Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Patients Visiting Emergency Departments

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Legend

CADTH - Canadian Agency for Drugs and Technology in Health

CIHI – Canadian Institute for Health Information

CTAS - Canadian Triage Acuity Scale

CI – Confidence Interval

CM – Compulsion subscale of Cyberchondria Severity Scale

CSS-30 – Cyberchondria Severity Scale 30 items

DS - Distress subscale of Cyberchondria Severity Scale

ED - Emergency Department

eHEALS – eHealth Literacy Scale

EM – Emergency Medicine

EP – Emergency Physician

ER - Emergency Room

EX – Excessiveness subscale of Cyberchondria Severity Scale

GT – Grounded Theory

HUI – Healthcare Utilization Intent

OHR - Online Health Research

OHI – Online Health Information

PI – Principal investigator

PUI – Problematic Internet Use

RE - Reassurance subscale of Cyberchondria Severity Scale

SHAI – Short Health Anxiety Inventory

Telehealth, THAS - Telephone Health Advisory Services

Abstract

Finding health information online continues to help patients understand new symptoms. However, incomplete information or advice that errs on the site of caution can cause distress or anxiety and prompt visits to a doctor. Cyberchondria, a new phenomenon, is defined as excessive compulsive searching for health information online that leads to distress and increase utilization of healthcare services. Grounded theory guided the conception of a mixed method study to investigate cyberchondria and symptom appraisal within Emergency Departments. A questionnaire and interviews were used to collect data from patients visiting a local Emergency Room. Results showed 63.3% of respondents looked up their symptoms online before their visit, and exhibited higher levels of cyberchondria and health anxiety than those who did not (p .001, p .004), and that health information consulted online can impact the decision to seek out immediate care. Strategies are needed to improve and promote quality online sources to benefit both seekers and services.

Keywords: online health information seeking, Symptom appraisal, Cyberchondria, emergency department utilization, questionnaire, interviews, case study, eHealth communication

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Chapter 1 Introduction

1.1 Context

The Internet has allowed for greater access to health-related information. Unlimited access to such a vast amount of information can fashion more informed patients who are able to discuss medical conditions and symptoms they experience with greater ease than before. Being able to research symptoms online can also help bring attention to the warning signs and cause an earlier diagnosis to potentially life-threatening or chronic conditions which might have otherwise gone unnoticed (Muller et al., 2017). However, literature continues to demonstrate that searching for symptoms and medical information online can also leave people feeling more anxious and distressed (Akhart & Fatima, 2020; Norr, Capron, & Schmidt, 2014). This is in part because overconsumption of online material can increase exposure to poor-quality or misleading information, and unsound medical advice as unregulated health-related information continues to run rampant on the Internet (Starcevic & Berle, 2013). This type of exposure is problematic and can lead to functional impairments and increased utilization of healthcare services, particularly in those who have anxious tendencies or are anxious about their health (Mathes, Norr, Allan, Albanese & Schmidt, 2018; Muse, McManus, Leung, Meghreblian, Williams, 2012; Starcevic, Baggio, Berle, Khazaal, Viswasam, 2019; Te Poel, Baumgartner, Hartmann, & Tanis, 2016; Ybarra & Suman, 2006). An upsurge in the number of walk-ins and appointments with healthcare providers is an unwanted consequence of online medical information seeking behaviour (Muse et al., 2012; Starcevic et al., 2019). Over consultation with physicians can have adverse effects on sectors of the healthcare system, notably in emergency medicine which is already experiencing long wait times and a strain on resources (CIHI, 2014; HQO, 2016; HQO, 2020).

1.2 Background

1.2.1 Internet Use for Health Information and eHealth

When people experience a health concern many use the Internet to find information (Muller et al., 2017 ; Semigran et al., 2015). Going online is convenient and an efficient way to find answers (Mathes et al., 2018). Around the world, individuals can search for and browse a variety of online platforms to learn about health conditions, diseases, symptoms, and treatments for themselves or their loved ones. Data suggests that many Internet users take advantage of the web for self-diagnostic purposes (Diviani, Bas van den Putte, Meppelink, & Weert, 2016; McMullan, Berle, Arnáez, Starcevic, 2019).

The growing dependence and utility of the Internet converging with the medical sphere is known as the domain of eHealth. It is defined as "health information and services being delivered and enhanced by the Internet" (Senft & Everson, 2018, p. 2). The accessibility and number of sources available online has revolutionized the way that people understand and deal with health information, use healthcare services and communicate with healthcare providers (Esyenbach, 2001). Over the last decade, many Internet searches worldwide have been symptom-based meaning that terms for the symptoms themselves are used in the search bar (Mueller et al., 2017a). Symptom appraising, researching with the aim of evaluating one's symptom, is becoming a common online searching behaviour (Mueller et al., 2017a). In the United Kingdom, the NHS reports over 15 million visits per month on websites dedicated to symptom appraisal alone (Semigran et al., 2015). Similarly, two thirds of Americans use the Internet for information related to self-diagnosis (Semigran et al., 2015). Consulted sites for symptom appraisal include Healthline, eMedicine, Wikipedia, WebMD, Mayoclinic (Rao, Goldfarb, Cohen, Wysocki, 2018). Regularly consulted sources extend beyond government and health organizational

websites. Health information is disseminated through social networking sites and YouTube, online communities like forums or support groups, dynamic user generated content (UGC) sites, e-consulting services, and health applications for mobile devices (Muse et al., 2012; Starcevic & Berle, 2013).

Many of these platforms are unregulated and unmoderated, which puts into question the validity and accuracy of the content being shared (Muse et al., 2012). The material can be anecdotal, or opinion based, which leads to subjective interpretations and emotional responses (Muse et al., 2012). Additionally, sources generated from search engines and diagnostic tools are more likely to disproportionally generate information on extreme or rare conditions and chronic diseases or to provide risk-averse advice (Semigran et al., 2015; Chambers et al., 2019). Semigran et al. (2015) refer to risk adverse advice as "encouraging users to seek care for conditions where self-care is reasonable" (p.1) or as "overly cautious" advice (p.8).

People who are inadequately equipped to sort through or correctly apply the information are more susceptible to misinformation and are at a higher risk of being negatively affected. Following age, race and gender, other predictors of how one consumes and digests online sources include: literacy and health literacy, level of cognitive and Internet skills, socioeconomic and psychosocial resources, and health status (very ill or not) (Percheski & Hargittai, 2011; Diviani et al., 2016). For instance, false information found on an online forum could be acted on before corroborating with other sources. Additionally, secondary source selection could be misguided, referring a reader to sources like Wikipedia over a medical site since it is easier to digest. The community intelligence found on the Internet can lack evidence-based conclusions and be biased (Hesse et al., 2011). Furthermore, individuals who have serious health conditions may be emotionally triggered by more risk averse advice found online (Beaunoyer, et al. 2017).

These various interactions may lead to disparities in health due to poor decisions for those individuals who are in unfavourable situations.

1.2.2 Obsessive Information Seeking Behaviours, Health Anxiety and Cyberchondria

Those who engage in unremitting online searching are subject to feeling overwhelmed by the over-exposure to inconsistent messages and misinformation. Prolonged Internet searches are correlated with increased levels of health anxiety and distress (Norr et al., 2014) which is escalating concerns amongst medical and health communication professionals (Teriaky et al., 2015). Amongst the concerns is *Cyberchondria*, the notion of repetitive online searching of medical information which results in excessive concerns about one's health and is associated with elevated levels of health anxiety (Starcevic et al., 2019). While symptoms of cyberchondria are considered distinct from health anxiety, the two are positively correlated (Mathes et al., 2018; McMullan et al., 2019). Studies have shown that people who experience both cyberchondria and symptoms of health anxiety have a higher tendency towards healthcare utilization (Mathes et al., 2018). Moreover, research suggests that health information seekers, defined as those who search online for health information, call upon health services with greater frequency to address the anxiety provoking information found online than non-health information seekers (Mathes et al., 2018; White & Horvitz, 2010). These events create a vicious cycle of searching and seeking reassurance from healthcare professionals for peace of mind.

1.2.3 Increased Visits with Healthcare Providers

Ontario's Emergency Departments (ED) have been in a state of overcrowding for years (HQO, 2016; HQO, 2019). In 2017, 5.9 million people visited Ontario's ED, an 11.3% increase since 2011 (HQO, 2018). In that same year, 40% of patients visiting the ED were coming in for issues that could have been treated by their primary healthcare provider (HQO, 2018). A recent

report from Health Quality Ontario (HQO) indicates the increase of visits has risen to 12% (HQO, 2019). According to Canadian Census data, between 2011 to 2016 Ontario saw a population increase 4.6% and over the same time Canada grew by 5.0% (by 1.68 million) (Census highlights, Gov Ontario, 2017). From 2016 to 2017, and 2017 to 2018 Ontario experienced growth rates of 1.40% and 1.77% respectfully (Statistics Canada, 2018). The population growth alone does not account for the increase in visits. Many medical professionals are aware of the issue of overcrowding, however, there is a need to continue research which focuses on the patient perspective and motivations for engaging with emergency care services for non-urgent matters (CIHI, 2014; Han et al., 2007; Raven, Lowe, & Maselli, 2013; Rowe, Ovens & Schull, 2020). Although there are other factors at play including lack of primary care physicians (CJEM, 2016; Rowe, Ovens & Schull, 2020) a perceived sense of urgency coupled with over-consultation of online resources, and the resultant recommended course of action being immediate care, could be possible contributors to the uptick in such visits and are worth exploring. Health anxiety and the recent phenomenon of cyberchondria arguably occupies space in the fabric of this complex issue.

1.3 Theoretical Context

The opening of this document discussed how the Internet and online resources influence people's health decisions. Continuously consuming and digesting medical content can elicit detrimental effects on mental health and well-being as well as negative emotional and behavioural consequences. Supported by prior research studies, this section will describe the theoretical context on which our thesis lies.

As the accessibility of health information increased due to the Internet, Ybarra & Suman (2006) raised the importance of learning what people do with the information they find online

and how they apply it. As we trend toward acquiring and processing health information online, who is likely to act on it and how? Additionally, Ybarra & Suman (2006) explored characteristics such as Internet usage, perception of the Internet and reasons for use as being helpful in answering these questions. Their study revealed that 55% of online health information seekers contacted a health professional because of the information they received online. Their work is relevant to this project as it emphasizes the need to explore the behaviours of those who use the Internet to search for health information (health information seekers) and those who visit healthcare professionals. As the Internet becomes further ingrained in the lives of health consumers, their research highlights the importance of pursuing studies on the way online health information is presented, perceived and its influence on the intent to seek health services (Ybarra & Suman, 2006).

Another element which was considered in the context of this research design is the prominence of symptom appraising online and how this information is presented and interpreted by consumers. Recently, Mueller et al., (2017a) conducted a systematic review to understand "the current role of the web, in help seeking and symptom evaluation, and the strategies people use to access information" (p. 2). Their review brings forth many key concepts such as how symptom appraisal is conducted and its ensuing behavioural and emotional consequences in relation to human behaviour and physical symptoms (Mueller et al., 2017a). The influence of instinct seeker bias, known as seeking until one finds the information that corresponds confirming their beliefs, can lead to increase searching and emotional reactions to the results. Their findings draw our attention to the effects of web use by comparing those who used the Internet as a resource to those who do not in a health clinic. These aspects of online health information (OHI) seeking are worth exploring within an emergency setting since either a wrong

self-diagnosis, increased health anxiety and cyberchondria could create more anxious patients and increased visits to emergency departments.

Ybarra & Suman (2006) and Mueller et al., (2017a) recommend pathways for future studies which include the need to study the impacts of the emerging searching trends, since many web users perform symptom-based searches. Results are crucial in discerning the advantages and disadvantages of web use and the accessibility of web content. By conducting such a study in a 'real-world' situation. This information can help in the development of strategies and communication tools and further discuss eHealth communication technologies that address the needs of the consumer while also minimizing the negative effects of risk averse advice or poorly understood health information found on various online sources.

Overconsumption of information can foster feelings of anxiety and uncertainty, especially when information seekers try to interpret troubling symptoms and make possible diagnosis online. Vladan Starcevic is one of the pioneers in cyberchondria research. His cornerstone paper, co-authored by David Berle, was published in 2013 following influential studies by White and Horvitz (2009; 2010) who proposed a link between online health research behaviour and the intention to engage with health providers. For their part, Tyrer et al., (2019) compared the prevalence of anxiety in medical clinics. Their findings revealed that health anxiety is on the rise in outpatient clinics and their cited explanations include increased accounts of cyberchondria, excessive use of the Internet, and increased attempts to interpret and self-diagnose symptoms. Tyrer et al., (2019) caution that attempts to self-diagnosing can cause unnecessary worry in patients, alter the communication between healthcare provider and the individual and increase visits to healthcare clinics. Since this thesis focuses on OHI, the rising prevalence of cyberchondria cannot be ignored.

1.4 Central Research Question

The above considerations inspired the conception of an exploratory research project to better understand people's experiences with OHI seeking, and what role cyberchondria and health anxiety play, if any, in patients seeking emergency services. To achieve this, we endeavoured to investigate people's perceptions, attitudes, and beliefs regarding OHI, the frequency of symptom appraising and the manifestation of cyberchondria and health anxiety. Accordingly, we are interested in the prevalence of cyberchondria and health anxiety in patients visiting the ED and its associations with healthcare utilization. Further, we are interested to see the rate at which people engage in online symptom appraisal prior to their visit and the likelihood associations with cyberchondria compared to their non-searching counterparts.

To date, we have not come across a study which incorporates these themes. For this reason, we are interested in investigating not only the experiences of people who previously viewed online medical information but also in narrowing our investigation to this emerging phenomenon within the context of EDs.

The results drawn from this study will help start discussions about the creation of strategies to help communication and medical professionals circumvent the proliferation and accessibility of erroneous OHI during patient interactions, while also contributing to the creation of elaborated communication tools to help improve eHealth literacy among Internet-users. Insights gained on the patient experience might help in the development of alternative eHealth technologies to better address the needs of OHI seekers. Indirectly, these efforts may help mitigate over-visitations of ER (or other health facilities) initiated by the distress and anxiety provoked by repetitive OHI seeking and symptom appraisal.

1.5 Methodology

In considering our research topic and gaps in the literature, it seemed logical to investigate directly in a hospital's emergency department. To fully answer our research question, we thought it essential to include both quantitative and qualitative data sets, lending to a mixed-methods approach. First, we employed a web-based questionnaire on site to patients visiting a local emergency room in Ottawa. Of the 208 surveys opened by participants, 128 were included in the analysis. The questionnaire allowed us to collect a high volume of responses which helps analyze the behaviours and trends of patients coming through our chosen site: the Hôpital Montfort's Emergency Department. Topics addressed in the questionnaire include health behaviour, Internet use, OHI seeking and symptom appraisal, eHealth literacy, cyberchondria and health anxiety.

Second, we conducted voluntary follow-up semi-structured telephone interviews. Nine participants took part in the interviews. The in-depth telephone interview gave respondents a chance to expand freely on their lived experiences and share their personal accounts with the Principal Investigator (PI) regarding the questionnaire topics. This qualitative data affords a richer analysis of people's individual experiences which deepens the exploratory nature of our study.

1.6 Thesis Structure

Chapter 1 Introduction

In this chapter we illustrate the issues that compelled the development of the research project, as well as provide appropriate background information to inform readers of the prominence of the issue. This chapter introduces the theoretical context, the central research question and the methodology that guided our research project.

Chapter 2 Background, Theory, Literature Review

This section provides an account of existing literature on our topic. The key findings of the literature review are discussed and serve as justification for our research questions. The chosen theoretical framework and research questions are further elaborated. We conclude by explaining the importance and contribution that this project will have on the current body of knowledge.

Chapter 3 Research Design and Methodology

We discuss the research strategy and methodology used to answer our research questions. The study design and tools are also presented in this chapter.

Chapter 4 Results and Analysis

This chapter explains our findings and offers an analysis of the results. The analysis was conducted within our chosen theoretical framework to best answer our research question. Our discussion focuses on our primary findings and relates them back to the literature review.

Chapter 5 Conclusion

This chapter summarizes and discusses the importance of the research findings while also providing real-word applications within the healthcare industry and field of health communication. Lastly, we discuss the limitations in our study and address considerations for future research to facilitate the conception of prospective studies.

Chapter 2 Literature Review

Chapter 1 offered an overview of how vast amounts of medical information have become accessible via the Internet. The content consumed can either empower people in terms of their health matters or create anxieties and uncertainties. Both circumstances can influence people's decisions to use (or not) healthcare resources. This section will first introduce the notion of eHealth, then go on to present the dynamics of Online Health Research (OHR), Online Health Information (OHI), and cyberchondria and health anxiety on Healthcare Utilization Intent (HUI). We will then discuss Emergency Medicine in Canada, and the potential risks Emergency Departments (ED) are confronted with as online health information seeking becomes commonplace. This chapter concludes by asserting our motivation for undertaking this study, the research questions, and the theoretical framework of the project.

2.1 eHealth, Health Literacy, and eHealth Literacy

As the Internet establishes itself as invaluable to our daily operations, it has become a popular avenue to access health-related information (Starcevic et al., 2019). eHealth, notably the convergence of the information technologies and the medical field has also come to embody the "new challenges" as well as great opportunities brought forth by this merger (Eysenbach, 2001, p.1). Eysenbach (2001) defines and describes e Health

eHealth is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology (Eysenbach, 2001, p.1).

eHealth enhances communication between provider and patients, business institutions and healthcare establishments, and patients and non-healthcare providers (Eysenbach, 2001). Senft and Everson (2018) classifiy eHealth into two categories: provider-facing activities which help facilitate communication with providers and independent activities refer to patient-led online research and communicating with non-healthcare providers (Senft & Everson, 2018). Via independent activities, patients now have the means to engage in their health and coordinate their healthcare (Senft & Everson, 2018). Most notably, patients can supplement information given by their providers with additional information acquired from the Internet. For instance, patients can take a more active role in their health, be more aware and informed, and feel empowered. However, the ability to research health information may also propagate negative or unwanted effects to both the individual and the healthcare system (Senft & Everson, 2018). Not all people have the same quality and access to the Internet. Disparities in health outcomes could occur because of differing socioeconomic status and cultural backgrounds. As Benigeri and Pluye (2003) remarked, "for educated people who know how to find useful information on the Internet regarding self-care and disease prevention, and who also know how to deal with the health care system, the Internet holds great promise (p.384)". However, equal access to OHI can help reduce the gap between health professionals and the population in terms of power dynamics and communication (Benigeri & Pluye, 2003).

Health literacy, a measure of health competence, is defined as a set of skills including basic reading and numerical competencies that make it possible for individuals to navigate the healthcare system, understand matters and make decisions regarding their health, and communicate effectively with their provider (Beaunoyer et al., 2017; Gutierrez et al., 2014). Literacy levels, as well as health literacy levels, contribute to a person's experience with OHI.

Health information seekers have varying levels of education and consequently operate at different reading levels (Benigeri & Pluye, 2003). Those with lower literacy levels face challenges when trying to read and comprehend advanced material and technical medical terminology. Often, technical information presented on organizations' sites is at a high school literacy level or higher. Thus, eHealth literacy is associated with the ability to discern valid medical information from disinformation or incomplete information found online and navigate the terrain of eHealth (Beaunoyer et al., 2017; Divani et al., 2016; Gutierrez et al., 2014). High levels of eHealth literacy are correlated to one's ability to locate, navigate and comprehend sources found online sufficiently to make an informed health decision (Paige et al., 2017). The positive interaction with OHI leaves the individual feeling empowered and confident. Alternatively, those with insufficient levels of eHealth literacy are at risk of feeling overwhelmed, anxious, misinterpreting information they consume or avoiding the Internet altogether. Interpreting information presented online can be emotionally triggering, especially if it pertains to a serious health condition, and can evoke feelings of fear and uncertainty (Beaunoyer et al., 2017).

The eHealth literacy scale (eHEALS) was developed to measure eHealth literacy and is currently the only one of its kind. The scale measures one's perceived confidence in their ability to locate and evaluate information retrieved online to make informed health decisions (Paige et al., 2017). eHEALS is featured in academic studies and used as a screening tool for patient groups in a range of settings with satisfactory validity. Though proven to be satisfactory, updates to the instrument are needed to capture the rapid evolution of data being uploaded to the Internet, for instance, to include the dynamic elements found on social media sites. Formal evaluation

criteria for the new interactive media should incorporate readability, emotional tone, understandability, usability, connectivity, and multimodality of content (Beaunoyer et al., 2017).

2.2 Online Health Research Behaviour and Healthcare Utilization Intent

2.2.1 Internet Usage

In 2013, two billion people accounted for the global Internet usage (Teriaky, Tangri & Chande, 2015). Today, the Internet continues to be a prominent platform to educate people on a variety of topics, including medical and health-related matters (Teriaky et al., 2015). Individuals can search for and browse online venues to learn about health conditions, diseases, symptoms, treatments and how to maintain overall health (Diviani et al., 2016 ; McMullan et al., 2019). People also use the Internet to research information like conditions or treatment they have heard either discussed or advertised on mainstream media (Hogue, Doran & Henry, 2012). We know that online resources compliment interactions with health professionals, rather than replace them (Percherski & Hargittai, 2011) as patients will perform searches before and after consulting with their physician (Sillence et al., 2007). Advice acquired online can boost that received from the social support system and healthcare professionals which helps in the patient's decision-making process (Sillence et al., 2007).

Increased OHI seeking is correlated with age, gender, and race/ethnicity with Caucasian, white middle-aged women being more likely than their counterparts to engage in online health research (OHR) (Elliot et al., 2015; Percherski & Hargittai, 2011). Other factors associated with increased OHR include higher levels of education, social support systems, health status, and one's ability to use the web (e.g., previous engagements with online banking, online shopping, etc.) (Baker et al., 2010; Hageman et al., 2015; Percherski & Hargittai, 2011; Ybarra & Suman, 2006).

2.2.2 Sources for Finding Medical Information

Prior to the Internet health information was communicated through traditional print media or broadcasts. As the functionalities of websites were created, static government-regulated, medical societies and health organizational sites housed health information. Today, as the online landscape evolves Web 2.0, or participatory web, presents us with a collective intelligence realized by dynamic and participatory features such as communally created pages (e.g., Wikipedia), and the ability to post comments, consume audiovisual elements, and like and share pages (Hesse et al., 2011). Moreover, public access to domains and social media sites has enabled content to rapidly proliferate since the early 2000s.

Highly trafficked websites for finding health and medical content now include those run by medical professionals, commercial search facilities, social media sites and YouTube, online communities like patient-led groups or support groups, dynamic user generated content (UGC) sites, e-consulting services, and health applications for mobile devices (Muse et al., 2012; Starcevic & Berle, 2013). Preference for resources is highly individualized based on one's firsthand experiences, culture, language, health beliefs and social support systems (Ditzler & Greenhawt, 2016). However, as the number and types of platforms increase, sorting through and determining which sources to consult and rely on can be both overwhelming and challenging.

2.2.3 Problems: Confounding, Unreliable Facts and Misinformation

In the year 2000, up to 100,000 health-related websites were identified (Zun et al., 2004). Search engines have greatly facilitated the retrieval of resources from the sea of content found on the web and continue to be the most used method of acquiring information by seekers (Chen, Zhao & Wang, 2020). Hundreds even thousands of sources are available within seconds. Many of the websites provided contain incomplete, inaccurate, misleading, or poor-quality information

(Eichenberg & Schott, 2019; Semigran et al., 2015; Starcevic & Berle, 2013; Starcevic et al., 2019; Rao et al., 2018). A study performed by Zun et al. (2004) which surveyed medical sites found that only 26.8% to 74.8% are complete with all medically relevant information. The quality of information across various health domains continues to be 'problematic' as concluded by an extensive systematic review of websites available to the public (Zhang, Sun & Zie, 2015). and that information found on easily accessibly sites do not always agree with professional or association recommendations regarding assessments and treatments (Whitley & Kieran, 2020). OHI seekers will encounter information that is misleading or based on insufficient scientific evidence: online support groups offering anecdotal evidence which may not be applicable to everyone or may lend to subjective interpretations; or consumer advertisements from the private sector (Benigeri & Pluye, 2003; Muse et al., 2012). Many chatrooms are unregulated and unmoderated which runs the risk of spreading false information (Beaunoyer et al., 2017; Muse et al., 2012). In other instances, if the information is valid, it may be incomplete by omitting alternative/holistic medicines (Benigeri & Pluye, 2003). Some websites with correct advice are busy, contain advertisements, or are unorganized which requires extra effort to sort through the material. These elements discourage visitors from staying on the page (Zun et al., 2004). As previously discussed, other sites contain medical terminology that is hard to understand. Diagnostic tools used for symptom appraisal are more likely to disproportionally generate information on extreme or rare conditions, chronic health diseases or risk-averse advice (Chambers et al., 2019). Especially when searching for acute symptoms (chest pain, shortness of breath, abdominal pain, headache, fever, diarrhea, nausea and vomiting, fainting) which are also non-specific, research shows that the websites' first page recommended to seek care in 38% pages ranked 1-5, 48% ranked 6-10 and 28% ranked 11-15, and found that symptoms sites

highly ranked by search engines were found to triage advice towards ED most often (North et al., 2012). North et al also found that not all sites consistently address the complexities of triage by failing to provide diverse or nuanced options and lack timelines regarding when to see a physician (2012).

Various associations have been established to help regulate content being posted on the web. Organizations like Health on the Net and the American Accreditation Health Care Commission Inc. are dedicated to regulating online health information (Zun et al., 2004). Health on the Net has a set of guidelines, named the HON Code where abiding websites are honoured with a badge. However, this seal goes unrecognized by the average health consumer. Eysenbach and Kolher (2002) noted during their study that when the badge did appear on the page, consumers often did not click it. Health on the Net does not employ active surveillance processes for seeking out false information, nor does it oblige a renewal. Unfortunately, there are no tangible incentives for receiving the badge. Additionally, general awareness and adherence to these guidelines are low (HON, 2020; Zun et al., 2004).

Despite the best intentions set out by guidelines, the Internet remains a largely unregulated territory. Poor quality information is ubiquitous with the rise in fake news outlets and puts consumers at risk of making ill-informed health decisions. The fast-paced, rapidly changing environment is creating complex and varying information. Assessing validity, reliability and quality of information has become the responsibility of the consumer. To cope, seekers have adopted heuristic strategies and rely on subjective evaluation criteria (Beaunoyer et al., 2017; Jung, Chung & Soo Rhee, 2018; Sillence et al., 2007).

2.2.4 Source Credibility and Trustworthiness

There is a growing body of literature investigating the appraisal of source credibility and quality of online sources in response to the propagation of readily accessible health-related content. The established criteria for appraising the credibility of a source are the site owner, authors qualifications/credentials, and visible update stamp (Eysenbach & Kohler, 2002). Although in theory consumers identify these as important, they are not applied by most information seekers. Trust is another important aspect of OHI seeking. Established criteria for determining trustworthiness of a site include the authority of the source, layout and appearance, advertising, readability, outbound links, picture of the site owner, email contact, credentials, qualifications, updating content, and a quality seal and third-party endorsement (Eysenbach & Kohler, 2002).

Searching for and isolating credible sources requires skills, patience, and practice. There is a failure on behalf of seekers to implement a systematic approach and follow recommended appraisal guidelines. Many people lack the appropriate skills to critically appraise the information they consume online (Akhart & Fatima, 2020; Paige et al., 2017). Instead, the user's experience navigating the web has emerged as an extremely important dimension for seekers. The interaction will result in accepting or rejecting the site based on subjective (non-established) evaluation criteria. Studies have concluded that an overwhelming majority of searches begin by using Google instead of going directly to a trusted site (government, association, medical societies, or organization) or even a library (Diviani et al., 2016; Eysenbach & Kohler, 2002). Research shows that seekers spend as little as 11 seconds on a website and can reject a site within 10 seconds (Sillence et al., 2007). As we progress into the 21st century, people's interactions with search results remains relatively quick as Chen, Zhao and Wang (2020) found

that those who search for health information online were found to spend between 52 to 85 seconds and browse five to seven pages when looking for information on healthcare services to diagnoses (Chen, Zhao & Wang, 2020). First impressions of a source have become critical in establishing a trusting relationship. Non-established criteria, such as the look and feel of the website, as opposed to established ones, are used. Specifically, it is the attractiveness of the site that influences how seekers determine its credibility (Diviani et al., 2016; Jung, Chung & Rhee, 2018). The quality of the information is judged by the aesthetics and presentation rather than the content itself. Subjective criteria like font size, colour and page layout have become key elements rather than objectively assessing the material written on the page (Beaunoyer et al., 2017; Jung, Chung & Soo Rhee, 2018). Other notable elements that are used to assess the quality of information by OHI seekers include simple language, interactive features, FAQ page and discussion groups (Sillence et al., 2007). If the surface characteristics do not meet the user's expectations, then they quickly lose interest (Jung et al., 2018). Similarly, if the page is disorganized or contains broken links then the user loses trust in the source (Sillence et al., 2007).

Secondly, the overall the ranking of the search results are still perceived as being more reliable to seekers (Diviani et al., 2019). When examined in earlier studies, the first ranked links are always selected (Eysenbach & Kohler, 2002) and people still use this searching strategy and admit that ranking or placement must suggest higher credibility (Haider & Sundin, 2022). Unfortunately, these are not substantive strategies since attractiveness and hit order do not equate to high-quality information.

The use of non-established criteria is problematic because it tends to be subjective. Valuable information can be dismissed due to surface level features. As evidenced above, the evaluation of OHI at large is problematic.

2.2.5 Symptom Appraisal, Self-Assessment and Web-Based Triage Tools

Websites with web-based algorithm triage features are designed to help patient triage their symptoms and conditions into issues that can be dealt with at home, seen by a family doctor or to be seen by an emergency physician, (e.g., WebMD, Healthline or NHS) have added another level of complexity to consumers (Chambers et al., 2019). Over the last decade, people around the world have been consulting such sites in attempts to self-diagnose (Diviani et al., 2016; McMullan et al., 2019; Mueller et al., 2017a). In the United Kingdom, the NHS reports over 15 million visits per month on websites dedicated to symptom appraisal (Semigran et al., 2015). Similarly, two thirds of Americans use the Internet for information related to self-diagnosis (Semigran et al., 2015). Experts caution against using these sites because they provide inconsistent, vague, or extreme medical advice and there is a tendency to over diagnose rare conditions (Chambers et al., 2019). Most web-based triage functions limit their suggestions to 1) treating the symptom(s)/condition(s) at home; 2) making an appointment with a primary care provider; or 3) seeking immediate medical attention. Studies have illustrated that the recommendations made online are often more conservative and risk-averse compared to an in-person consultation (Chambers et al., 2019; Semigran et al., 2015), meaning the lack of specificity to the seeker's situation and confounding results will usually result in recommendations towards an in-person appointment with a healthcare professional to err on the side of caution. In other words, these triage websites and their advice tend to be "overly

cautious" which can push seekers towards appointments with practitioners (Semigran et al. 2015).

There are considerations when using these sites. For one, not all sites' algorithms conform to the well-known triage methods, such as Schmitt or Thompson protocols (Semigran et al., 2015). Secondly, symptoms and pains can be hard to articulate. Non-medically trained individuals often lack the medical terminology to accurately describe their symptoms. The mislabelling of a primary symptom can yield unfit information or triage advice (Baker et al., 2010). Differential diagnosing performed by physicians is a complex art which relies heavily on the chief complaint weighted out against other symptoms and by an account of the patient's medical and lifestyle history that is usually determined through a dialogue (Maude, 2014).

2.2.6 Health Searching Behaviour and Healthcare Utilization Intent

The source and content related to medicine and health continues to diversify on the Internet and provides patients with tools to coordinate their care (McMullan et al., 2019: Senft & Everson, 2018). Not only are people searching for medical information relating to symptoms, conditions, and treatments, but they can also share their experiences as well as consult with professionals online. These revelations have shaped novel health-related Internet behaviours (Starcevic & Berle, 2013). Patterns of searching can be routine or excessive. Engaging in health searching behaviour can influence decisions whether to speak with their physician about treatment, therapy or over all approach to maintaining one's health (White & Horvitz, 2010).

Ybarra and Suman (2006) revealed certain circumstances that are more likely to incite contacting a medical professional (Ybarra & Suman, 2006). In their national study of help seeking and the Internet, these authors found that people who search for a specific cause online are up to 60% times more likely to seek out professional health services compared to those who

did not search online. Additionally, people who try to diagnose a problem using the Internet were 2.5 times more likely to contact a health professional than those who did not self-diagnose. In terms of Internet usage, those who spent more time per day on the web looking for health information were more likely to reach out to a health professional. And those who had a challenging time understanding the information found were 2.6 times more likely to seek out support. For individuals who may already be sick, consulting sources on the Internet seems to play a role in inciting people to follow up with their healthcare provider for reassurance.

White and Horvitz (2010) refer to this level of engagement as healthcare resource utilization intent (HUI). Although the Internet is providing people with a way to be more informed, the number of physician consultations and visits to medical facilities is not decreasing. Results from White and Horvitz's (2010) online survey on online health searching behaviour revealed people experience feelings of uncertainty and distress and these unwanted feelings could push them to engage with their healthcare provider either for a consultation, to request diagnostic testing or certain types of therapies in the hopes of easing the worry. Interestingly, they found 25% of respondents stated seeking medical attention because of their emotional response (White & Horvitz, 2010).

It has been repeatedly suggested that increased OHI seeking may further reinforce the anxiety of those who are overly anxious about their health and runs the risk of overconsuming online material (Benigeri & Pluye, 2003; Te Poel et al., 2016). Individuals who experience higher levels of anxiety or uncertainty following online searching are more susceptible to seeking reassurance, which can result in an unwarranted visit with a medical professional. The outcomes of these behaviours not only risks causing a strain on the healthcare system by overuse of resources, but also impacts the individual.

2.2 Cyberchondria, Health Anxiety and Problematic Internet Use

Amongst the useful and empowering information that exists on the Internet but as previously discussed there is a slew of incongruous, complex, oversimplified, and false information. This next section outlines how consumption of the latter can create confusion, worry and uncertainty. Whether it is to learn more about a condition or illness, or to self-diagnose, seekers risk developing anxiety following their queries (Te Poel et al., 2016).

Health anxiety is known as the anxiety surrounding one's health. It is the distress that one feels about their health due to the unfounded misreading of bodily sensations (Te Poel et al., 2016). In the most acute cases, people will believe that they have a serious medical condition or illness. Health anxiety now forms a central feature of both Illness Anxiety Disorder and Somatic Symptom Disorder (Doherty-Torstrick, Walton & Fallon, 2016). With health information being more readily accessible on the web, obsessive OHR is contributing to growing anxiety about one's health. This new phenomenon is known as Cyberchondria. Simply put, it is the cyclic anxiety and distress caused by excessive and repetitive OHI seeking. Second to causing distress to the individual, the psychological effects also impact people's use of healthcare services. Further, it has been associated with driving people "over the edge" to seek out healthcare services and using healthcare resources (White & Horvitz, 2010).

Cyberchondria's 20-year history makes it a relatively new topic in the academic literature. The ease of access and exposure to medical information online received a lot of negative attention in the mainstream media in the early 2000s, the first article to bring the potential issues of having health information online to the public eye was published in the Wall Street Journal in 1999 by journalist Ann Carrns titled 'On the Internet, diseases are rampant, playing to worries of hypochondriacs' (Starcevic & Berle, 2013, p.206). Following this article,

bold claims that the availability of health information online was having deleterious effects on the public were circulating in the headlines like “New disorder, cyberchondria, sweeps the Internet” published in The Independent, a British newspaper and consequently the term Cyberchondria was popularized by the media (Starcevic & Berle 2013, p.206), Its etymology is inspired by *cyber* and *hypochondriasis*. The news stories addressed the repetitive behaviour of online searching as a form of addiction (Starcevic, Berle & Arnáez, 2020a). Health professionals were initially skeptical to investigate possible medical relevance due to hyperbole connotations being propagated by the media (Starcevic, Berle & Anáez, 2020a) but in 2003 researchers Starcevic and Berle began their own academic investigations. Their findings validated aspects claimed by journalists and laid a solid foundation towards better understanding of this phenomenon. Influential research by White and Horvitz published in 2009 and 2010 seconded the notions of worries manifesting after extensive exposure to information found on the Internet in attempts to self-diagnose. These findings legitimized the pursuit of subsequent empirical and theoretical research, propelling efforts aimed at understanding the impacts of the intersection of health information and the Internet on people (Starcevic, Berle & Arnáez, 2020a).

