, new clinical information can be improved, thus supporting the delivery of quality care and evidence-based practice.

In addition, the respondents from this study were willing to promote Internet use in their clinical practice. A high percentage of respondents (76%) reported having encouraged their clients to use the Internet as a resource for finding health information. This finding may be indicative of occupational therapists’ affirmative attitude towards promoting the use of Internet resources to empower their clients to meet their health care needs. According to Rogers’ Diffusion of Innovation (1995), this finding may provide evidence for the positive influence occupational therapists make on their clients’ gradual adoption of the Internet as a therapeutic resource for community, health and medical information. Within the practice domain of occupational therapy, occupational therapists play a key role in encouraging clients to use such
resources and guiding their clients’ understanding and application of the Internet information to enhance functional adaptation (Bright et al., 2005; Sharry & McKenna, 2001). The growing trend towards a greater number of established websites for interactive patient education and monitoring, such as the mental health website for youth (Rickwood, Deane, & Wilson, 2007), would be crucial in order to meet the information demands of both clinicians and clients.

**Types of Internet Applications**

A majority of respondents confirmed that Internet searches for medical, health and community information were useful in their practice. As the clinical focus of occupational therapy is to promote the functional independence of health consumers and to encourage their engagement in meaningful activities, therapists have begun to use the Internet information and may find the Internet particularly useful when they need to find current data about community programs and assistive devices. This finding further supports the need to develop reliable websites about medical knowledge and treatment. Similarly, websites of local organizations should continue to provide disease-specific information, as well as information about activity programs (e.g., the Alzheimer’s Society), since these websites act as useful Internet resources for community service linkage and patient education.

With respect to the use of the Internet as a communication tool, therapists’ use of email communication with other health providers was more common than communication with their clients. This observation is consistent with past findings where physicians had a much higher rate of email communication with other clinicians and a significantly lower rate with their patients (Moyer et al., 2002; Sittig et al., 2001). This study found that therapists identified their concerns about information confidentiality, and the lack of ethical and practical guidelines, are barriers to their adoption of email communication with their clients. With respect to Rogers’
Diffusion of Innovation (1995), a large percentage of respondents in this study may be in their “decision” stage when they have not adopted emails to communication with their clients. This study, together with previous studies, consistently provided clear evidence that clinicians’ concern of confidentiality and privacy is a barrier to email use with their clients. This suggests a need for clear email guidelines for therapists’ communication with their clients, so they can take advantage of the benefits of email use which has long been a popular and common communication tool within other life domains (e.g., social and business context).

As tele-health and tele-rehabilitation are still in their infancy for occupational therapy practice, this study provided preliminary findings suggesting that occupational therapists were not familiar with other Internet-based applications, such as the use of online chat rooms. As evident in the study findings, audio and video conferencing were not commonly used among the respondents. It is quite probable that respondents’ low usage of these innovations as alternative ways to interact with their clients was related to their lack of technical expertise. Therefore, training therapists in the broader use of information and communication technology is essential for the expansion of service delivery beyond traditional treatment settings.

Having proficiency in using the Internet for video and audio communication is likely to open innovative channels to deliver clinical care through the Internet. As seen in past research (Lupiáñez-Villanueva et al., 2010), the Internet allows physicians to provide advice to clients through online support groups, providing an additional channel for them to monitor their clients’ medical status. Stakeholders may wish to reassess the Internet for the potential development of cost-effective service delivery models, particularly for serving rural and remote populations. For instance, hospital therapists could conduct in-home assessments via video-conferencing, thus
enabling the primary therapist to refine the clients’ hospital-based treatment plan after assessing their home environment.

With the swift development of Internet-based interventions for different clinical populations (e.g., stress management and smoking cessation), Webb and his colleagues (2010) found that positive behavioural changes were based on increased interaction between clinicians and clients when clinicians could use cost-effective methods (e.g., email communication) to reinforce the application of clinical theories in the clients’ rehabilitation programs. Training clinicians to use different information and communication tools would therefore be essential for the successful adoption of Internet-based interventions. Therefore, occupational therapists should take this opportunity to explore and advocate for innovative treatment approaches (e.g., online support and self-management groups) to promote client self-management of disability, broadening occupational therapy practice through the Internet and information technology.

