MENTAL HEALTHCARE PROFESSIONALS' PERCEPTIONS OF MENTAL HEALTH APPS

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Bachelor of Arts, University of Lethbridge. 2018

A thesis submitted
in partial fulfilment of the requirements for the degree of

MASTER OF EDUCATION

In

COUNSELLING PSYCHOLOGY

Faculty of Education
University of Lethbridge
LETHBRIDGE, ALBERTA, CANADA

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Date of Defense: June 16, 2022

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DEDICATION

To my loving husband, Bruce, thank you for being my partner in all things. To my family, who probably learned more about mental health apps and SPSS than they ever wanted. To my Thesis Buddies, who truly got me through this experience. To my cohort, who made this experience one I will never forget. And finally, to my committee, thank you for supporting me through my research and allowing me to learn from you throughout this process.

ABSTRACT

Smartphones continue to become integrated into every aspect of an individual's life. There are currently applications (apps) for an extensive selection of sectors, including mental health. These mental health apps have the potential to play a major role in the future development of mental healthcare. Although mental health apps seem to be in abundance, it is unknown how mental healthcare professionals are employing these applications with their clients, and what they think about them. For this study, a cross-sectional survey design was used to collect information to describe 69 mental health professionals' current perceptions regarding mental health apps. Results show that these mental health professionals primarily employ mental health apps for between-session support with clients dealing with depression, anxiety, and trauma, and they tend to utilise mindfulness and mediation-type apps. Participants generally favoured the possible accessibility that apps can provide, specifically surrounding portability and affordability. On the other hand, professionals' lack of understanding of and training with apps, as well as privacy and confidentiality concerns, presented as perceived limitations. 47% of these mental health professionals believe that apps should be more incorporated into mental health care, with under 34% were unsure, and only 13.4% were against the idea. Finally, recommendations are provided for possible future research.

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List of Definitions

Digital Technology	Technologies that are manifested as digital communication systems, resources, and devices that generate, store, or process data.
Mobile Technology	A form of digital technology that can go where the user goes
Mental Health	A dynamic state of internal equilibrium which enables individuals to use their abilities in harmony with universal values of society.
E-mental health	E-mental health, also known as e-therapy and telepsychology is when a mental healthcare professional provides mental health services via digital communication technology.
Mobile Application	Computer or software program that is designed to run on devices such as a phone, tablet, or watch.
Mobile Medical Application	Fast-growing category of software that can be installed on personal smartphones.
Mental Health App	A subset of mobile medical applications that are aimed at helping individuals identify and treat mental illness, or support overall mental health.
COVID-19	Coronavirus disease (COVID-19) is an Infectious disease caused by the SARS-CoV-2 virus.

CHAPTER 1: Introduction

Within the past decade, mobile devices have become a central part of many peoples' personal, occupational, and social lives (Bakker et al, 2016). It is estimated that people check their phones up to 150 times a day, demonstrating the significant role these devices play in our lives (Bakker et al., 2016). A mobile application (app) is a software program that is designed to run on a mobile device. In the past few years, a growing number of apps have been developed to help users improve their mental health and well-being (Donker et al, 2013). These mental health apps have the potential to play a notable role in the future development of mental healthcare (Simon & Ludman, 2009). Specifically, mental health apps may be able to assist in expanding the healthcare field to include constant availability, greater access, anonymity, adapted programming, and stigma reduction (Grist et al, 2017). While mental health apps have the possibility of serving a positive function in the future of mental healthcare, there is a lot of uncertainty surrounding them. Although mental health apps provide distinct opportunities to offer help, there is also a list of possible drawbacks, such as potential privacy issues, a lack of research, and the high turnover rate of app development.

Mental healthcare professionals are in a unique position that allows them to recommend mental health apps to individuals who may benefit from them. Furthermore, because mental healthcare professionals have specific mental health knowledge, they may also have more educated views on the usefulness, benefits, and barriers of these apps. Thus, mental healthcare professionals' perceptions of apps could be beneficial in understanding how they may fit into the current healthcare system. Despite recent research into mental health apps during the COVID-19 pandemic, there is currently a gap in the research on mental healthcare professionals' perceptions of mental health apps (Kuhn et al., 2014; Leigh & Flatt, 2015; Olff, 2015).

As technology is becoming increasingly prevalent (Linke, 2013; Mantha, 2018), it is essential for mental healthcare to adapt with it to best meet the needs of people requiring support. Developing an understanding of how professionals view mental health apps can allow for growth within the mental health field, as well as a possible adoption and expansion of current technology use to better support clients. Although this is a preliminary study, there is potential for future research to grow from the information gathered, thereby providing a basis for understanding app integration into mental healthcare.

Although mental health apps have the potential to impact mental health services, it is unknown whether mental healthcare professionals are implementing these apps in their practice. The primary questions of this thesis are twofold:

1) What are mental health professionals' perceptions of mental health apps?

2) How are health professionals using mental health apps in their practice[s] with clients?