Problematic Internet use (PIU) is defined as the ‘inability to control one’s used of the Internet which leads to negative consequences in daily life’ which overlaps with addition, impulse control disorders (Spada, 2014, p.1). The construct encompasses five main components including loss of control, preoccupation, withdrawal symptoms, coping or mood modification and conflict has been the focus of recent investigations (Fergus & Dolan, 2014). The main feature of PIU is excessive use of the Internet as a whole (Fergus & Dolan, 2014). People who engage in PIU experience greater levels of subjective distress (Fergus & Dolan, 2014). The most prominent finding asserts that health anxiety is positively correlated with the frequency of

health-related online searching (Fergus & Dolan, 2014). Other data suggests that PIU is associated with increased reassurance-seeking behaviour, the action of seeking our assurances or looking to be reassured (Doherty-Torstrick et al., 2016). In fact, reassurance-seeking in those with obsessive-compulsive tendencies lead to more distress rather than its intended conciliatory effects. Indeed, cognitive-behavioural models now posit that reassurance-seeking is a main factor in health anxiety (Doherty-Torstrick et al., 2016).

Following studies on health anxiety, conclusive evidence links health anxiety to searching for health information online (Fergus & Dolan, 2014). Specifically, those with higher levels of health anxiety have been found to seek OHI more frequently, spend more time searching and find searching more distressing and anxiety provoking than those with lower levels of health anxiety (Muse et al., 2012; Norr et al., 2014; Starcevic & Berle, 2013). Additionally, searching for health information online may create levels of anxiety where there was none before (Muse et al., 2012; Norr et al., 2014). The largest proportion of OHR is on symptoms and trying to self-diagnose based on recommendations found online (Bisson et al., 2016 ; Semigran et al., 2019 ; Chambers et al., 2019). Fears and distress are generated based on the potential diagnosis with the worst-case prognosis.

The growing body of knowledge and literature is contributing to a deeper understanding of cyberchondria. Early literature relates cyberchondria to ones' active searches for health-relevant information using the Internet rather than to passive exposure to online health content. This behaviour has been associated with unpleasant and negative effects, mainly in the form of heightened anxiety, either producing or amplifying distress and anxiety (Starcevic & Berle, 2013). An identifiable characteristic of cyberchondria has been excessiveness exhibited by repeated or lengthy searching (Starcevic & Berle, 2013).

Current literature confirms dimensions of cyberchondria as: time-consuming and repetitive nature of online searches, negative emotional states and the corresponding physiological reactions associated with searches, inner conflict as to whether to trust one's own doctor or the results of online searches, experience of the searches as unwanted and reassurance seeking (Starcevic et al., 2019). Truly defining it has been a challenge due to the fluidity and overlapping characteristics observed amongst Anxiety and Obsessive-Compulsive Disorders. Firstly, there is an element of compulsion where there is an urge to engage in OHR, against one's wishes even if it is known to be an unpleasant experience. This impulsion detracts from other activities, both online and offline (White & Horvitz, 2009). Additionally, the person presents distress as they experience the negative feelings and emotional state while they are looking online (Muse et al., 2013; White & Horvitz, 2009). The searches may also amount to the need to seek reassurance from a medical professional to either confirm or disprove a self-assessment based on the information provided online (White & Horvitz, 2010). There may be a mistrust in the medical professional inn cases where the anxiety is so crippling that the individual is inconsolable by their medical professional, leaving them in a state of paranoia believing firmly in what they have consulted on the web.

2.2.1 Steps Towards a Better Understanding of Cyberchondria

As research moves forward, Starcevic, Berle and Arnáez (2020a) propose two main approaches to best define cyberchondria. The first approach puts emphasis on health anxiety, in that cyberchondria is a behaviour of repetitive and or excessive online health research that results in health anxiety or distress. The second approach acknowledges both health anxiety and an element of compulsiveness, taking on a broader scope and classifying cyberchondria as a multidimensional syndrome.

New findings and contributions from diverse studies and theoretical works have supported the integration of OHR. Recent conceptions of cyberchondria include notions of repetitive and time-consuming OHR, hard to resist, and serves the purpose of reinforcing negative emotional states or distress associated with OHR, prioritizing OHR causing an interruption of other activities, and consulting a physician for reassurance (Starcevic et al., 2020a; Vismara et al., 2020). Despite the negative feelings and consequences, afflicted individuals continue to engage in the cycle. Through continued understanding, cyberchondria may be better defined as a dimensional construct on a continuum from mild to severe psychopathological pattern. The continuum would assess OHR as a behaviour associated with distress or anxiety to the point of interfering with functioning (Starcevic et al., 2020a).

Although there is no conclusive evidence pointing towards what causes one to exhibit some of the characteristics of cyberchondria, it is posited to be associated with a range of factors. For example, it may be related to a difficulty in distinguishing between credible and non-credible sources on the web. OHI can range from being peer-reviewed or professionally reviewed to personal blogs, opinions, or anecdotes of other patients (Akhtar & Fatima, 2020). Information can vary in quality and patients may not have the necessary skills to evaluate the medical information and relate it to their own health circumstances (Akhtar & Fatima, 2020).

People tend to seek reassurance without critically appraising source data, leading to a sense of being overwhelmed and disempowered by the information they find (Doherty-Torstrick et al., 2016). This causes people to feel worse after reassurance seeking rather than better, which maintains their anxiety. Discrepancies between sources force consumers to make a choice on whom to trust. This confusion finally leads them to consult their medical practitioner to discuss their concerns and get reassurance from them (Akhtar & Fatima, 2020).

Poor techniques and disproportionate use of social media to advise and diagnose symptoms contributes to unnecessary worry and consultations (Tyrer et al., 2019). Although cyberchondria does not appear to be a distinct disorder at this time, it has been associated with functional impairment and increased healthcare utilization.

2.2.2 Impacts on Public Health Outcomes and Healthcare Utilization

Increased use of healthcare services can impact public health outcomes which has significant public health implications (Starcevic et al., 2019). Beyond poor health outcomes of these individuals' interactions with healthcare providers can change towards improved communication or decreased communication (Tryer et al., 2019; Starcevic, Berle & Arnáez, 2020a). Influential studies by White and Horvitz in 2010 initially explored people's intentions to visit health services after they spent time searching for the symptoms on the web. Since then, the literature continues to document accounts of people feeling more anxious and distressed and having trouble sleeping after having searched their symptoms on the Internet (Akhtar & Fatima, 2020).

Health anxiety and cyberchondria are related but showed distinct public health outcomes. Health anxiety is more related to a poorer quality of life, while cyberchondria is associated with greater functional impairment and healthcare utilization (Starcevic et al., 2020a). The distinction illustrates how the phenomenon caused by excessive OHR is influencing people's psychosocial functioning (Mathes et al., 2018). A reassurance assessment of cyberchondria is positively correlated to a person's tendency to see their healthcare provider regarding what they have consulted online and may lead to asking for more frequent unnecessary medical interventions which can become costly for the healthcare systems (Akhtar & Fatima, 2020).

A study conducted by Doherty-Torstrick et al. (2016) revealed that more than two thirds of their participants reported having had their symptoms checked by a physician after feeling "frightened" by the health-related information accessed online. They also noted that the time spent symptom checking online was a significant predictor in worsening symptoms of anxiety (Doherty-Torstrick et al., 2016).

Most people with health anxiety present themselves to a general hospital instead of mental health services and Tryer et al. (2019) note that shift towards personal responsibility in monitoring health is a concern amongst health services as the anxiety should be address by social psychiatry (Tyrer et al., 2019). According to a recent study, over half of walk-in patients in a hospital presented elevated levels of depressive symptoms who have also searched for their health conditions online (Akhtar & Fatima, 2020). Additionally, Tyrer et al. (2019) found an increase in patients presenting health anxiety in various outpatient clinics (Cardiology, Endocrinology, Gastroenterology, Respiratory Medicine). Indeed, increased reassurance seeking was associated with greater physical and mental healthcare utilization (Mathes et al., 2018).

Additionally, communication between patients and physicians can be impacted by becoming adversarial or avoidant (Starcevic, Berle & Arnáez, 2020a).

The dangers of unnecessary worry and concern have not been sufficiently recognized on a national scale. As illustrated in the with previous examples, continued evidence suggests cyberchondria does have a distinct set of characteristics and symptoms which require further investigation due to its impact on psychosocial functioning as in the individual's suffering and over consultation of healthcare utilization.

2.3 Health Information Seeking and Cyberchondria in the COVID-19 Pandemic

March of 2020 marked the start of the global pandemic. The COVID-19 pandemic was characterized by novel strains of coronavirus that rippled through the globe for over two years, setting record infection rates and forcing people into lockdowns and online interactions. Internet usage increased as work and social interactions shifted online. The pandemic was particularly unprecedented in how it affected information and communication technologies. Public health and political officials were forced to adapt their messaging with changing directives as scientists continued to learn more about the rapidly mutating strains. At the height of the pandemic, source credibility was put into question by increased use of social media accounts and authorities in politics and public health unable to synchronize the messaging in their districts as large amounts of information was being published as scientific facts evolved (Starcevic, Schimmenti, Billieux, Berle, 2021). The emergence of alternative platforms of communication and the growing distrust in government officials has led consumers to rate these alternative sources of information (e.g., social media) as equally as reliable sources which has led to the "Pandemic of misinformation" (Starcevic, Berle & Arnáez, 2020a).

This bombardment of messaging resulted in information overload, incongruent, misinformation and mistrust of officials (Starcevic et al., 2020a; Starcevic et al., 2021). The lines of truth were blurred even more as incomplete or misinformation was circulating on social media and people using these channels of information at higher rates became more prone to cyberchondria (Starcevic et al., 2021). Globally, levels of health anxiety increased, and people became predisposed to cyberchondria due to compulsive and excessive searches, and distress caused by frequent active Internet activity (Starcevic et al., 2021).

2.4 Emergency Medicine and Triage in Canada

Significant changes to the field of Emergency Medicine (EM) in Canada began to occur in the 1970s. Up until the early 1980s, the Emergency Departments (ED) were typically staffed by family medicine practitioners (CWG-EM, 2016). The skills they needed to care for their patients were reliant on a mixed bag of training in acute primary care and family medicine and on experience they acquired 'on the job.' In 1983, following years of advocacy for its own residency programs to meet the needs of the incoming patients, EM became a recognized specialty in Canada (Rutledge, 2008). Though the specialty is relatively new, the ongoing dedication to expand the field of EM in Canada has resulted in a quality of care by international standards (Rutledge, 2008). Nevertheless, despite great advances in care, education, research, and policies, a disparity exists between the number of emergency physicians (EP) and patient demand for emergency services in Canada (Rutledge, 2008; CWG-EM, 2016). The Collaborative Working Group on the Future of Emergency Medicine in Canada (CWG-EM) predicts a shortage of 1518 EPs by 2025 (CWG-EM, 2016). As the patient demands and visits increase EDs across the country, EP are grappling with issues of overcrowding.

A shift in the types of cases being treated at EDs was being observed in the 1980s. As the number of lower acuity cases (non-urgent cases) increased EPs recognized a need for a triage system (Berman, Coleridge & McMurry, 1989). The Canadian Triage and Acuity Scale (CTAS) was implemented to effectively manage this upsurge (Grafstein et al., 2008). The CTAS helps identify the sickest patients (CTAS 1) and provides a rank to less urgent cases (CTAS 2 to CTAS 5) (Grafstein et al., 2008). According to the HQO, in 2017 2 in 5 visits to Ontario EDs could have been treated by a primary care physician (HQO, 2018 p. 55). This means that across the province, 40% of cases in 2017 would be considered low-acuity, or not emergency specific. The

most common reasons to visit the ED have been sited to be upper respiratory infections, antibiotic therapies, sore throats, ear infections (CIHI, 2014).

A study showed that 45% of patients visiting ED in the Waterloo Wellington Local Health Integration Network, were labelled as low acuity visits (CTAS 4-5), while nationally, 57% of ED visits are less urgent cases (CTAS 4 and CTAS 5) (Jones et al., 2015). These types of ailments are typically treated at a family medicine practice. When looking into this, studies have shown that 12% of patients coming to the ED do not have a family doctor (Han et al., 2007). According to Statistics Canada's 2015-2017 report 15% of Canadians age over 12 years old do not have a regular primary care provider (Rowe, Ovens & Schull, 2020). There have been reports addressing the need for more robust primary care facilities and community care resources. Han et al., (2007) documented that patients presenting to the ED who have a primary care physician differ from those who do not, further suggesting that they may be inefficiencies in the health care system, or that this patient demographic perceive the ED to be their best option (Han et al., 2007; CIHI 2014). Interestingly, patients both over and underestimate the severity of their symptoms (Rowe, Ovens & Schull, 2020). As we march into the digital era, is the wealth of medical information coupled with the onus being put on the individual to maintain their health plus shortcomings in primary aggravating EDs?

2.4.1 The Issue of Overcrowding

Overcrowding in EDs "occurs when the demand for emergency services exceeds the ability to provide care within a reasonable time" (Rowe et al., 2006, p.1). The early 2000s marked collaborative efforts to tackle the issue as the first national comprehensive study was released in 2006 by the Canadian Agency for Drugs and Technology in Health (CADTH). The conclusion of the study led to the introduction of national standards for wait-times.

A report by the Canadian Institute of Health Information (CIHI) (2014), noted Canadians use the ED at a higher rate and experience longer wait times than their international counterparts. Patients can wait up to and over 16 hours to be assessed (NARCS, 2019). Despite the long wait times, Ontarians continue to solicit care from EDs. Between 2011 and 2017, the province of Ontario noted an 11.3% increase in visits to ED (HQO, 2018, p. 28). A recent report from Health Quality Ontario (HQO) indicates that this figure has risen to 12% (HQO, 2019). The yearly total of low-urgent visits in Ontario between 2020 and 2021 was 1.2 million visits, accounting for nearly one quarter of visits (HQO, 2021). According to reports from Statistics Canada, Ontario's growth rate of 1.8% between 2017-2018 was the strongest since 1989-1990 (Statistics Canada, 2018). Some experts have flagged the change in demographics in Canada towards an older population and this group non-urgent symptoms but being recommended more often towards ED as a factor the increased visits towards ED over the years (Goodridge & Stempien, 2019). A frequent user is considered to visit the ED more than three times a year (Jones et al. 2015) and this is defined as over usage. Excessive usage is defined as up to 25 visits per year (HQO, 2021). Why patients with non-urgent cases call on emergency services remains poorly understood today due to the limited number of studies being conducted in Canadian Hospital EDs. Could the wealth of medical information online coupled with the onus being put on the individual to maintain their health plus shortcomings in primary care aggravating EDs?

2.4.2 Diverging Patients from Emergency Departments

Across Canada, efforts have been put forth to help diminish wait times (Jones et al., 2015). Some organizations have attempted to use Telephone Health Advisory Services (THAS) or online consultation services to help patients assess the need to visit an ED. However, some services will advise callers to seek emergency care as a precaution (Jones et al., 2015). Jones et

al. (2015) even noted that patients calling regional health lines are up to ten times more likely to be directed to an ED than to a family physician's office. One study revealed respondents reported trying one of the following three options to avoid going to the ED, before ultimately finding themselves sitting in the ER: visiting a physician's office, calling a regional health line (14%), or calling a physician's office (47%). When patients called a physician's office, visiting the ED was recommended 63% of the time and when they called the regional health service, visiting the ED was recommended 58% of the time (Han et al., 2007). Almost two thirds of patients took action to consult at least one other source before going to the ED. Interestingly, of those who attempted to use another service, 89% still believed that the ED was their best option.

Recently, additional efforts to divert and inform patients of their symptoms have been made using technologies and artificial intelligence (AI). In November 2021 Ontario Health published a symptom assessment tool on the Health811 webpage. The assessment tool, named Ada, was developed by doctors and scientists to "think like a doctor" (Ontario Health, 2023). This AI tool provides personalized reports and can link to regional health centres across the province. Little is known about the effects of this tool as it is very new. In early 2022 Ontario Health also posted articles about which symptoms to be concerned about (Ontario Health, 2023). Little is known about the effects of this online consultation service and how patient reactions materialize in facets of the healthcare system; however, future reports will surely address its performance.

2.4.3 Risks Posed by Overconsumption of Online Health Information and Increased Prevalence of Cyberchondria

The misuse of online health-related resources, defined as the unnecessary visit with a physician due to misguided information on the web which can result in "preventable suffering"

(Tyrer et al., 2019, p.568) and incidence of cyberchondria poses potential risks to EDs. In terms of web use, gaps in the literature reveal that little is known about how people respond to the advice from health information sites at large (Powley, 2016). Even less research has been done on emergency care in North America with respect to the effects of the web. Gaps in the literature exist as to why patients choose to use hospital emergency services (Han et al., 2007). Mueller et al. (2017a) note that research efforts should focus on producing comparative profiles symptom appraisers and those who present to care services, to better understand the impact of the web on people's HUI. Cyberchondria has an international reach inciting studies in Europe, Australia, Asia, and North America (Barke et al., 2016; Malik et al., 2020; Wijesinghe et la., 2019). Through our research we hope to better understand the realities of cyberchondria in Canada, by examining a sample in Ottawa, Ontario. Ottawa is a large diverse city which will help give meaningful insights.

2.5 Conceptual Framework

The phenomenon we wish to investigate remains poorly understood. When it comes to online health research and symptom appraisal, few studies have investigated how the results materialize in the real world. Moreover, there is a lack of qualitative research considering the patient experience with online health information and reassurance seeking. Investigations are ongoing to better identify the dynamics between OHI seeking and cyberchondria. The notable increase of visits at emergency departments continues to attract attention (Goodridge & Stempien, 2019). Contributing to studies that bring the patient's perspective to the forefront can continue to provide valuable insights to this complicated issue. Additionally, no study to our knowledge has investigated cyberchondria in emergency services in Canada. Therefore, our primary objective is to continue to advance the knowledge in these areas by providing contextual

data to these phenomena. Our research favours a mixed methods approach, using both quantitative and qualitative methods for collecting data. Primary data will be generated by an online questionnaire consisting of closed questions, validated scales, and open-ended questions in addition to semi-structured interviews destined to yield rich personal accounts.

Grounded Theory is well suited for our study. Grounded Theory was shaped by the convergence of symbolic interactionism and descriptive statistics data sets undergoing constant comparative analyses (Chun Tie, Birks, & Francis, 2019). There are two schools of thought when it comes to GT. One takes on more tenets of Constructivist Theory which supports the co-construction of meaning that is produced by the participants to explain the event of interest (Chun Tie et al., 2019), while the other adopts tenet of symbolic interactionism. Symbolic interactionism "relies on the symbolic meaning people ascribe to the processes of social interaction" (Chun Tie et al., 2019, p. 2). The ascribed meaning is inherently a person's subjective truth.

Accordingly, Grounded theory is the most appropriate when considering less explored phenomena. Using this framework enables researchers to construct a theory from systematic collection and analysis of the data. This process is not linear but rather it is dynamic and extremely iterative in nature. The process involves rigorous methods of inductive and deductive reasoning which cultivates a theory grounded in that data set. Concepts are pulled from the data, constantly compared, and refined through progressive coding techniques.

The detailed understanding acquired using Grounded Theory has some limitations due to it being conceived from a specific sample. Since our project is operating as a case study at one emergency department, the findings cannot be generalized beyond this setting. Important conclusions will be drawn nevertheless and may serve as a foundation for future studies.

Our central research questions revolve around investigating people's perceptions, attitudes, and beliefs towards online health information, the behaviour of symptom appraising and the manifestation of symptoms of cyberchondria and health anxiety. We are interested in assessing the levels of cyberchondria and health anxiety in patients visiting the ED and the influence of these symptoms on healthcare utilization. Further we wish to examine the frequency with which people engage in OHI seeking prior to their visit and the likelihood of exhibiting symptoms of cyberchondria compared to their non-searching counterparts. To gain a better understanding of these phenomena, using descriptive and inferential statistical methods, we are curious to know the following:

RQ1. What are the levels of cyberchondria and anxiety present in patients that present to the emergency department?

RQ2. Do the people who research symptoms online before coming to the emergency department demonstrate higher levels of cyberchondria than their counterparts. Are there any correlations between prior symptom seeking online and visiting the emergency department?

Within the theoretical framework of Grounded Theory, we hope to learn about patients' lived experiences through qualitative thematic analyses, which will help construct a theory explaining the process surrounding OHI seeking, cyberchondria and impact on healthcare services utilization.

RQ3. The process in which people engage in online health information seeking (symptom-seeking) prior to their visit?

RQ4. What role does online health information seeking (symptom-seeking) have on the decision to visit the Emergency Department?

2.6 Summary

As we progress into the digital era, it is imperative to be equipped with tools and knowledge to contend with and navigate the changes brought on by the Internet. This is particularity true within in the healthcare industry. Literature in the fields of health information seeking, cyberchondria and emergency medicine advocate for continued advancements in their respective fields. Emphasis is also placed on the continuation of studies that seek to understand the relationship between online health information and cyberchondria as this complex dynamic affects quality of life, use of healthcare services and public health outcomes.

Our project seeks to explore the implications of OHI seeking in the context of emergency medicine in addition to exploring the levels of cyberchondria and health anxiety in patients presenting themselves to emergency departments. The objectives are two-fold. First, using quantitative methods, we aim to capture data relating to the patient's OHI seeking behaviours and use of health services. We also seek to examine the prevalence of patients exhibiting signs of cyberchondria. The data collected will allow for various avenues to be explored and links to be postulated.

Second, using a qualitative approach, we hope to better understand patients' attitudes, perceptions, and behaviours regarding their motivation to consult online health sources as well as to seek immediate services. Using this mixed method approach, we hope to contribute to the understanding of influential factors leading to engagement with online health research and use of emergency services.

Results obtained from this exploratory research project may in part help contribute to the definition and understanding of cyberchondria. A better understanding of patients experiencing

both online health information and cyberchondria will help address needs or gaps in service delivery.

We hope to contribute knowledge and understanding to help inform the creation of strategies to help communication and medical professionals address the issues of misinformation online and prevalence of cyberchondria and health anxiety. This knowledge may also help equip physicians with tools to use during their patient interactions. Further, conclusions drawn can also contribute to the creation and elaborate on communication tools and strategies to help improve health literacy and eHealth literacy amongst Internet-users. Indirectly, these efforts may help mitigate over-visitations of emergency rooms (or other health facilities) initiated by the distress and anxiety provoked by repetitive OHI seeking by fostering the development of individuals who are more informed and able to effectively manage their searches online.

On a larger scale, contributing to this area of research can help in the creation and bolstering of policies to protect both the individual from health misinformation. It may help support the need for programming or additions to curriculums with the aim of increasing of e-Health Literacy.

This project reaches beyond current literature by providing an amalgamation of these significant fields of research from a patient perspective for the first time in Canada, to our knowledge. Future research should continue to build on these findings, particularly in appraising health information and acting on health information found online.

Chapter 3 Research Design and Methodology

Chapter 2 provided background information on how consulting online health information and symptom appraising can contribute to feelings of anxiety, and the issue of overcrowding in Emergency Departments. This next chapter outlines the rationale for the choice of research design and methodology and tools, and explains how the analysis will be carried out. A copy of the documents and tools referenced in this section can be found in the appendix.

3.1 Research Design

It was important that our research permitted us to gain insights into people's perceptions, attitudes, and beliefs towards online health information (OHI) seeking, the behaviour of symptom appraising and the manifestation of cyberchondria and health anxiety amongst patients presenting at the Emergency Room (ER). We were interested in assessing the prevalence of cyberchondria and how people engage with online sources before visiting the ER to discover what role OHI seeking has on the patient's decision to use healthcare services. Our research design and methodology will enable us to observe what transpires at the intersection of OHI seeking, cyberchondria and the decision to visit the ER.

3.1.1 Sample Population

The study was conducted at an ER to accurately investigate the real-life implications of OHI seeking on visiting the Emergency Department (ED). The Hôpital Montfort, Ontario's Francophone academic hospital, was chosen as the site because not only for its affiliation with the University of Ottawa but because the thesis supervisor, Dr. Luc Bonneville, is a primary researcher at l'Institut du Savoir Montfort which facilitated our access to the site.

The sample was selected by volunteer sampling, a non-probability sampling technique. The study was intended to be a case study and be exploratory in nature. Therefore, the sample

did not have to be representative of the general population. The Hôpital Montfort's emergency medicine staff uses the Canadian Triage and Acuity Scale (CTAS) to triage patients. CTAS 1 is designated most urgent while CTAS 5 is the least urgent. We opted to capture responses from patients categorized as CTAS 2 or higher (emergent to non-urgent) in the ER's waiting areas. Patients in these groups are stable, coherent, and non-emergent.

Though we chose volunteer sampling, other non-probability sampling methods were considered. We could have used crowdsourcing techniques via social media or other platforms to get a larger, perhaps more generalizable sample. In the end, crowdsourcing was not an appropriate method because it could have skewed the sample towards being more proficient in searching the Internet or biased towards health seekers. Snowball or network sampling was not an appropriate choice either. The ultimate factor in not employing either of these sampling techniques was because they removed the direct connection to emergency services. Alternatively, we could have randomly selected a sample based on the visitors within a date range using the hospital's patient database. And while we could have emailed the questionnaire to patients who visited the ER, this would have required additional dependence on hospital staff who are already very busy. Due to time constraints and logistics, random sampling techniques were not conducive for this study.

We do acknowledge that in using volunteer sampling there is always a risk of excluding non-volunteers who may have had interesting perspectives. Still, the benefits of this sampling technique outweighed the others. We were still able to collect sufficient data to study the phenomenon. Further, we knew that the people coming into the ED were truly living this experience and either did or did not look up their symptoms or advice online before their visit. Lastly, being in person on site provided an equal chance for all types of patients to participate

regardless of sociodemographic characteristics, or level of interaction with the Internet (having a social media account, etc.) in attempts to have unbiased responses.

3.1.2 Methods

We opted for a mixed method approach to fully answer our research questions and thus both quantitative and qualitative methods were used to collect primary data. We wanted to quantify the occurrences of people's engagement with the Internet as well as qualitatively analyze firsthand experiences. An online cross-sectional questionnaire administered on-site, and a semi-structured telephone interview were selected to achieve this objective. The tools can be found in Appendix B and Appendix C respectfully.

The questionnaire is the most appropriate instrument to collect quantitative data from a larger sample in a short amount of time. It is important to note that the questionnaire was not intended to establish causality between variables, but rather to capture a snapshot of events, behaviours, and experiences to observe any significant correlations. The advantages of administering the survey on-site outweighed those of administering it off-site. Capturing the sample population on-site allows for real time responses. Respondents were able to refer to the situation that prompted them to seek out services that day. Importantly, long wait times before seeing a physician encouraged participation because it gave the patients something to do while waiting for the physician. The survey was not administered by phone or email to reduce recall bias.

The semi-structured interview was selected as the instrument for collecting qualitative data because of its ability to collect rich and detailed accounts from respondents. These findings were extremely important given our approach and the observed gaps in the literature. The interviews could not be held in the waiting room due to limited space, lack of privacy and

coordination. Patient mobility between rooms is unpredictable which would have interrupted the interview. The state of mind and pain level of were also factors limiting on site interviews. The interviews were scheduled to take place by phone later.

The investigation could have been carried out solely by quantitative methods or qualitative methods. However, each alone would not have rendered data capable of telling the full story. Ultimately, the questionnaire and semi-structured interviews were the most suitable tools to collect the data. Using a mixed method approach enabled us to explore both quantitative and qualitative aspects surrounding the phenomena of cyberchondria, OHI seeking and visiting the ER.

3.2 Protocol

Approval from an ethics committee was obtained since the study involved human subjects. An ethics approval certificates were issued on January 19, 2021, and March 2, 2021, by the Research Ethics Boards (REB) of both the University of Ottawa and Hôpital Montfort respectfully (Appendix D).

Various departments and teams at the Hôpital Montfort were consulted to determine an appropriate protocol to reach our target sample. The clinical managers of the Emergency Department and the coordinators of professional education at the Institut de Savoir Montfort were consulted to help facilitate the operations. The hospital's disease control and prevention team were consulted to advise on and approve our protocol given the unprecedented situation arising due to the novel coronavirus (COVID-19).

Data collection ran from July 29, 2021, until January 18, 2023. We had to delay and extend our data collection period from 12 months to 18 months due to the extraordinary events caused by the COVID-19 pandemic lockdowns and restricted access to the hospital. The

objective was to collect 200 questionnaire responses. Over the course of those 18 months, we collected 208 unique scans. We had to omit 78 incomplete responses and exclude 2 ineligible responses. A total of 128 cases were analyzed.

Originally, the questionnaire was intended to be completed by patients waiting in the 'Green Zone' of the Emergency Department waiting room at the Hôpital Montfort but this was expanded to the entire waiting room due to physical distancing measures. Recruitment was done via posters containing QR codes and web links. Participants used their mobile devices to complete the survey. Pamphlets with the same information as the posters were distributed while physical distancing measures were in place to increase the visibility of the study. Both tools are in Appendix E.

As COVID-19 restrictions eased in July 2022, the PI began in-person recruitment by speaking directly with patients in the waiting room and inviting them to complete the survey. Having a person on-site significantly increased the rate of participation. In-person recruitment occurred from July 2022 until October 2022. The principal investigator (PI) explained the scope and objective of the study and asked if the patients would like to participate. An iPad was used for a brief period to include those who did not have a smart device but was stopped due to the complications caused by the patient mobility. Pamphlets continued to be distributed albeit infrequently, to those who wanted to participate but did not have a smart phone or if their phone was running out of battery. As far as selection criteria, participants had to be at least 18 years old, have a grade 8 comprehension or higher of either French or English to be included. Patients who were brought in by ambulance or rushed directly in to see a physician (qualifying as CTAS 1) were excluded. Patients who felt too unwell were also excluded. Questionnaire responses were anonymous, and consent was obtained (Appendix F).

Semi-structured interviews took place between July 21, 2022, and December 1, 2022. Recruitment for the interviews was done on a voluntary basis. Those interested in participating in the interview left their name, email, and telephone number in the corresponding fields of the questionnaire. To encourage participation volunteers were compensated $20. The interviews were conducted in both English and French, were conducted by phone and recorded with a recorder to facilitate the analysis later. Respondents had to be over 18 years of age and use the Internet to be included. The PI contacted volunteers first by email to set up a time to conduct the interview (Appendix G). Only one reminder was sent. A consent form was sent by email (Appendix H). The consent form had to be signed and returned to continue. The purpose of the research study was explained by the PI at the start of the interview. All participants were notified that the interview would be recorded to produce a transcript verbatim, only used for the analysis. Verbal consent was obtained again before starting. Participants were reminded that information collected during the interview would remain confidential and anonymous. We aimed to conduct ten interviews. Thirty respondents volunteered their contact information, 21 did not respond. We ended up conducting nine interviews (six in English and three in French). The average length of the recordings was 50 minutes.

3.3 Design of Research Tools

3.3.1 Questionnaire

Qualtrics was chosen as the survey tool to build and administer the web-based questionnaire. A professional licence was obtained from a research lab at the University of Ottawa's School of Psychology. Instructions, research objectives and consent were placed on the home page of the survey. The responses were voluntary and anonymous.

The questionnaire contained 20 closed ended questions (multiple choice and Likert scales), three validated scales, three open-ended questions and six sociodemographic questions. This format is consistent with examples found in the literature. English and French versions were available to accommodate both linguistic groups. The validated scales enabled us to measure the prevalence and characteristics of eHealth literacy, health anxiety and cyberchondria in the sample population.

e-Health Literacy Scale (eHEALS)

The respondents' level of eHealth Literacy was measured using the "e-Health Literacy Scale (eHEALS)" developed by Paige et al. (2017). It is an 8-item scale that measures an individual's knowledge of health information resources on the Internet and perceived confidence and ability to find, evaluate and use health information online to make informed decisions (ex. I know how to use the health information I find on the Internet to help me.). Participants are asked to indicate the extent to which they agree with the statements on a 5-point Likert scale *(1- Strongly Disagree, 5- Strongly Agree).* Cronbach's alpha (α) reliability analysis revealed excellent levels of internal consistency ($\alpha = 0.92$, $M = 29.7$, $SD = 5.9$). Mean scores were reported. The higher the score, the higher the degree of e-health literacy. Minimal possible score is 8 and maximum score possible is 40.

Short Anxiety Inventory (SHAI)

Respondents' level of health anxiety was measured using the "Short Health Anxiety Inventory (SHAI)" developed by Salkovskis et al. (2002). The SHAI measures anxiety in clinical and non-clinical patients and is best reflects the various symptoms exhibited by hypochondria patients. The scale consists of 14 questions with 4 statements each that measure the degree to which the participant experiences health anxiety and hypochondriasis (ex. I am constantly aware

of bodily sensations or changes). Participants were asked to select the statements that most applied to them. Answers are scored *0-3* (*0 – low anxiety, 3- high anxiety*). When more than one answer was selected the higher score was retained for scoring. The internal consistency measured using Cronbach's alpha (α) revealed excellent internal consistency (α = 0.91, *M* = 12.0, *SD* = 7.1). Means scores were reported. The higher the score, the higher the degree of health anxiety. The lowest possible score of 0 and highest possible score is 42. A score of 20 is now acceptable of a threshold for a higher degree of health anxiety (Tyrer et al., 2019). Those scoring over 2 standard deviations above the mean were categorized as extreme levels of SHAI.

Cyberchondria Severity Scale (CSS)

Respondents' level and severity of cyberchondria was measured using the "Cyberchondria Severity Scale (CSS)" developed by (McElroy & Shevlin, 2014). It is a self-reporting tool aimed at evaluating the various psychometric properties of anxiety as a result of OHR. McElroy & Shevlin's (2014) scale assesses the five dimensions (compulsion, distress, excessiveness, reassurance seeking and mistrust of medical professionals) of the emotional, cognitive and behaviour states of Cyberchondria in a cohesive manner.

The first subscale, labelled compulsion, includes items that capture the 'unwanted, compulsive (CM) element to cyberchondria' and the degree to which the actions interrupt daily activities (McElroy & Shevlin 2014, p. 263). The second subscale contains statements designed to illustrate the effects of OHR on one's emotional state, namely distress (DS). Items that make up the third subscale convey elements of excessiveness (EX), which include repetitive searches for long duration, often using various sources for symptom appraisal or a health condition. The fourth factor or subscale's items relate the need to seek reassurance (RE) from a medical

professional. The last factor reflects the person's hesitancy towards trusting their medical professionals is labelled Mistrust of Medical Professional.

As recommended in the literature, the last three items relating to mistrust in medical professionals were omitted (Fergus & Russel 2016; Mathes et al., 2018). Therefore, we used the CSS-30 consisting of 30 items measuring participants' behaviours and reactions following seeking health information online. The scale is divided into 4 subscales: Compulsions (CM) (ex. Researching symptoms or perceived medical conditions online interrupts my offline work activities), Distress (DS) (ex. I find it hard to stop worrying about symptoms or perceived medical conditions that I have researched online), Excessiveness (EX) (ex. I enter the same symptoms into a web search on more than one occasion), Reassurance Seeking (RE) (ex. I find myself thinking: "I would not have gone to the doctor if I had not read about that symptom/condition online"). The statements were adapted to reflect Canadian expressions. Respondents indicated the extent to which the statements were true for them using a 5-point Likert scale (*1- Never, 5- Always*).

The internal consistency of the scale measured using Cronbach's alpha (α) indicated excellent internal consistency (CSS $\alpha = 0.95$, $M = 65.6$, $SD = 20.9$). Excellent reliability was calculated for the CM 8-item subscale ($\alpha = 0.94$, $M = 13.5$, $SD = 6.3$) and DS 8-item subscale alpha ($\alpha = 0.94$, $M = 16.0$, $SD = 7.4$). Strong internal consistency was calculated for the EX 8-item subscale ($\alpha = 0.85$, $M = 21.5$, $SD = 6.8$) and RE 6-item subscale ($\alpha = 0.82$, $M = 14.5$, $SD = 5.1$). Mean scores were calculated for the entire scale and the subscales. The higher the score, the more severe the cyberchondria assessment. The minimum possible overall score is 30, and the maximum possible overall score is 150. The prevalence of extreme levels of overall cyberchondria was determined by scores falling two standard deviations below and above the

mean as low anxiety and high anxiety respectfully (Doherety-Torstrick et al., 2016). Those scoring over 107.3 (2 *SD* above the mean) were categorized as high levels of cyberchondria.