Factors related to Internet use

While establishing the role of the Internet as a popular way for occupational therapists to obtain current clinical information, this study identified a number of obstacles inhibiting the promotion of Internet use for patient care. A majority of the respondents indicated that they were provided with computers and core peripheral devices (e.g., printer); the lack of newer technological devices in the workplace, such as a smart phone which enables Internet access, may pose a barrier to the expansion of therapeutic opportunities (e.g., online support group for clients after their hospital discharges). Funding to provide current technologies (e.g., web cameras and encryption software for email communication) and adequate technical support is a prerequisite to enabling a smooth transition towards innovative service delivery methods.
In addition to a modern technologically-equipped workspace, “having technical support in the workplace” and relevant training may be significant factors influencing the therapists’ Internet use. The present findings suggest that older therapists were less likely to use the Internet in their clinical practice; thus, computer training could be another domain of continuing education (Ishizuki & James Cotter, 2009; Mckenna et al., 2005; Powell & Case-Smith, 2003). Training in Internet search skills, search engines and databases, as indicated by the survey responses, will improve therapists’ proficiency in performing Internet searches so they can remain informed of current treatment developments, medical breakthroughs, and community resources. Occupational therapists’ need for training to improve computer skills and search techniques, as well as critical thinking skills to evaluate research findings, was also reflected in previous studies (Bennett et al., 2003; McClusky, 2003).

Besides developing clinician’s Internet search techniques, Haigh (2006) suggested having a clinical librarian to help clinicians to effectively look for information. Her recommendation coincides with a 2009 survey finding of allied health professionals which showed that more than 50% of respondents would use the Electronic Health Library if they had access to a professional librarian to assist with their information search (Allied Health Professional Development Fund, 2010). As a result, a pilot service is now funded by the Allied Health Professional Development Fund (AHPDF) in Ontario, which provides allied health professionals access to one-on-one librarian services when using the Electronic Health Library (Allied Health Professional Development Fund, 2010). This government-led project aims to help promote Internet use among occupational therapist in Ontario to access information for best practice, as well as learning from the librarians on the use of online database and search techniques, for those who do not currently have this access at work.
Also, therapists from different clinical fields showed slightly different rates of using the Internet in their clinical practice. It is not known if the difference in frequency is related to unavailable or limited online resources in specific fields. Having a list of recommended websites or disease-specific electronic databases, as suggested by some respondents, may facilitate their access to reliable online information. Past research (Amtmann & Johnson, 1998; Bennett et al., 2003; Cullen & Litt, 2000; Haigh, 2006; Koller at al., 2001; Wyatt, 2001) also called for the establishment of updated, clinically-specific online databases to address the unique information needs of therapists with different clinical backgrounds. The OTSeeker website sets an example by providing direct access to clinically relevant information that encourages the application of research knowledge in occupational therapy practice (McKenna et al., 2005). Also, the recent introduction of an online librarian service supported by the College of Occupational Therapists of Ontario is another supportive move towards therapists’ access to online clinical resources.

Other obstacles that may inhibit Internet use among occupational therapists included the credibility of websites, the accuracy of Internet information, and liability concerns of therapists prescribing Internet information. These same concerns were also found in past research (Cooper et al., 2001; Cullen, 2000; Eberhart-Phillips et al., 2000; Gerber & Eiser, 2001; Hart et al., 2004; Jennett at al., 2004; Wilson, 1999; Yan 2010). Although website development guidelines exist, these guidelines did not seem to be well understood or well known to everyday Internet users. Thus, education about the features of a reliable website is needed to help both occupational therapists and clients differentiate among Internet resources with reference to credible sources of information and quality presentation.

All in all, this study provides some insights as to the extent of Internet use by occupational therapists in Ontario. The current levels of Internet use and the provision of
technological devices can serve as a baseline measure for future comparisons of occupational therapists’ adoption of information and communication technology. Specifically, knowing the extent of Internet use would help to guide government and corporate funding allocation for equipment and technical support. Future studies that investigate the technical proficiency of occupational therapists would also help website developers focus on making user-friendly databases for clinical applications.