Closed-ended Questions

The closed-ended questions enabled us to report on the behaviours of the sample and provided us with independent and dependent variables for comparative and correlational analyses. Health seeking behaviour questions were modelled after Ybarra and Suman (2006) and Han et al. (2007). Health information seeking and healthcare utilization intent (HUI) questions were inspired by White and Horvitz (2009). We queried the sample on having a family doctor (Y/N) and the number of visits in the last year, their primary source of health information (health professional, the Internet, media, family, other), if they use the Internet use (Y/N) and average time spent on it, if they have used the Internet for health information in the last 12 months (Y/N), frequency of online health information seeking, average hours spent searching for health information and sources used, if a medical professional had been contacted as a result of the information consulted online in the last 12 months (Y/N), if symptoms were looked up online prior to ER visit (Y/N), the length of time spent searching their symptoms, if sources recommended they visit ER, and elapsed time before deciding to visit ER. Skip logic was used when the preceding answers did not relate to the next. Demographic information collected included age, gender, ethnicity (self-reported), level of education, occupation, and postal code.

Open-ended Questions

Opened-ended questions asked participants their reasons for using the Internet for health/medical information, how they found their experiences searching online for health information, and how they felt after consulting online sources. The following three questions were asked; Why do you use the Internet for finding health and or medical information? Please

describe your experiences with searching for health and or medical information. How do you feel after consulting online sources?

3.3.1.2 Analyses

IBM SPSS Statistics version 28.0.1.1 (15) was used to analyze the quantitative data from the questionnaire. Skip logic was used in the questionnaire to prevent respondents answering non-applicable to follow-up questions relating to searching done before the ER visit and were coded as non-seekers. The term seekers and non-seekers were adapted from the definition by Ybarra and Suman (2006) meaning those who reported using the Internet to access health information online in the last 12 months to meaning those that looked for symptoms online before their visit. We used the term symptom-seekers and non-symptom seekers to describe the behaviour of searching for symptoms before the ER visit. Cases with at least one scale was missing more than 50% of the entries were excluded, as done by Doherty-Torstrick et al. (2016). Series means technique was used to fill in other missing values in scale scores and missing answers (1.08%). Respondents self-identified for ethnicity. Responses were then categorized into White/European, Black/African, Asian, Arab, Hispanic, Native, multiracial. Missing values for age, education, ethnicity, and occupation were coded as unknown. Anonymous respondents were assigned ID numbers and answers were coded before being imported into SPSS. Descriptive statistics were used to report on frequencies of categorical data. The prevalence of cyberchondria, health anxiety and eHealth literacy were determined by calculating the mean and standard deviation. Scores beyond two standard deviations above the mean would be considered as very severe.

Inferential statistical methods were used to further analyze patterns in the data. Parametric Pearson's correlation (R coefficient, *r*) was used to test a correlation between

continuous numeric variables of eHEALS, SHAI and CSS-30 scores. Nonparametric correlation test Kendall's tau-b (τb) was used to determine the correlations between ordinal variables such as frequency of OHI seeking and symptom appraisals with continuous variables of the scales eHEALS, SHAI, CSS-30, and its subscales, to further examine EX and RE subscales. One-way ANOVA (95% confidence level) analyses was used for variance and difference of mean scores amongst groups for education, gender, and age. Tests for homogeneity and post hoc analyses were conducted to assess variance. The measures obtained from the scales were used as our dependent variables while the OHI seeking, and Internet use is the independent variables. We used the independent T-Test to evaluate the difference of mean scores between seekers and non-seekers in our sample. Cross sectional profiles were created to compare those that looked up their symptoms online prior to ER visit and those who did not amongst other health and Internet behaviours. Factorial ANOVA analyses were used to determine if factors of categorial variables had any effect on the test scores.

The open-ended questions were answered by 101 of the 128 participants. Thematic content analysis was used to code the qualitative data. The qualitative data from the open-ended questions were used to get a better understanding of people's reasons, experiences, and feelings with online health information. Reasons reported by respondents for using the Internet for health information were first grouped by repeated words, then similar ideas were grouped together. By grouping together similar ideas the umbrella themes emerged. Experiences were grouped into positive, negative, neutral, and responses that revolved around utility and outcomes were identified. Feelings were grouped into positive negative and neutral feelings in responses to the OHR. The most prominent and relevant themes were reported in this thesis in response to our research questions and objectives. The coding was done by the PI only. The process was iterative

and was repeated at the end of the data collection to ensure the same main themes were emerging to ensure consistency of analysis. Triangulation technique was used to assess trustworthiness (Lincoln & Guba, 1985).

3.3.2 Semi-Structured Interviews

The grid for the semi-structured interview was developed as a tool to guide the session. It consisted of a series of open-ended and follow-up questions grouped by theme. The primary and follow-up questions were designed to collect the respondent's beliefs, feelings, opinions, and motivations regarding OHI seeking. Participants elaborated on their experiences with Internet use, researching health-related information online, factors which influence utilization of emergency services, and feelings or reactions evoked by searching for symptoms online. The interviews were conducted with a total of nine participants: six males, three females.

3.3.2.1 Analyses

The interview recordings were transcribed to facilitate analysis. The responses from the telephone interviews were subjected to a rigorous coding analysis. Lived experiences shared by the participants were analyzed. The data analysis included stages of coding and constant comparative analysis, theoretical sampling and annotations (Chun Tie et al., 2019). The story line technique was utilized to weave the emergent steps and categories together to formulate a process of how respondents search for and act on online health information in response symptom appraisal and their visits to the emergency department. (Chun Tie et al., 2019). Open coding, axial coding and selective coding were done to produce process and relationship diagrams. Common experiences that respondents reported is what dictated the elements of the process diagram in seeking care from an Emergency Department. Themes with insufficient data were not retained. This allowed for a thorough examination of the data to construct a working

theory, which will be representing the next chapter. Any repetition of the themes identified in the open-ended questions were noted in the same way. Lincoln and Guba's (1985) negative or deviant case analysis and triangulation techniques were used to establish the trustworthiness of the interview data.

The research design and methodology used to conduct this study was ultimately the optimal choice. It allowed us to target a specific sample population by recruiting on site at a local hospital's ER. This gave us privileged insights into the phenomenon of OHI seeking and prevalence of cyberchondria amongst patients visiting ERs. A mixed method approach allowed us to collect both quantitative and qualitative data to confirm and report on occurrences, collect nuanced answers, while giving space for new findings to emerge within the framework of Grounded Theory. The findings of our questionnaire and interviews will be presented and discussed in the next chapter, Chapter 4 Results and Analysis.

Chapter 4 Results and Analysis

Chapter 3 discusses the research design and methodology. Chapter 4 presents the results and offers an analysis of data collected from the questionnaire and telephone interviews. The goal was not to generalize the results of this study but, rather, to contribute Canadian participant perspectives for working theories and to guide future studies.

4.1 Quantitative Online Questionnaire Results.

Table 1

Mean and standard deviation of eHealth literacy, cyberchondria and health anxiety scale results of sample broken down by sociodemographic category

		eHealth Literacy		Cyberchondria		Health Anxiety		Full Sample	
		M	*SD*	*M*	*SD*	*M*	*SD*	N	%
Age	18 to 34 yrs old	30	5	72.0	21.2	14.6	8.2	53	41.4
	35 to 49 yrs old	30	6	60.5	18.5	11.1	6.1	39	30.5
	50 to 64 yrs old	29	7	67.6	26.1	9.1	4.3	16	12.5
	Over 65 ys old	29	6	54.9	15.5	7.8	3.9	12	9.4
	Unknown	30	7	60.1	13.2	10.8	5.1	8	6.3
Gender	Male	30	6	64.9	22.4	10.1	5.8	49	38.3
	Female	30	6	65.9	20.4	13.1	8.0	64	50.0
	Non Binary	35	3	70.4	12.1	15.8	3.5	4	3.1
	No answer	29	6	64.7	21.5	12.4	6.2	11	8.6
Highest Level of Education	High School or Less	29	7	60.0	19.7	11.2	6.5	26	20.3
	College Diploma	30	6	66.2	20.9	14.2	7.8	22	17.2
	Bachelor's Degree	29	6	63.4	17.7	13.0	8.8	36	28.1
	Above a Bachelor's Degree	31	5	72.6	24.7	10.4	4.9	36	28.1
	Unknown	30	7	60.1	13.2	10.8	5.1	8	6.3
Occupation	Working Full Time	29	6	64.1	21.0	11.9	7.3	75	58.6
	Working Part Time	29	5	74.9	27.9	15.7	4.8	8	6.3
	Homemaker	28	6	67.8	22.7	14.2	10.9	4	3.1
	Student	31	7	75.0	13.4	13.0	5.4	11	8.6
	Retired	30	6	59.0	15.3	7.7	3.5	15	11.7
	Unemployed	31	7	75.1	31.8	16.1	10.7	7	5.5
	Unknown	30	7	60.1	13.2	10.8	5.1	8	6.3
Ethnicity	White / European	30	6	64.1	22.2	12.0	7.4	64	50.0
	Black / African	28	5	72.1	15.3	15.5	8.1	8	6.3

	Asian	30	4	73.0	26.0	10.2	3.3	5	3.9
	Arab	27	4	54.7	7.0	6.0	3.5	3	2.3
	Hispanic	32	9	55.2	15.7	8.3	8.0	4	3.1
	Native	30	2	75.8	10.9	7.0	1.7	3	2.3
	Multi-Racial	34	4	72.0	12.7	14.6	6.9	7	5.5
	Unknown	29	7	65.6	21.8	12.2	6.6	34	26.6
Survey Language	English	30	5	68.1	18.7	12.6	7.2	87	68.0
	French	28	6	60.2	24.3	10.6	6.6	41	32.0

Note: N = 128

Table 2

Mean and standard deviation of eHealth literacy, cyberchondria and health anxiety scale results of Internet usage Health and online health information seeking behaviours

		eHealth Literacy		Cyberchondria		Health Anxiety		Full Sample	
		M	*SD*	*M*	*SD*	*M*	*SD*	*N*	*%*
Family Doctor	Yes	30	6	65.5	20.1	11.6	6.5	97	75.8
	No	30	6	65.8	23.5	13.3	8.5	31	24.2
Monthly Visits in the Last 12 Months	No Family Doctor	30	6	65.8	23.5	13.3	8.5	31	24.2
	0 to 2	30	6	65.1	19.5	10.4	5.2	59	46.1
	3 to 5	30	5	66.6	21.6	13.2	8.3	25	19.5
	5 to 7	31	5	64.3	17.6	12.7	6.9	9	7.0
	7 to 10	26	6	67.2	32.4	15.9	9.5	4	3.1
Primary Source for Health Information	Health Professional	30	6	60.2	20.3	11.1	6.4	54	42.2
	Internet	31	5	68.2	17.2	12.9	7.2	58	45.3
	Media	36	6	99.0	72.1	4.5	.7	2	1.6
	Family	26	5	73.7	26.4	12.6	6.3	7	5.5
	Other	26	6	67.1	21.0	13.1	11.2	7	5.5
Use the Internet	Yes	30	6	65.8	20.7	12.0	7.1	127	99.2
	No	24	.	30.9	.	6.0	.	1	0.8
Average Internet Use	At Least Once a Day	30	6	66.1	20.7	12.1	7.0	126	98.4
	At Least Once a Week	32	11	34.4	5.0	4.0	2.8	2	1.6
Average Use of Internet Hours per Day	0	32	11	34.4	5.0	4.0	2.8	2	1.6
	1 to 5	30	6	63.4	21.5	11.1	6.8	74	57.8
	6 to 10	30	5	67.4	18.9	13.1	7.1	38	29.7
	11 to 15	30	8	80.2	19.1	16.4	8.7	9	7.0
	16 +	31	8	70.2	16.4	10.8	4.4	5	3.9
Use the Internet for Health Information in the Last 12 Months	Yes	30	6	66.7	20.6	12.1	7.2	120	93.8
	No	24	5	48.9	19.4	9.9	3.8	8	6.3

Frequency of Online Health Information Seeking	Non Seekers	24	5	48.9	19.4	9.9	3.8	8	6.3
	At Least Once a Day	37	5	114.5	50.2	9.5	6.4	2	1.6
	At least Once a Week	31	6	75.5	18.6	15.3	6.8	35	27.3
	At Least Once a Month	30	6	63.5	16.8	11.2	6.7	37	28.9
	A few times a Year	29	6	60.5	19.2	10.5	7.4	46	35.9
Average Hours Spent Seeking Health Information Online	Non Seekers	24	5	48.9	19.4	9.9	3.8	8	6.3
	0	29	7	58.9	18.1	8.8	5.5	35	27.3
	1 to 5	31	5	69.6	21.1	13.5	7.5	80	62.5
	6 to 10	30	4	73.6	17.9	13.3	7.5	4	3.1
	11 to 15	40	.	81.0	.	11.0	.	1	0.8
Primary Online Source for Health Information	Non Seekers	24	5	48.9	19.4	9.9	3.8	8	6.3
	Directly From Medical Website	33	5	66.9	19.5	12.0	7.9	34	26.6
	Search Engines	29	6	64.5	18.5	11.8	6.0	74	57.8
	Institutional or Society Website	34	5	65.8	23.7	14.3	11.8	7	5.5
	Blogs	31	.	88.0	.	9.0	.	1	0.8
	Pharmaceutical Company Website	33	.	75.0	.	10.0	.	1	0.8
	Chatrooms	34	8	127.5	31.8	20.5	21.9	2	1.6
	Other	20	.	78.0	.	15.0	.	1	0.8
Contacted a Health Professional in the last 12 Months Because Online Consultation	Yes	30	6	73.6	22.8	14.4	8.3	56	43.8
	No	29	6	59.3	16.9	10.1	5.3	72	56.3
Frequency of Symptom Appraising Online	Never	26	9	39.5	12.2	7.3	4.8	5	3.9
	Rarely	27	4	57.5	14.8	7.7	3.7	21	16.4
	Occasionally	30	6	61.3	18.4	11.3	7.4	51	39.8
	Frequently	31	6	70.5	14.9	14.1	5.3	32	25.0
	Very Frequently	32	6	84.5	27.2	16.1	8.9	19	14.8
Frequency Use of Telehealth Services	Never	29	7	56.8	19.2	9.7	6.2	45	35.2
	Rarely	31	5	67.1	18.4	12.9	8.0	43	33.6
	Occasionally	30	6	76.5	21.8	13.2	6.3	28	21.9
	Frequently	31	6	64.1	23.8	14.8	7.2	9	7.0
	Very Frequently	31	2	78.0	7.2	13.0	5.2	3	2.3

Note: N = 128

Table 3

Mean and standard deviation of eHealth literacy, cyberchondria and health anxiety scale results of Health information seeking, symptom appraisal and telehealth service usage before visit to the emergency department.

		eHealth Literacy		Cyberchondria		Health Anxiety		Full Sample	
		M	*SD*	*M*	*SD*	*M*	*SD*	*N*	*%*
Searched for Symptoms Online Prior to ER Visit	Yes	31	5	71.2	20.5	13.3	7.1	81	63.3
	No	28	7	55.8	18.0	9.7	6.4	47	36.7
Hours Spent Searching Online for Symptoms Prior to ER Visit	Non Seekers	28	7	55.8	18.0	9.7	6.4	47	36.7
	30 Minutes or Less	32	5	67.4	21.7	11.3	6.5	38	29.7
	Up to One Hour	31	5	77.4	20.5	15.2	7.4	25	19.5
	Up to Two Hours	30	4	70.9	14.3	14.7	9.2	9	7.0
	Over Two Hours	29	7	70.3	18.7	14.9	5.3	9	7.0
Online Sources Recommended ER Visit	Non Seekers	28	7	55.8	18.0	9.7	6.4	47	36.7
	Yes	32	5	74.4	23.9	13.7	7.9	48	37.5
	No	30	5	66.9	15.6	12.8	5.3	16	12.5
	Not Sure	27	4	68.9	14.2	12.4	6.4	7	5.5
	No Triage Recommendation	31	4	64.7	7.4	12.9	6.9	10	7.8
Time Spent Deciding Before Visiting ER	Non Seekers	28	7	55.8	18.0	9.7	6.4	47	36.7
	The Day Of	32	5	72.3	20.8	13.4	6.0	41	32.0
	The Day Before	31	5	74.2	22.2	14.9	8.8	20	15.6
	Two Days Before	31	6	66.1	22.3	13.2	9.0	12	9.4
	Within the Last Week	25	5	65.9	9.7	9.3	3.6	8	6.3
Consulted Telehealth Services Prior to ER Visit	Yes	30	5	73.5	20.3	13.8	8.2	29	22.7
	No	30	6	63.3	20.6	11.4	6.7	99	77.3
Did Telehealth Services Recommend ER Visit	Did Not Call Telehealth	30	6	63.3	20.6	11.4	6.7	99	77.3
	Yes	31	5	73.4	20.2	14.1	8.5	23	18.0
	No	24	2	59.3	11.1	9.0	8.0	3	2.3
	Not Sure	23	.	73.0	.	11.0	.	1	0.8
	No Triage Recommendation	30	4	95.5	27.5	20.0	2.8	2	1.6

Note : N = 128

Table 4

Correlations and p vales with confidence intervals of eHEALS, SHAI, CSS-30 and CSS-30 subscales mean scores and ordinal variables regarding searching behaviours

	1.	2.	3.	4.
1.OHI 12 mo.	1.00			
2. Hr/wk OHI	.51** <.001 [.42, .59]	1.00		
3. SA 12 mo.	.50** <.001 [.41, .58]	.43** <.001 [.33, .52]	1.00	
4.Time SS before ER	.34** <.001 [.23, .43]	.28** <.001 [.17, .39]	.32** <.001 [.22, .42]	1.00
5.eHEALS	.19** .007 [.07, .30]	.19** .007 [.08, .30]	.21** .003 [.09, .32]	.11 .097 [-.002, .23]
6.SHAI	.22** .001 [.11, .33]	.23** .001 [.12, .34]	.33** <.001 [.23, .43]	.26** <.001 [.14, .36]
7.CM	.22** .002 [.11, .33]	.31** <.001 [.20, .41]	.24** <.001 [.13, .35	.19** .006 [.08, .30]
8.DS	.17* .015 [.05, .28]	.12 .093 [.005, .23]	.21** .002 [.09, .32]	.22** .001 [.11, .33]
9.EX	.35** <.001 [.24, .45]	.28** <.001 [.17, .38]	.36** <.001 [.26, .46]	.32** <.001 [.22, .42]
10.RE	.28** <.001 [.17, .38]	.19** .009 [.07, .30]	.34** <.001 [.23, .44]	.25** <.001 [.13, .35]
11.CSS30	.29** <.001 [.18, .39]	.27** <.001 [.15, .37]	.34** <.001 [.23, .44]	.29** <.001 [.18, .39]

Note. N=128. Kendall's tau-b correlational analyses. OHI 12 mo. = Frequency of OHI seeking in the past 12 months. Hrs/wk OHI = Hours spent a week OHI seeking. SA 12 mo = Frequency of symptom appraising in the past 12 mo. Time SS before ER = Time spent symptom seeking before ER visit.
Values in brackets are the lower and upper limits at the 95% CI.
**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Sample population

Our full sample was made up mainly of young adults aged between 18 and 34 years (41.4%), followed by adults aged 35 to 49 (30.5%). Overall, there were more females (50.0%) than males (38.3%) of respondents. White/European was the most self-identified ethnicity (50.8%). Most participants had at least a bachelor's degree. More than half (58.6%) were working full time. About two thirds (68.0%) of the questionnaires were completed in English (Table 1).

Internet Use and Health Behaviours

All but one respondent uses the Internet (99.2%). Most use the Internet at least once a day (98.4%), with a small percentage using the Internet at least once a week (1.6%). Over half spent between one and five hours online, while 29.7% spent between six and ten hours online a day (Table 2). Respondents most frequently access the Internet from home (*n* = 119, 93.0%), on cell phones (*n* = 115, 89.8%), or from work (*n* = 72, 56.3%).

Most respondents had a family doctor (75.8%). One quarter (24.2%) of our sample did not. Of those that have a family doctor (*n* = 97), 39.2 % reported over 3 visits and 13.4 % reported more than 5 visits in the last 12 months. When asked to indicate their primary source of health information, there was a slight majority preference for the Internet (45.3%) over a healthcare professional. Only 1.6% of participated cited the media (e.g., news, radio, books) as their primary source (Table 2).

Online Health Information Seeking

Most of our respondents (93.8%) reported looking up health information within the last twelve months. Almost one third of this group reported searching for health information at least once a week (29.2%). Most reported spending one to five hours searching (66.7%). With respect

to symptoms searching behaviour in the last twelve months, participants reported searching symptoms frequently (25%) or very frequently (14.8%) throughout the year (Table 2).

Most respondents reported search engines (61.7%) as their primary source for accessing health information. Less than one third of our participants (28.3%) reported going directly to medical websites. Only 6.3% reported not consulting OHI in the last year (Table 2).

Help Seeking Behaviour

Almost half of our sample (43.8%) saw a health professional because of what they had consumed online in the last twelve months, while 56.3% said they had not consulted a healthcare professional in the last 12 months because of online health information (Table 2).

Symptom Seeking Behaviour Before ED Visits and Health Care Utilization

Two thirds (63.3%, $N = 81$) of our respondents searched for their symptoms online before coming to the ER. With respect to duration of online searching, about half (46.9%) reported spending 30 minutes or less online before the visit, almost one third (30.7%) spent up to an hour searching and 22.2% spent over one hour searching (Table 3).

Over half (59.3%) of symptom-seekers were recommended to visit ED by the sources they consulted ($n = 48$). Half (50.6%) made the decision to visit the ED the same day ($n = 41$) and about one quarter (24.7%) waited a day before deciding to go to the ED ($n = 20$). Our numbers are higher than a previous study on web-triage websites which found that 33% of cases were recommended to seek immediate care, and 24.5% were advised to seek care in 12 to 24 hours (Sole, Stuart, & Deichen, 2006). The results of this section suggest that guidance from information online does have an impact of the decision to visit healthcare services.

Telehealth Advisory Services

In the last twelve months 21.9% of participants reported occasionally using Telehealth advisory services while most have never used telehealth (35.2%) (Table 1). With respect to engagement prior to their ER visit, about one quarter of respondents (22.7%) called telehealth. A small portion of the sample both looked online and called telehealth (18.8%). Of respondents who called telehealth (N = 29), 79.3% received a recommendation to seek ER services. 10.3% came to the ED after reportedly receiving a recommendation not to visit (Table 3).

eHealth Literacy Scale (eHEALS) Assessment in Sample Population

The sample's mean score of eHealth literacy was calculated to be 29.7 (*SD* = 5.9). Following ANOVA analyses, we did not observe a significant difference of eHealth literacy across level of education, gender, or age (Table 8 & 9).

Short Health Anxiety Inventory (SHAI) Assessment in Sample Population

The mean score of health anxiety was calculated to be 12.0 (*SD* = 7.1). 13.3% of our sample exhibited high levels of health anxiety, with a score of 20 or above while 4.6% of our sample was categorized as exhibiting extremely high health anxiety with scores above two standard deviations over the mean. In ANOVA analyses we did not observe a significant difference of SHAI scores across level of education or gender (Table 8). Statistical differences were found for age (Table 19). Post hoc analysis using Games-Howell criterion revealed significant differences between age groups (Table 10). Respondents between the ages of 18 and 34 were more anxious about their health than those over 50 years old ($p = 0.008$, 95% CI [1.10, 9.99]). Those 18 to 34 years old were also more anxious than respondents older than 65 years ($p < 0.001$, 95% CI [2.30, 11.4]).

Cyberchondria Severity Scale (CSS-30) Assessment in Sample Population

The mean score of cyberchondria in our sample was 65.6 (*SD* = 20.9). Almost one third (29.7%) scored above the mid score, putting them at high levels of cyberchondria, while 4.6% fell two standard deviations above the mean signifying extreme levels of cyberchondria. In ANOVA analyses we did not observe any statistically significant differences in overall cyberchondria scores between level of education and gender nor age. Further analyses were carried out on the four subscales of the global construction of cyberchondria : compulsion, distress, excessiveness, reassurance seeking. Post hoc analysis using Scheffé criteria for significance indicated the younger age group reported a higher mean distress score than older age groups 18 years to 34 years compared with the over 65 years group ($p = 0.007$, 95% CI [1.2, 9.98]).

Independent T-test analyses were done for the language of respondents. English respondents had statistically significant higher scores in all measures than the French respondents.

Online Health Information and Help Seeking Behaviour in the Last Twelve Months

Independent T-test used to analyze the difference of scores between OHI seeking behaviour, those who selected the Internet ($M = 68.8$, $SD = 17.2$) as their primary source of health information reported statistically significant higher overall levels of cyberchondria than those who selected a healthcare professional ($M = 60.8$, $SD = 20.3$) for the global construct of cyberchondria ($t\ (110) = 2.256$, $p = 0.026$). The results in our sample showed that those who seek OHI primarily from medical sites ($M = 32.7$, $SD = 4.6$) report higher levels of eHealth literacy than those who use search engines ($M = 28.6$, $SD = 5.8$) for eHealth literacy ($t\ (106) = 3.642$, $p < .001$).

When asked about whether a health professional was consulted in the last twelve months because of online health information there was significant difference of scores between those who reported seeking out a consultation with a provider after the searching online in the last twelve months to those who had not seen a health professional in the last twelve months due to the information consulted online. Those who reported to seeing a health professional exhibited more health anxiety ($p < .001$, 95% CI [.29, 1.0]), cyberchondria ($p < .001$, 95% CI [.36, 1.1]) and higher reassurance seeking ($p < .001$, 95% CI [.33, 1.1]) than those who reported not visiting a healthcare professional.

Comparing Symptom-Seekers and Non-Symptom Seekers

Results of independent t-test analyses on symptom-seekers and non-symptom seekers prior to visiting the ER revealed that those who searched for their symptoms were significantly more anxious about their health $t(126) = 2.86$, $p = .004$, $d = 6.87$. Symptom seekers also had higher levels of cyberchondria, $t(126) = 4.29$, $p = .001$, $d = 0.74$. They also scored higher on excessiveness subscale ($t(126) = 4.75$, $p < .001$, $d = 0.81$ and reassurance seeking subscales, $t(126) = 3.46$, $p < .001$, $d = 0.61$.

Results of ANOVA Games-Howell's post hoc analysis amongst symptom seekers that received an online recommendation to seek immediate services. Symptom-seekers who received an online recommendation to visit the ER scored higher in the overall cyberchondria, distress and reassurance seeking subscales than non-symptom seekers ($p < .001$*, 95.5% CI [6.49, 30.63], $p = .021$, 95% CI [. 51, 9.26], $p = .003$, 95% CI [1.0, 7.2]) respectively.

In Games-Howell's post hoc analysis, significant differences were observed amongst the excessiveness subscale, those deemed symptom-seekers had higher scores than non-symptoms seekers in the excessiveness subscale ($p < .001$, 95% CI [3.0, 10.6]). Those who did not have an

online recommendation had a lower excessiveness score than those who did receive an online recommendation (p = .030, 95% CI [.28, 7.85]).

Lastly, results of ANOVA analysis between when the decision was made to go to the ER and symptom seeking behaviour. Post hoc analyses using Scheffé criterion were done to further discriminate between means, symptom-seekers who came to the ER the same day had statistically significant higher levels of cyberchondria than non-symptom seekers (p = .006, 95% CI [3.3, 29.6]). This was also true for excessiveness (p < .001, 95% CI [2.2, 10.6]) and reassurance seeking subscales (p = .032, 95% CI [.190, 6.70]). Similarly, symptom-seekers who came the next day had higher levels of cyberchondria than non-seekers (p = .019, 95% CI [1.98, 34.8]). This same group had higher excessiveness scores (p = .034, 95% CI [.25, 10.8]). There were no significant differences observed amongst groups for compulsion and distress subscales.

A Factorial ANOVA analysis was conducted to compare the main effects of searching habits and Internet usage on having searched for symptoms before the ED visit on cyberchondria scores. Analyses did not reveal any significant interactions between having searched for symptoms or not prior to the visit. However, the amount of time spent online, both with respect to OHR and general Internet use, was positively correlated to levels of cyberchondria in respondents. We evaluated reported frequency of searching symptoms in the 12 months. We observed significant differences in reported levels of cyberchondria depending on the frequency of symptoms appraising participants were engaging in (p < .001, np^2 = .117). Significant differences in means were found between those who never search for symptoms with those who did so frequently (△36.2, p < .001), between those who rarely search compared to frequently search (△18.2, p = .003) and occasionally compared to frequently (△ 14.4, p = .002). Moreover, there was a significant difference between the rate of symptom appraising and responses on

mean cyberchondria score (p = .008, np^2 = .093). Analyses revealed that respondents who searched for symptoms on a weekly basis reported statistically significant higher mean scores than non-seekers (△28.7, p = 0.02). There was a slight difference between weekly and monthly searching (△14.1, p = 0.019) and weekly searching vs. a few times a year (△17.2, p = 0.001). The most prominent difference is amongst those that search at least one a week as this group had the highest mean scores.

Similarly, there is a significant correlation between levels of cyberchondria with hours spent on the Internet at a day. Those who spend 11 or more hours on the Internet per day reporting statistically significantly higher mean scores than those spending 5 hours or less online (△14.0, p = .044).

Correlations Amongst Parameters and Variables

Table 25 presents the results of the Pearson's Correlational (r) analyses. A weak positive correlation was revealed between eHealth literacy with cyberchondria scores (r = .18, p = .048), and with excessiveness (r = .23, p = .008) and reassurance seeking subscales (r = .31, p < .001). We expected a negative correlation based on the literature since higher levels of literacy were posited as a protective factor against cyberchondria due to the ability to discern online health information (Beaunoyer et al., 2017; Gutierrez et al., 2014; Paige et al., 2017). This discrepancy might suggest that, in our sample, the more one can understand what they are reading and is more apt at finding the information, the greater the likelihood of generating worry because of the ability to adequately consume this information. There was no correlation between eHealth literacy and health anxiety, nor were we expecting any correlation between these two measures.

Pearson's correlational analysis revealed a significant moderate positive correlation between health anxiety and cyberchondria (r = .49, p < 0.001, 95% CI [.35, .61]), meaning that

participants with higher cyberchondria scores also had higher health anxiety scores. We also observed positive correlations with between health anxiety and compulsion ($r = .39$, $p < 0.001$), distress ($r = .53$, $p < 0.001$), excessiveness ($r = .40$, $p < 0.001$) and reassurance seeking ($r = .23$, $p = 0.010$).

Kendall's tau-b (τb) analyses revealed positive correlations between hours a week spent using searching for OHI and each of the validated scales. Increased time spent OHI seeking showed weak positive correlations with eHealth literacy ($\tau b = .19$, $p = .007$). There was also a weak positive relationship between reassurance seeking and eHealth Literacy ($\tau b = .19$, $p = .009$). Hours a week spent searching showed moderate positive correlations with health anxiety ($\tau b = .23$, $p = .001$), cyberchondria ($\tau b = .27$, $p < .001$) and excessiveness ($\tau b = .28$, $p < .001$. A strong positive correlation was noted between hours spent searching OHI and compulsion ($\tau b = .306$, $p < .001$). (Table 4)

Kendall's tau-b analyses revealed a positive correlation between the frequency of online OHI seeking in the last twelve months (never, a few times a year, up to at least once a day). Positive week correlations were revealed between frequency of OHI seeking and eHealth Literacy ($\tau b = .19$ $p = 0.007$) and between distress ($\tau b = .17$, $p = .01$). Moderate positive correlations were revealed between frequency of OHI seeking between health anxiety ($\tau b = .22$, $p = 0.009$), cyberchondria ($\tau b = .29$ $p < .001$), compulsion ($\tau b = .22$, $p = .002$) and reassurance seeking ($\tau b = .28$ $p = <.001$). The strongest correlation was between the frequency of OHI seeking and excessiveness ($\tau b = .35$, $p = <.001$). (Table 4)

Significant positive correlations were found between the frequency of online symptom appraisal in the last 12 months and mean scores following Kendall's tau-b analyses. Frequently looking up symptoms online showed moderate positive correlations with eHealth literacy ($\tau b =$

.21, $p = .003$) and compulsion ($\tau b = .24$, $p < .001$). Frequency of symptom appraising showed strong positive correlations between health anxiety ($\tau b = .33$, $p < .001$), cyberchondria ($\tau b = .34$, $p < .001$), excessiveness ($\tau b = .36$, $p < .001$) and reassurance seeking ($\tau b = .34$, $p < .001$).

Similarly, Kendall's tau-b analyses showed significant positive correlation between time spent searching for symptoms before ER and mean test scores. Time spent looking up symptoms online before visiting the ER showed moderate positive correlations to health anxiety ($\tau b = .23$, $p < .001$), cyberchondria ($\tau b = .29$, $p < .001$), and reassurance ($\tau b = .25$, $p < .001$). Time spent looking up symptoms prior to the visit showed a strong positive correlation with excessiveness ($\tau b = .32$, $p < .001$). (Table 4).

4.2 Results and Analysis of Qualitative Data from Open-ended Questions from Questionnaire

The main objective of the open-ended questions was to contribute to a nuanced understanding of respondents' experience with OHI. A desire to explore more deeply the role of OHR in service utilization and characteristics of cyberchondria guided our line of inquiry. We received written responses from 101 participants. There was a sense of self-reliance amongst participants when faced with a health issue. The overarching theme of the analysis depicts online health information as a tool to help deal with fleeting health concerns and steer seekers towards healthcare services. Three main reasons were identified for relying on OHI: as a tool to educate; due to shortcomings in the healthcare system; and seeking direction for next steps. The experiences related to anxiety and distress after searching were analyzed to further understand how seekers live this unwanted outcome.

Tool to Educate

Education and curiosity were cited as motivations for seeking information online. Respondents are curious about themselves, their loved ones, their medical symptoms, conditions,

and treatments. Symptoms, conditions, and treatments continue to be the main searched categories in our sample, as in the literature (Muller et al., 2017a). An element of wanting to satisfy personal curiosity was documented as reported by respondent #123 who said "[j]'ai satisfait ma curiosité" (Female over 75 years old).

Using the Internet for symptoms provides respondents with more vocabulary to help with dialogue with doctors, either to better communicate their symptoms or to engage in discussion to add to the possible diagnosis. Interactions with OHI become more focused and positive after a diagnosis (Muller et al., 2017a). This pattern was observed in our data suggests as participants mentioned their searches were more targeted and constructive once they had received a diagnosis . There is a sense of control and a need to be proactive towards a health concern, driving the need to educate themselves further. Lastly, some respondents referenced a personal or professional affiliation with research and are more invested in the exercise of searching for health information. In some cases, the tone would suggest the online health research as an appropriate way of going about solving a health concern given their training. It can be perhaps concluded that the affinity and familiarity with navigating online sources and databases have adequately trained them to navigate OHR. Like respondent #4 who simply said "[b]ecause I am a trained researcher and scientist" (Female 18 to 34 years old).

Increased Self-Reliance in the Wake of Healthcare System Challenges

The ease of use, speed, and efficiency of the Internet emerged as a main reason for consulting online sources. Undeniably, the Internet has caused people and systems to change and adapt. It has also reinforced independence and self-assertion (Lemire, 2010). Not only is accessing OHI easy, but it has become "easier", as cited by respondents. Many cited easier than

seeing a physician, waiting in the queue, or calling telehealth. For them, the Internet has provided a way to get immediate answers.

Turning to the Internet for answers was also because of a growing level of dissatisfaction with the healthcare system and the quality of service received. Inferences were made to self-reliance as participants are feeling let down by the healthcare system and are seeking alternate methods of care. Explicitly, some citing poor interactions with doctors, a lack of attentiveness and feeling like their health claims are not being taken seriously as reasons for the shift to self-reliance. Inadequate amount of time spent in appointments was another frustration in dealing with doctors. This was the case for respondent #125 who says:

Parce qu'il est difficile d'avoir accès au médecin et que ce dernier n'est pas toujours enclin à discuter de ce qui me préoccupe. Les médecins sont tellement pressés. Ils passent vite aux conclusions et aux patients suivants (Male 50 to 64 years old).

Others referenced mistakes or misdiagnoses which steered them online. According to previous research, mistrust in health professionals is a predisposition to health anxiety and ensuing cases of cyberchondria (McElroy & Shevlin, 2014; Mueller et al., 2017a). Mistrust in physicians can lead to increased autonomous searches. Indeed, independent excessive and repetitive searching are pillars of cyberchondria (Starcevic et al., 2020a; Fergus & Dolan, 2014). Respondant #37 briefly shares her experience with mistrust:

If I feel like something is off, I will Google the symptom to try to make sense of it. I had a health crisis a few years back that took a lot of time to be diagnosed so sometimes I feel I understand my body better than doctors" (Female 18 to 34 years old).

Secondly, there was a certain degree of responsibility in searching first to not add strain to a healthcare system which is already strained due to the current shortcomings in the Ontario

healthcare system ranging from lack of family doctors to overcrowding in emergency rooms (CIHI, 2014; HQO, 2016; HQO, 2019). Respondent #37 indicated a lack of primary care doctor saying as a reason for seeking health information online. Some use online resources to mitigate the patient load by avoiding the need to see a doctor. Respondent #16 tells us she uses the Internet "[a]s a starting point so that I don't take advantage of our already-overwhelmed healthcare system. (Female 35 to 49 years old)".

For others, like respondent #42, it was "[t]o avoid going to the emergency (Female 35 to 49 years old)". The aversion for the hospital ER can most likely be attributed to long wait times patients face recently (HQO, 2023).

Direction for Healthcare Utilization

Patients go online as a first assessment to determine whether their sensation or symptom should be addressed urgently or will resolve on its own. Seekers try to assess the severity and urgency of symptoms to decide which action to take. Curiously, many respondents indicated they were checking if they needed immediate attention. Respondent #89 shared that her searches reassured her and pointed towards the next steps to take.

J'ai très mal au genou et je suis enthousiaste de trouver plus d'informations en ligne. Mes lectures m'ont rassurée. Ça m'éclaire pour les prochaines étapes à entreprendre (je suis maintenant à l'urgence) (Female 50 to 64 years old).

Her last sentence in brackets says 'I am now at the emergency' from which we can assume that the results of her searches guided her toward the ER or immediate care.

In situations like these, the element of reassurance suggests seeking services were already being considered. The directions found online convinced them to take the next step. In other

cases, they are looking for a confirmation. Whether there is doubt or uncertainty in their options, they want to make sure they are making the correct choice. Respondent #77 shares:

I usually see if the symptoms and medical websites agree with what I think needs to be done. Like go to the doctor or go immediately to the ER or if it's something that can be managed at home (Female 35 to 49 years old).

In the process of searching the seeker might be confronted with information fuelling conformation bias towards certain information to confirm or disprove a certain course of action.

Anxiety and Distress After Searching Online

A prominent observation was that the intent for searching and the result of the query greatly impacts the emotional outcomes of the experience, meaning why they are looking and what they find. Specifically, in terms of negative experiences, the words anxious, overwhelmed, worried and feel worse were reported most often. In many circumstances, participants stated feeling worse after their online research, with some admitting to being alarmed by worst-case scenarios and others citing the need for interventions to be calmed down. This theme was expected to emerge based on our literature review as the abundance of information, risk averse recommendations, and misinformation were often cited as reasons for causing anxiety in seekers (Beaunoyer, et al. 2017; Chambers et al., 2019; Semigran et al., 2015; Te Poel et al., 2016). Increased time spent symptom checking online also worsens anxiety levels over time (Doherty-Torstrick et al., 2016). Specifically, respondent #84 explains that her the results can dictate her reactions:

Depends on the issue, try to be balanced and not think of the worst-case scenario but when symptoms fit a specific condition well, I get anxious and sometimes have a panic attack. (Female 18 to 34 years old)

Anxiety can also ensue when the online sources recommendation is immediate services. As stated by respondent #58, the recommended course of action can be the trigger for anxiety. He explains he feels "[g]enerally relieved, but sometimes anxious when a lot of the sources come back as "go to ER/ consult doctor ASAP" (in my case chest pain)" (Male 18 to 34 years old). This idea was not further developed by the respondent, but we can infer that seeing a recommendation to go to the ER for chest pain could insinuate feeling anxious about potential a heart attack or stroke which is often associated with chest pain. In other cases, seekers can become distraught to the point of seeking emotional supports. Respondent #20 explains that "I generally feel worse after consulting online sources and require friends and family to talk me down" (Female 18 to 34 years old).

One respondent's experience exemplified an extreme level of cyberchondria and health anxiety as noted in the literature. Respondent #127 explains the intense feelings that lead to seeking help and the anxiety that can manifest as a result. In the case of respondent #127, her extreme health anxiety seems to cause mistrust in the healthcare profession, which is one of the tenets of cyberchondria:

J'ai l'impression d'avoir tous les symptômes des maladies graves que je recherche. Je deviens anxieuse jusqu'à ce que mon médecin de famille me confirme que je n'ai rien (et même là, je doute de sa parole) (Female 18 to 34 years old).

Online Sources

Perspectives on the utility of OHR were in opposition amongst respondents. In other words, OHI both helps and hinders. This dichotomy is not new and was expected, but interestingly it does not seem to lessen over time. With the data from the open-ended questions, it was possible to deduce that sources are mainly what affected patients' experiences. Positive

experiences with OHI and symptom seeking were associated with the use of reliable and trusted sources. The notion of reliability is a well-known factor in positive outcomes (Ybarra & Suman, 2006). The literature points to the trustworthiness of as a factor in positive outcomes (Starcevic & Berle, 2013). Some respondents explicitly stated academic or scientific journals, medical websites, or governmental sites as trusted sources. In other cases, respondents simply wrote 'reliable' or 'credible' sources. This led to participants answering feeling confident in the information they consumed.

In contrast, as posited by Akhtar and Fatima (2020), cyberchondria may be strongly associated with a difficulty in distinguishing between credible and non-credible sources. We found that negative experiences amongst respondents were indeed associated with being overwhelmed by the amount of information available, the perceived absence of, and difficulty finding reliable sources. It was mentioned in participants' responses coded as negative in the analyses that it was hard knowing what information to trust online. It is well documented that OHI is often disorganized, poor quality, contains language which is hard to understand and causes negative side effects and anxiety (Te Poel et al., 2016). Our anonymous questionnaire responses continue to illustrate that sources are both barriers and positive indicators to one's experience with OHI.

4.3 Telephone Interview Results and Analysis

The semi-structured interviews were designed to dig deeper into the topics of the questionnaire while allowing new ideas to emerge. The average age of the interviewees was 36 years old, the majority worked full time, had at least a bachelors' degree and self-reported as high Internet users. The sociodemographic information of the interviewees can be seen in Table 5. Our intention in conducting interviews was to better understand how engagement with OHR

and cyberchondria, particularly excessiveness and reassurance seeking, affect healthcare utilization. The overarching theme of people's experience with symptom seeking emerged through Grounded Theory as a sense of ownership and due diligence in looking for direction towards seeking help. We noted that the main factors leading to healthcare utilization stem from an initial reflex towards the Internet, outcomes of using online sources to ascertain the severity and events of anxiety and health anxiety. We were able to map out a flow of events based on common experiences and themes gained from the telephone interview. Figure 1 illustrates the process of symptom seeking and decision-making prior to visiting immediate care services as deduced from the qualitative thematic analysis.

Table 5

Profile of the nine telephone interview participants

Case	Age	Gender	Highest Level of Education	Industry	Average Internet use	Used Internet before ER visit
AX005	36	Male	College diploma	Construction	Everyday	No
AX006	76	Male	Master's degree	Education	Everyday	No
AX40T	38	Male	Master's degree	Public service	Everyday	Yes
XG543	29	Female	Master's degree	Public service	Everyday	Yes
00XT4	23	Female	Highschool	Student	Everyday	Yes
00XT3	27	Male	Master's Degree	Student	Everyday	No
DQ3T7	28	Male	Master's degree	Public service	Everyday	No
FR096	27	Female	Bachelor's degree	Administration	Everyday	Yes
XG543	36	Male	Bachelor's degree	Sales	Everyday	Yes

Self-reliance / First Step in Dealing With a New Symptom

People continue to search for their symptoms before accessing the healthcare system (Rao et al., 2018; Sillence et al., 2007). Increasingly, it is an easy way to get quick information to try to figure out what is happening in the body without having to relocate to a facility (McMullan et al., 2019; Muse et al., 2012; Starcevic et al., 2019). This occurrence is certainly reinforced by smartphones which have allowed mobile access to the Internet. We were not surprised to

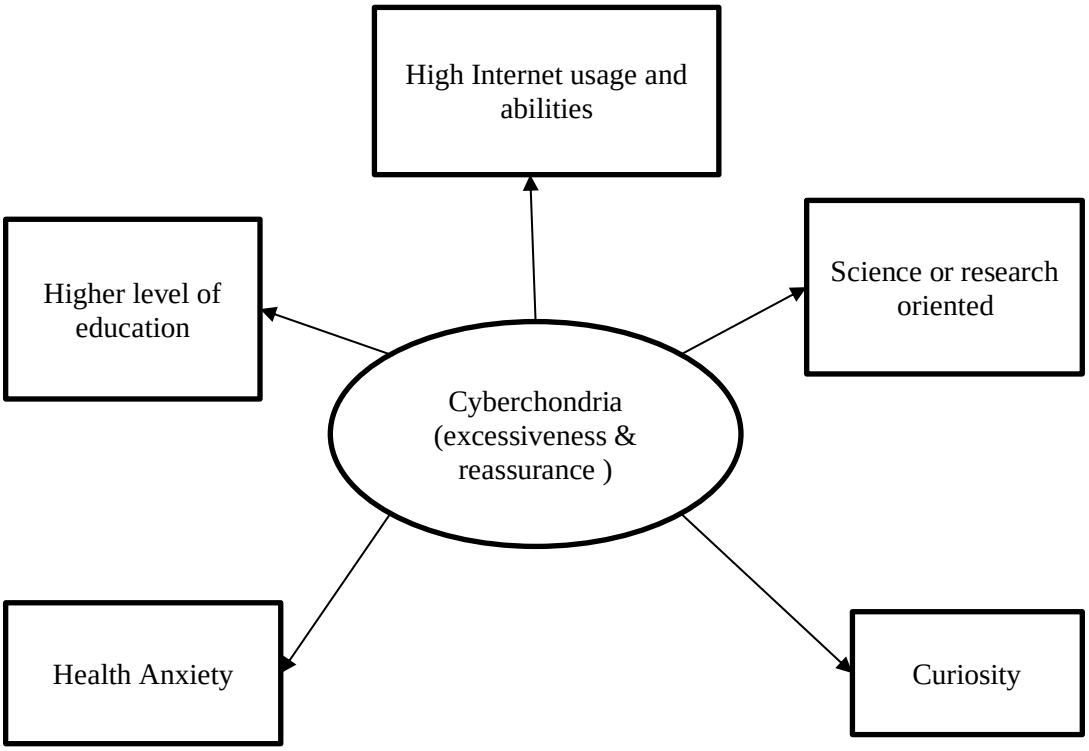
encounter this in our sample since it has been widely stated the literature (McMullan et al., 2019). As mentioned by participant 00XT3, a 27-year-old male, the ease of access to sources is simply enough to prompt a search. He goes on to explain that "/…/ usually it's my phone, and I would just put it [the symptom] into Google, if it was a little more personal, I would put it [the symptom] into an anonymous search engine like DuckDuckGo" (Participant 00XT3).

As originally proposed by Lemire (2010), the Internet can lead to changes in personal behaviour and decisions, since it helps reinforce independence and self-assertion. The Internet is becoming a first source of health information (Muse et al., 2012.). When retelling their experiences with OHI seeking and symptom seeking almost all interviewees described turning to

the Internet as a first reflex and a first step upon feeling a new symptom or sensation. Going online is seen as the first step in the process of seeking healthcare services. There was little hesitation or deliberation. There was a sense that the behaviour has become normalized. As expected from the open-ended questions symptom appraising continues to be the prominent reason for OHR.

Figure 1

Diagram of recurring personal traits proposed as being associated with increased levels of cyberchondria and tendency for searching symptoms online

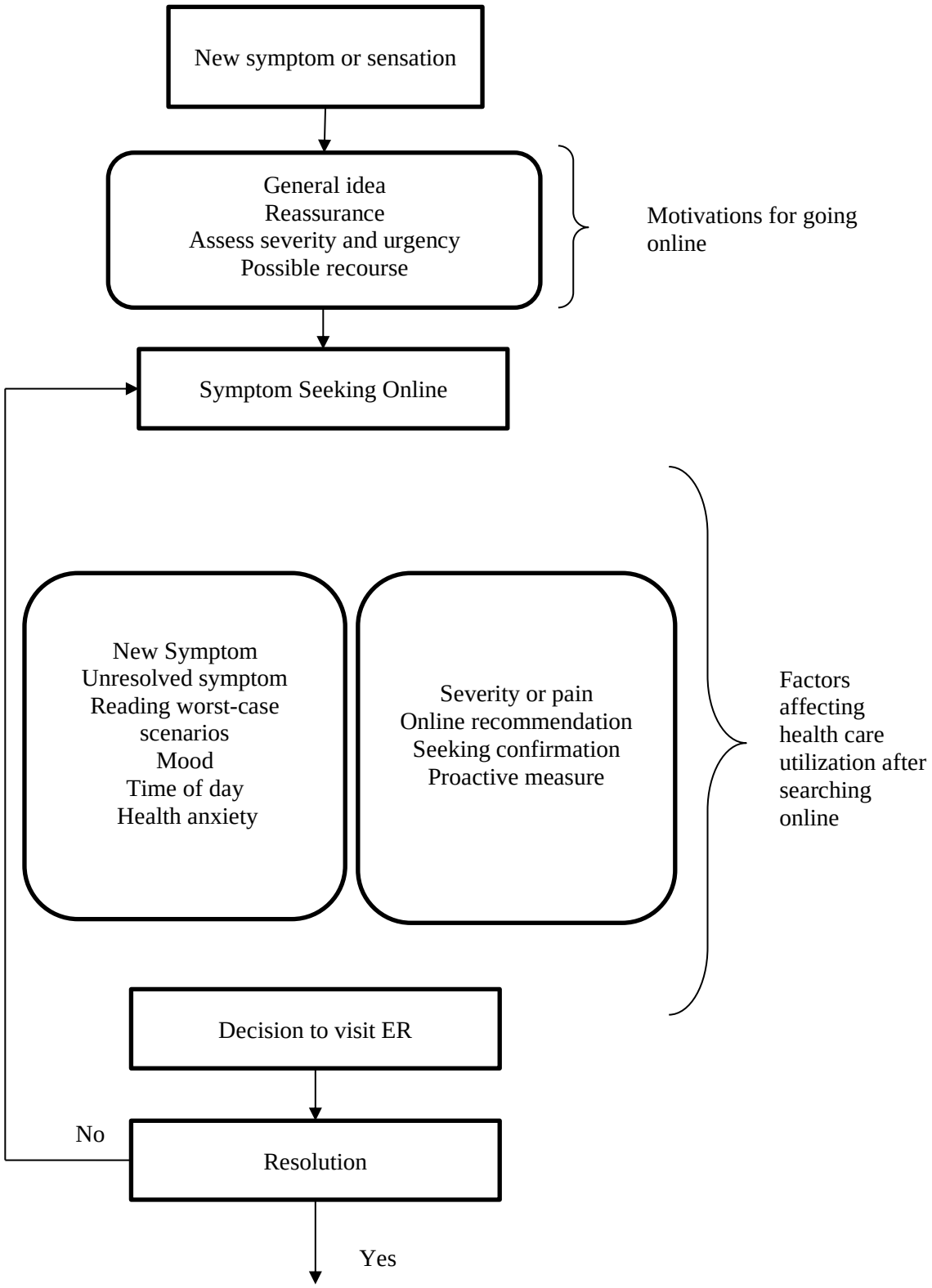


Pour moi je dirais que c'est mon premier point de référence lorsque je me demande t'sais comme ah, je ne me sens pas très bien, Je dirais que mon premier reflex est de, au lieu t'sais par exemple, au lieu d'appeler mon médecin ou une infirmière ou quoi que ce soit c'est de faire une petite recherche pour déterminer un peu c'est quoi mes symptômes. (Participant XG543, female 29 years old)

More and more this behaviour is reinforced not only with the trend towards the use of the Internet in all spheres of daily life, but also due to the increase in self-reliance and responsibility towards health (Tyrer et al., 2019). This has certainly become more evident in the global pandemic.

Figure 2

Process of symptom seeking and decision making towards immediate care services



It is important to highlight that experiences are different whether the search is for a new versus a diagnosed symptom. When searching for a new symptom, efforts are channelled towards figuring out what it is. Participant AX40T, a 38-year-old male, had been dealing with unexplained symptoms and a lack of diagnosis for the greater part of two years. His example touches on both the notion of the first reflex and the accessibility of being able to start searching. Ultimately illustrating that the combination of the habit of searching, accessibility and convenience is causing self-led OHR to become to the first access point in dealing with health issues:

So, um the trigger for starting the research would usually be, a symptom would pop up that I had hadn't had before, or a worsening of a symptom that I, you know, I would have been having since June 2020. So, if I felt particularly uncomfortable or particularly impeded by the symptom that uh could prompt me to, to look one up, I would find more often than not I would end up doing the research uh, you know like in the evening after my daughter had gone to bed by I was kind of sitting without anything specific to do, and at that time I was having a flare up or an unexplained bodily sensation, that could prompt me to, to research. (Participant AX40T, male 38 years old)

Ascertaining Severity and Urgency / Sense of Personal Action

Beyond a first reflex, interviewees expressed the main reason for symptom seeking is to assess the severity and urgency of their symptom, to know whether it could be dealt with at home, by making an appointment or if it requires an immediate intervention. The level of severity portrayed online greatly guided seeking out services. One participant explains his reaction toward getting services following this assessment:

Generally pretty quickly. Like same day. If I am researching something and if it looks serious I would say that same day I would follow up or make the move for further examination or reach out to the healthcare system. (Participant: XG543, male 36 years old)

Participants defined the severity of the situation by referencing articles or sources that concluded by explicitly stating there is a chance that the symptom could develop into a more serious condition. Many participants justified seeking services as affording them with the peace of mind. Otherwise, the unknown would stew in their mind until there was a resolution. The notion of being proactive in the face of an uncertain situation has been documented in the literature (Starcevic et al., 2019). Participant XG543 explains that when she encounters information saying that her symptoms could evolve into something more serious, she proactively decides use healthcare services:

C'est par rapport à comment je me sens ou si ça va dégénérer de façon importante. Donc si les premiers symptômes peuvent mener à des choses plus graves c'est peut-être la décision de comme ok, ça vaut la peine d'aller faire ce rendez-vous là et puis, élimine la possibilité que ça soit quelque chose de plus grave. Donc pour s'assurer ça et puis, tout ça c'est vraiment par rapport à comment je me sens versus ce que je lis en ligne. Mais c'est un peu en concordance. Donc, si je ne me sens pas super bien, et puis je lis des choses qui ne sont pas super, t'sais, s'ils ne sont pas trop positifs (rit) je me dis, t'sais peut-être que ça vaut la peine d'aller et voir qu'est-ce qui se passe ici. (Participant XG543, female 29 years old)

The idea that searching for health information online may create levels of anxiety where there was none before was reported by our participants, particularly when the symptom could be indicative of a serious or benign issue. The following anecdote suggests one participant became

worried after reading possible explanations for her symptoms online. Her examples of 'this' infer serious issues. Her worries of it being serious led her to seek out a consultation at the ER:

Yes, like online, like it'll tell you you may have this, this, this, or stress. And I am like OK. But I'm like "what if it's not stress" because that was the one time, that the one time that the pain doesn't go away after a while, and I'm like oh what if it's not stress? And the doctor told me 'yah you're fine.' (Participant 00XT4, female 23 years old).

And in many cases, respondents explicitly said they were looking at whether they should be going to the ER depending on severity. The decision to seek immediate services was heavily informed by the results of the online research. Participants admitted directly going to the ER in this case. One participant recounts his intense encounter:

/…/ I don't know what the readings are because I've never had an issue. So, I went online (laughed), and uhm, saw something that said 'blood pressure of X number systolic X number diastolic is of concern' and it was only one of the two that was concerning for me. But I took three readings and they were all higher than the number that I had seen on the website I was checking, I can't remember which was it was, that said you know go to the emergency if... that was the basis for me for going. (Participant AX40T, Male 38 years old)

These nuanced responses on perceived severity provided context to results from Han et al. (2007), who noted the top response for visiting the ER was the patient's perceived severity of their health problem. It should be noted that participants in our study reported going directly to the ER without going online first in true emergencies (broken bones, accidents, etc.).

Anxiety and Health Anxiety

The sentiment of turning online to be reassured came up in the interviews. Reassurance is defined as seeking reassurance from a healthcare professional (Doherty-Torstrick et al., 2016;

Starcevic & Berle, 2013; Te Poel et al., 2019). Reassurance was also used to describe the motivation for seeking out symptoms online, namely, to be reassured that their symptom was not severe to reduce their health anxiety (Te Poel et al., 2016). In our study we observed that participants were in fact looking to OHI for reassurance on whether their sensations were normal. This finding corresponds to the recent conceptions of cyberchondria, prompting engagement with OHR for the purpose of reassuring and for consulting a physician out of reassurance (Starcevic et al., 2020a; Vismara et al., 2020). That our sample is looking for reassurance from their search results suggests that anxiety is already present. Some onus has shifted onto the patient. This coincides with observations of increased guidance towards individual responsibility to monitor health creating a stir of anxiety (Tyrer et al., 2019). As seen in the following extract, which illustrates the experiences of Participant FR096 with health anxiety and frequent check-ups:

T'sais comme les deux derniers mois j'étais à l'urgence trois fois. Mais à chaque fois je sors en me disant que je n'avais rien. Du coup-là, là je pense que je vais arrêter de garder sur Internet mes symptômes. T'sais des fois ça peut juste être est-ce que je suis fatigué ou que j'ai quelque chose, mais que je n'ai pas forcément une maladie grave. Mais à chaque fois que j'ai mal quelque part je me dis que c'est une maladie grave, une très grave. (Participant FR096, Female 27 years old)

Interviewees described going back to online sources to confirm if they understood the messaging correctly, or to review the next steps if the symptom did not resolve on its own. Indeed Tyrer et al. (2019) observed that increased health anxiety is a possible result of cyberchondria due to the excessive use of the Internet to interpret symptoms. Concerns of an illness were shown to increase over time and with exposure to various sources (Doherty-

Torstrick et al., 2016). In her case, pain in her left side has gone undiagnosed for five years. She goes on to explain:

Dans le fond moi, c'est comme, ça fait environs cinq ans que j'ai des douleurs au niveau de mon côté gauche qui n'a jamais pu être diagnostiqué donc à chaque fois que je vais à l'hôpital j'ai fait tous les types de radio[graphie], de prises de sang, d'échographie, de rayon X de CT scan et tout, tout, tout puis ils n'ont jamais révélé que j'ai une anomalie au niveau de mon ventre, mais moi je suis sûr que j'ai quelque chose. Donc des fois je vais en en ligne avec les symptômes que j'ai, comme regarder, comme qu'est-ce qu'elle, en ayant ces symptômes, quelles maladies ça peut refléter. (Participant FR096, Female 27 years old)

Indeed, the theme of anxiety was anticipated. We found most respondents experienced anxiety at different stages in the process of online research which led to using healthcare services. Through the analysis of the interview transcripts, it became evident that a level of anxiety is already present in the interviewees when experiencing a new sensation or symptom, even before they turn to the Internet. It is the unfamiliar sensation that triggers the concern. This initial feeling of anxiety is unrelated to the search.

Secondly, 'paranoia' and 'panic attacks' we also used to describe this experience when the results of the searches come back as being more severe than originally anticipated, or when their hunt revealed a more severe 'diagnosis' than they thought possible. Participant 00XT3 explains "[u]sually it's more paranoia, so probably negative (slight laugh) overall because it usually tells me whatever symptom it is, that it's probably more harmful that I would typically imagine.

Further in the process, we know that increased OHI and symptom appraisal can further reinforce the anxiety of those who are overly anxious about their health (Benigeri & Pluye, 2003;

Te Poel et al., 2016). We found this phenomenon to be true for some of the interviewees in our sample as participants shared that they tend to worry more when something is off, especially when they go to great lengths to stay healthy. Some interviewees mentioned that the time of the day or their mood when researching symptoms online sometimes contributed to increased anxiety (e.g., researching late at night, or when their stress levels are already elevated).

We observed through qualitative analyses that reassurance seeking towards a physician can results from high levels of anxiety as an outcome of online symptom seeking. Participant 00XT4's anecdote exemplifies the effects these factors can have on her searching behaviour. Here we see the excessiveness as well as the reassurance seeking:

[I]t depends on myself, usually when I am stressed, I will google for days, for hours, on end about a certain symptom. But if I am nonchalant, I am feeling pretty well, I've been doing well for myself, I just check the symptoms. If it seems like nothing serious, I let it be. But uh, yah for example's sake, I've been really, really stressed these days so when I did go to the hospital very recently, I was on Google days on end googling my symptoms and they were pretty bad. So, I was like 'oh ok I guess I'll go to the hospital and uh hopefully they tell me it's fine.' (Participant 00XT4, female 23 years old)

Increased events of searching can result in people becoming more aware of their body as they learn more about various organs and systems. This new awareness draws attention to somatic sensations which can fuel anxiety and, in many cases, creates the illusion of worsening symptoms. Tyrer et al. (2019), refer to this part of health anxiety and cyberchondria as the "catastrophic misinterpretation of bodily sensations" (p.566). This event of misinterpretation is referred to as pseudo symptoms in our analysis. A dynamic relationship between exists between anxiety, true symptoms, and pseudo-symptoms during the process of symptom appraisal. For our

participants the likelihood of developing pseudo symptoms was seen to increase the longer and more frequently the person searches and learns. Most interestingly were many participants' self-awareness of this dilemma. Participant AX40T circles back on his experiences and brings up the notion of misinterpreted bodily sensations as a main instigator:

So I think, you know jumping to conclusions, or maybe, focusing on if you kinda you're initial search leads you to a worst-case scenario, "blood pressure this high could cause a stroke", that uh, instead of taking some time to um, break it down make sure I understood correctly, like as soon I got that information piece it did prompt the, a lot of the anxiety and that visit. And I was already feeling lightheaded and because of the high blood pressure which brought up my heart rate up probably and made me feel more lightheaded. It's just a spiral from there. And you don't know what's being caused by the anxiety cause or what is being caused by the underlying physical condition. /…/ And, of course, by the time I got there my blood pressure was below that number and they you know, by the time I finally saw the doctor, by EKG, was normal again. And I think I saw the doctor for five minutes after a ten hour wait. (Participant AX40T, male 38 years old)

In terms of speaking about their experiences consuming OHI once they were in front of a healthcare provider roughly one third of interview participants would not admit to their provided that they had looked online prior to the visit because their ultimate trust was in the professional and did not want to send their diagnosis off track. Alternatively, the other third reported offering suggestions, either by referencing only scientific or credible sources, or would offer a nuance in the diagnosis by omitting the Internet for fear of their points being dismissed. The other third had no reservations about mentioning their online research with the professional and took it as a learning opportunity.

Individuals who report to be curious in nature and/ or who are Scientific or Research oriented

The notion of being a researcher by profession and curiosity played a role in excessive searching amongst participants in our study. Their revelations came unprompted by questions. Each thought their characteristic might be unique. But in fact, it was a common theme:

I may be in a unique position because it is such a big part of my job, uh is also devoted to that. To doing research, to digging, it's just an overload of information on a certain topic. Now my job is never related to health related to stuff, but I wonder if my research-based career and the analytic approach I have to take to my work makes me more prone to this kinda health research about myself." (Participant AX40T, male 38 years old)

When probed further, this behaviour is not just concerning health topics, but found that interview participants self-reported being curious on a wider spread of topics. Many admitted to engaging in impulsive online searches on anything that comes to mind. People are innately eager to learn more, especially if they are curious by nature. This coupled with the accessibility and being proficient in technology led to a higher tendency towards the Internet.

I am definitely one of those people who are glued to their phones. I am constantly using it. It is always in my hand. I am constantly researching things, whether it's for work, whether it's for my health, whether it's for financial literacy, whether it's really anything in life. I heavily use the Internet. (Participant XG543, male 36 years old)

Our findings support the notion from previous studies suggesting that symptom checking on the Internet may indicate a thirst for knowledge about symptoms (Doherty-Torstrick et al., 2016; Norr et al., 2014). And supports that this trait could make them more susceptible to aggravated health anxiety (Norr et al., 2014). Alternatively, it could signal potential levels PIU regarding impulsions towards the Internet (Spada, 2014) but would have to be probed further.

Je lis beaucoup aussi quand j'ai du temps au boulot, je ne suis pas infirmière de formation, mais je m'intéresse beaucoup à ça, à la recherche scientifique aux maladies et tout. Des fois en allant regarder ces choses-là je me dis, à chaque fois que je me dis ce que peut-être que je ne sais pas, que ce n'est pas encore développer peut-être c'est, c'est le début de la maladie t'sais un moment donné que j'avais arrêté, je me disais 'j'espère que je n'ai pas de soucis, de problèmes mentaux là", mais, comme je trouve que c'est épeurant. (Participant FR096, Female 27 years old).

4.4 Discussion

Data was collected from one ED in Ottawa, Ontario (Hôpital Montfort) to carry out this case study. Results have provided important insights on the phenomenon of symptom appraisal and OHI seeking and cyberchondria. Gaining a better understanding of people's experiences with health information online was important to contribute to informing and adapting can help inform online content and eHealth technologies.

Internet use and Health Information Seeking

It is important to mention that the data collection primarily took place at the tail of the COVID-19 pandemic when symptoms were still being monitored closely and authorities were still enforcing isolation, which caused people to consult the Internet more often than before the pandemic (Starcevic, Berle & Arnáez, 2020a). This could have factored into the high rates of symptom appraisal prior to the visit. Our findings support the literature however that OHI seeking and symptom appraising is a common reason for people to use the Internet. (Diviani et al., 2016; Elliot et al., 2015; North et al., 2012; Starcevic & Berle, 2013).

Overall, our results agree with findings in the literature that relate Internet use and OHR to age, gender, race/ethnicity, levels of education (Baker et al., 2010; Elliot et al., 2015;

Hageman et al., 2015; Percherski & Hargittai, 2011; Ybarra & Suman, 2006). Categorically younger individuals and women are and those with higher education, income, and health status more likely to consult the web (Teriaky et al., 2015; Baker et al., 2010; Teriaky et al., 2015; Ybarra & Suman, 2006). Most who looked up their symptoms before their visits were younger, White/European females, with at least a bachelor's degree.

The literature continues to propose the Internet becoming a primary source for health information (Dobransky & Hargittai, 2012; McMullan et al., 2019). The results of our sample illustrate the shift towards digital and online sources as most respondent's primary source for health information was the Internet. The predominant use of search engines by our sample was not surprising, given that search engines have been cited repeatedly in literature as a first step in accessing health information (Muse et al., 2012; Starcevic & Berle, 2013; Chen, Zhao & Wang, 2020). Given this emerging trend, healthcare professionals and communication professionals should take note of the need to have effective and clear health information online for the public to consult.

When assessing eHealth literacy levels we were surprised not to find any significant sociodemographic differences (e.g. education level or age). However, with respects to searching patterns, those who go directly towards medical websites had higher levels of eHealth Literacy then those who use search engines. Troubles navigating and understanding online sources emerged as an obstacle in our sample and contributed to anxiety for many respondents. Better education to improve eHealth literacy and critical source appraisal has been cited as a strategy to improve seekers experiences with online sources (Paige et al., 2017). Part of the education efforts could on how to critically appraise sources and information to avoid reliance on algorithms results from search engines.

Cyberchondria and Health Anxiety

Seeing as the phenomenon of cyberchondria is relatively understudied, particularly in outpatient clinics, emergency departments, and in Ontario, one of the objectives of this research was to determine the magnitude of cyberchondria in patients presenting at the ED.

While a smaller portion of the sample had extreme high levels of cyberchondria, about one third reported high levels. The prevalence of high levels of health anxiety lower in comparison, with 13% scoring above the threshold. While about one third of participants exhibited extreme levels of health anxiety. Cyberchondria and health anxiety were positively correlated in our sample. This outcome was expected as it has been found in the literature that health anxiety and cyberchondria are positively correlated (McMullan et al., 2019). In sum, people who are more anxious about their health are more likely to search online for medical/health-related information (Muse et al., 2012). Specific correlations between health anxiety and the subscales of cyberchondria of compulsion, distress, and excesses in our sample further support links between problematic Internet use, Internet use and health anxiety.

The younger participants in our samples reported higher levels of health anxiety and distress. Previous studies pointed towards older age groups being more health anxious (McMullan et al., 2019). Therefore, we were not expecting the younger group to exhibit more distress than the older age group.

The relatively high level of cyberchondria in our sample and its correlations with using online sources may further support the arguments associating cyberchondria with the consultation of online sources. When investigating cyberchondria we found that Internet users had higher cyberchondria levels than those who indicated health professional as a primary source of health information. Similarly, qualitative analyses illustrate that feelings of anxiety and

moments of panic or emotional distress are associated with pre- and post-online research on health concerns. For our participants, looking to relieve anxiety about a condition often propagated anxiety and worry, and prompted reassurance seeking towards a physician. This study was particularly interested in evaluating the excessiveness and reassurance seeking subscales and their associations with healthcare usage to contribute insights to the continued quest to determine indicators of healthcare utilization (Mathes et al., 2018; McElroy & Shevlin, 2014; Starcevic et al., 2019). Our participants statistics support suggestions that people who see a healthcare provider due to what they consulted online tend to exhibit more reassurance seeking characteristics as noted by Akhtar & Fatima (2020). Our results also support other claims made in the literature Internet users tend to have higher anxiety (Muse et al., 2012).

Symptom Seeking and Correlational Analyses

Another main objective was to determine if patients researched their symptoms prior to presenting at the ED. Asking this categorical question enabled comparative profiles to be created. Contributing to comparative profile research was highlighted as a key path towards better understanding of this occurrence in society (Mueller et al., 2017a). Comparative profiles were used to determine if differences exist amongst symptom seeking patients and non-symptom seeking patients. Our correlational analysis showed that symptom-seekers did demonstrate higher health anxiety, cyberchondria and reassurance seeking than their counterparts. Upon further examination, excessiveness is positively correlated with eHealth literacy. This relationship illustrates that the more proficient in online research for health information one is the more prone they are to engage in repeated searching, perhaps due to their proficiency and comfort level in using the Internet. The element of excessiveness could have been exacerbated in the aftermath of the COVID-19 pandemic due to people consistently researching symptoms of

covid as the directives evolved over the course of the pandemic (Starcevic, Berle & Arnáez, 2020a). Moreover, healthcare providers and facilities were more difficult to access in person which may have caused people to seek information online. Improving online health information literacy has been proposed as a strategy moving forward to help manage this phenomenon (Starcevic et al., 2021). However, with this revelation in mind, it will be important to clearly communicate symptom-related information so as to not create an unwanted reaction.

Symptom seeking prior to ED Visit

We expected that some participants would have consulted online sources prior to their visit based on studies done in other healthcare settings (Rao et al., 2018). But there are little to no studies on searching prior to ED visits. Our findings have given some insight into patients searching habits. Much discussion in the literature revolves around triage recommendations and risk-averse recommendations (Chambers et al., 2019; Semigran et al., 2015). Interestingly, over half of symptom-seekers were recommended to visit ER by the sources they consulted. The results of this section suggest that guidance from information online does have an impact of the decision to visit healthcare services. Our sample had high rates of participants receiving recommendations. This finding warrants further investigations.