Nevertheless, the clinical use of the Internet for finding information was evident, and this justifies the need for reliable websites and the development of clinically oriented electronic databases, ongoing training to therapists about information-search skills and use of peripheral computer devices and software, as well as complimentary practice guidelines. Email use was also recognized as a useful communication tool, although the expansion of its use with clients appeared to be facilitated by improved security, ensuring confidentiality of clients’ information.
Strengths and Limitations

In general, the study sample was drawn on the basis that all potential candidates had an equal chance to participate, within the administrative constraints (e.g., unknown changes to work addresses). However, 6% of total survey packages sent were returned to sender. Because occupational therapists are mandated to report personal profile changes within three months, a smaller time gap between the acquisition of the mailing address database and the survey mail-out date could have helped avoid the incidence of surveys returned because of incorrect addresses.

Despite the number of surveys returned, one of the strengths of this study is its relatively high response rate for a postal survey as a reasonable response rate has been estimated to be around 30% (Bailey, 1991). In their investigation of comparing the response rate of mail and web surveys, Kaplowitz and his colleagues (2004) found that the response rate of postal surveys was 32%. Similarly, the response rate of a recent survey of Canadian physicians conducted in 2007 was 32% (Grava-Gubins & Scott, 2008). The response rate of this study (38.7%) was high comparatively. As such, our findings are more generalizable and also the study benefitted from stronger statistical power for analyses.

This survey study also considered different ways to promote a higher response rate within the study budget, such as using a slogan on the envelope and a postcard insert to draw immediate attention from the recipients before the survey package was discarded, as well as limiting the survey completion time to approximately 10 minutes. Reminders were not mailed out as the researchers of this study did not expect a significant effect on response rate.
Kaplowitz and his colleagues (2004) for instance, confirmed that having email and postcard reminders had insignificant impact on raising the response rate of postal surveys.

As there could be many potential explanations to response rates of mail and web surveys (such as age difference and computer access), a mixed-mode approach of sending out both postal and web surveys with email reminders was recommended (Kaplowitz et al., 2004; Beebe, Locke, Barnes, Davern & Anderson, 2007). The use of both postal and web surveys with emails reminders could be considered as a way to maximize the chance of reaching out to all potential respondents. Nevertheless, as Kaplowitz and his colleagues (2004) suggested that populations that already used the Internet, electronic surveys have been found useful in providing a cheaper cost to a survey study with comparable response rate to a postal survey. Since this study found that almost 100% of occupational therapists had Internet access, future studies should investigate if response rates of web surveys and postal surveys are comparable in order to determine if web surveys can indeed be a more economical alternative for savings of time, postage and printing costs (Grava-Gubins & Scott, 2008).

In addition, therapists practicing in different clinical areas and different clinical settings were represented. The distribution of therapists in different clinical fields was similar to that of the profile reported by the College of Occupational Therapists of Ontario (COTO, 2008a), Canadian Association of Occupational Therapists (2007) and the Canadian Institute for Health Information (CIHI; 2008). In terms of demographics, the mean age of our sample (39 years old) was the same as the Ontario occupational therapists workforce and also with identical gender distribution (CIHI, 2008, p. 75; COTO, 2008a, p. 20). In addition, the distribution of types of education was extremely similar. For instance, the number of occupational therapists with diplomas was 5% in both our sample and the Ontario population, the number of occupational
therapists with B. Sc. (OT) was 69% in our sample versus 72% in the Ontario population (CIHI, 2008, p. 76). We had a slightly small percentage of M. Sc. (OT), 19%, versus 23% Ontario-wide. Also, we had a higher percentage of Ph.D. level training, 7% versus 0.3% in the Ontario occupational therapists workforce (CIHI, 2008, p. 76). Given our comparative high response rate, as well as comparable demographic characteristics, we believe that the results were fairly representative of the Internet use pattern of occupational therapists in Ontario.

Although our study sample showed a profile which may represent Ontario occupational therapists, it was difficult to compare all other characteristics because the wording of our survey and the Ontario occupational therapists workforce data collection was not directly comparable. Effort was made to draw comparisons with analysis of wording used in both surveys, it was found that in our sample and the Ontario occupational therapists workforce, a similar proportion of therapists worked in adult physical medicine, 61% versus 60% (CIHI, 2008; p. 75), and in hospital setting, 51% versus 48% (COTO, 2008a, p. 20). Future survey studies should consider matching their wordings with the COTO and CIHI surveys when they quantify their variables so that direct comparison of sample to population could be made.