Opportunities for alternative methods of eHealth

Previous studies noted that patients calling regional health lines are more likely to be directed to ER than to a family physician's office (Han et al. 2007; Jones et al. 2015). While we do not know the reasons for the call in this study, the results from our sample saw a high percent of respondents being recommended to visit to the ED by the Telehealth Advisory Services. Interestingly there were some situations where participants presented to the ED despite reporting not receiving a recommendation to go. This last occurrence highlights a potential opportunity to

think about alternatives to help communicate appropriate information about symptom appraisal in situations when patients are seeking reassurance about what to do about their symptoms.

Comparing Seekers and Non-seekers

It was speculated that the perceived sense of urgency, coupled with over consultation of online resources and a recommendation to seek immediate care were possible contributors to increased healthcare use (comparing seekers vs non-seekers). Higher health anxiety and reassurance seeking scores might suggest that search results may have caused anxiety and prompted the ED visit. Given the high levels of anxiety in our sample, our figures align with White and Horvitz (2010), initial proposal that searches may result in the need to seek reassurance and that the person may want to speak with a health professional to ease any worries or to have their self-assessment confirmed. Symptom-seekers had higher reassurance seeking scores than non-seekers, which suggests that reassurance seeking is related to healthcare service utilization.

Higher levels of excessiveness were observed in those who received a recommendation and reported acting on the advice found online. This might suggest that those who received a recommendation to visit the ED are more inclined to carry out excessive or repeated searches in attempts to be informed or seek reassurance.

Correlational analysis with symptom seeking prior to ED visit

Particular attention was paid to the correlations between OHR and healthcare utilization to better understand the role of online sources in seeking out a consult with a physician. The results of our study also suggest that reassurance seeking is correlated with health anxiety, as was found in previous research (e.g., Doherty-Torstrick et al., 2016).

Interpretations of the correlational analyses illustrate the time spent looking up symptoms or health information online as positively correlated higher reported levels of anxiety and cyberchondria. Our results echo research that found the duration of time spent checking symptoms online as a significant predictor of worsening anxiety (Doherty-Torstrick et al., 2016) Our results do support that those with higher levels of health anxiety and cyberchondria spent longer time searching for symptoms and OHI at higher frequencies (Muse et al., 2012; Norr et al., 2014; Starcevic & Berle, 2013).

Levels of eHealth literacy was positively correlated to time spent online looking for symptoms and health information. The positive correlation with online searching and eHealth Literacy could be explained by perceived level of proficiency with using online health resources which encourages more online activity.

Secondly, there may have been a difference in symptom seeking versus OHI seeking. Symptom seeking was the variable with the strongest positive correlation between scores of health anxiety, eHealth Literacy and particularly for the cyberchondria severity scale as well as key tenets of cyberchondria: excessiveness and reassurance seeking. This suggests that the process and searching for symptoms versus general health information is experienced differently, perhaps due to the circumstance surrounding the search or due to how the information is being communicated and consumed. Our results correspond with the progression of the conceptualization of the cyberchondria as excessiveness and repetitive searches since those subscales had the strongest correlations with symptom checking and online health information (Doherty-Torstrick et al., 2016).

Examining correlations and factors associated with visiting the ED were also of interest. Generally, symptom-seeking yielded stronger positive correlations with scores and other

parameters than simply searching for health information. Specifically examining pre-ED behaviours (e.g., time spent searching symptoms and when the decision was made to visit the ED), showed significant positive correlations with levels of cyberchondria. Similarly general behaviours of Internet usage were found to be positively correlated to higher levels of cyberchondria. Frequency of OHI seeking and symptom seeking were positively correlated with higher levels of cyberchondria. Our results suggest that searching for symptoms does indeed have an impact on the decision to seek out care at an ED, especially if information consumed recommend seeking immediate treatment. If the OHR was done at least one day before the day of their visit participants were more likely to seek out a consult with a physician. Reassurance levels were positively correlated with symptom seeking. Based on these results we can deduce that searching for symptoms online does have an impact on health services and potential public health implications as pointed out by Starcevic et al. (2019). Our results show correlations between cyberchondria and healthcare utilization as suggested by Starcevic, Berle and Arnáez (2020a) and Akhtar and Fatima, (2020).

We also set out to learn more about the process by which people engage with OHI. While those with health anxiety are known to be more prone to using the Internet for medical information, we found that participants who do not identify as being anxious about their health equally relied on the Internet for symptom seeking. The results of this study illustrates that online symptom-seeking has become a common way to address a health question or issue before going to the ED. The main reasons for OHR have surfaced as getting an idea of what is happening in the body, to ascertain the severity of the symptom and to determine if it requires medical intervention. Our participants reported using OHI as a guide and a tool to dictate access to healthcare services, at least as it related to the Canadian healthcare system. Factors that

reinforced searching in our sample were related to increased levels of eHealth literacy, being proficient with the Internet and being curious or having an affiliation with research. Our findings confirmed the proposed difficulties in managing feelings of uncertainty with respect to search results (Starcevic et al., 2019), as participants' anecdotes demonstrate that repetitive searching is done in attempts to decrease uncertainty to arrive at a resolution and secure closure.

Particular attention was paid to healthcare utilization because as a result of OHR to better understand its role with seeking services. The results of our study also suggest that reassurance seeking is correlated with health anxiety, as was found in previous research (e.g. Doherty-Torstrick et al., 2016). Overall, it was concluded that information related to symptoms online plays a strong role in the decision to seek services. The decision is heavily informed by the perceived severity of one's situation, as ascertained from online sources. At the same time, online recommendations could cause anxiety and generate a sense of urgency in seekers. Looking up the severity of a symptom was found to escalate the anxiety and prompt the use of services for many of our participants. This reaction of anxiety rather than necessity was indeed what led some participants to ER visits as evidenced by the telephone interviews. Increases in this behaviour has the potential to pose a public health burden and strain to the healthcare system as suggested in previous studies (Mathes et al., 2018; Starcevic et al., 2019).

A main take away from this study is that the Internet is a primary source of health information. Even though the process of OHI seeking helps inform people, the information consumed and how its perceived also leaves people feeling more anxious and worried about their health. Increased health-related online research seems to be indicative of a growing feeling towards staying healthy and avoiding illness, but also trying to take control of healthcare decisions in an era where services are increasingly difficult to access. Through this investigation

we have shown that symptom appraising online before visiting the ED seems to be a common practice. The results of our investigation help contribute to the knowledge of what drives people to seek out ER services following symptom seeking and appraising online. This study has allowed us to explore how online health information and the way it is perceived and understood can be related to health anxiety and cyberchondria and impact healthcare utilization.

Empirical data of this research study further support the case of an overuse of healthcare resources which is often driven by anxiety as opposed to necessity. This over consultation does pose a public health burden, not only as a strain to the healthcare system, but on patients themselves. The relationships between the way in which health and symptom appraisal information is presented and perceived online and its associations with cyberchondria are worth being considered when discussing overcrowding and over consultations with emergency department physicians. Together, they provide a basis for the argument to put more resources into either regulating online sources and for authorities to consider how to assure the quality of online information and make it more accessible. This is also an opportunity for communication professionals in healthcare to turn their attention towards developing alternatives in eHealth communication technologies to help reassure patients who are experiences new symptoms so they can make informed and appropriate decisions on which levels of healthcare services to seek out and avoid negative emotional outcomes like anxiety and distress.

Chapter 5 Conclusion

Chapter 4 presented and analyzed the data that was collected. This fifth and closing chapter offers a summary of the results along with its potential real-world applications and the limitations of the study. The thesis will conclude by identifying avenues for future research and final remarks.

This mixed method study collected data from 128 patients visiting Hôpital Montfort's Emergency Room using an online questionnaire and conducting nine telephone interviews. Patients categorized as CTAS 2-5 were recruited by volunteer sampling. The questionnaire was designed to analyze correlations between prior symptom appraising behaviours and levels of cyberchondria. Semi-structured qualitative interviews were conducted to gain a deeper understanding of people's experiences with symptom appraisal and visiting emergency services. Gaps identified in the literature on these topics inspired this undertaking. The COVID-19 Pandemic occurred between the conception of this project and the end which undoubtedly affected our findings and will continue to impact symptom appraising moving forward.

5.1 Summary of Findings

Our analysis revealed that almost all respondents had searched online for health information in the past year. In fact, an important revelation of this study is that the Internet outranked healthcare professionals as a primary source of health information. Search engines were used by most participants to find OHI instead of going directly to medical websites. The majority of participants did search for their symptoms online before going to the ED, either the same day or the previous day. Most spent 30 minutes or less searching for their symptoms and received a recommendation to seek out immediate care. Most survey respondents who called telehealth were directed towards the ED.

Cyberchondria and health anxiety mean scores were positively correlated. A small number of people ranked in the extreme limits in both cyberchondria and health anxiety scales. Those who searched for their symptoms prior to the ED visit exhibited significantly higher levels of health anxiety, cyberchondria and reassurance seeking than those who did not. The frequency of symptom appraising is positively correlated with levels of eHealth literacy, health anxiety, cyberchondria and compulsion. The length of time spent searching for symptoms prior to the ED was positively correlated with health anxiety, cyberchondria, as well as excessiveness and reassurance seeking. Moreover, seekers who search more frequently for health information or symptoms reported higher levels of cyberchondria than non-seekers.

The results of this study begin to explain the role of the OHI in assisting with the decision to use healthcare services. Seeking information online is a first step in determining the severity of the symptom and to confirm whether seeking immediate care is required. Some patients are often overwhelmed, and they may experience anxiety and distress from the results of their searches. In some cases, seekers will experience perceived worsening symptoms or pseudo symptoms after consulting online sources, which can prompt visits. Many trips to the ED were either because of online recommendations or done as a precaution to eliminate the risk that the symptoms develop into something serious based on what they read online. In some cases, seekers want confirmation for a condition they believe they have based on what they read online.

5.2 Importance of Findings

While previous studies explored the theoretical aspect of healthcare utilization intent (e.g., White & Horvitz, 2010), our study offers empirical data on the effects of OHI on ED visits. Causality was outside the scope. Instead, we were interested in examining prevalence and correlations.

We did not observe significant differences of eHealth literacy amongst our sample. According to the literature, eHealth literacy levels were suggested to have a protective effect in safely navigating OHI (Diviani et al., 2016). However, this was not observed in our data. In fact, eHealth literacy was positively correlated with cyberchondria, as well as excessiveness and reassurance. In other words, those with high levels of eHealth literacy still exhibited higher levels of cyberchondria, excessive and reassurance tendencies. This suggests that the ability to adequately locate and understand online medical information might invite excessive searching. Feelings of anxiety might ensue as a consequence and may result in seeking reassurance from a health professional.

Overall, people put a considerable amount of weight on the results of searches and have come to rely on the information provided. Information retrieved is used to determine the next steps. Each source, from government sites, medical association sites to articles and even blogs, has its place in helping in the decision. This has created an opportunity to produce more creative, innovative, and reassuring ways to communication more about symptoms and provide appropriate direction to online health consumers. Developing public health communication strategies to mitigate the negative effects of OHI continue to be recommended (Starcevic et al., 2021; Teriaky et al., 2015). Discouraging use of online sources does not seem like a practical solution given the ubiquity of the Internet. Instead, awareness campaigns on best practices when it comes to using OHI could be produced by authorities and promote accredited seals like the HON Code to increase the awareness on how to recognize certified credible sources. People see hospitals as authority figures[1] (see footnote 1). A shift in the way health authorities and hospitals communicate with the community could lead to fruitful results. Launching a pilot project to create a platform certified by Ottawa hospitals containing how and where to go to consult trusted

health information from Canadian sources could be a good start. Just like efforts on recommending telehealth services on Ontario Health websites, there could be a link to trusted sites and protocols for consulting OHI.

It would be safe for physicians and healthcare professionals to assume that most of their patients would have researched their symptoms online before coming in for their appointment. On an interpersonal communication level OHI is altering the patient-provider interaction (Starcevic, Berle & Arnáez, 2020a). Therefore, practitioners should be open to address symptom appraisal and point their patients to credible and reliable sources. Healthcare professionals could benefit from training to help lead constructive discussions in patient interactions to support productive OHR. These concerted efforts may help reduce health anxiety and lead to economic savings for Eds in Ontario, and throughout Canada, by indirectly helping ease the situation of over consultation so that patients are better equipped to deal with the outcomes of OHR.

5.3 Potential Limitations

Potential limitations include not knowing what condition or symptoms the patients were coming in with, nor the resultant diagnosis of the visit. For instance, with respect to receiving recommendations to visit the ED (both online and telehealth), for some participants the recommendations could have been for the right reason. Knowing the reasons for the visits and making a judgment on a patient's grounds for visiting the ED was beyond the scope of this thesis. Additionally, perceived severity of the symptom remained a subjective measure through the analysis. For some the severity could be perceived as higher than it was medically. In terms of our sample population, patients who were feeling too unwell the day of the visit who would have been strong participants, may have opted out. Secondly, since recruitment was done by posters, we cannot know for sure if each respondent was a patient. Future iterations could

include a patient identifying criterion, allowing for exclusion. With respects to eHealth Literacy assessment, the eHealth Literacy Scale requires updating to include social media and dynamic elements of the web (Paige et al., 2017). Given the rapidly expanding use of social media, and audiovisual elements, the slight disconnect could have affected our results. Although our best efforts have been put into reducing the amount of recall bias, there is still the possibility that our participants exhibited a certain level of recall bias, which could impact the survey results.

5.4 Possibilities for Future Research

During this case study, we compared those who reported searching for symptoms to those who did not, amongst patients who were present in the ED. Since this was a case study, it would be worth repeating in other locations to investigate any possible similarities, behavioural and cultural differences, and in a sample large enough to generalize the results to the Canadian public. Future studies comparing seeking habits and profiles are recommended to gain a fuller understanding of how people are seeking, consuming, understanding and acting on OHI to explore alternative methods of communicating triage recommendations or explore alternative and new eHealth technologies to help health consumers navigate and understand their symptoms. Further analyses should be done to investigate the counter-intuitive positive correlation between eHealth literacy and cyberchondria to establish it as an anomaly or as something meriting further consideration this in context.

A next study could take a deeper dive in the types of supports that could benefit seekers, specifically using focus groups to discuss what type of supports, whether community awareness programs could or workshops to help learn best practices regarding the ways in which online health information could be better communicated to be more useful to consumers, or to investigate concrete ways to help patients navigate online sources for purposes of healthcare

utilization intent. The results of the focus group could help start discussions on the possibility of elaborating and implementing care consortiums to help direct patients on how to manage searching for health information online. A longitudinal study could be carried out to test the effects of the strategies and skills in place to assess whether they have an effect.

5.5 Final Remarks

The way health information is communicated and presented has evolved greatly since the Internet and has influenced how people process and act on information. This use of online sources has infiltrated healthcare as evidenced by more respondents choosing the Internet as a primary source of health information. The way content is created and communicated to consumers online is important given the weight of its impacts and implications on public health outcomes (e.g., socially, psychologically, emotionally and healthcare services utilization). This shift in reliance on the Internet for health-related matters should be factored in when considering future definitions of cyberchondria. Further there seems to be an increased prevalence of anxiety within the general population as the global COVID-19 pandemic undoubtedly contributed to both the increased reliance on the Internet and in anxiety levels (Starcevic, Berle & Arnáez, 2020a). This relationship should continue to be monitored as the healthcare system experiences a shift in patient responsibility and ownership in health.

Humans have evolved with technology. However, it is important that individuals not ignore innate instinct and the human ability to make decisions. While the Internet has become a valuable tool to assist us in making decisions, let us not become too dependent on allowing it to make decisions for us.

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Footnotes

1. The following theme did not explicitly answer our research question. However, it was worth mentioning as it does add a cultural perspective to the issue of online health information seeking in Canada. Since the majority of seekers initiate their searches using search engines, Canadian sources do not tend to show up first. Additionally, information published by the government are not perceived to be accessible or easy to find.

Lack of Access to Canadian Sources

Specific to our case study was that the lack of Canadian sources on search engines was a reoccurring comment from questionnaire and interview participants alike. There is a growing frustration on the influence of American and British content dominating search engine due to algorithms and a desire for Canadian produced content.

> J'essaie souvent de trouver des informations, euh, de Canada.ca ou, gc.ca. Um c'est pas toujours facile. Et puis souvent, comme des sites de recherche American. Je dirais que toutes les recherches sont plus faciles à trouver presque que ceux canadiens. Et souvent je pense que c'est une question des algorithmes, des choses comme ça. (Participant XG543, Female 29 years old)

The issue of culturally relevant sources was raised a similar study in Sri Lanka, (Wijesinghe et al., 2019). As this topic begins to garner international attention, this conclusion can be expected to reproduce. This principle is applicable to all contexts given search engines use of algorithms. Moreover, the idea that information should not change depending on the site you are on and for responsibility from government or hospitals in directing seekers and information.

Si ça serait, disons un site comme je dis encore si c'est un site approuver par le Canada, ou c'est des liens qui sortent un site qui est approuvé par [l'hôpital] Montfort ou [l'hôpital] Général et que si je vais sur la page de Montfort et je clique le lien ou la page du Général et je clique le lien et ça ramène tout au même standard, le même site la même chose. (Participant AX005 Male 36 years old).

Tables

Descriptive Statistics Tables

Table 6

Sociodemographic breakdown of respondents and symptom-seekers

		Searched for Symptoms Before ER Visit					
		Yes		No		Full Sample N= 128	
		n	%	n	%	N	%
Age	18 to 34 yrs.	36	67.9	17	32.1	53	41.4
	35 to 49 yrs.	24	61.5	15	38.5	39	30.5
	50 to 64 yrs.	10	62.5	6	37.5	16	12.5
	Above 65 yrs.	5	41.7	7	58.3	12	9.4
	Unknown	6	75	2	25	8	6.3
Gender	Male	30	61.2	19	38.8	49	38.3
	Female	43	67.2	21	32.8	64	50.0
	Non-Binary/Third gender	2	50	2	50	4	3.1
	Prefer not to answer	6	54.5	5	45.5	11	8.6
Highest Level of Education	High school diploma or less	16	61.5	10	38.5	26	20.3
	College diploma	14	63.6	8	36.4	22	17.2
	Bachelor's degree	20	55.6	16	44.4	36	28.1
	Above a bachelor's degree	25	69.4	11	30.6	36	28.1
	Unknown	6	75	2	25	8	6.3
Occupation	Working full time	47	62.7	28	37.3	75	58.6
	Working part time	6	75	2	25	8	6.3
	Homemaker	3	75	1	25	4	3.1
	Student	9	81.8	2	18.2	11	8.6
	Retired	6	40	9	60	15	11.7
	Unemployed	4	57.1	3	42.9	7	5.5
	Unknown	6	75	2	2	8	6.3
Ethnicity	White/European	41	63.1	24	36.9	65	50.8
	Black/African	6	75	2	25	8	6.3
	Asian	3	60	2	40	5	3.9
	Arab	1	33.3	2	66.6	3	2.3
	Hispanic	2	50	2	50	4	3.1
	Native	1	33.3	2	66.6	3	2.3
	Multi-racial	5	83.3	1	16.7	6	4.7
	Unknown	22	64.7	12	35.3	34	26.6
Language	English	56	64.4	31	35.6	87	68.0
	French	25	61	16	39	41	32.0

Table 7

Symptom seeking before ER visit

		N	%		
Searched online Before ER	Yes	81	63.3		
				n	%
		Time spent searching	30 minutes or less	38	46.9
			Up to 1 hour	25	30.9
			Up to 2 hours	9	11.1
			2 + hours	9	11.1
		Online Recommendation towards ER	Yes	48	59.3
			No	16	19.8
			Not sure/Do not remember	7	8.6
			Did not provide triage recommendation	10	12.3
		Decision made to come to ER	The day of	41	50.8
			The day before	20	24.7
			Two days before	12	14.8
			Within the last week	8	9.9
	Non-symptom seekers	47	36.7		

Note. N = 128

Inferential Statistics Tables

Table 8

ANOVA difference of means level of education, gender

Level of Education	Sum of Squares	*df*	Mean Square	F(4, 123)	*p*	Point estimate	[LL, UL]
eHEALS	33.27	4	8.32	0. 26	.904	.008	[.000, .021]
SHAI	266.34	4	66.58	1.35	.255	.042	[.000, .101]
CSS-30	2992.96	4	748.24	1.76	.142	.054	[.000, .120]
CM	221.19	4	55.30	1.23	. 228	.044	[.000, .105]
DS	295.54	4	73.89	1.38	.244	.043	[.000, .103]
EX	188.54	4	47.13	1.02	.401	.032	[.000, .083]
RE	141.77	4	35.44	1.39	.243	.043	[.000, .103]
Gender	Sum of Squares	df	Mean Square	F(3, 124)	*p*	Point estimate	[LL, UL]
eHEALS	121.62	3	40.54	1.18	.322	.028	[.000, .085]
SHAI	300.87	3	100.29	2.06	.109	.048	[.000,.119]
CSS-30	129.35	3	43.12	0.10	.962	.002	[-.008,-.006]
CM	34.66	3	11.55	0.29	.833	.007	[.000, .034]
DS	60.10	3	20.03	0.37	.779	.009	[.000, .041]
Groups							
EX	33.43	3	11.14	0.24	.871	.006	[.000,.029]
RE	80.72	3	26.91	1.04	.377	.025	[.000,.079]

Note. Point estimate Eta-squared. 95% CI. LL = Lower limit. UL = Upper Limit

Table 9

ANOVA difference of means age

Age	Sum of Squares	*df*	Mean Square	F(4, 123)	*p*	Point estimate	LL	UL
eHEALS	40.70	4	10.17	0.29	.886	.009	.000	.028
SHAI	767.85	4	191.96	5.05	.003*	.121	.017	.210
CSS-30	4859.36	4	1214.84	2.96	.023	.088	.001	.168
CM	65.44	4	16.36	0.41	.801	.013	.000	.041
DS	540.10	4	135.03	3.46	.018*	.079	.000	.156
EX	498.75	4	124.69	2.85	.027	.085	.000	.164
RE	268.51	4	67.13	2.73	.032	.082	.000	.160

Note. * The mean difference statistically significant at the 0.05 CI level (2-tailed)

Point estimate Eta-squared. 95% CI. LL = Lower limit. UL = Upper Limit

Table 10

ANOVA post hoc Means, standard deviations and p values with confidence intervals between age groups

SHAI	M	SD	1
1. 18 to 34 yrs old	14.6	8.2	
2. 50 to 64 yrs old	9.1	4.3	.008* [1.1, 9.9]
3. Over 65 yrs old	7.8	3.9	<.001* [2.3, 11.4]

Note. Values in brackets are lower and upper limits at the 95% CI.

*. The mean difference is significant at the 0.05 level.

Table 11

ANOVA post hoc Means, standard deviations and p values with confidence intervals between age groups

DS		M	SD	1
1.	18 to 34 yrs	18.2	8.3	
2. Over 65 yrs old		12.6	3.6	.007* [1.2, 1.0]

Note. Values in brackets are lower and upper limits at the 95% CI.

*. The mean difference is significant at the 0.05 level.

Table 12

Difference in means between language of correspondence

	English		French		*t*(126)	*p*	Cohen's *d*
	M	SD	M	SD			
eHEALS	30.5	5.7	28.2	6.5	2.07	.041* [.096, 4.45]	0.39
CSS-30	68.1	18.7	60.2	24.3	2.02	.045* [.17, 15.64]	0.38
EX	22.5	6.2	19.4	7.6	2.48	.014* [.64, 5.64]	0.46
RE	15.2	4.9	13.2	5.3	2.08	.039* [.10, 3.86]	0.39

Note. English respondents (n = 87), French respondents (n = 41). There was no significant difference of scores between SHAI and the CM and DS subscales with English respondents still having a higher score than the French respondents. Values in square brackets are lower and upper limits at the 95% CI.

*. The mean difference is significant at the 0.05 level

Table 13

Primary source of health information

	Health Professional		Internet		*t*(110)	*p*	Cohen's *d*	LL, UL
	M	SD	M	SD				
CSS-30	60.2	20.3	68.8	17.2	2.26	0.026*	0.41	[-.80, -.05]

Note. Health Professional (n = 54) Internet (n = 58). 95% CI. Two-tailed p

* The mean difference is significant at the 0.05 level.

Table 14

Primary online source for health information

	Directly from Medical sites		Search Engines		*t*(106)	*p*	Cohen's *d*	LL, UL
	M	SD	M	SD				
eHEALS	32.7	4.6	28.6	5.8	3.642	<.001*	0.69	[.33, 1.2]

Note. Directly from Medical Sites (n = 34) Search Engines (n = 74). 95% CI. Two-tailed p.

* The mean difference is significant at the 0.05 level.

Table 15

Consulted a health professional in the last twelve months because of OHI

	Yes		No		*t*(126)	*p*	Cohen's *d*
	M	SD	M	SD			
SHAI	14.4	8.3	10.2	5.3	3.615	<.001* [.29, 1.0]	0.59
CSS-30	73.6	22.9	59.3	16.9	4.061	<.001* [.36, 1.1]	0.68
RE	16.4	5.0	13.1	4.7	3.887	<.001* [.33, 1.1]	0.64

Note. Yes (n = 56) No (n = 72). Values in square brackets are the lower and upper limits at the 95% CI Two-tailed p.

* The mean difference is significant at the 0.05 level.

Table 16

Searched for symptoms before visiting ER

	Yes		No		t(126)	*p*	Cohen's *d*
	M	SD	M	SD			
SHAI	13.3	7.1	9.7	6.4	2.86	.004* [.18, .91]	0.51
CSS-30	71.2	20.5	55.8	18.0	4.29	.001* [.41, 1.2]	0.74
EX	23.6	6.5	18.1	5.9	4.75	<.001* [.49, 1.2]	0.81
RE	15.7	4.4	12.6	5.3	3.46	<.001* [.21, 1.0]	0.61
					t(79.11)	p	Cohen's d
eHEALS	30.9	5.2	27.8	6.6	2.95	.004* [.87, 5.3]	0.53

Note. Yes (n=81) No (n=47). Values in square brackets are lower and upper limits at the 95% CI. Two-tailed p. eHEALS equal variance was not assumed.

* The mean difference is significant at the 0.05 level.

Table 17

ANOVA received recommendation online versus non-symptom seekers

	Sum of Squares	*df*	Mean Square	F	*p*	Point estimate	LL	UL
eHEALS	481.08	4	120.27	4.15	.009*	.109	.011	.196
SHAI	403.54	4	100.89	2.09	.086	.064	.000	.135
CSS-30	8304.11	4	2076.03	5.42	<.001*	.150	.034	.244
CM	420.87	4	105.22	2.34	.083	.085	.000	.164
DS	594.35	4	148.59	2.54	.062	.087	.000	.166
EX	1152.57	4	288.14	6.55	<.001*	.196	.066	.294
RE	420.61	4	105.15	4.51	.002*	.128	.021	.218

Note. * The mean difference is significant at the 0.05 level.

Table 18

ANOVA post hoc Means, standard deviations and p values with confidence intervals between those who received online recommendation

eHEALS	M	SD	1
1. Non-symptom seekers	27.8	6.6	
2. Yes	31.9	5.3	.010* [.71, 7.5]
CSS-30	M	SD	1
1. Non-symptom seekers	55.8	18.0	
2. Yes	74.4	23.9	<.001* [6.49, 30.63]
DS	M	SD	1
1. Non-symptom seekers	13.6	6.62	
2. Yes	18.5	8.59	.021* [. 51, 9.26]
RE	M	SD	1
1. Non-symptom seekers	12.6	5.3	
2. Yes	16.7	4.8	.003* [1.0, 7.2]

Note. *. The mean difference is significant at the 0.05 level. Values in the brackets are LL and UL at the 95% CI

Table 19

ANOVA post hoc Means, standard deviations and p values with confidence intervals those who received online recommendation

	EX	M	SD	1	2
1.	Non-symptom seekers	18.1	5.9		
2.	Yes	24.9	7.3	<.001* [3.0, 10.6,]	
3.	Not sure do not remember	19.9	2.8		.024* [.51, -9.48]
4.	Did not provide recommendation	20.8	2.6		.030* [.28, 7.85]

Note. *. The mean difference is significant at the 0.05 level. Values in the brackets are LL and UL at the 95% CI

Table 20

ANOVA decision make to go to ER versus non-symptom seekers

	Sum of Squares	*df*	Mean Square	F	*p*	Point estimate	LL	UL
eHEALS	592.05	4	148.01	4.68	.004*	.135	.025	.226
SHAI	566.50	4	141.63	3.35	.021*	.089	.001	.170
CSS-30	7820.51	4	1955.13	5.06	<.001*	.141	.029	.234
CM	356.35	4	89.09	2.60	.055	.072	.000	.146
DS	494.17	4	123.54	2.38	.055	.072	.000	.146
EX	1010.78	4	252.68	6.37	<.001*	.172	.049	.268
RE	371.98	4	92.99	3.92	.005*	.113	.013	.200

Note. *. The mean difference is significant at the 0.05 level.

Table 21

ANOVA post hoc Means, standard deviations and p values with confidence intervals between groups decision made to go to ER after searching symptoms online

eHEALS		M	SD	1
1.	Non-symptom seekers	27.8	6.6	
2.	Day of	31.6	4.7	.018* [.46,7.20]
SHAI		**M**	**SD**	**1**
1.	Non-symptom seekers	9.7	6.4	
2.	Day of	13.4	6.0	.050* [.003,7.30]
RE		**M**	**SD**	**1**
1.	Non-symptom seekers	12.6	5.3	
2.	Day of	16.0	4.6	.032* [.190, 6.70]
CSS-30		**M**	**SD**	**1**
1.	Non-symptom seekers	55.8	18.0	
2.	Day of	72.3	20.8	.006* [3.3, 29.6]
3.	The day before	74.2	22.2	.019 [1.98, 34.8]
EX		**M**	**SD**	**1**
1.	Non-symptom seekers	18.1	5.9	
2.	Day of	24.5	6.6	<.001* [2.2, 10.6]
3.	The day before	23.6	5.6	.034* [.25, 10.8]

Note. *. The mean difference is significant at the 0.05 level. Values in brackets are lower limit and upper limit at the 95% CI.

Figure 3

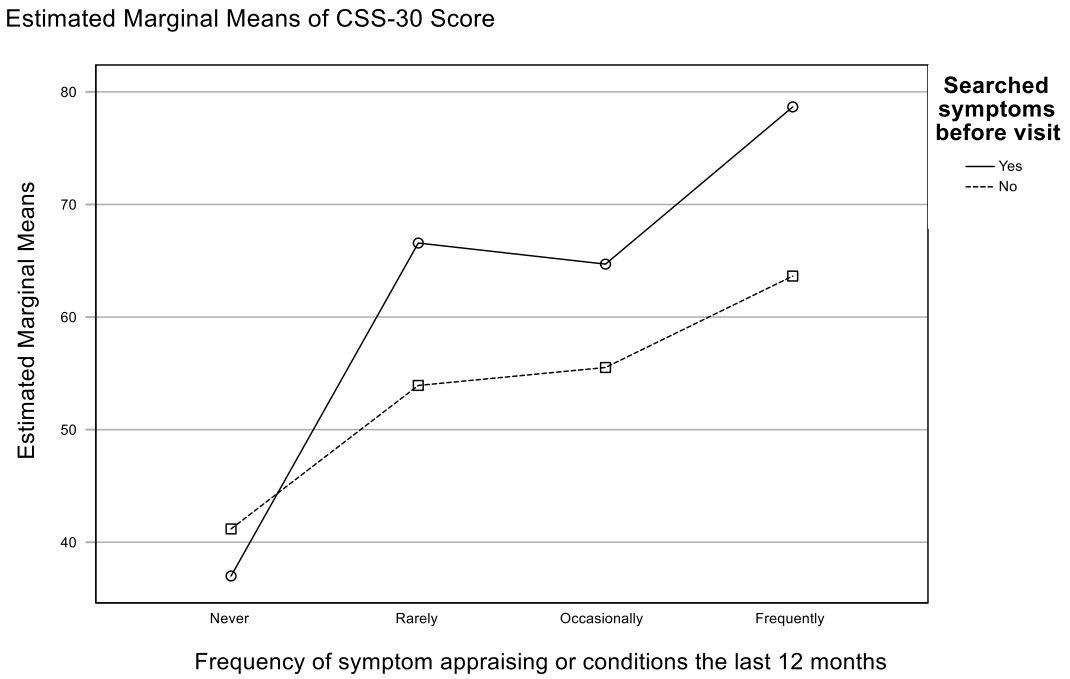

Table 22

Tests of Between-Subjects Effects

Dependent Variable: CSS-30 Score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Symptom seeking before ED visit	837.29	1	837.29	2.46	.120	.02
Frequency of symptom appraisal in the last 12 months	5395.52	3	1798.51	5.26	.002	.12
Symptom seeking before ED visit * Frequency of symptom appraisal in the last 12 months	457.75	3	152.58	.45	.720	.01

a. R Squared = .261 (Adjusted R Squared = .218)

Figure 4

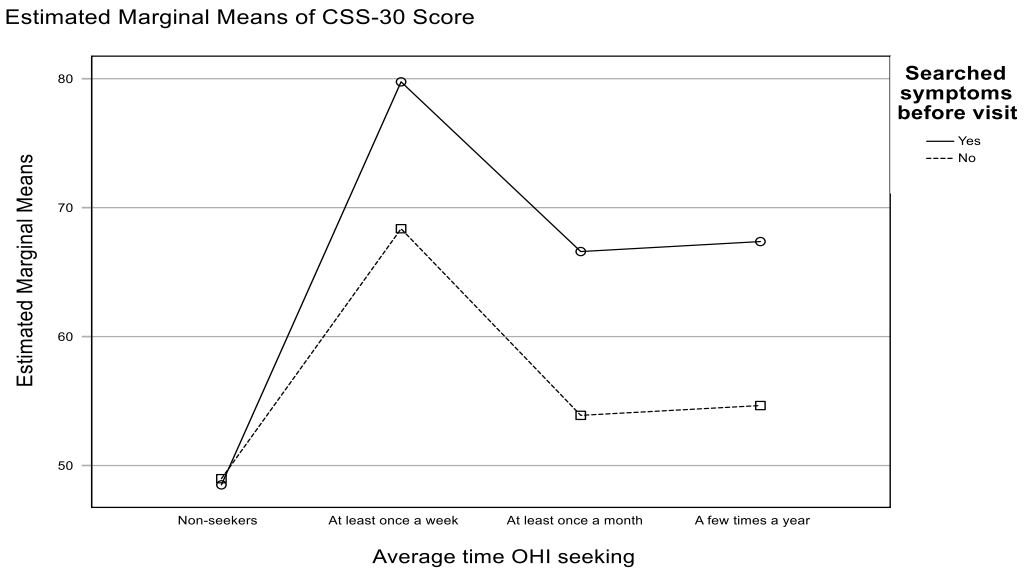

Table 23

Tests of Between-Subjects Effects

Dependent Variable: CSS-30 Score

Source	Type III Sum of Squares	*df*	Mean Square	F	*p*	Partial Eta Squared
Searching for symptoms before ED visit	1225.53	1	1225.53	3.44	.066	.03
Average time of OHI seeking	4386.02	3	1462.01	4.10	.008	.09
Searching for symptoms before ED visit * Average OHI seeking	241.63	3	80.54	.23	.878	.01

a. R Squared = .228 (Adjusted R Squared = .183)

Figure 5

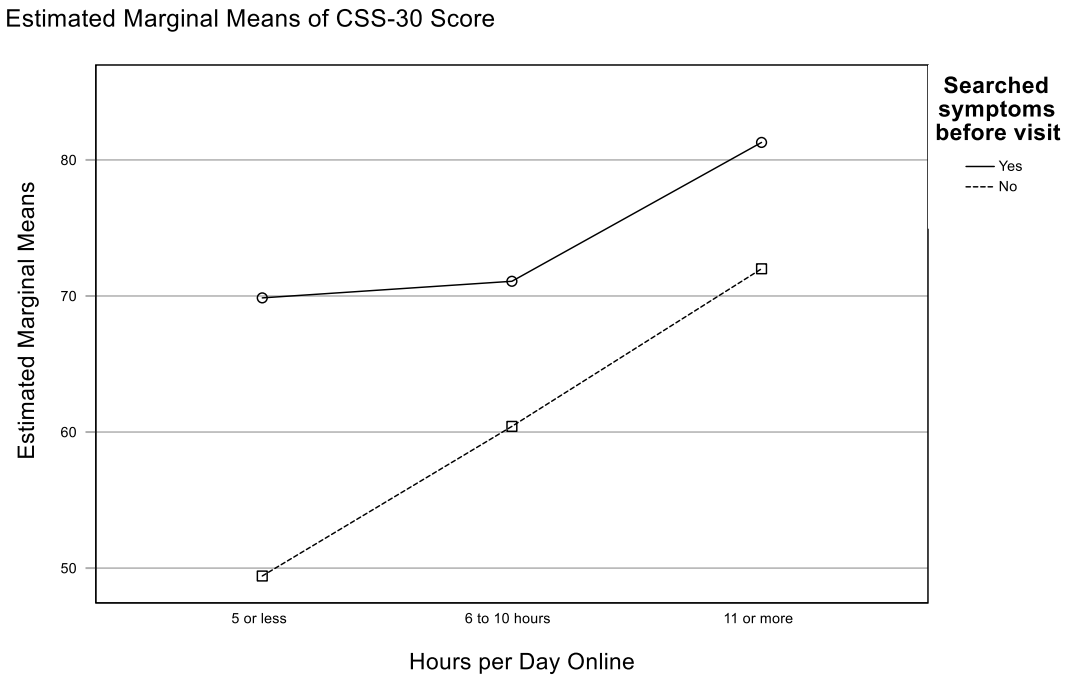

Table 24

Tests of Between-Subjects Effects

Dependent Variable: CSS-30 Score

Source	Type III Sum of Squares	df	Mean Square	F	*p*	Partial Eta Squared
Searching symptoms before ED visit	3546.05	1	3546.05	9.77	.002	.07
Hours online per day	3628.02	2	1814.01	4.99	.008	.08
Searching symptoms before ED visit * Hours online per day	742.15	2	371.07	1.02	.363	.02

a. R Squared = .200 (Adjusted R Squared = .167)

Table 25

Correlations and p values with confidence intervals of validated mean score scores

	1.	2.	3.	4.	5.	6.
1.CSS-30	1.00					
2.RE	.72** <.001 [.63, .80]	1.00				
3.EX	.88** <.001 [.83, .91]	.67** <.001 [.56, .75]	1.00			
4. DS	.87** <.001 [.83, .91]	.45** <.001 [.30, .58]	.69** <.001 [.59, .77]	1.00		
5.CM	.77** <.001 [.68, .83]	.35** <.001 [.19, .50]	.49** <.001 [.34, .61]	.63** <.001 [.51, .72]	1.00	
6.SHAI	.49** <.001 [.35, .61]	.23** .010 [.06, .39]	.40** <.001 [.25, .54]	.53** <.001 [.39, .64]	.39** <.001 [.23, .53]	1.00
7.eHEALS	.18* .048 [.001, .34]	.31** <.001 [.15, .46]	.23** .008 [.06, .39]	.003 .974 [-.17, .18]	.07 .430 [-.10, .24]	-.05 .546 [-.23, .12]

Note: Pearson's R coefficient analysis between continuous scale score data. Values in square brackets indicate the lower and upper limit at the 95% CI.

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Qualitative Data Tables

Table 26

Demographic characteristics of telephone interview participants

	N
Gender	
Male	6
Female	3
Occupation	
Working full time	6
Student	2
Unable to work	1
Language	
English	6
French	3
Highest level of education	
High school or less	1
College	1
Bachelor's degree	2
Above a bachelor's degree	5
Average Internet use	
High	9
Searched for Symptoms before ER visit	
Yes	5
No	4

Note. N = 9

ANOVA Tables

ANOVA

Age

		Sum of Squares	*df*	Mean Square	*F*	*p*
eHeals Score	Between Groups	40.70	4	10.18	.29	.886
	Within Groups	4353.78	123	35.40		
	Total	4394.48	127			
SHAI Score	Between Groups	767.85	4	191.96	4.25	.003*
	Within Groups	5562.10	123	45.22		
	Total	6329.95	127			
CSS-30 Score	Between Groups	4859.36	4	1214.84	2.96	.023
	Within Groups	50524.75	123	410.77		
	Total	55384.12	127			
CM Subscale Score	Between Groups	65.44	4	16.36	.41	.801
	Within Groups	4909.79	123	39.92		
	Total	4975.23	127			
DS Subscale Score	Between Groups	540.10	4	135.03	2.62	.018*
	Within Groups	6330.32	123	51.47		
	Total	6870.42	127			
EX Subscale Score	Between Groups	498.75	4	124.69	2.85	.027*
	Within Groups	5387.65	123	43.80		
	Total	5886.39	127			
RE Subscale Score	Between Groups	268.51	4	67.13	2.73	.032*
	Within Groups	3019.46	123	24.55		
	Total	3287.97	127			

ANOVA

Gender

		Sum of Squares	*df*	Mean Square	*F*	*p*
eHeals Score	Between Groups	121.62	3	40.54	1.18	.322
	Within Groups	4272.86	124	34.46		
	Total	4394.48	127			
SHAI Score	Between Groups	300.87	3	100.29	2.06	.109
	Within Groups	6029.08	124	48.62		
	Total	6329.95	127			
CSS-30 Score	Between Groups	129.35	3	43.12	.10	.962
	Within Groups	55254.77	124	445.60		
	Total	55384.12	127			
CM Subscale Score	Between Groups	34.66	3	11.55	.29	.833
	Within Groups	4940.57	124	39.84		
	Total	4975.23	127			
DS Subscale Score	Between Groups	60.10	3	20.03	.37	.779
	Within Groups	6810.32	124	54.92		
	Total	6870.42	127			
EX Subscale Score	Between Groups	33.43	3	11.14	.24	.871
	Within Groups	5852.96	124	47.20		
	Total	5886.39	127			
RE Subscale Score	Between Groups	80.72	3	26.91	1.04	.377
	Within Groups	3207.25	124	25.87		
	Total	3287.97	127			

ANOVA

Level of Education

		Sum of Squares	*df*	Mean Square	*F*	*p*
eHeals Score	Between Groups	33.27	4	8.32	.26	.904
	Within Groups	4361.20	123	35.46		
	Total	4394.48	127			
SHAI Score	Between Groups	266.34	4	66.584	1.35	.255
	Within Groups	6063.61	123	49.298		
	Total	6329.95	127			
CM Subscale Score	Between Groups	221.19	4	55.30	1.23	.228
	Within Groups	4754.04	123	38.65		
	Total	4975.23	127			
DS Subscale Score	Between Groups	295.54	4	73.89	1.38	.244
	Within Groups	6574.88	123	53.45		
	Total	6870.42	127			
EX Subscale Score	Between Groups	188.54	4	47.13	1.02	.401
	Within Groups	5697.86	123	46.32		
	Total	5886.39	127			
RE Subscale Score	Between Groups	141.77	4	35.44	1.39	.243
	Within Groups	3146.20	123	25.58		
	Total	3287.97	127			
CSS-30 Score	Between Groups	2992.96	4	748.24	1.76	.142
	Within Groups	52391.15	123	425.94		
	Total	55384.12	127			

ANOVA

Online recommendations

		Sum of Squares	*df*	Mean Square	*F*	*p*
eHeals Score	Between Groups	481.08	4	120.27	4.15	.009
	Within Groups	3913.40	123	31.82		
	Total	4394.48	127			
SHAI Score	Between Groups	403.542	4	100.89	2.09	.086
	Within Groups	5926.41	123	48.18		
	Total	6329.95	127			
CSS-30 Score	Between Groups	8304.11	4	2076.03	5.42	<.001*
	Within Groups	47080.00	123	382.76		
	Total	55384.12	127			
RE Subscale Score	Between Groups	420.61	4	105.15	4.51	.002*
	Within Groups	2867.36	123	23.31		
	Total	3287.97	127			
DS Subscale Score	Between Groups	594.345	4	148.59	2.54	.062
	Within Groups	6276.07	123	51.03		
	Total	6870.42	127			
EX Subscale Score	Between Groups	1152.57	4	288.14	6.55	<.001*
	Within Groups	4733.82	123	38.49		
	Total	5886.39	127			

ANOVA

Time spent deciding on visiting ER

		Sum of Squares	*df*	Mean Square	*F*	*p*
eHeals Score	Between Groups	592.05	4	148.01	4.86	.004*
	Within Groups	3802.43	123	30.91		
	Total	4394.48	127			
SHAI Score	Between Groups	566.50	4	141.63	3.35	.021*
	Within Groups	5763.44	123	46.86		
	Total	6329.95	127			
CSS-30 Score	Between Groups	7820.51	4	1955.13	5.06	<.001*
	Within Groups	47563.61	123	386.70		
	Total	55384.12	127			
CM Subscale Score	Between Groups	356.35	4	89.09	2.60	.055
	Within Groups	4618.88	123	37.55		
	Total	4975.23	127			
DS Subscale Score	Between Groups	494.168	4	123.54	2.38	.055
	Within Groups	6376.25	123	51.84		
	Total	6870.42	127			
EX Subscale Score	Between Groups	1010.72	4	252.68	6.37	<.001*
	Within Groups	4875.67	123	39.64		
	Total	5886.39	127			
RE Subscale Score	Between Groups	371.98	4	92.99	3.92	.005*
	Within Groups	2915.99	123	23.71		
	Total	3287.97	127			

Appendix A. List of Acronyms

CADTH - Canadian Agency for Drugs and Technology in Health

CIHI – Canadian Institute for Health Information

CTAS - Canadian Triage Acuity Scale

CI – Confidence Interval

CM – Compulsion subscale of Cyberchondria Severity Scale

CSS-30 – Cyberchondria Severity Scale 30 items

DS - Distress subscale of Cyberchondria Severity Scale

ED - Emergency Department

eHEALS – eHealth Literacy Scale

EM – Emergency Medicine

EP – Emergency Physician

ER - Emergency Room

EX – Excessiveness subscale of Cyberchondria Severity Scale

GT – Grounded Theory

HUI – Healthcare Utilization Intent

OHR - Online Health Research

OHI – Online Health Information

PI – Principal investigator

PUI – Problematic Internet Use

RE - Reassurance subscale of Cyberchondria Severity Scale

SHAI – Short Health Anxiety Inventory

Telehealth, THAS - Telephone Health Advisory Services

Appendix B. Questionnaires

Questionnaire – English Version

English Copy of Questionnaire

Title: Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients

The goal of this research is to better understand people's experience with searching for health and medical information online and the impact of this searching on various behaviours. The study is particularly interested in individuals who use emergency services. As part of this research, we are interested in people's perceptions, opinions and beliefs about online health information. More specifically, this research will look at what is known as "cyberchondria", i.e., individuals engaging in somewhat compulsive searches for information about health, healthcare, medications or treatments on the Internet.

It should take approximately 20 minutes to complete this questionnaire.

Thank you in advance for your time and participation today!

If you have any questions or concerns, please do not hesitate to contact us.

For information concerning ethical aspects of this research, you may contact the Hôpital Montfort Research Ethics Board, 745-A Montreal Road, suite 102 Ottawa, Ontario by telephone at 613-746-4621, extension 2221, or by email at ethique@montfort.on.ca.

Consent form will be added in this section of the online platform (Qualtrics).

Part A: Health Behaviour

Please answer the following questions by answering the choice that best describes your answer.

1. Do you have a family doctor?
    a. Yes
    b. No *(skips to #3)*
2. How many visits have you had with your family doctor/nurse practitioner within the last 12 months?
    a. 0-2
    b. 3-5
    c. 5-7
    d. 7-10
    e. 10+
3. What is your primary health information source? Rank your primary sources of health information.
    a. healthcare professional
    b. Internet
    c. Media (news/radio/books)
    d. Family
    e. Other. _____

Part B: Internet use

Please answer the following questions by answering the choice that best describes your answer.

4. I use the Internet:

   a. Yes
   b. No *(if selected no, go straight to Part E#14)*
5. I have access to the Internet from: please check all that apply.
   a. Home
   b. Work
   c. Cell phone
   d. Library
   e. Community Centre
   f. Other. Please specify: _____
6. On average, how often do you use the Internet?
   a. At least once a day
   b. At least once a week
   c. At least once a month
   d. A few times a year
   e. Never *(if selected skip to Part E #14)*
7. On average, how many hours **per day** do you spend on the Internet (online or on the web)? *(Ybarra & Suman, 2006).*
   a. 0 hours
   b. 1-5 hours
   c. 6-10 hours
   d. 11-15 hours
   e. 16 + hours

Part C: Online Health Information Seeking

Please answer the following questions by answering the choice that best describes your answer.

8. I have used the Internet to access health or medical information in the last 12 months *(Ybarra & Suman 2006. To determine health seekers).*
   a. Yes
   b. No *(Skip to Part D)*
9. On average, how often do you use the Internet to find health and/or medical information?
   a. At least once a day
   b. At least once a week
   c. At least once a month
   d. A few times a year
   e. Never *(if never, go to Part E #14)*
10. On average, how many hours **per week** do you spend looking for health and/or medical information online?
   a. 0 hours
   b. 1-5 hours
   c. 6-10 hours
   d. 11-15 hours
   e. 16 + hours
11. While using the Internet, which is your primary source for seeking health and/or medical information? Rank your primary sources for seeking health information.
   b. Directly from medical websites
   c. Through search engines
   d. Institutional or society websites
   e. Blogs
   f. Pharmaceutical company websites
   g. Chatrooms
   h. Other: _____

Part D: Help-Seeking Behaviour

Please answer the following questions by answering the choice that best describes your answer.

12. In the last 12 months, have you contacted a medical professional because of the health and/or medical information you consulted online? *(Ybarra & Suman, 2006. used to define Help-Seeking Behaviour).*
    a. Yes
    b. No

Part E: Symptom Appraisal behaviour

Please answer the following questions by answering the choice that best describes your answer.

13. How often would you say you use the Internet to look up symptoms or perceived medical conditions?
    a. Very Frequently
    b. Frequently
    c. Occasionally
    d. Rarely
    e. Never

14. How often would you say you use telephone triage services when dealing with symptoms or perceived medical conditions?
    a. Very Frequently
    b. Frequently
    c. Occasionally
    d. Rarely
    e. Never

Part F: Health behaviour prior to visiting the emergency department

Please answer the following questions by answering the choice that best describes your answer.

15. Did you search for your symptoms online before visiting the emergency department?
    a. Yes
    b. No *(skip to #19)*

16. How long did you spend searching your symptom(s) before visiting the emergency department?
    a. 30 minutes or less
    b. 1 hour
    c. 2 hours
    d. More than 2 hours

17. Did online sources recommend you seek emergency or urgent services?
    a. Yes
    b. No
    c. Not sure/Do not remember
    d. Did not provide a triage recommendation

18. How long ago before you decided to visit to the emergency department?
    a. Today / The day of
    b. Yesterday / the day before
    c. Two days ago/ Two days before
    d. Within the last week

19. Did you consult a telehealth triage service immediately before your visit to the emergency department?
    a. Yes
    b. No *(skip to Part G)*

20. Were you advised to seek emergency care or emergency services by the telehealth triage service?
a. Yes
b. No
c. Not sure/do not remember

Part G: e-Health Literacy Scale (eHEALS) (Paige, Krieger, Stellefson & Alber, 2017).
English version of the eHEALS is an 8-item scale measured on a 5-point Likert scale (1- Strongly Disagree to 5- Strongly Agree). Used to measure an individual's knowledge of health information resources on the Internet and perceived confidence in ability to find, evaluate and use health information found to make informed health decisions.

Section title in Qualtrics: Knowledge of health information sources on the Internet

Please read each statement and select the box which best describes your level of agreement.

Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I know what health resources are available on the Internet.					
I know where to find helpful health resources on the Internet.					
I know how to use the health information I find on the Internet to help me.					
I know how to find helpful health resources on the Internet.					
I have the skills I need to evaluate the health resources I find on the Internet.					
I know how to use the Internet to answer my questions about health.					
I can tell high quality health resources from low quality sources on the Internet.					
I feel confident in using information from the Internet to make health decisions.					

Part H: Cyberchondria Severity Scale (CSS) (McElroy & Shevlin, 2014)
33-item self-reported measure that assesses anxiety and behaviours associated with online health information seeking. Adapted to suit the context of Emergency Medicine in Canada.

Section title in Qualtrics: Behaviours associated with online health information seeking

Please read each statement and select the column that best describes your answer.

Item	Never	Rarely	Sometimes	Often	Always
Researching symptoms or perceived medical conditions online interrupts leisure activities (e.g., streaming movies)					
Researching symptoms or perceived medical conditions online interrupts my time spent on Facebook/Twitter/other social networks					

Researching symptom or perceived medical conditions online interrupts my offline work activities	
Researching symptom or perceived medical conditions online distracts me from reading news/sports/entertainment articles online	
Researching symptom or perceived medical conditions online interrupts or slows my online communication (e.g., Instant messaging, Skype)	
Researching symptom or perceived medical conditions online interrupts my work (e.g., writing emails, working on word documents or spread sheets)	
Researching symptom or perceived medical conditions online interrupts my offline social activities (reduces time spend with friends/family)	
Researching symptom or perceived medical conditions online interrupts other research (e.g., for my job/college/university/assignments/home work)	
I have trouble relaxing after researching symptoms or perceived medical conditions online	
I find it hard to stop worrying about symptoms or perceived medical conditions that I have researched online	
I have trouble getting to sleep after researching symptoms or perceived medical conditions online	
I feel more anxious or distressed after researching symptoms or perceived medical conditions online	
I start to panic when I read online that a symptom I have is found in a rare/serious condition	
I think I am fine until I read about a serious condition online?	
I am more easily annoyed or irritated after researching symptoms or perceived medical conditions online	
I lose my appetite after researching symptoms or perceived medical conditions online	
I read different web pages about the same perceived condition	
I read the same web pages about a perceived condition on more than one occasion	
I enter the same symptoms into a web search on more than one occasion	
When I research a symptom online, I feel the ranking of the web search results	

reflects how common an illness is, with more likely medical conditions appearing higher up on the result page?	
When researching symptoms or medical conditions online I visit both trustworthy websites and user-driven forums	
When researching symptoms or medical conditions online, I visit forums where diagnosed or concerned individuals discuss their medical conditions, symptoms and experiences	
If I notice an unexplained bodily sensation, I will search for it on the Internet	
I visit trustworthy sources only (e.g., NHS.co.uk) when researching symptoms or perceived medical conditions online	
I discuss my online medical findings with my family doctor/health professional	
Discussing online info about a perceived medical condition with my family doctor/health professional reassures me	
Researching symptoms or perceived medical conditions online leads me to consult with other medical specialists (e.g., consultants)	
Researching symptoms or perceived medical conditions online leads me to consult with my family doctor/health professional	
I find myself thinking: "I would not have gone to the doctor if I had not read about that symptom/condition online"	
I suggest to my family doctor/health professional that I may need a diagnostic procedure that I read about online (e.g., a biopsy/a specific blood test)	
~~I trust my family doctor/health professional diagnosis over my online self-diagnosis.~~	
~~I take the opinion of my family doctor/health professional more seriously than my online medical research~~	
~~When my family doctor/health professional dismisses my online medical research, I stop worrying about it~~	

Part I: Short Health Anxiety Inventory (SHAI) (Salkovski, Rimes, Warwick & Clark, 2002).
14-item self-report inventory that measures health anxiety and hypochondriasis. Modified to fit online format.

Section title in Qualtrics: Experienced feelings following online health information seeking

Each question in this section consists of a group of four statements. Please read each group of statements carefully and then select one which best describes your feelings, **over the past six months**. Identify the statement by selecting it. If more than one statement applies, please select all that apply.

1. (a) I do not worry about my health.
   (b) I occasionally worry about my health.
   (c) I spend much of my time worrying about my health.
   (d) I spend most of my time worrying about my health.

2. (a) I notice aches/pains less than most other people (of my age).
   (b) I notice aches/pains as much as most other people (of my age)
   (c) I notice aches/pains more than more people (of my age).
   (d) I am aware of aches/pains in my body all the time.

3. (a) As a rule I am not aware of bodily sensations or changes.
   (b) Sometimes I am aware of bodily sensations or changes.
   (c) I am often aware of bodily sensations or changes.
   (d) I am constantly aware of bodily sensations or changes.

4. (a) Resisting thoughts of illness is never a problem.
   (b) Most of the time I can resist thoughts of illness.
   (c) I try to resist thoughts of illness but am often unable to do so.
   (d) Thoughts of illness are so strong that I no longer even try to resist them.

5. (a) As a rule I am not afraid that I have a serious illness.
   (b) I am sometimes afraid that I have a serious illness.
   (c) I am often afraid that I have a serious illness.
   (d) I am always afraid that I have a serious illness.

6. (a) I do not have images (mental pictures) of myself being ill.
   (b) I occasionally have images of myself being ill.
   (c) I frequently have images of myself being ill.
   (d) I constantly have images of myself being ill.

7. (a) I do not have any difficulty taking my mind of thoughts about my health.
   (b) I sometimes have difficulty taking my mind of thoughts about my health.
   (c) I often have difficulty taking my mind of thoughts about my health.
   (d) Nothing can take my mind off thoughts about my health.

8. (a) I am lastingly relieved if my doctor tells me there is nothing wrong.
   (b) I am initially relieved but the worries sometimes return later.
   (c) I am initially relieved but the worries always return.
   (d) I am not relieved if my doctor tells me there is nothing wrong.

9. (a) If I hear about an illness I never think I have it myself.
   (b) If I hear about an illness I sometimes think I have it myself.
   (c) If I hear about an illness I often think I have it myself.
   (d) If I heat about an illness I always think I have it myself.

10. (a) If I have a bodily sensation or change I rarely wonder what it means.
    (b) If I have a bodily sensation or change I often wonder what it means.
    (c) If I have a bodily sensation or change I always wonder what it means.
    (d) If I have a bodily sensation or change I must know what it means.

11. (a) I usually feel at very low risk for developing a serious illness.
    (b) I usually feel at fairly low risk for developing a serious illness.

(c) I usually feel at moderate risk for developing a serious illness.
(d) I usually feel at high risk for developing a serious illness.

12. (a) I never think I have a serious illness.
(b) I sometimes think I have a serious illness.
(c) I often think I have a serious illness.
(d) I usually think that I am seriously ill.

13. (a) If I notice an unexplained bodily sensation I don't find it difficult to think about other things.
(b) If I notice an unexplained bodily sensation I sometimes find it difficult to think about other things
(c) If I notice an unexplained bodily sensation I often find it difficult to think about other things.
(d) If I notice an unexplained bodily sensation I always find it difficult to think about other things.

14. (a) My family/friends would say I do not worry enough my health.
(b) My family/friends would say I have a normal attitude to my health.
(c) My family/friends would say I worry too much about my health.
(d) My family/friends would say I am a hypochondriac.

Part J: Open-ended questions

Character limit set to 500 characters in Qualtrics.

Please answer the following questions to the best of your ability.

21. Why do you use the Internet for finding health and/or medical information? *(Adapted from Ybarra & Suman, 2006).*

22. Please describe your experiences with searching for health and/or medical information online.

23. How do you feel after consulting online sources?

Part K: Demographic questions

Please answer the following questions by answering the choice that best describes your situation.

24. What is your age?
a. Less than 18
b. 18-34 years
c. 35-49 years
d. 50-64 years
e. 65-74 years
f. Above 75 years

25. Which gender do you most identify with?
a. Male
b. Female
c. Nonbinary
d. Prefer not to answer

26. Which ethnic group do you most identify with? *(Open-ended question cross reference with categories by StatsCan).*

27. What is your highest level of education?
a. Less than high school
b. High School Diploma
c. College Diploma
d. Bachelor's Degree
e. Master's Degree
f. Doctorate Degree

28. What is your occupation?
    a. Working full time
    b. Working part-time
    c. Homemaker
    d. Student
    e. Retired
    f. Unemployed, able to work
    g. Unemployed, unable to work
    h. Other. Please specify.
29. What is your postal code?
    a.

Part L: Voluntary Contact for Telephone Interview
(Text Box for answer)

We are looking for volunteers to take part in an in-depth telephone interview. The interview session should last between 30 minutes to an hour and will cover the topics in the questionnaire you just completed.

If you are interested, please leave your name, email, and phone number so that the Principal Investigator can follow up with you.

Thank you for your time and participation!

Part M: Thank You

Thank you for your time and participation!

If you have any questions or concerns, please do not hesitate to contact us.

Questionnaire – French Version

Questionnaire numérique en français

Titre : Enquête sur les implications de la recherche d'informations de santé en ligne et sur la prévalence de la cybercondrie chez les patients qui se présentent aux services d'urgences

Le but de ce projet exploratoire est de mieux comprendre l'expérience des gens en matière de recherche d'informations de santé et médicales en ligne et l'incidence de l'angoisse liée à la santé auprès des gens qui effectuent des recherches sur l'Internet. L'étude s'intéresse particulièrement aux individus qui fréquentent des services d'urgence. Dans le cadre de cette recherche nous souhaitons nous pencher sur les perceptions, les options et les croyances des gens à l'égard des informations de santé et médicales en ligne. Plus spécifiquement, cette recherche porte sur le phénomène de la cybercondrie, c'est-à-dire la tendance que l'on peut avoir de s'engager dans des recherches parfois compulsives sur Internet pour obtenir des informations en matière de santé, de soins de santé, de médicaments ou de traitements.

Nous estimons que le sondage vous prendra 20 minutes à compléter.

Merci à l'avance de votre temps et participation!

Si vous avez des questions, n'hésitez pas à communiquer avec :

Pour tout renseignement sur les aspects éthiques de cette recherche, vous pouvez vous adresser au Comité d'éthique de la recherche de l'Hôpital Montfort, 745-A chemin Montréal, suite 102, à Ottawa, Ontario par téléphone 613-746-4621, poste 2221 ou par courriel à ethique@montfort.on.ca.

Formulaire de consentement sera ajouter ici dans la plateforme Qualtrics.

Partie A: Les comportements portant sur la santé

Veuillez répondre aux questions suivantes en indiquant le choix qui correspond le mieux à votre réponse.

1. Avez-vous un médecin de famille ?
a. Oui
b. Non (Passez à la #3).
2. Combien de visites avez-vous eues avec votre médecine de famille ou professionnel de la santé au cours des 12 derniers mois?
a. 0 à 2
b. 3 à 5
c. 5 à 7
d. 7 à 10
e. 10+
3. Quelle est votre source principale d'information sur la santé?
a. Professionnel de la santé
b. Internet
c. Médias (actualités/radio/livres)
d. Famille
e.Autre. Veuillez préciser. _____

Partie B: Usage d'Internet

Veuillez répondre aux questions suivantes en indiquant le choix qui correspond le mieux à votre réponse.

4. J'utilise l'Internet
a. Oui
b. Non (si non, passez directement à E#14)
5. J'ai accès à l'Internet à partir de _____. Veuillez cocher toutes qui s'appliquent.
a. Chez moi

b. Mon bureau de travail
c. Téléphone cellulaire
d. Bibliothèque
e. Centre communautaire
f. Autre_____ Veuillez préciser.

6. En moyenne, à quelle fréquence utilisez-vous l'Internet ?

a. Au moins une fois par jour
b. Au moins une fois par semaine
c. Au moins une fois par moi
d. Quelques fois par an
e. Jamais (Passez à E#14)

7. En moyenne, combien d'heures **par jour** passez-vous sur l'Internet (en ligne ou sur le web)? (Ybarra & Suman, 2006).

a. 0 heure
b. 1 à 5 heures
c. 6 à 10 heures
d. 11 à 15 heurs
e. 16 + heures

Partie C: La recherche d'informations sur la santé en ligne

Veuillez répondre aux questions suivantes en indiquant le choix qui correspond le mieux à votre réponse.

8. J'ai utilisé l'Internet pour accéder à des informations sur la santé et/ou médicales au cours des 12 derniers mois (Ybarra & Suman, 2006).

a. Oui
b. Non (Passez à la partie D).

9. En moyenne, à quelle fréquence utilisez-vous l'Internet pour trouver des informations sur la santé et ou médicales?

a. Au moins une fois par jour
b. Au moins une fois par semaine
c. Au moins une fois par mois
d. Quelques fois par an
e. Jamais (Passez à E#14)

10. En moyenne, combien d'heures **par semaine** consacrez-vous à la recherche d'informations sur la santé et ou médicales en ligne?

a. 0 heure
b. 1 à 5 heures
c. 6 à 10 heures
d. 11 à 15 heures
e. 16 + heures

11. Lorsque vous utilisez l'Internet, quelle est votre principale source d'information sur la santé?

a.Directement à partir des sites médicaux
b. À partir des moteurs de recherche
c.À partir des sites institutionnels ou des associations
d. Blogs
e.À partir des sites des entreprises pharmaceutiques
f. Salles de discussion (Chatrooms)
g. Autre. Veuillez préciser. _____

Partie D: Comportements de recherche d'aide

Veuillez répondre aux questions suivantes en indiquant le choix qui correspond le mieux à votre réponse.

12. Au cours **des derniers 12 mois,** avez-vous pris contact avec votre médecin de famille ou professionnel de la santé en raison des informations médicales que vous avez consultées en ligne ? *(Ybarra & Suman, 2006. Utilisé pour définir le comportement de recherche).*

a. Oui
b. Non

Partie E: Comportement portant sur l'évaluation des symptômes

Veuillez répondre aux questions suivantes en indiquant le choix qui correspond le mieux à votre réponse.

13. À quelle fréquence diriez-vous que vous utilisez l'Internet pour rechercher des symptômes ou des conditions médicales perçues?

a. Très fréquemment
b. Fréquemment
c. Occasionnellement
d. Rarement
e. Jamais

14. À quelle fréquence diriez-vous que vous utilisez des services de triage téléphonique (Télésanté) pour consulter à propos des symptômes ou des conditions médicales perçues?

a. Très fréquemment
b. Fréquemment
c. Occasionnellement
d. Rarement
e. Jamais

Partie F: Comportement avant de se rendre au service des urgences

Veuillez répondre aux questions suivantes en indiquant le choix qui correspond le mieux à votre réponse.

15. Avez-vous recherché vos symptômes en ligne avant de vous rendre à l'urgence?

a. Oui
b. Non (Passez à la # 19)

16. Combien de temps avez-vous passé à faire des recherches en rapport avec vos symptômes avant de vous rendre à l'urgence?

a. 30 minutes ou moins
b. 1 heure
c. 2 heures
d. Plus que 2 heures

17. Les sites en ligne vous ont-ils recommandé de faire appel aux services d'urgences?

a. Oui
b. Non
c. N'ont pas fourni de recommandations de triage
d. Pas sûr/ne me souvient pas

18. Après combien de temps avez-vous décidé de vous rendre à l'urgence?

a. Aujourd'hui / le jour même
b. Hier / il y a un jour
c. Il y a deux jours
d. Au cours de la dernière semaine

19. Avez-vous consulté un service de triage télésanté immédiatement avant votre visite à l'urgence?

a. Oui
b. Non (si non passez à G).

20. Vous ont-ils conseillé de faire appel à des soins d'urgence ou à des services d'urgences?

a. Oui

b. Non
c. N’ont pas fournir de recommandation de triage
d. Pas sûr/ne me souvient pas

Partie G: Échelle d’alphabétisation en matière de santé en ligne (eHEALS) (Paige, Krieger, Stellefson & Alber, 2017).
La version anglaise, traduite en français, de eHEALS est une échelle de 8 points mesurée sur une échelle de Likert à 5 points (de 1 Fortement en désaccord à 5 Fortement d’accord). Elle est utilisée pour mesurer la connaissance qu'a une personne des ressources d'information de santé sur Internet et sa confiance perçue dans sa capacité à y trouver, évaluer et utiliser les informations pour prendre des décisions éclairées en matière de santé.

Titre dans la plateforme Qualtrics : Connaissances des sources d'information sur la santé sur Internet

Veuillez lire chaque déclaration et sélectionner la colonne qui reflète le mieux vos sentiments.

Énoncé	Fortement en désaccord	En désaccord	Neutre	En Accord	Fortement en accord
Je sais quelles sont les ressources en matière de santé disponibles sur Internet.					
Je sais où trouver des ressources utiles en matière de santé sur Internet.					
Je sais comment utiliser les informations sur la santé que je trouve sur l’Internet pour m’aider.					
Je sais comment trouver des ressources utiles en matière de santé sur l’Internet.					
J’ai les compétences nécessaires pour évaluer les ressources de santé que je trouve sur l’Internet.					
Je sais comment utiliser l’Internet pour répondre à mes questions sur la santé.					
Je sais distinguer les ressources de santé de haute qualité des sources de faible qualité sur l’Internet.					
Je me sens en confiance pour utiliser les informations de l’Internet pour prendre des décisions en matière de santé.					

Partie H: Échelle de gravité de la cybercondrie (CSS) (McElroy & Shevlin, 2014)
Mesure de 33 points qui évalue l’anxiété et les comportements associés à la recherche d’information de santé en ligne.

Titre dans la plateforme Qualtrics : Comportements associés à la recherche d'informations sur la santé en ligne

Veuillez lire chaque déclaration et sélectionner la colonne qui reflète le mieux votre réponse.

Article	Jamais	Rarement	Parfois	Souvent	Toujours
La recherche de symptômes ou de conditions médicales perçues en ligne interrompt les activités					

de loisirs (par exemple, la diffusion de films en direct).
La recherche de symptômes ou de conditions médicales perçues en ligne interrompt le temps que je passe sur Facebook/Twitter/autres réseaux sociaux.
La recherche de symptômes ou de conditions médicales perçues en ligne interrompt mes activités professionnelles.
La recherche de symptômes ou de conditions médicales perçues en ligne me distrait de la lecture d'articles d'actualité, de sport ou de divertissement en ligne.
La recherche de symptômes ou de conditions médicales perçues en ligne interrompt ou ralentit ma communication en ligne (par exemple, la messagerie instantanée, Skype).
La recherche de symptômes ou de conditions médicales perçues en ligne interrompt mon travail (par exemple, écrire des courriels, travailler sur des documents Word ou des feuilles de calcul).
La recherche de symptômes ou de conditions médicales perçues en ligne interrompt mes activités sociales non connectées (réduis le temps passé avec mes amis/famille).
La recherche de symptômes ou de conditions médicales perçues en ligne interrompt d'autres recherches (par exemple pour mon travail/collège/université/évaluations/devoirs).
J'ai du mal à me détendre après avoir fait des recherches en ligne sur les symptômes ou les conditions médicales perçues.
J'ai du mal à cesser de me préoccuper des symptômes ou des conditions médicales perçues que j'ai recherchées en ligne.
J'ai des difficultés à dormir après avoir fait des recherches en ligne sur les symptômes ou la perception de problèmes médicaux.
Je me sens plus anxieux ou angoissé après avoir effectué des recherches en ligne sur les symptômes ou les conditions médicales perçues.
Je commence à paniquer lorsque je lis en ligne qu'un de mes symptômes est associé à une maladie rare ou grave.
Je pense que je vais bien jusqu'à ce que je lise un article sur une maladie grave en ligne ?
Je suis plus facilement agacé ou irrité après avoir fait des recherches en ligne sur les symptômes ou les problèmes médicaux perçus.
Je perds l'appétit après avoir fait des recherches en ligne sur les symptômes ou les conditions médicales perçues.
Je lis différentes pages web sur la même condition perçue.
Je lis plus qu'une fois les mêmes pages web sur une condition perçue.