Another potential short-coming of this study is disproportional response related to age. Respondents from our study sample were younger than 40 years old and had practiced for less than 10 years. This may warrant cautionary interpretation of the survey responses. The high response rate among the younger therapists may be partially explained by respondent interest in the survey subject and the motivation of the ballot-draw prize. Also, because of the extreme ratio between male and female respondents, any plausible gender effect may not have been captured. As with other surveys, the interpretation of the results must guard against self-selected
bias, because the findings may reflect opinions from respondents with a special interest in the survey subject matter.

Although we found that a majority of respondents used Internet information in their practice, the potential of future use by non-users was not clearly defined by the survey design. More meaningful data could have been collected if non-users had been asked to select their anticipated timeframe for using Internet information on a Likert scale of “in the next 0 to 3 months,” “3 to 6 months,” “6 to 9 months,” “9 to 12 months,” and “beyond 12 months.” Knowing how soon the therapists see themselves using the Internet would allow stakeholders to take appropriate action, such as pooling funding for more computer stations and drafting practice guidelines and reimbursement schedules for time spent on Internet-based communications.

This study serves as a preliminary investigation of occupational therapists’ Internet use for the purposes of information gathering and email communication. It provides information on Internet use at one time point from which future use can be compared. To further understand the specific needs of the therapists, more in-depth studies are called for to examine the information gap not provided by the Internet. For example, there may be an extensive amount of information found on arthritis but less on brain injury. Such an information gap, once identified, may help drive the development of online information resources for clinicians in different fields. Likewise, further investigation of therapists’ pattern of email use in a clinical context may guide development of secure information-sharing channels (e.g., intranet within a health care organization) to establish another new, efficient communication alternative.

In addition, the literature review for this study was only able to provide a brief overview of Internet use among professionals who work exclusively in the medical field. Potentially,
some important literature on surveys of a broader range of professionals such as social workers may have been missed. Findings about the extent of, and the factors influencing, Internet use among other allied health professionals may also provide relevant evidence to support the use of advanced information technology in occupational therapists’ practice in a multi-disciplinary context.

Lastly, since this study was conducted in 2007, the survey responses ought to be updated in order to reflect the current trends of Internet use among occupational therapists. Particularly, Internet access may have been different when increasing number of smart phones and other web-ready portable devices (e.g., netbooks) are made available at a more affordable prices. As well, as more rehabilitation programs are delivered via the Internet (Kairy, Lehoux, Vincent & Visintin, 2009), we believe that this may positively influence the number of therapists who wish to use the Internet for their clinical practice.
Conclusion

Performing searches for clinical information was the most popular Internet activity among occupational therapists. The respondents generally reported that the Internet provides useful information essential for their clinical practice and only a minority reported having difficulty in their Internet search. To further promote Internet use, research with more in-depth investigation of the actual information sources and naturalistic observations of their search behaviours should be conducted to further identify their training needs in clinical Internet use and search performance techniques. Having assistance from a clinical librarian, occupational therapists’ access of online information for best practice may also promote OT Internet use. The efficacy of such a service needs to be examined in order to justify organizational resource.

Despite the study’s limitations, the findings provided concrete evidence and hold significant implications for policy-making, training, and the future scope of occupational therapy practice. First, it identifies the need for technical workplace support to meet occupational therapists’ training needs when they lack proficiency using computers and information technology devices. Second, this study offers concrete evidence for regulatory and professional bodies about the need for practice guidelines to facilitate the adoption of email communication between occupational therapists and their clients. Lastly, because other Internet-based applications, such as video conferencing with clients, were uncommon, we suggest that future research efforts be directed towards finding evidence to support the development of cost-effective and client-empowering rehabilitative treatments using Internet technology (e.g., online consultation via video conferencing).
From this study, the current levels of Internet use and the provision of technological devices can serve as baseline for comparisons of future adoption of information and communication technology. Specifically, as the Ontario government promotes the adoption of different e-health strategies in health care settings, such as real-time streaming of video assessment for clients living in remote areas, computer technology relevant to clinical applications should be established in areas where none is currently available.

The study results revealed that occupational therapists have a wide range of experience with different Internet-based activities. The use of chat rooms, message boards, and audio-visual conferencing, however, was much lower than the use of the Internet for seeking information. Innovative clinical activities, such as moderating Q&A sessions through online message boards, online consultations or support groups and web-conferencing, are not common practice but present new clinical opportunities. Occupational therapists’ ability to address the rehabilitation needs of all clients may no longer be bounded by clinical setting and geographical area. More studies are needed to establish sound scientific evidence to support the clinical value of these Internet-based activities when developing newer treatment models using advanced information technology. The expansion of traditional care to Internet-enabled treatment modules, such as online support groups and health websites, is likely to push occupational therapists and other health care providers to become more proficient in the use of the latest information and communication technologies, for a possible cost-saving way to deliver rehabilitation treatment.

Last but not least, in order to reap the benefits of Internet-based technologies, our findings show that up-to-date training on Internet searches and the use of technical devices will need to be incorporated into therapists’ ongoing professional development. In addition, it is essential that all university programs ensure that new graduates have these skills. Clinical
practice guidelines and a reimbursement schedule for time spent in Internet-based activities also need regular review so that these will be in pace with the change of clinical practice when occupational therapists begin to adopt innovative ways in their delivery of care.
References


Appendices

Appendix A - Survey Package

Cover Letter

Survey

Ballot Form

Postcard
Welcome to the Study of
“Internet Use among Occupational Therapists in Their Clinical Practice”

This study is conducted by Veronica Law, M. Sc. Candidate, OT Reg. (Ont.), under the supervision of Dr. Angela Colantonio, Ph. D., OT Reg. (Ont.), Department of Occupational Science & Occupational Therapy and Graduate Department of Rehabilitation Sciences, University of Toronto.

The purpose of this survey study is to examine Occupational Therapists’ use of Internet in their clinical practice. It also investigates the factors that might influence their use in a clinical setting.

This survey should take approximately 5-10 minutes to complete. Your response is important to allow us to know how occupational therapists can use technology in their clinical practice.

After you complete the survey, you are invited to enter our Lucky Draw with a chance of winning one of three $25 Chapters gift certificates or an iPod Shuffle MP3 Player!!

Please kindly return this survey in the provided envelope before June 1, 2007 or as soon as possible.

If you have any questions about the study, please contact Veronica Law at 416-597-3422 ext. 7842.

Also, please note that:
- All information collected from this survey is confidential. You will not be identified personally from the submission of this survey.
- All data will be kept in locked filing cabinets and password protected computer files.
- The study has received research ethics approval from the University of Toronto.

Thank You.

Veronica Law
Principal Researcher, M. Sc. (Candidate)

Acknowledgement: This study is in part supported by the Medicare to Home and Community, under the Community Alliances for Health Research Programme of the Canadian Institutes for Health Research (CIHR); the Genesis Fellowship Award, under the Health Care Settings and Canadians, the Canadian Health Services Research Foundation in partnership with the CIHR and the Interdisciplinary Capacity Enhancement (ICE) grant under the University of Toronto Healthcare, Technology and Place CIHR strategic Research & Training.

* * * * * * * * * * * * *

On a weekly basis, the average time you spend on indirect &/or direct client care is:

Note: Direct Care is defined as face-to-face interaction with clients; indirect care is defined as interaction with clients without meeting in person, such as telephone or email communication.

☐ 0 hours
☐ Less than 18 Hours
☐ 18 – 37.5 Hours
☐ 37.5 Hours or more

Please continue to complete the survey if your clinical hour is more than zero.

If you do not have contact with clients, please return this survey with this introduction letter, indicating your clinical hour = 0, and complete the ballot form to enter the lucky draw if you wish.
** Survey **

** Please answer the following questions according to your TYPICAL Internet Use in the last 3 months before you complete this survey **

1a). Do you have Internet access?
   □ Yes  □ No

b). How many days per week do you use the Internet?
   i) For personal use? (e.g., emailing friends & accessing online banking)
      □ I do not use
      □ Less than 1 day per week (e.g., weekly, biweekly, monthly)
      □ 1 – 2 days
      □ 3 – 4 days
      □ 5 – 6 days
      □ Everyday

   ii) For use with clients? (e.g., providing information about treatment & community resources)
      □ I do not use
      □ Less than 1 day per week (e.g., weekly, biweekly, monthly)
      □ 1 – 2 days
      □ 3 – 4 days
      □ 5 – 6 days
      □ Everyday

   iii) For other work-related use? (e.g., email communication with colleagues & for professional development)
      □ I do not use
      □ Less than 1 day per week (e.g., weekly, biweekly, monthly)
      □ 1 – 2 days
      □ 3 – 4 days
      □ 5 – 6 days
      □ Everyday