Je saisis plusieurs fois les mêmes symptômes dans une recherche sur le web.
Lorsque je fais une recherche sur un symptôme en ligne, j'ai l'impression que le classement des résultats sur le web reflète la fréquence d'une maladie, les conditions médicales les plus probables apparaissant plus haut sur la page de résultats ?
Lorsque je recherche des symptômes ou des conditions médicales en ligne, je visite à la fois des sites web fiables et des forums d'utilisateurs.
Lorsque je recherche des symptômes ou des conditions médicales en ligne, je visite des forums où des personnes diagnostiquées ou concernées discutent de leurs conditions médicales, de leurs symptômes et de leurs expériences.
Si je remarque une sensation corporelle inexpliquée lorsque je fais la recherche sur Internet.
Je ne consulte que des sources fiables (par exemple, NHS.co.uk) lorsque je recherche en ligne des symptômes ou des conditions médicales perçues
Je discute de mes résultats médicaux en ligne avec mon médecin de famille/ professionnel de la santé.
Discuter en ligne avec mon médecin traitant d'un problème médical perçu me rassure.
La recherche de symptômes ou de conditions médicales perçues en ligne m'amène à consulter d'autres spécialistes médicaux (par exemple, des consultants).
La recherche de symptômes ou de conditions médicales perçues en ligne m'amène à consulter mon médecin de famille/professionnel de la santé.
Je me retrouve à réfléchir : "Je ne serais pas allé chez le médecin si je n'avais pas lu des informations sur ce symptôme/cette affection en ligne".
Je suggère à mon médecin de famille/professionnel de la santé que je pourrais avoir besoin d'une procédure de diagnostic dont j'ai pris connaissance en ligne (par exemple, une biopsie ou un test sanguin spécifique).
~~Je fais confiance au diagnostic de mon médecin de famille/professionnel de la santé plutôt qu'à mon autodiagnostic en ligne.~~
~~Je prends l'opinion de mon médecin de famille/professionnel de la santé plus au sérieux que mes recherches médicales en ligne.~~
~~Lorsque mon médecin de famille/professionnel de la santé rejette mes recherches médicales en ligne, je ne m'en fais plus.~~

Part I: Échelle d'anxiété liée à la santé (SHAI) (Salkovskis, Rimes, Warwick & Clark, 2002).

Inventaire d'autodéclaration de 14 points qui mesure l'anxiété et l'hypocondrie liée à la santé. Modifier pour la plateforme en ligne.

Titre dans la plateforme Qualtrics : Sentiments éprouvés suite à la recherche d'informations de santé en ligne

Chaque question de cette section consiste d'un groupe de quatre déclarations. Veuillez lire attentivement chaque groupe de déclarations et choisir celle qui décrit le mieux vos sentiments, au cours **des six derniers mois.** Identifiez l'affirmation en la sélectionnant. Il se peut que plusieurs énoncés soient applicables, veuillez tous les sélectionner.

1. (a) Je ne m'inquiète pas pour ma santé.
(b) Je m'inquiète occasionnellement pour ma santé.
(c) Je passe une grande partie de mon temps à m'inquiéter pour ma santé.
(d) Je passe la plupart de mon temps à m'inquiéter de ma santé.

2.(a) Je ressens moins de douleurs que la plupart des autres personnes (de mon âge).
(b) Je ressens des maux/ douleurs autant que la plupart des autres personnes (de mon âge)
(c) Je remarque des courbatures plus que d'autres personnes (de mon âge).
(d) Je suis tout le temps conscient des maux/ douleurs dans mon corps.

3.(a) En règle générale, je ne suis pas conscient des sensations ou des changements corporels.
(b) Parfois, je suis conscient de sensations ou de changements corporels.
(c) Je suis souvent conscient de sensations ou de changements corporels.
(d) Je suis constamment conscient des sensations ou des changements corporels.

4. (a) Résister à des pensées de maladie n'est jamais un problème.
(b) La plupart du temps, je peux résister aux pensées de maladie.
(c) J'essaie de résister aux pensées de maladie, mais je suis souvent incapable de le faire.
(d) Les pensées de maladie sont si fortes que je n'essaie même plus d'y résister.

5.(a) En règle générale, je ne crains pas d'être atteint d'une maladie grave.
(b) Je crains parfois d'être atteint d'une maladie grave.
(c) Je crains souvent d'être atteint d'une maladie grave.
(d) Je crains toujours d'être atteint d'une maladie grave.

6.(a) Je n'ai pas d'images (images mentales) de moi-même étant malade.
(b) J'ai occasionnellement des images de moi étant malade.
(c) J'ai fréquemment des images de moi étant malade.
(d) J'ai constamment des images de moi étant malade.

7. (a) Je n'ai aucune difficulté à me changer les idées sur ma santé.
(b) J'ai parfois des difficultés à me changer les idées sur ma santé.
(c) J'ai souvent des difficultés à me changer les idées de ce que je pense de ma santé.
(d) Rien ne peut m'enlever des pensées sur ma santé.

8.(a) Je suis durablement soulagé si mon médecin me dit qu'il n'y a rien de mal.
(b) Je suis d'abord soulagé, mais les soucis reviennent parfois plus tard.
(c) Je suis d'abord soulagé, mais les soucis reviennent toujours.
(d) Je ne suis pas soulagé si mon médecin me dit qu'il n'y a rien de grave.

9. (a) Si j'entends parler d'une maladie, je ne pense jamais que je l'ai moi-même.
(b) Si j'entends parler d'une maladie, je pense parfois que je l'ai moi-même.
(c) Si j'entends parler d'une maladie, je pense souvent que je l'ai moi-même.
(d) Si j'entends parler d'une maladie, je pense toujours que je l'ai moi-même.

10.(a) Si j'ai une sensation ou un changement corporel, je me demande rarement ce que cela signifie.
(b) Si j'ai une sensation ou un changement corporel, je me demande souvent ce qu'il signifie.

(c) Si j'ai une sensation ou un changement corporel, je me demande toujours ce qu'il signifie.
(d) Si j'ai une sensation ou un changement corporel, je dois savoir ce qu'il signifie.

11.(a) Je me sens généralement à très faible risque de développer une maladie grave.
(b) Je me sens généralement assez peu exposé au risque de développer une maladie grave.
(c) Je me sens généralement exposé à un risque modéré de développer une maladie grave.
(d) Je me sens habituellement à haut risque de développer une maladie grave.

12.(a) Je ne pense jamais avoir une maladie grave.
(b) Je pense parfois que j'ai une maladie grave.
(c) Je pense souvent que j'ai une maladie grave.
(d) Je pense généralement que je suis gravement malade.

13.(a) Si je remarque une sensation corporelle inexpliquée, je n'ai pas de mal à penser à autre chose.
(b) Si je remarque une sensation corporelle inexpliquée, j'ai parfois du mal à penser à autre chose
(c) Si je remarque une sensation corporelle inexpliquée, j'ai souvent du mal à penser à autre chose.
(d) Si je remarque une sensation corporelle inexpliquée, j'ai toujours du mal à penser à autre chose.

14. (a) Ma famille/mes ami-es dirait que je ne m'inquiète pas assez de ma santé.
(b) Ma famille/ mes ami-es diraient que j'ai une attitude normale vis-à-vis de ma santé.
(c) Ma famille/ mes ami-es diraient que je m'inquiète trop de ma santé.
(d) Ma famille/ mes ami-es diraient que je suis hypocondriaque.

Part J: Questions ouvertes

La limite de caractères est fixée à 500 caractères dans Qualtrics.

Veuillez répondre aux questions suivantes au mieux de vos capacités.

21. Pourquoi utilisez-vous l'Internet pour trouver des informations de santé ou médicales ? (Adapté de Ybarra & Suman, 2006).

22. Veuillez décrire vos expériences en matière de recherche d'informations sur la santé en ligne.

23. Comment vous sentez-vous après avoir consulté des sources en ligne ?

Partie K: Questions démographiques

Veuillez répondre aux questions suivantes en indiquant le choix qui correspond le mieux à votre situation.

24. Quel est votre âge?
a. Moins de 18 ans
b. 18 à 34 ans
c. 35 à 49 ans
d. 50 à 64 ans
e. 65 à 74 ans
f. Plus âgé que 75 ans

25. Avec quel genre vous identifiez-vous le plus?
a. Homme
b. Femme
c. Non binaire
d. Préfère ne pas répondre

26. À quel groupe ethnique vous identifiez-vous le plus? *(Réponse ouverte – renvoi avec les catégories de StatsCan).*

27. Quel est votre niveau d'éducation le plus élevé?
a. Moins que l'école secondaire

b. Diplôme d'études secondaire
c. Diplôme d'études collégiale
d. Baccalauréat de premier cycle
e. Baccalauréat de Maîtrise
f. Baccalauréat de Doctorat
28. Quelle est votre profession?
a. Je travaille à temps plein
b. Je travaille à temps partiel
c. Personne au foyer
d. Étudiant.e
e. Retraité
f. Chômeur.e, capable de travailler
g. Chômeur.e, incapable de travailler
h. Autre. Veuillez-préciser
29. Quels sont les trois premiers caractères de votre code postal? *(Réponse ouverte)*

Partie L: Contact volontaire pour un entretien téléphonique

Nous recherchons des volontaires pour participer à un entretien téléphonique approfondi qui fait partie de la deuxième phase du projet de recherche. L'entretien devrait durer de 30 minutes à une heure et portera sur les thématiques du questionnaire que vous venez de remplir.

Si vous êtes intéressé(e) à participer, veuillez laisser votre nom, adresse courriel et numéro de téléphone afin que le chercheur principal puisse effectuer un suivi auprès de vous.

Merci de votre temps et participation!

(Champs pour texte)

Partie M : Merci

Ceci met fin au questionnaire.

Merci de votre temps et participation!

Si vous avez des questions, n'hésitez pas à communiquer avec nous.

Appendix C. Telephone Interview Grid

Telephone Interview Grid – English Version

Participant Code name:
Date: _____ Time: _____
Introduction

Research title: Investigating the implications of online health information seeking and prevalence of cyberchondria amongst emergency medicine patients.

The purpose of this call is to carry out your scheduled interview It is important to note that this call is not regarding your medical care. Your participation in this call is entirely voluntary. You can choose not to participate, or you can stop at any time. Your decision will have no effect on the quality of care you currently receive or will receive in the future at the Montfort Hospital.

The goal of this research is to better understand people's experience with searching for health and medical information online and the impact of this searching on various behaviours. The study is particularly interested in individuals who use emergency services. As part of this research, we are interested in people's perceptions, opinions and beliefs about online health information. More specifically, this research will look at what is known as "cyberchondria," i.e. individuals engaging in somewhat compulsive searches for information about health, health care, medications or treatments on the Internet.

This call will be recorded to help with transcription and data analysis. Are you willing to continue with this call?

❒ Yes

❒ No

If yes:

Wonderful. Did you have any questions about the consent form? Over the next 30 minutes to an hour, I will be asking you a series of open-ended questions. Please respond to the best of your ability. All information gathered today will remain confidential, and all results will be anonymous. Your identity will be replaced with a code that only that I and my supervisor will have access to. 20$ compensation will be offered by e-transfer upon finishing the interview.

Do you have any questions at this time?
Do you agree to continue?

❒ Yes

❒ No

If yes:
Okay perfect. Let us begin.
If no:
Okay, not a problem. Thank you kindly for your time today.

Questions
Answer/Notes

Would you mind sharing your age?
Which gender do you identify with most?
Can you tell me your highest level of education?
Which service or industry do you work in?
How long have you had this position?
In general, what device(s) do you use to access the Internet?
In an average week, how often do you use the Internet?
What are the main reasons for using the Internet?
How comfortable would you say you are using the Internet?
Tell me about yourself

Overall, what do you think (what are your thoughts) about being able to use the Internet to find health or medical information?

What are your experiences with search online for health information? Can you describe some situations?

Do you worry about your health?

Why do you use the internet for finding health and/or medical information?
Can you explain?

What type of health information do you look up online?
When do you look it up?
How often?

How do you find the process?
How does that make you feel? Why?

Q: How do you feel afterwards? Can you give some examples?
Depends on what? Can you give an examples?

What makes a productive search for you?
What makes for an unproductive search for you?
Can you give some examples?

Do you think about what you've searched afterwards?

What do you do after you've researched health information/medical/symptoms online?
Interrupt activities?
Does it impact your decisions to seek health services? How do you decide?
Can you give some examples?

Do you talk to your doctor about what you found online? Why, why not? How does it make you feel?

How do you feel after seeing your health provider? Why, why not?

Ask about visit to the emergency (filling out the survey)
What was that like for you?

Closing remarks

This officially concludes the telephone interview. Do you have anything you would like to add? Do have any questions or concerns?

Thank you for participating, I really appreciate you making time and for answering my questions.

If you have any questions or concerns, please do not hesitate to reach out.

Have a good rest of the day.

Telephone Interview Grid - French Version

Nom de code du participant:

Date: _____ Heure: _____

Introduction

Enquête sur les implications de la recherche d'informations de santé en ligne et sur la prévalence de la cybercondrie chez les patients qui se présentent aux services d'urgences.

Le but de cet appel est donc de poursuivre l'entretien. II est important de noter que cet appel n'est pas un suivi médical. Votre participation à cet appel est entièrement volontaire. Vous pouvez choisir de ne pas y prendre part ou vous pouvez arrêter à tout moment. Votre décision n'aura aucune conséquence sur la qualité des soins que vous recevez actuellement ou recevrez dans le futur à l'Hôpital Montfort.

Le but de cette recherche est de mieux comprendre l'expérience des gens en matière de recherche d'informations de santé et médicales en ligne et l'incidence de cette recherche sur les différents comportements. L'étude s'intéresse particulièrement aux individus qui fréquentent des services d'urgence. Dans le cadre de cette recherche, nous souhaitons mieux comprendre les perceptions, les opinions et les croyances des gens à l'égard des informations de santé en ligne. Plus spécifiquement, cette recherche va se pencher sur ce qu'on appelle la « cybercondrie », c'est-à-dire la tendance que l'on peut parfois avoir de s'engager dans des recherches compulsives sur l'Internet pour obtenir des informations en matière de santé, de soins de santé, de médicaments ou de traitement.

J'aimerais souligner que cet appel sera enregistré afin de faciliter la transcription et analyse de données à la suite de l'étude. Acceptez-vous de poursuivre avec cet appel?

❒ Oui
❒ Non

Si oui :

Avant de commencer, j'aimerais faire un survol du formulaire de consentement qui vous a été envoyé, signer, que vous avez signé avant de nous le retourner. L'entretien est d'une durée de 30 à 60 minutes. Je vais vous poser une série de questions à développement, et je vais vous demander d'y répondre du mieux que vous pouvez. Veuillez noter qu'il n'y a pas de « bonnes ou de « mauvaises » réponse. Toute information collectée restera confidentielle, et tous résultats seront anonymes. Nous allons coder vos réponses pour conserver votre identité. Seuls mon superviseur Dr Luc Bonneville et moi-même aurons accès aux données. Vous ne recevrez aucune indemnisation pour votre participation aujourd'hui.

Avez-vous des questions?
Souhaitez-vous continuer?

❒ Oui

❒ Non

Si oui :
Excellent. D’abord nous allons commencer.
Si non:
Je vous remercie de votre attention et du temps que vous m’avez accordé.

Questions informatives
Réponses/Notes
Parle moi de vous-même.

CIBLER LES SENSIMENTS ET RÉACTIONS

Dans l'ensemble, que pensez-vous de la possibilité d'utiliser l'Internet pour trouver des informations sur la santé ou des informations médicales ?

Quels sont vos expériences avec la recherche en ligne? Pouvez-vous me partager quelques exemples?

Est-ce ce votre santé vous préoccupe? Est-ce que vous etes préoccuper par votre santé?

Quelles sont vos raisons de vouloir utiliser l'Internet pour trouver des informations médicales ou de santé ?
Pouvez-vous me donner des exemples?

Quelle genre d’information (santé) est-ce que vous rechercher en ligne?
À quel moment de la journée est-ce que vous êtes plus porter à faire vos recherches en ligne?
À quel fréquence?

Comment trouvez-vous ce processus?
Pourquoi?

Q: Comment vous sentez-vous après ta recherche? Avez-vous des exemples?
Dépends sur quoi? Avez-vous des exemples?

Qu’est-ce qui rend une recherche productive ?
Qu’est-ce qui rend une recherche non productive?
Avez-vous des exemples?

Votre humeur?
Est-ce que les résultats ou les recherches vous préoccupe?

Que faites-vous après avoir effectué vos recherches sur le web ?

Est-ce que les résultats ou actions de vos recherches on influencer autre comportements ou habitudes?

Quel est l'impact de la recherche de vos symptômes en ligne sur la volonté de consulter (ou pas) un professionnel de la santé?
Pouvez-vous me décrire votre processus/réflexion?

Avez-vous des exemples?

Est-ce que vous en discute avec votre médecin?
Êtes-vous à l'aise de discuter vos recherches avec un professionnel de la santé? Pourqoui / pourquoi pas?
Comment vous sentez-vous après?

Comment vous sentez-vous après avoir vu le medécin? Pourquoi? Pourqoui pas?

Comment est-ce que les recherches en ligne pour les informations de santé médicaux influencent votre décision d'utiliser les services d'urgence.

Vous l'avez véçu comment?

Remarques finales

Nous sommes rendus à la fin de l'entretien. Avez-vous autre chose à ajouter? Avez-vous des questions ou préoccupations?

Je vous remercie de votre attention et du temps que vous m'avez accordé.

Si vous avez des questions ou préoccupations, n'hésitez pas à nous contacter.

Prenez-soins de vous.

Appendix D. Ethics Certificates

Hôpital Montfort Ethics Certificates

Montfort
Hôpital universitaire
Academic Hospital

Affilié à l'Université d'Ottawa | Affiliated with the University of Ottawa

Notice of Ethics Approval
745-A, chemin Montréal road, Ottawa (Ontario) K1K 0T1

January 19, 2021

Principal investigator

Danielle Rutty

Responsible site investigator

Luc Bonneville
University of Ottawa

Project title: « Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients »

File number: 20-21-11-034

Start date: January 19, 2021

End date: January 20, 2022

In accordance with the latest edition of Tri-Council Policy Statement - Ethical Conduct for Research Involving Humans Subjects (TCPS 2), I confirm that the Hôpital Montfort Research Ethics Board (REB) has evaluated and **approved the research project** and the following documents for the start and end dates mentioned above:

- Hôpital Montfort Research Ethics Board Review Application Form Version 2 submitted on January 11, 2021
- Recruitment poster (FR & EN) submitted on November 16, 2020
- Recruitment e-mail (FR & EN) – Version 1, dated 28/10/2020
- Online Questionnaire Consent Form (FR & EN) – Version 3, dated 18/01/2021
- Recruitment Email telephone interview (FR & EN) – Version 2 , dated 07 and 10/01/2021
- Telephone Interview Grid (FR & EN) – Version 2, dated 07/01/2021
- Questionnaire (FR & EN) – Version 1 – Dated 27/10/2020
- Telephone interview Consent form (FR & EN) - Version 2, dated 07 and 10/01/2021
- COVID-19 Safety Protocol – Version 1 – Dated 12/9/2020

The Hôpital Montfort REB is established and operates in compliance with the Clinical Practice Guidelines: Consolidated Guidelines of the International Council for the Harmonization of Technical Requirements for the Registration of Pharmaceuticals for Human Use (ICH-GCP E6), Part C, Title 5 of the Food and Drug Regulations, and The applicable regulations, Part 4 of the Natural Health Products Regulations; Part 3 of the Medical Devices Regulations, the "Code of Federal Regulations" of the United States, the Ontario Personal Health Information Protection Act, 2004, and the laws and regulations applicable in Ontario. Montfort's REB is registered with the U.S. Department of Health and Human Services (DHHS) and the Office for Human Research Protection (OHRP).

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613-746-4621
613-748-4914
www.hopitalmontfort.com

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Avis d'approbation éthique demande de modification
Comité d'éthique de la recherche (CÉR) de l'Hôpital Montfort

Le 30 décembre 2021

Chercheure principale :

Danielle Rutty

Chercheur responsable de site

Luc Bonneville
University of Ottawa

Titre du projet: « Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients »

Numéro du dossier : 20-21-11-034

En conformité avec la dernière édition de l'Énoncé de politique des trois conseils — Éthique de la recherche avec des êtres humains (ÉPTC 2), le Bureau d'éthique de la recherche (BÉR) de l'Hôpital Montfort vous informe que votre demande de modification soumise le 22 décembre 2021 pour le projet mentionné ci-dessus a été **évaluée** et **approuvée** en comité délégué par le président du CÉR ou son délégué. Les décisions prises au sujet des dossiers évalués en comité délégué sont ratifiées par le comité lors de sa prochaine réunion plénière. Les modifications approuvées touchent les éléments et documents suivants :

- **Research Protocol:** The research team will modify the recruitment protocol. Originally, the target was the Green Zone of the emergency department. However, with the restrictions caused by the COVID-19 pandemic it is a less trafficked area of the emergency room waiting room. This plan was devised because currently there are few volunteer staff per 4-hour shift. The same group of patients are in the Green Zone for 4-6 hours, which matches the shift of the volunteer. This limits the interactions that a volunteer has with a patient. Therefore, they will be expanding to the waiting room to increase the pool of potential respondents. More patients will see the posters, and the hospital volunteer staff will be able to distribute the pamphlets with the links and QR codes to the study. The research team wants to enact this change because response rates continue to be low after 5 months of recruitment. The objective is 200, but the research team is only at 14.

- **Documents utilisés pour le recrutement :** Additionally, to increase the number of responses, in collaboration with the hospital volunteer team, the research team will attempt to do a blitz recruitment. This means that a group of hospital volunteer staff and the principal investigator will be on site at the hospital multiple time (a few consecutive days or weekends) to increase interactions with the patients and explain the research project and encourage responses.

Le CÉR a également reçu et approuvé le document suivant :

- Research Protocol, version # 1, dated December 21, 2021
- Affiche de recrutement (FR & AN) version soumise le 22 décembre 2021

Le CÉR de l'Hôpital Montfort est constitué et exerce ses activités d'une manière conforme aux Bonnes pratiques cliniques : directives consolidées, du Conseil international sur l'harmonisation des exigences techniques relatives à l'homologation des produits pharmaceutiques à usage humain (CIH-BPC E6), à la Partie C, Titre 5, du Règlement sur les aliments et drogues et aux règlements applicables, à la partie 4 du Règlement sur les produits de santé naturels; à la partie 3 du Règlement sur les

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Certificat de renouvellement de l'approbation éthique
Comité d'éthique de la recherche (CÉR) de l'Hôpital Montfort

Le 12 janvier 2022

Chercheure principale :

Danielle Rutty

Chercheur responsable de site

Luc Bonneville

Titre du projet: « Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients »

Numéro du dossier : 20-21-11-034

Date de début : 19 janvier 2022

Date de fin : 18 janvier 2023

Renouvellement #1

Le Bureau d'éthique de la recherche (BÉR) de l'Hôpital Montfort vous informe que votre demande de renouvellement annuel de l'approbation éthique pour le projet mentionné ci-dessus a été **évaluée** et **approuvée** par le président du CÉR ou son délégué. Les décisions prises au sujet des dossiers évalués en comité délégué ou évaluation administrative sont ratifiées par le comité lors de sa prochaine réunion plénière.

Le protocole de l'étude ne peut être modifié sans une approbation préalable du CÉR sauf s'il est question de la sécurité immédiate des participants. Le chercheur doit, avant toute utilisation, soumettre pour évaluation et approbation toutes les modifications au protocole et à la documentation destinée aux participants, par exemple, formulaire de consentement et aux outils de recrutement. Vous devez aussi aviser le CÉR immédiatement de tout événement indésirable ou nouvelle information pouvant augmenter le risque ou modifier le cours du projet de recherche.

Votre certificat d'approbation est valide pour les dates de début et de fin mentionnées ci-dessus et vous devriez nous acheminer **quatre semaines avant la date d'échéance de cet avis d'approbation**, un rapport final ou d'étape annuel afin de fermer le dossier ou de faire une demande de renouvellement de l'approbation éthique. Veuillez noter que vous pouvez soumettre votre demande de renouvellement plus tôt que le délai exigé. Toutefois, le CÉR évaluera et émettra le certificat de renouvellement à une date qui ne remonte pas à plus tôt que 30 jours avant la date d'expiration du certificat valide.

Le CÉR de l'Hôpital Montfort est constitué et exerce ses activités d'une manière conforme aux Bonnes pratiques cliniques : directives consolidées, du Conseil international sur l'harmonisation des exigences techniques relatives à l'homologation des produits pharmaceutiques à usage humain (CIH-BPC E6), à la Partie C, Titre 5, du Règlement sur les aliments et drogues et aux règlements applicables, à la partie 4 du Règlement sur les produits de santé naturels; à la partie 3 du Règlement sur les

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U*niversity of Ottawa Ethics Certificate*

02/03/2021

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

Lettre d'approbation administrative | Letter of administrative approval

Numéro de dossier / Ethics File Number	S-02-21-6103
Titre du projet / Project Title	Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients.
Type de projet / Project Type	Thèse de maîtrise / Master's thesis
CÉR primaire / Primary REB	Hôpital Montfort / Hôpital Montfort
Statut du projet / Project Status	Approuvé / Approved
Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)	02/03/2021
Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)	20/01/2022

Équipe de recherche / Research Team

Chercheur / Researcher	Affiliation	Role
Danielle Paige RUTTY	Département de communication / Department of Communication	Chercheur Principal / Principal Investigator
Luc BONNEVILLE	Département de communication / Department of Communication	Superviseur / Supervisor

Conditions spéciales ou commentaires / Special conditions or comments:

Montfort Hospital REB file number 20-21-11-034

550, rue Cumberland, pièce 154 550 Cumberland Street, Room 154
Ottawa (Ontario) K1N 6N5 Canada Ottawa, Ontario K1N 6N5 Canada

613-562-5387 • 613-562-5338 • ethique@uOttawa.ca / ethics@uOttawa.ca
www.recherche.uottawa.ca/deontologie | www.recherche.uottawa.ca/ethics

19/01/2022

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

Lettre d'approbation administrative | Letter of administrative approval

Numéro de dossier / Ethics File Number	S-02-21-6103
Titre du projet / Project Title	Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients.
Type de projet / Project Type	Thèse de maîtrise / Master's thesis
CÉR primaire / Primary REB	Hôpital Montfort / Hôpital Montfort
Statut du projet / Project Status	Renouvelé / Renewed
Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)	02/03/2021
Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)	18/01/2023

Équipe de recherche / Research Team

Chercheur / Researcher	Affiliation	Role
Danielle Paige RUTTY	Département de communication / Department of Communication	Chercheur Principal / Principal Investigator
Luc BONNEVILLE	Département de communication / Department of Communication	Superviseur / Supervisor

Conditions spéciales ou commentaires / Special conditions or comments:

Numéro du dossier - CER Montfort : 20-21-11-034

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Appendix E. Questionnaire Recruitment Tools

Recruitment Poster to Participate – Bilingual

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LA RECHERCHE DE VOLONTAIRES

À quelle fréquence avez-vous tendance à consulter des informations de santé en ligne?

Nous sommes à la recherche de participants dans le cadre d'une étude qui vise à mieux comprendre l'expérience de la recherche d'informations de santé et médicales en ligne et l'incidence de cette recherche sur les différents comportements.

Critères de sélection :

- Âgé de 18 ans ou plus;
- Doit avoir un niveau de compréhension de l'anglais ou le français qui va au-delà de la 8e année;
- Doit avoir été catégorisé dans la zone verte de la salle d'attente de l'urgence à l'Hôpital Montfort.

Accédez au questionnaire via l'adresse suivante, ou utilise le code QR
https://bit.ly/3fmfQn5

Questions? Communiquez avec :

[redacted]

Ce projet a été approuvé par le comité d'éthique de la recherche de l'Hôpital Montfort.

LOOKING FOR VOLUNTEERS

How often do you consult health information online?

We are looking for individuals to participate in a study to better understand people's experience with searching for health and medical information online and the impact of this searching on various behaviours.

Selection criteria:

- 18 years or older;
- Must have a level of comprehension of either English or French beyond Grade 8;
- Must have been placed in the Green zone of the waiting room at the emergency department of the Montfort Hospital.

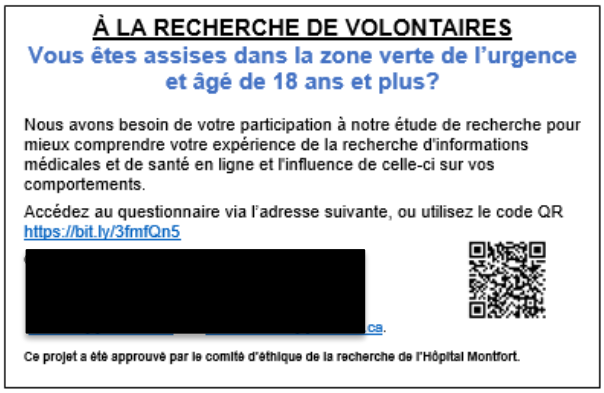
Access the questionnaire using the following link or scanning the QR code:
https://bit.ly/2O4fOF6

Questions? Please contact:

[redacted]

This project has been approved by the Hôpital Montfort Research Ethics Board.

Recruitment Pamphlets – Bilingual



À LA RECHERCHE DE VOLONTAIRES

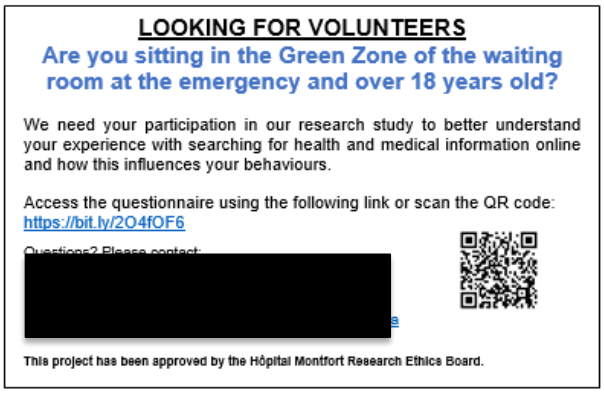
Vous êtes assises dans la zone verte de l'urgence et âgé de 18 ans et plus?

Nous avons besoin de votre participation à notre étude de recherche pour mieux comprendre votre expérience de la recherche d'informations médicales et de santé en ligne et l'influence de celle-ci sur vos comportements.

Accédez au questionnaire via l'adresse suivante, ou utilisez le code QR
https://bit.ly/3fmfQn5

[redacted]

Ce projet a été approuvé par le comité d'éthique de la recherche de l'Hôpital Montfort.



LOOKING FOR VOLUNTEERS

Are you sitting in the Green Zone of the waiting room at the emergency and over 18 years old?

We need your participation in our research study to better understand your experience with searching for health and medical information online and how this influences your behaviours.

Access the questionnaire using the following link or scan the QR code:
https://bit.ly/2O4fOF6

[redacted]

This project has been approved by the Hôpital Montfort Research Ethics Board.

Appendix F. Questionnaire Consent Forms

Questionnaire Consent Form – English Version

Online Questionnaire Consent Form

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1. GENERAL INFORMATION
Project Name: Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients.

Principal Researcher's Name : Danielle Rutty, student in the Master of Arts in Communication, Department of Communication, Faculty of Arts at the University of Ottawa.

Names and Contact Information of Supervisor: Dr. Luc Bonneville, Professor in the Department of Communication, Faculty of Arts at the University of Ottawa and affiliated researcher at l'Institut du Savoir Montfort.

Emergency Contact: Dr. Luc Bonneville.

Funding Source: This project is not receiving any source of funding nor sponsorship by any research organization.

Conflicts of Interest: This project does not present any conflicts of interest.

2. INTRODUCTION
Before agreeing to participate in this research project, please take the time to read and understand the following information. This document explains the purpose of the research project, its benefits, risks, the estimated time required to answer the questions, confidentiality issues and alternatives to participation. Please ask either of the research team members whose contact information is given above any questions you consider relevant.

3. INVITATION TO PARTICIPATE
I am being asked to participate in the above-named research project conducted by Danielle Rutty of the Department of Communication, Faculty of Arts at the University of Ottawa under the supervision of Dr. Luc Bonneville professor of the Department of Communication, Faculty of Arts, at the University of Ottawa affiliated researcher at l'Institut du Savoir Montfort.

I am free to participate or not in this study. My decision to participate or withdraw from the study will not affect the quality of services I currently receive nor the ones I may or will receive in the future.

4. PURPOSE
The goal of this research is to better understand people's experience with searching for health and medical information online and the impact of this searching on various behaviours. The study is particularly interested in individuals who use emergency services. As part of this research we are interested in people's perceptions, opinions and beliefs about online health information. More specifically, this research will look at what is known as "cyberchondria," i.e. individuals engaging in somewhat compulsive searches for information about health, healthcare, medications or treatments on the Internet.

5. PARTICIPATION
My participation will consist of completing an online survey entitled "*Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients"*. The online questionnaire was designed to measure the use of the Internet for health-related information, identify what type of research is conducted, how often the Internet is used for health-related information and what websites are used while navigating the Internet. Topics covered in the questionnaire include Internet use, online health information searching

behaviours and feelings towards researching symptoms and medical information online. I will be asked to answer the questions to best of my ability. The questions be mostly multiple-choice questions, but some will be open-ended questions. I will only be asked to complete the survey once. The questionnaire will last approximately 20 minutes.

There is a section at the end of the questionnaire where I can volunteer to participate in the second part of this project. The second part of the study consists of completing a telephone interview entitled "*In-depth telephone interview investigating the implications of online health information seeking and prevalence of cyberchondria amongst emergency medicine patients."* The interview will last between 30 minutes to an hour. In order to participate I will be asked to provide my name, email address, and telephone number. This personal contact information will only be used to contact me and provide me with the next steps which will consist of an interview conducted over the telephone. Another consent form will be used for the telephone interview phase.

6. BENEFITS

I will not personally benefit from this study, but I understand that my participation in this research will contribute to the scientific literature concerning online health and medical information, anxiety about searching the Internet for health and medical information, and the use of hospital emergency departments. Lessons learned from this research will also contribute to the adaptation of health communication strategies but also to the creation of innovative strategies to raise awareness of how to navigate and search online. The research findings may also provide useful tools that emergency department staff can use to help manage patient interactions and promote conversations about how to search for and consult various sources of health information online.

Overall, the results of this study could help fuel creative and innovative ways to reduce emergency department overcrowding and web-induced anxiety.

7. RISKS

I understand that since my participation in this research requires me sharing my health or medical research habits as well as some personal information, it may create possible emotional or psychological discomfort. I am aware that I may feel uncomfortable answering some questions.

Since the research team is aware of the associated discomforts, a great deal of thought has been put into the choice and wording of the questions to ensure the best outcomes. I am invited to answer the questions to the best of my abilities, but I may also decide not to answer certain questions.

8. DATA CONSERVATION

The data gathered in electronic format will be securely stored. Reports will be downloaded from the survey platform, *Qualtrics*, and saved in the University of Ottawa's secure hard drive. Only the Principal Investigator and the supervisor will have access to the data. Any hard-copy print outs will be locked in a drawer in the supervisor's office.

The data collected in *Qualtrics* is protected by high-end firewall systems which are scanned regularly to ensure that any vulnerabilities are found and repaired quickly. Access to systems is restricted to those on a need-to-know basis and bound by confidentially obligations.

The research team's data is stored in Canada therefore abides by the associated national data sovereignty requirements. All answers to the online questionnaire will be stored on *Qualtrics* survey platform's servers located in Canada and subject to the Canadian Policy on Management of Information Technology. Canadian information and management policy laws meet internationally recognized certifications such as the International Organization for Standardization's ISO 27001.

The data will be conserved for a period of three years after which they will be deleted and destroyed.

9. CONFIDENTIALITY AND ANONYMITY

I have the researcher's assurance that the information I share with her will be kept confidential except if required by law. I expect that the content used will only be for research proposes. In accordance with confidentiality provisions all questionnaire responses will remain anonymous by being assigned a code. The coded responses will be analyzed. Reported results will not be attached to the participant's entries. There is a possibility that research records identifying

me will be examined in the presence of the researcher or by a representative of the Research Ethics Board for control purposes. However, I have been given assurances that no record identifying me, by name or initials, for example, will be permitted to leave the supervisor's office.

My personal contact information acquired for the telephone interview will only be available to the Principal Investigator and the thesis supervisor. They will be stored, and password protected on the network's server, and promptly discarded once the interview has been conducted and verified.

Anonymity will be guaranteed as follows, the names of participants will not be published, only the Principal Investigator and the research supervisor will have access to the data.

10. VOLUNTARY PARTICIPATION
My participation is voluntary. I am free to answer the questionnaire or not, or to refuse to answer certain questions, without exposing myself to any negative consequences. Should I withdraw myself from the study, the data obtained up until that point will be included in the analysis.

Participants will be informed should any events arise throughout the course of the study that would otherwise impact their willingness to voluntary participate.