2. Where do you use the Internet? (Check all that apply)
   a) Work  □ Yes  □ No
   b) Home  □ Yes  □ No
   c) Public place (e.g., library)  □ Yes  □ No
   d) Other  □ Yes  □ No

   Specify: ____________________________

3. At the place where you use the Internet most of the time, what is the connection speed? (Please check one only)
   □ Hi-Speed
   □ “I do not know the exact speed but it is good enough for me to do my Internet search”
   □ “I don’t know the exact speed but it is slow”
   □ “I don’t know”
   □ Other

   Specify: ____________________________
4. If you need information about your clinical practice, you would … (Check all that apply)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Ask a colleague</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Search textbooks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Look up answers in journal articles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Do an Internet search</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specify: ________________________________

5. Are the following Internet applications useful to your clinical practice? (Check all that apply)

<table>
<thead>
<tr>
<th>Application</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Searches for rehabilitation and/or medical knowledge (e.g., intervention or assessments, prognoses)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Searches for community resources (e.g., stroke support groups)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Email communication with clients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Email communication with clinical partners (e.g., other health professionals)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Leaving and reading messages on bulletin boards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Engaging in conversation via online chatrooms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Using a microphone for audio conversation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Using a web-camera for video conferencing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. It is not useful – I do not use the Internet in my practice</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Which of the following has helped or would facilitate using the Internet in your clinical practice? (Check all that apply)

<table>
<thead>
<tr>
<th>Facilitator</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Paid time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Quicker Internet connection speed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Having a computer station readily accessible for my clinical practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Having technical support at work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Credibility rating of websites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Having clients who use health information from the Internet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Having clients who use email to communicate with me</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. A work culture which depends on and fosters Internet use (e.g., working with OT colleagues who use emails and/or perform Internet searches)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Seeing other healthcare professionals (e.g., nurses) using the Internet in their practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. Training regarding the use of Internet applications (e.g., “how to provide consultation in an online chatroom”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Training regarding performing Internet searches (e.g., “how to perform an effective Internet search”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>l. Regulatory guidelines regarding the use of Internet in clinical practice (e.g., email communication with clients)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>m. Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specify: ________________________________

7. Do you use information gained from the Internet in your clinical practice with your clients?
   
   ☐ Yes ☐ No

   If yes,
   a) Do you have difficulty looking for information from the Internet?
      ☐ Most of the time ☐ Sometimes ☐ Neutral ☐ Not at all
   b) Do you find the Internet information useful for your clinical practice?
      ☐ Most of the time ☐ Sometimes ☐ Neutral ☐ Not at all

   If no, It is likely that you will use information gained from the Internet in your clinical practice
   c) In the next 12 months ☐ Yes ☐ No
   d) Beyond the next 12 months ☐ Yes ☐ No

8a). In your experience, which of the following use the Internet to look for information about their clinical condition and/or treatment? (Check all that apply)

   a) Adult clients with diagnoses of physical illness ☐ Yes ☐ No ☐ Don’t Know ☐ Not Applicable
   b) Adult clients with mental health diagnoses ☐ Yes ☐ No ☐ Don’t Know ☐ Not Applicable
   c) Geriatric clients ☐ Yes ☐ No ☐ Don’t Know ☐ Not Applicable
   d) Pediatric clients ☐ Yes ☐ No ☐ Don’t Know ☐ Not Applicable
   e) Family and/or friend caregivers ☐ Yes ☐ No ☐ Don’t Know ☐ Not Applicable
   f) Other healthcare professionals ☐ Yes ☐ No ☐ Don’t Know ☐ Not Applicable
   g) Other ☐ Yes ☐ No ☐ Don’t Know ☐ Not Applicable

   Specify: _______________________________

b). Have you ever encouraged any of your clients to use Internet to look for information and/or resources?
   ☐ Yes ☐ No

Personal Profile

9. What is your age? _______________________

10. What is your gender? ☐ Female ☐ Male

11. What are the first three letter/numbers in your postal code? _____ _____ _____

12. Where do you mostly work?
    ☐ Rural/Remote area ☐ Urban area ☐ Both

13. What is your highest education level?
    ☐ Diploma in O.T. &/or P.T. ☐ B. Sc. (O.T.) ☐ M. Sc. (O.T.)
    ☐ Other Masters Degree ☐ Ph.D.
14. How many years have you been working as an OT? ________________

15. What is your clinical area? (Check all that apply)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>a</td>
<td>Pediatric</td>
<td>Yes</td>
</tr>
<tr>
<td>b</td>
<td>Physical Medicine – Adult</td>
<td>Yes</td>
</tr>
<tr>
<td>c</td>
<td>Mental Health – Adult</td>
<td>Yes</td>
</tr>
<tr>
<td>d</td>
<td>Geriatric</td>
<td>Yes</td>
</tr>
<tr>
<td>e</td>
<td>Other</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Specify: ______________________</td>
<td>Yes</td>
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</table>

16. What describes your role as an OT? (Check all that apply)

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<tr>
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<tbody>
<tr>
<td>a</td>
<td>Therapist delivering direct &amp;/or indirect care</td>
<td>Yes</td>
</tr>
<tr>
<td>b</td>
<td>Educator</td>
<td>Yes</td>
</tr>
<tr>
<td>c</td>
<td>Consultant</td>
<td>Yes</td>
</tr>
<tr>
<td>d</td>
<td>Case Manager</td>
<td>Yes</td>
</tr>
<tr>
<td>e</td>
<td>Researcher</td>
<td>Yes</td>
</tr>
<tr>
<td>f</td>
<td>Sales</td>
<td>Yes</td>
</tr>
<tr>
<td>g</td>
<td>Other</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Specify: ______________________</td>
<td>Yes</td>
</tr>
</tbody>
</table>

17. Please indicate the clinical settings that you work in? (Use “1” for your primary setting, “2” for the second setting, & “3” for the third setting, maximum 3 settings.)

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<td>c</td>
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<td>d</td>
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<tr>
<td></td>
<td>e</td>
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<td></td>
<td>f</td>
</tr>
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</tbody>
</table>

18. What is the major funding source of your OT practice? (Use “1” for your primary setting, “2” for the second setting, & “3” for the third setting, maximum 3 settings.)

<p>| | |</p>
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<td>a</td>
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<td>b</td>
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<td></td>
<td>c</td>
</tr>
<tr>
<td></td>
<td>d</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
19. Do you use and/or own the following technology for your clinical work? (Check all that apply)

<table>
<thead>
<tr>
<th>Types of Technology</th>
<th>Do you use it for your clinical work?</th>
<th>Is it provided by your employer or your contracted agency?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Aids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. BlackBerry</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>b. Regular Cellular Phone</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>c. Fax Machine</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>Computers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Desktop Computer</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>e. Laptop Computer</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>f. Personal Digital Assistant, e.g., Palm Pilot</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>Computer Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Assessment Software</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>h. Documentation Software</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>i. Online Billing System</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>j. Email</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Digital Camera</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>l. Web-Camera</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>m. Computer Microphone</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>n. Printer</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
<tr>
<td>o. Scanner</td>
<td>1 Yes 0 No</td>
<td>1 Yes 0 No</td>
</tr>
</tbody>
</table>

<< The End >>

Thank You for Your Time & Please fill out the Ballot Form to enter the Lucky Draw.
Ballot Form

The Study of
“Internet Use among Occupational Therapists in Their Clinical Practice”

Please Complete the Following to Enter the Lucky Draw – Win 1 of three $25 Chapters Gift Certificates or an iPod Shuffle MP3 Player!!

Name: __________________________  Phone Contact: __________________

Send this ballot form with your survey and introduction letter using the self-addressed stamped envelope.
Ever wonder how the Internet influences your clinical practice?

“Internet Use among Occupational Therapists in Their Clinical Practice” is a study which investigates how the Internet influences OT practice and serves as a clinical resource.

We invite you to complete the enclosed survey - 10 minutes is all it takes.
Your input is valuable - We eagerly await your response!