11. COMPENSATION
I will not be receiving any compensation for my participation in the study.

12. NOTIFICATION OF RESULTS
Results will not be distributed to participants. However, on request published results may be shared with participants by the Principal Investigator. They will be shared via email.

13. CIVIL LIABILITY
My consent to participate in this study does not affect my right to seek legal recourse in any manner whatsoever. If my participation causes me any prejudice, I reserve the right to take any available legal resource against the various research partners.

14. CONSENT
I understand that by answering and submitting the online questionnaire I consent to participate in the research project conducted by Danielle Rutty supervised by Dr. Luc Bonneville.

For any further information concerning this study, please contact the principal investigator or the supervisor.

For information concerning ethical aspects of this research, I may contact the Hôpital Montfort Research Ethics Board, 745-A Montreal Road, Ontario by telephone at 613-746-4621, extension 2221, or by email at ethique@montfort.on.ca.

Acceptance: By checking the box, "I agree to participate" below, I confirm that:

1. I understand what is being asked of me based on the information above;
2. I understand that my participation is voluntary and that I may choose not to answer certain questions or to withdraw from the study at any time;
3. I understand the confidentiality limits specified above.

☐ I agree to participate.

☐ I do not wish to participate.

Questionnaire Consent Form – French Version

Formulaire de consentement pour le questionnaire numérique

1. RENSEIGNEMENTS GÉNÉRAUX

Titre du projet : Enquête sur les implications de la recherche d'informations de santé en ligne et sur la prévalence de la cybercondrie chez les patients qui se présentent aux services d'urgences

Nom du chercheur principal : Danielle Rutty, étudiante au programme de Maitrise ès art communication, Département de communication, à la Faculté des Arts, de l'Université d'Ottawa.

Nom et coordonnées du superviseur : Dr Luc Bonneville, professeur au Département de communication, à la Faculté des Arts de l'Université d'Ottawa, et chercheur affilié à l'Institut du Savoir Montfort.

Contact en cas d'urgence *:* Dr Luc Bonneville

Source de financement : Cette étude n'est pas financée par un organisme de recherche.

Conflits d'intérêts : Cette étude ne présente aucun conflit d'intérêts.

2. INTRODUCTION

Avant d'accepter de participer à ce projet de recherche, veuillez prendre le temps de lire et de comprendre les renseignements qui suivent. Ce document vous explique le but de ce projet de recherche, avantages, risques et inconvénients, et le temps que nous estimons nécessaire pour répondre aux questions, les questions de confidentialité et les alternatives à la participation. Nous vous invitons à poser toutes les questions que vous jugerez utiles à l'un ou l'autre des membres de l'équipe de recherche dont les coordonnées sont indiquées précédemment.

3. INVITATION À PARTICIPER

Je suis invité (e) à participer à la recherche nommée ci-dessus qui est menée par Danielle Rutty du Département de communication, Faculté des Arts de l'Université d'Ottawa sous la supervision de Dr Luc Bonneville du Département de communication, Faculté des Arts de l'Université d'Ottawa et chercheur affilié à l'Institut du Savoir Montfort.

Je suis libre de participer ou non à cette étude. Ma décision de participer ou de me retirer de l'étude n'affectera en rien la qualité des services qui me sont offerts actuellement ou me seront offerts à l'avenir.

4. BUT DE L'ÉTUDE

Le but de cette recherche est de mieux comprendre l'expérience des gens en matière de recherche d'informations de santé et médicales en ligne et l'incidence de cette recherche sur les différents comportements. L'étude s'intéresse particulièrement aux individus qui fréquentent des services d'urgence. Dans le cadre de cette recherche, nous souhaitons mieux comprendre les perceptions, les opinions et les croyances des gens à l'égard des informations de santé en ligne. Plus spécifiquement, cette recherche va se pencher sur ce qu'on appelle la « cybercondrie », c'est-à-dire la tendance que l'on peut avoir de s'engager dans des recherches parfois compulsives sur l'Internet pour obtenir des informations en matière de la santé, de soins de santé, de médicaments ou de traitements.

5. PARTICIPATION

Ma participation consistera essentiellement à répondre à un sondage disponible en ligne intitulé *« Enquête sur les implications de la recherche d'informations de santé en ligne et sur la prévalence de la cybercondrie chez les patients qui se présentent aux services d'urgences »*. Le questionnaire numérique a été conçu pour mesurer l'utilisation de l'Internet pour les informations portant sur la santé et les informations médicales, identifier le type de recherche effectué, la fréquence d'utilisation de l'Internet pour les informations relatives à la santé et les sites web utilisés lors de la navigation sur l'Internet. Les thématiques du sondage portent sur l'usage de l'Internet, les comportements de recherche en matière d'informations de santé en ligne et les sentiments envers la recherche des symptômes et l'information médicales en ligne. Les questions qui me seront posées sont pour la plupart des questions à choix

multiples, mais il y aura aussi quelques questions ouvertes (à développement). Je vais répondre de mon mieux aux questions posées. Je ne répondrai au sondage qu'une seule fois. Le questionnaire a une durée d'environ 20 minutes.

Il y a une section à la fin du questionnaire où je peux me porter volontaire pour participer à la deuxième partie de ce projet. La deuxième partie de l'étude consiste à réaliser un entretien téléphonique intitulé "*Entretien téléphonique approfondi sur les implications de la recherche d'informations de santé en ligne et sur la prévalence de la cybercondrie chez les patients qui se présentent aux services d'urgences* ". Pour participer, je serai invité à fournir mon nom, mon adresse de courrier électronique et mon numéro de téléphone. Ces informations personnelles ne seront utilisées que pour me contacter et me fournir les prochaines étapes liées à l'entretien téléphonique. Un autre consentement sera utilisé pour l'entrevue téléphonique.

6. BIENFAITS

Je ne bénéficierai pas personnellement de cette étude, mais je comprends que ma participation à cette recherche contribuera à la littérature scientifique en matière d'information de santé et médicales en ligne, l'angoisse face à la recherche sur l'Internet pour des informations de santé et médicales et l'utilisation des services d'urgence hospitalisés. Les enseignements tirés de cette recherche exploratoire contribueront aussi à l'adoption des stratégies de communication de santé, mais aussi à la création des stratégies novatrices pour sensibiliser les gens à naviguer et effectuer des recherches en ligne. Les conclusions tirées de la recherche pourront également fournir des outils utiles que le personnel des services d'urgence pourra utiliser pour aider à gérer les interactions avec les patients et à promouvoir des conversations sur la manière de rechercher des informations en ligne sur la santé.

Dans l'ensemble, les résultats de cette étude pourraient contribuer à alimenter des moyens créatifs et innovants pour réduire la surpopulation des urgences et l'anxiété induite par le web.

7. RISQUES

Je comprends que puisque ma participation à cette recherche exige un partage à la fois de mes habitudes de recherche de matière de santé en ligne et d'informations personnelles, il est possible qu'elle crée de possibles inconforts émotionnels ou psychologiques. Par ailleurs, il se peut que je me sente mal à l'aise en répondant à quelques questions selon la nature des thématiques de cette étude.

Tout en étant conscient des risques associés à la participation à cette étude, l'équipe de recherche, soit du chercheur principal, le superviseur et l'équipe au sein de l'Institut de Savoir Montfort, ont accordé beaucoup d'importance à la formulation des questions qui sont posées. Je suis invité à répondre le mieux possible aux questions, mais je peux aussi décider de ne pas répondre à certaines questions.

8. CONSERVATION DES DONNÉES

Les données recueillies seront conservées de manière sécurisée. Les rapports qui doivent être téléchargés à partir de la plateforme d'enquête (soit *Qualtrics*) seront sauvegardés dans le disque dur sécurisé de l'Université d'Ottawa. Seuls le chercheur principal et le superviseur auront accès aux données. Toute copie papier sera conservée dans un tiroir fermé à clé dans le bureau du chercheur principal.

Les données recueillies dans *Qualtrics* sont protégées par un système de pare-feu avancé qui est scanné régulièrement pour s'assurer que toute vulnérabilité est détectée et réparée en temps opportun. L'accès au système est limité aux personnes autorisées qui sont liées par des obligations de confidentialité.

Les données de l'équipe de recherche sont conservées au Canada et respectent donc les exigences de la souveraineté nationale en matière de données. Toutes les réponses aux questionnaires en ligne seront conservées sur les serveurs de la plateforme d'enquête *Qualtrics* qui se trouvent au Canada alors sont soumises à la politique canadienne sur la gestion des technologies de l'information, qui répondent aux certifications reconnues au niveau international, tel que la norme ISO 27001 de l'Organisation internationale de normalisation.

Les données seront entreposées pour une durée de trois ans et seront supprimées et détruites par la suite.

9. CONFIDENTIALITÉ ET ANONYMAT

J'ai l'assurance du chercheur que l'information que je partagerai avec elle restera confidentielle sauf en cas d'obligation légale. Je m'attends à ce que le contenu ne soit utilisé que pour les fins de la recherche. Selon le respect de la confidentialité, toute information personnelle ou identifiable sera protégée en assignant un code aux réponses

recueillies par l'entremise de la plateforme pour le questionnaire numérique. Les réponses ne seront analysées qu'en fonction du code. Il se peut néanmoins que les dossiers de recherche qui m'identifient soient inspectés en présence du chercheur ou du comité d'éthique de la recherche aux fins de contrôle de la recherche. J'ai reçu l'assurance qu'aucun dossier m'identifiant, par exemple avec mon nom et mes initiales, ne sera autorisé à sortir du bureau du chercheur.

Mes coordonnées personnelles acquises pour l'entretien téléphonique ne seront accessibles qu'au chercheur principal et au directeur de thèse. Elles seront sauvegardées et protégées par un mot de passe sur le serveur du réseau, et seront rapidement supprimées une fois que l'entretien mené et vérifié.

L'anonymat est garanti de la façon suivante; le nom des participants ne sera publié. Seuls le chercheur principal et le superviseur auront accès aux données non codées.

10. PARTICIPATION VOLONTAIRE
Ma participation à la recherche est volontaire. Je suis libre de me retirer en tout temps ou de refuser de répondre à certaines questions, sans subir de conséquences négatives. Si je choisis de me retirer de l'étude, les données jusqu'alors fournies ne seront pas analysées.

Le participant sera informé en temps opportun si de nouveaux renseignements ressortent qui pourraient avoir un impact sur la volonté de poursuivre à l'étude.

11. INDEMNISATION
Je ne recevrai aucune indemnisation pour participer à la recherche.

12. COMMUNICATION DES RÉSULTATS
Sur demande uniquement, il sera possible d'obtenir les résultats de la recherche sous forme de publication par le chercheur principal et le superviseur. Les résultats seront communiqués par courriel.

13. RESPONSABILITÉ CIVILE
En acceptant de participer à cette étude, je ne suis privé d'aucun droit au recours judiciaire. Si je devais subir un préjudice en lien avec ma participation, je conserverais tous mes recours légaux à l'encontre des différents partenaires de la recherche.

14. CONSENTEMENT
Je comprends qu'en répondant et en soumettant le questionnaire électronique au chercheur signifie que je consens à participer au projet de recherche mené par Danielle Rutty sous la supervision de Dr Luc Bonneville.

Pour tout renseignement additionnel concernant cette étude, je peux communiquer avec le chercheur ou son superviseur.

Pour tout renseignement sur les aspects éthiques de cette recherche, je peux m'adresser au Comité d'éthique de la recherche de l'Hôpital Montfort, 745-A chemin Montréal, à Ottawa, Ontario par téléphone 613-746-4621, poste 2221 ou par courriel à ethique@montfort.on.ca.

Acceptation : En cochant « Je consens à participer » ci-dessous, je confirme que :

1. Je comprends ce que l'on me demande de faire d'après les renseignements décrits ci-haut;
2. Je comprends que ma participation est volontaire et que je suis libre de pas répondre à l'une ou l'autre des questions et de me retirer à tout moment;
3. Je comprends les limites à la confidentialité telles que précisées ci-haut.

☐ Je consens à participer.

☐ Je ne souhaite pas participer

Appendix G. Telephone Interview Recruitment Tool
Email Invite to Participate in Telephone Interview – English Version

Email Invite to participate in Telephone Interview – English Version

Subject line: You are invited to participate in a follow-up telephone interview as part of research investigating how people use the internet to search for health-related information.

Title: In-depth telephone interview investigating the implications of online health information seeking and prevalence of cyberchondria amongst emergency medicine patients.

Hello,

My name is Danielle Rutty. I am a graduate student in the Master of Arts in Communication at the University of Ottawa. I am conducting research relating to health information found online. This study will be carried out in collaboration with the Montfort Hospital.

I am emailing you following your visit with the emergency department at the Montfort Hospital, where you took part in an online survey, and indicated your willingness to participate in a follow-up interview.

The purpose of this email communication is to invite you to participate in the interview as part of the research project: ***Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients***. It is important to note that we are not contacting you today regarding your medical care. We would like to highlight that your participation in this call is entirely voluntary. You can choose not to participate, or you can stop at any time. Your decision will have no effect on the quality of care you currently receive or will receive in the future at the Montfort Hospital.

The goal of this research is to better understand people's experience with searching for health and medical information online and the impact of this searching on various behaviours. The study is particularly interested in individuals who use emergency services. As part of this research we are interested in people's perceptions, opinions and beliefs about online health information. More specifically, this research will look at what is known as "cyberchondria", i.e. individuals engaging in somewhat compulsive searches for information about health, healthcare, medications or treatments on the Internet.

If you are willing to continue in this study, please sign and return the attached consent form to the following address and include three possible times that we could schedule the telephone interview. The interview should last approximately 30 minutes to one hour. **You will be compensated $20 for your participation.**

If are no longer interested in participating, simply disregard this email, there is no need to respond.

Thank you for taking the time to carefully read and respond to our email.

If you require particular needs or adaptive measures, please let us know.

Should you have any questions or concerns please do not hesitate to contact us.

Kind regards,

Danielle Rutty
Étudiante à la maitrise ès arts Communication / Student in the Master of Arts in Communication
BHS, BSc.
Université d'Ottawa / University of Ottawa

Email Invite to Participate in Telephone Interview – French Version

Courriel de recrutement pour l'entrevue par téléphone – Français

Objet : Vous êtes invité à participer à une entrevue téléphonique dans le cadre d'un projet de recherche visant à mieux comprendre votre usage de l'Internet pour obtenir des informations de santé.

Titre : Entretien téléphonique approfondi sur les implications de la recherche d'informations de santé en ligne et sur la prévalence de la cybercondrie chez les patients qui se présentent aux services d'urgences.

Bonjour,

Je m'appelle Danielle Rutty et je suis étudiante à la maitrise ès arts communication à l'Université d'Ottawa. Je mène une recherche sur l'usage de l'Internet-santé. Cette recherche se fait en collaboration avec l'équipe de recherche à l'Hôpital Montfort. Mon courriel d'aujourd'hui fait suite à votre visite à l'urgence de l'Hôpital Montfort, durant laquelle vous avez répondu à un questionnaire numérique et avez ensuite consenti à être contacté pour participer à une entrevue par téléphone.

Le but de ce courriel est de vous inviter à entreprendre l'entrevue dans le cadre du projet ***les implications de la recherche d'informations de santé en ligne et sur la prévalence de la cybercondrie chez les patients qui se présentent aux services d'urgences.*** II est important de noter que cette correspondance n'est pas un suivi médical. Votre participation à cette étude est entièrement volontaire. Vous pouvez choisir de ne pas y prendre part ou vous pouvez arrêter à tout moment. Votre décision n'aura aucune conséquence sur la qualité des soins que vous recevez actuellement ou recevrez dans le futur à l'Hôpital Montfort.

Le but de cette recherche est de mieux comprendre l'expérience des gens en matière de recherche d'informations de santé et médicales en ligne et l'incidence de cette recherche sur les différents comportements. L'étude s'intéresse particulièrement aux individus qui fréquentent des services d'urgence. Dans le cadre de cette recherche, nous souhaitons mieux comprendre les perceptions, les opinions et les croyances des gens à l'égard des informations de santé en ligne. Plus spécifiquement, cette recherche va se pencher sur ce qu'on appelle la « cybercondrie », c'est-à-dire la tendance que l'on peut avoir de s'engager dans des recherches parfois compulsives sur l'Internet pour obtenir des informations en matière de la santé, de soins de santé, de médicaments ou de traitements.

Si vous acceptez de poursuivre, veuillez nous répondre en signant le formulaire de consentement et nous fournissant trois plages d'horaire qui vous conviendraient pour mener l'entretien téléphonique. L'entretien aura une durée approximative de 30 minutes à une heure. Nous allons vous récompenser $20 à la suite de votre entretien téléphonique.

Si vous n'acceptez pas de poursuivre avec l'étude, vous n'êtes pas obligé de faire suite à ce courriel. Veuillez tout simplement l'ignorer.

Je vous remercie de votre attention et du temps que vous m'avez accordé.

Si vous nécessitez des accommodements ou avez des besoins particuliers veuillez nous en faire part.

Si vous avez des questions ou préoccupations n'hésitez à nous contacter.

Au plaisir,

Danielle Rutty
Étudiante à la maitrise ès arts communication / Student in the Master of Arts in Communication
BHS, BSc.
Université d'Ottawa / University of Ottawa

Appendix H. Telephone Interview Consent Forms

Telephone Interview Consent Form – English Version

Telephone Interview Consent Form

GENERAL INFORMATION
Project Name: Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients.

Principal Researcher's Name: Danielle Rutty, student in the Master of Arts in Communication, Department of Communication, Faculty of Arts at the University of Ottawa

Names and Contact Information of Co-researchers: Dr. Luc Bonneville, Professor in the Department of Communication, Faculty of Arts at the University of Ottawa and affiliated researcher at l'Institut du Savoir Montfort.

Emergency Contact*:* Dr. Luc Bonneville.

Funding Sources: This project is not receiving any source of funding nor sponsorship by any research organization.

Conflicts of Interest: This project does not present any conflicts of interest.

2. INTRODUCTION
Before agreeing to participate in this research project, please take the time to read and understand the following information. This document explains the purpose of the research project, its benefits, risks, the estimated time required to answer the questions, confidentiality issues and alternatives to participation. Please ask either of the research team members whose contact information is given above any questions you consider relevant.

3. INVITATION TO PARTICIPATE
I am being asked to participate in the above-named research project conducted by Danielle Rutty of the Department of Communication, Faculty of Arts at the University of Ottawa under the supervision of Dr. Luc Bonneville professor of the Department of Communication, Faculty of Arts, at the University of Ottawa affiliated researcher at l'Institut du Savoir Montfort.

I am free to participate or not in this study. My decision to participate or withdraw from the study will not affect the quality of services I currently receive nor the ones I may or will receive in the future.

4. PURPOSE
The goal of this research is to better understand people's experience with searching for health and medical information online and the impact of this searching on various behaviours. The study is particularly interested in individuals who use emergency services. As part of this research we are interested in people's perceptions, opinions and beliefs about online health information. More specifically, this research will look at what is known as "cyberchondria," i.e. individuals engaging in somewhat compulsive searches for information about health, healthcare, medications or treatments on the Internet.

5. INCLUSION/EXCLUSION CRITERIA
The inclusion and exclusion criteria for taking part in this research are as follows:

- Must have a level of comprehension in English or French beyond Grade 8;
- Must have been placed in the green zone of the waiting room at the emergency department of the Montfort Hospital by the staff responsible for triage;
- Be 18 years of age or older;

- Consented to participate in the study (online questionnaire and telephone interview).

6. PARTICIPATION

My participation has already consisted of completing an online survey entitled "*Investigating the Implications of Online Health Information Seeking and Prevalence of Cyberchondria Amongst Emergency Medicine Patients."* The online questionnaire was designed to measure the use of the Internet for health-related information, identify what type of research is conducted, how often the Internet is used for health-related information and what websites are used while navigating the Internet. Topics covered in the questionnaire include Internet use, online health information searching behaviours and feelings towards researching symptoms and medical information online. The questions asked were mostly multiple-choice questions, but some were open-ended questions. I answered the questions to the best of my ability. I will only be asked to complete the survey once.

The second part of my participation will consist of answering questions in a telephone interview entitled "*In-depth telephone interview investigating the implications of online health information seeking and prevalence of cyberchondria amongst emergency medicine patients."* The interview should last approximately 30 minutes to an hour. The telephone interview is intended to collect in-depth information on my experiences of using the Internet to search for medical or health information. I will be asked a series of open-ended questions about Internet use, online health information seeking behaviours and my feelings about seeking symptoms and medical information online. I will answer the questions to the best of my ability. I will only be interviewed once. The answers that were provided in the online questionnaire will not be linked to my name, email address or telephone number. My contact information will remain confidential and kept with the principal investigator and the thesis supervisor only. My personal contact information will be deleted after the interview has been conducted and verified.

7. BENEFITS

I will not benefit personally from this study, but I understand that my participation in this research will contribute to the scientific literature concerning online health and medical information, anxiety about searching the Internet for health and medical information, and the use of hospital emergency departments. Lessons learned from this research will also contribute to the adaptation of health communication strategies but also to the creation of innovative strategies to raise awareness of how to navigate and search online. The research findings may also provide useful tools that emergency department staff can use to help manage patient interactions and promote conversations about how to search for and consult various sources of health information online.

Overall, the results of this study could help fuel creative and innovative ways to reduce emergency department overcrowding and web-induced anxiety.

8. RISKS

I understand that since my participation in this research requires me sharing my health or medical research habits as well as some personal information, it may create possible emotional or psychological discomfort. I am aware that I may feel uncomfortable answering some questions.

Since the research team is aware of the associated discomforts, a great deal of thought has been put into the choice and wording of the questions to ensure the best outcomes. I am invited to answer the questions to the best of my abilities, but I may also decide not to answer certain questions.

9. DATA CONSERVATION

The data gathered in electronic format will securely stored. Reports will be downloaded from the survey platform, Qualtrics, and saved in the University of Ottawa's secure hard drive. Only the Principal Investigator and the supervisor will have access to the data. Any hard-copy print outs will be locked in a drawer in the Principal Investigator's office.

The data collected in Qualtrics is protected by high-end firewall systems which are scanned regularly to ensure that any vulnerabilities are found and repaired quickly. Access to systems is restricted to those on a need-to-know basis and bound by confidentially obligations.

The research team's data is stored in Canada therefore abides by the associated national data sovereignty requirements. All answers to the online questionnaire will be stored on Qualtrics survey platform's servers located in Canada and subject to the Canadian Policy on Management of Information Technology. Canadian information and management policy laws meet internationally recognized certifications such as the International Organization for Standardization's ISO 27001.

Data from the interviews will be recorded and transcribed into a Word document. Electronic transcripts will be password-protected and saved to the university's secure network. Handwritten notes will be locked in the Research Supervisor's Office.

The data will be conserved for a period of three years after which they will be deleted and destroyed.

10. CONFIDENTIALITY AND ANONYMITY

I have the researcher's assurance that the information I share with her will be kept confidential except when required by law. I expect that the content to be used will only be for research proposes. In accordance with confidentiality provisions all questionnaire and interview responses will be coded to ensure anonymity. Coded responses will be analyzed. There is a possibility that research records identifying me will be examined in the presence of the researcher or by a representative of the Research Ethics Board for research control purposes. However, I have been given assurances that no record identifying me, by name or initials, for example, will be permitted to leave the researcher's office.

My personal contact information acquired for the telephone interview will only be available to the Principal Investigator and the thesis supervisor. They will be stored, and password protected on the network's server, and promptly discarded once the interview has been conducted and verified.

Anonymity will be guaranteed as follows, the names of participants will not be published, only the Principal Investigator and the research supervisor will have access to the data.

11. VOLUNTARY PARTICIPATION

My participation is voluntary. I am free to answer the questionnaire or not, or to refuse to answer certain questions, without exposing myself to any negative consequences. Should I withdraw myself from the study, the data obtained up until that point will be included in the analysis.

Participants will be informed should any events arise throughout the course of the study that would otherwise impact their willingness to voluntary participate.

12. REIMBURSEMENT/COMPENSATION

I will be receiving a $20 compensation for my participation in the telephone interview as part of this research project.

13. NOTIFICATION OF RESULTS

Results will not be distributed to participants. However, on request published results may be shared with participants by the Principal Investigator. They will be shared via email.

14. CIVIL LIABILITY

My consent to participate in this study does not affect my right to seek legal recourse in any manner whatsoever. If my participation causes me any prejudice, I reserve the right to take any available legal recourse against the various research partners.

15. CONSENT

Acceptance: I,_____, agree to participate in this research project conducted by Danielle Rutty under the supervision of Dr. Luc Bonneville. For any further information concerning this study, please contact the researcher or the researcher's supervisor.

For information concerning ethical aspects of this research, I may contact the Hôpital Montfort Research Ethics Board, 745-A Montreal Road, Ontario by telephone at 613-746-4621, extension 2221, or by email at ethique@montfort.on.ca.

There are two copies of the consent form, one of which I may keep.

Participant's Signature: Date:

Researcher's Signature: Date:

Telephone Interview Consent Form – French Version

Formulaire de consentement pour entrevue téléphonique

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1. RENSEIGNEMENTS GÉNÉRAUX

Titre du projet : Enquête sur les implications de la recherche d'informations de santé en ligne et sur la prévalence de la cyberchondrie chez les patients qui se présentent aux services d'urgences

Nom du chercheur principal : Danielle Rutty, étudiante au programme de Maitrise ès art communication, Département de communication, à la Faculté des Arts, de l'Université d'Ottawa.

Nom et coordonnées du superviseur : Dr Luc Bonneville, professeur titulaire au Département de communication, à la Faculté des Arts de l'Université d'Ottawa, et chercheur affilié à l'Institut du Savoir Montfort.

Contact en cas d'urgence *:* Dr Luc Bonneville

Source de financement : Cette étude n'est pas financée par un organisme de recherche.

Conflits d'intérêts : Cette étude ne présente aucun conflit d'intérêts et n'est pas liée à la commercialisation des résultats acquis.

2. INTRODUCTION
Avant d'accepter de participer à cette recherche, veuillez prendre le temps de lire et de comprendre les renseignements qui suivent. Ce document vous explique le but de la recherche, ses procédures, avantages, risques et inconvénients. Nous vous invitons à poser toutes les questions que vous jugerez utiles à la personne qui vous présente ce document.

3. INVITATION À PARTICIPER
Je suis invité (e) à participer à la recherche nommée ci-dessus qui est menée par Danielle Rutty du Département de communication, Faculté des Arts de l'Université d'Ottawa sous la supervision de Dr Luc Bonneville du Département de communication, Faculté des Arts de l'Université d'Ottawa et chercheur affilié à l'Institut du Savoir Montfort.

Je suis libre de participer ou non à cette étude. Ma décision de participer ou de me retirer de l'étude n'affectera en rien la qualité des services qui me sont offerts actuellement ou me seront offerts à l'avenir.

4. BUT DE L'ÉTUDE
Le but de cette recherche est de mieux comprendre l'expérience des gens en matière de recherche d'informations de santé et médicales en ligne et l'incidence de cette recherche sur les différents comportements. L'étude s'intéresse particulièrement aux individus qui fréquentent des services d'urgence. Dans le cadre de cette recherche, nous souhaitons mieux comprendre les perceptions, les opinions et les croyances des gens à l'égard des informations de santé en ligne. Plus spécifiquement, cette recherche va se pencher sur ce qu'on appelle la « cybercondrie », c'est-à-dire la tendance que l'on peut avoir de s'engager dans des recherches parfois compulsives sur l'Internet pour obtenir des informations en matière de la santé, de soins de santé, de médicaments ou de traitements.

5. CRITÈRES D'INCLUSION ET D'EXCLUSION

Les critères d'inclusion et d'exclusion pour prendre part à cette recherche sont les suivants :

- Doit avoir un niveau de compréhension de l'anglais ou le français au-delà de la 8e année;
- Avoir été catégorisé dans la zone verte de la salle d'attente de l'urgence à l'Hôpital Montfort par le personnel responsable pour le triage;
- Avoir 18 ans ou plus;

- Avoir consenti de participer à l'étude (questionnaire numérique et entrevu).

6. PARTICIPATION

Ma participation a déjà consisté à répondre à un sondage numérique intitulé *« Enquête sur les implications de la recherche d'informations de santé en ligne et sur la prévalence de la cybercondrie chez les patients qui se présentent aux services d'urgences »*. Le questionnaire numérique a été conçu pour mesurer l'utilisation de l'Internet pour les informations portant sur la santé et les informations médicales, identifier le type de recherche effectué, la fréquence d'utilisation de l'Internet pour les informations relatives à la santé et les sites web utilisés lors de la navigation sur l'Internet. Les thématiques du sondage portent sur l'usage de l'Internet, les comportements de recherche en matière d'informations de santé en ligne et les sentiments envers la recherche des symptômes et l'information médicales en ligne. Les questions qui m'ont été posées sont pour la plupart des questions à choix multiples, mais il y avait aussi quelques questions ouvertes (à développement). J'ai répondu de mon mieux aux questions posées. Je ne répondrai au sondage qu'une seule fois.

Dans un deuxième temps, ma participation consistera à répondre à des questions lors d'une entrevue téléphonique intitulé *« Entretien téléphonique approfondi sur les implications de la recherche d'informations de santé en ligne et sur la prévalence de la cybercondrie chez les patients qui se présentent aux services d'urgences »*. L'entretien a une durée d'environ 30 minutes à une heure. L'entretien téléphonique a pour but de recueillir des informations détaillées sur mon expérience personnelle de l'utilisation d'Internet pour rechercher des informations médicales ou de santé. Les thématiques aborder lors de l'entrevue porteront sur l'usage de l'Internet, les comportements de recherche en matière d'informations de santé en ligne et mes sentiments envers la recherche des symptômes et l'information médicales en ligne. Les questions qui me seront posées sont des questions ouvertes (à développement). Je vais répondre de mon mieux aux questions posées. Je ne participerai à l'entrevue qu'une seule fois. Les réponses fournies au questionnaire numérique ne seront pas liées à mon nom, mon adresse électronique ou mon numéro de téléphone. Mes coordonnées resteront confidentielles et ne seront conservées que par le chercheur principal et le directeur de thèse. Mes informations personnelles seront supprimées après la réalisation et la vérification de l'entretien.

7. BIENFAITS

Je ne bénéficierai pas personnellement de cette étude, mais je comprends que ma participation à cette recherche contribuera à la littérature scientifique en matière d'information de santé et médicales en ligne, l'angoisse face à la recherche sur l'Internet pour des informations de santé et médicales et l'utilisation des services d'urgence hospitalisés. Les enseignements tirés de cette recherche exploratoire contribueront aussi à l'adoption des stratégies de communication de santé, mais aussi à la création des stratégies novatrices pour sensibiliser les gens à naviguer et effectuer des recherches en ligne. Les conclusions tirées de la recherche pourront également fournir des outils utiles que le personnel des services d'urgence pourra utiliser pour aider à gérer les interactions avec les patients et à promouvoir des conversations sur la manière de rechercher des informations en ligne sur la santé en ligne.

Dans l'ensemble, les résultats de cette étude pourraient contribuer à alimenter des moyens créatifs et innovants pour réduire la surpopulation des urgences et l'anxiété induite par le web.

8. RISQUES

Je comprends que puisque ma participation à cette recherche exige de partager à la fois mes habitudes de recherche de matière de santé en ligne et des informations personnelles, il est possible qu'elle crée de possibles inconforts émotionnels ou psychologiques. Par ailleurs, il se peut que je me sente mal à l'aise en répondant à quelques questions selon la nature des thématiques de cette étude.

Tout en étant conscients des risques associés à la participation à cette étude, l'équipe de recherche, soit du chercheur principal, le superviseur et l'équipe au sein de l'Institut de Savoir Montfort, ont accordé beaucoup d'importance à la formulation des questions qui sont posées. Je suis invité à répondre le mieux possible aux questions, mais je peux aussi décider de ne pas répondre à certaines questions.

9. CONSERVATION DES DONNÉES

Les données recueillies seront conservées de manière sécurisée. Les rapports qui doivent être téléchargés à partir de la plateforme d'enquête (soit *Qualtrics*) seront sauvegardés dans le disque dur sécurisé de l'Université d'Ottawa. Seuls le chercheur principal et le superviseur auront accès aux données. Toute copie papier sera conservée dans un tiroir fermé à clé dans le bureau du chercheur principal.

Les données recueillies dans *Qualtrics* sont protégées par un système de pare-feu avancé qui est scanné régulièrement pour s'assurer que toute vulnérabilité est détectée et réparée en temps opportun. L'accès au système est limité aux personnes autorisées qui sont liées par des obligations de confidentialité.

Les données de l'équipe de recherche sont conservées au Canada et respectent donc les exigences de la souveraineté nationale en matière de données. Toutes les réponses aux questionnaires en ligne seront conservées sur les serveurs de la plateforme d'enquête *Qualtrics* qui se trouvent au Canada donc sont soumissent à la politique canadienne sur la gestion des technologies de l'information. Ce dernier répond aux certifications reconnues au niveau international, telles que la norme ISO 27001 de l'Organisation internationale de normalisation.

Les données issues des entrevues seront enregistrées et seront ensuite transcrites dans un document Word, lesquels seront conservés de façon sécuritaire sur le réseau de l'université au nom du chercheur principal, protégé par mot de passe. Les notes manuscrites issues du travail du chercheur principal qui se chargera de mener les entrevues seront, rangées dans un casier barré dans le bureau du superviseur de la recherche.

Les données seront entreposées pour une durée de trois ans et seront supprimées et détruites par la suite.

10. CONFIDENTIALITÉ ET ANONYMAT

J'ai l'assurance du chercheur que l'information que je partagerai avec elle restera confidentielle sauf en cas d'obligation légale. Je m'attends à ce que le contenu ne soit utilisé que pour les fins de la recherche. Selon le respect de la confidentialité, toute information personnelle ou identifiable sera protégée en assignant un code aux réponses recueillies des questionnaires numérique et l'entrevue. Mais les réponses ne seront analysées qu'en fonction du code. Il se peut néanmoins que les dossiers de recherche qui m'identifient soient inspectés en présence du chercheur ou du comité d'éthique de la recherche aux fins de contrôle de la recherche. J'ai reçu l'assurance qu'aucun dossier m'identifiant, par exemple avec mon nom et mes initiales, ne sera autorisé à sortir du bureau du chercheur.

Mes coordonnées personnelles acquises pour l'entretien téléphonique ne seront accessibles qu'au chercheur principal et au directeur de thèse. Elles seront sauvegardées et protégées par un mot de passe sur le serveur du réseau, et seront rapidement supprimées une fois l'entretien mené et vérifié.

L'anonymat est garanti de la façon suivante; le nom des participants ne sera publié. Seuls le chercheur principal et le superviseur auront accès aux données.

11. PARTICIPATION VOLONTAIRE

Ma participation à la recherche est volontaire. Je suis libre de me retirer en tout temps ou de refuser de répondre à certaines questions, sans subir de conséquences négatives. Si je choisis de me retirer de l'étude, les données jusqu'alors fournies ne seront pas analysées.

12. REMBOURSEMENT/INDEMNISATION

Je recevrai une indemnisation de $20 pour participer à l'entrevue téléphonique dans le cadre de ce projet de recherche.

13. COMMUNICATION DES RÉSULTATS

Sur demande uniquement, il sera possible d'obtenir les résultats de la recherche sous forme de publication par le chercheur principal et le superviseur. Les résultats seront communiqués par courriel.

14. RESPONSABILITÉ CIVILE

En acceptant de participer à cette étude, je ne suis privé d'aucun droit au recours judiciaire. Si je devais subir un préjudice en lien avec ma participation, je conserverais tous mes recours légaux à l'encontre des différents partenaires de la recherche.

15. CONSENTEMENT

Acceptation : Je, _____, accepte de participer à cette recherche menée par Danielle Rutty sous la supervision de Dr Luc Bonneville. Pour tout renseignement additionnel concernant cette étude, je peux communiquer avec le chercheur ou son superviseur.

Pour tout renseignement sur les aspects éthiques de cette recherche, je peux m'adresser au Comité d'éthique de la recherche de l'Hôpital Montfort, 745-A chemin Montréal à Ottawa, Ontario par téléphone 613-746-4621, poste 2221 ou par courriel à ethique@montfort.on.ca.

Il y a deux copies du formulaire de consentement, dont une copie que je peux garder.

Signature du participant : Date :

Signature du chercheur : Date :