Message from Dr. Angela Colantonio and Veronica Law, Dept. of Occupational Science & Occupational Therapy and Graduate Department of Rehabilitation Science, University of Toronto, the researchers of “Internet Use among Occupational Therapists in Their Clinical Practice”.
Appendix B - Letter from the College of Occupational Therapists of Ontario

September 27, 2006

Ms. Veronica Law
University of Toronto
Department of Rehabilitation Science
veronica.law@utoronto.ca

Dear Ms. Law,

Thank you for your recent submission of your proposed research project titled "The Study of the Use of Internet in Their Clinical Practice among Occupational Therapists in Ontario".

Upon review of the documents you have prepared, it is felt that we can support your research project as it is in the public interest that Occupational Therapists access good sources of information to meet their professional development plans and work with clients.

Upon receipt of documentation of the ethics review of your project, and the COTO Agreement Re: Provision of Mailing Addresses, we will be able to provide you with the information to print mailing labels from our data base.

Good luck with your research project.

Sincerely,

Elinor Lamney, MHSc., OT Reg. (Ont.)
Deputy Registrar
College of Occupational Therapists of Ontario

EL:mmr
Appendix C - Ethics Approval from the University of Toronto

UNIVERSITY OF TORONTO
Office of the Vice-President, Research and Associate Provost
Ethics Review Office

PROTOCOL REFERENCE #18799

November 2, 2006

Dr. Angela Colantonio
Rehabilitation Science
500 University Ave.
University of Toronto
Toronto M5G 1V7

Ms. Veronica Law
Rehabilitation Science
500 University Ave.
University of Toronto
Toronto M5G 1V7

Dear Dr. Colantonio and Ms. Law:

Re: Your research protocol entitled "The Use of Internet among Occupational Therapists in their Clinical Practice"

ETHICS APPROVAL

Original Approval Date: November 2, 2006
Expiry Date: November 1, 2007

We are writing to advise you that a member of the Health Sciences II Research Ethics Board has granted approval to the above-named research study, for a period of one year, under the REB's expected review process. Ongoing projects must be renewed prior to the expiry date.

The following consent documents (received October 16, 2006) have been approved for use in this study: Email Invitation, 1st Email Reminder, 2nd Email Reminder, Introduction Letter of Mailing Package, 1st Reminder of the Mailing Package and 2nd Reminder of the Mailing Package.

Participants should receive a copy of their consent form.

During the course of the research, any significant deviations from the approved protocol (that is, any deviation which would lead to an increase in risk or a decrease in benefit to participants) and/or any unanticipated developments within the research should be brought to the attention of the Ethics Review Office.

Best wishes for the successful completion of your project.

Yours sincerely,

Jenny Peto
Ethics Review Coordinator
Appendix D - Amendment Letter from University of Toronto

UNIVERSITY OF TORONTO
Office of the Vice-President, Research and Associate Provost
Ethics Review Office

PROTOCOL REFERENCE #18799

April 23, 2007

Dr. Angela Colantonio
Rehabilitation Science
500 University Ave.
University of Toronto
Toronto M5G 1V7

Ms. Veronica Law
Rehabilitation Science
500 University Ave.
University of Toronto
Toronto M5G 1V7

Dear Dr. Colantonio and Ms. Law:

Re: Your research protocol entitled “Internet Use among Occupational Therapists in Their Clinical Practice”

We are writing to advise you that a member of the Health Sciences II Research Ethics Board has granted approval to an amendment (received April 13, 2007) to the above referenced research study under the REB’s expedited review process. This amendment involves changing the name of the study, adding an additional postcard to the first mailing package, sending only one reminder instead of two, sending emails and/or flyers to clinical practice leaders or clinical managers, revisions to the survey, adding a ballot draw as a form of compensation and the addition of Dr. Mistalidis as a co-investigator.

The following consent documents have been approved for use in this study: Introduction letter, ballot form, postcard for the first mailing, postcard for the reminder, email and flyers (received April 13, 2007). Participants should receive a copy of their consent form.

During the course of the research, any significant deviations from the approved protocol (that is, any deviation which would lead to an increase in risk or a decrease in benefit to participants) and/or any unanticipated developments within the research should be brought to the attention of the Ethics Review Office.

Best wishes for the successful completion of your project.

Yours sincerely,

Jenny Pete
Ethics Review Coordinator

Simcoe Hall, 27 King's College Circle, Room 10A, Toronto Ontario M5S 1A1
TEL: 416 946-3073 FAX: 416 946-5763 EMAIL: ethics.review@utoronto.ca