CHAPTER 2: Literature Review

Digital Technologies in Society

There are multiple definitions of technology (Grubler, 1998), however, in the broadest sense of the term, technology is the culmination of techniques, skills, methods, and processes employed in the construction of goods or services, or in the achievement of intentions such as scientific exploration (La Shun, 2017). While the basic wheel itself is a form of technology, the modern use of the term often refers to digital or electronic systems that are used in everyday life (Fitzgerald et al., 2014). To clarify the form of technology discussed in this study, the term "digital technologies" will be used when referring to those technologies that are manifested as digital communication systems, resources, and devices that generate, store, or process data. Some examples of digital technology are cell phones, computers, laptops, tablets, televisions, car radios, and self-serve systems at commercial locations; all of which help demonstrate the ubiquity of digital technologies in modern society. Most individuals in North America, as well as other parts of the world, are consistently impacted by digital technologies (Linke, 2013). Digital technologies have allowed for the expansion of social media use, fundamentally changing traditional methods of communication (Anderson & Jiang, 2018; Boulianne, 2015; Correa et al., 2010; Zuniga et al., 2012). There is an ongoing, increased reliance upon digital technologies in daily living which has changed how individuals interact, receive news, access political information, run businesses, and spend leisure time (Boulianne, 2015; Correa et al., 2010; Hajli, 2014; Holte & Ferraro, 2018; Shirky, 2011; Zuniga et al., 2012).

Education and learning are other areas of everyday life that are heavily influenced by digital technologies (Blackwell, 2013; Heflin, 2017; Kirkwood, 2012; Selwyn, 2010; Sheng, 2012). Internet-facilitated learning is progressively being implemented throughout North

America and most of the world with the aim of transforming the learning experience. Because of this ongoing utilization of digital technologies in everyday life, education systems are evolving to incorporate these technologies into the learning environment to implement in the classroom what is also used outside of the classroom. Additionally, because children tend to be drawn to digital technologies (Plowman et al., 2009) and use them regularly (Chaudron, 2015; Mantilla & Edwards, 2019; Ofcom, 2017), integrating digital technologies into pedagogical strategies may increase a child's willingness to participate in learning. Furthermore, digital technologies are exceptionally beneficial in supporting children with special needs and can aid in strengthening their learning engagement and capacity to fulfil learning tasks (Barton et al., 2017; Cheng & Lai, 2019; Cumming & Rodrigues, 2017; Shih et al., 2014). Altogether, digital technologies actively serve a significant role in education and learning.

Digital technologies are also transforming healthcare (Bhavani et al., 2016; Free et al., 2013; Gagnon et al., 2015; Silva et al., 2015). Mobile healthcare (mHealth) incorporates programs and interventions that utilise mobile electronic devices to support overall healthcare (Free et al., 2013). Commonly, mHealth is used to 1) communicate with patients, 2) reduce the burden of disease linked with poverty, 3) improve access to health services, and 4) manage chronic disease (Marcolino et al., 2018). Hospitals are implementing mobile technologies to allow for patient care to be more efficient (Standing & Standing, 2008). Some primary examples of hospital implementation of mobile technology include matching bar-coded patient wristbands and medication packages to physician orders, as well as using wireless badges for voice communication (Standing & Standing, 2008). When mobile technology is incorporated into healthcare, some barriers can be bypassed. For example, some benefits of mobile technology in healthcare are the possible reduction of costs and the accessibility to resource-poor locations

(Free et al., 2013). Furthermore, as a tool to augment care, mobile technology's convenience and potential for individualized feedback are unmatched. Therefore, mHealth has shown the potential to provide an array of solutions to address public health difficulties in a unique way (Baig et al., 2014).

Overall, digital technology is actively being woven into everyday living, demonstrating the possibilities for a wide array of industries to include emerging forms of technology.

Smartphones and Mobile Technology

Mobile technology is a form of digital technology that can go where the user goes (Varnum, 2019). One of the most common modes of mobile technology is the smartphone, which is an advanced mobile device that typically has a touchscreen interface, Internet access, and an operating system that can run downloaded applications (Bakker et al., 2016). A smartphone can generally perform the same tasks as a computer; however, due to its mobility, it can arguably execute and provide more functions (Davies, 2015). According to data compiled between 2016 and 2021, it was estimated that smartphone subscriptions worldwide today surpass six billion and that most are owned in North America, China, and India (O'Deas, 2022a).

In 2019, approximately 30 million people in Canada used smartphones, and it is projected that by 2024 this number will continue to grow (O'Deas, 2020b). The projection of growth is based upon the common trends and growth that has been demonstrated throughout the past few years (Mantha, 2018). In 2019 approximately 287 million individuals owned a smartphone in the United States of America (O'Dea, 2020c; Pew Research Center, 2019; Statista Research Department, 2020). In 2017, it was estimated that there were eight billion devices simultaneously connected to the Internet, many of which were mobile phones (Rathbone & Prescott, 2017). This consistent growing prevalence of smartphone technology has created a curiosity surrounding

mobile technologies across all areas of healthcare, including the mental health sector (Firth & Torous, 2015). Medical doctors, psychologists, counsellors, and other healthcare professionals are hopeful that the use of technology, and smartphones, in particular, may provide new developments in the healthcare field (Firth & Torous, 2015). Given the vast diversity of mobile apps available on smartphones, there is a growing interest in how they can continue to be incorporated into healthcare.

Mental Health

The World Health Organization (2005) defines mental health as "a state of well-being in which every individual realizes his or her potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community." Mental health includes our psychological, emotional, and social well-being, as it affects how we think, feel, and act, as well as influences how we make choices, handle stress, and relate to others (Mentalhealth.gov, 2019). When individuals have access to different ways in which they can take care of and maintain their mental health, then they are more likely to experience positive mental health.

Galderisi et al. (2015) proposed a contemporary definition of mental health that demonstrates an awareness of differences across countries in terms of values, culture, and social background, to facilitate an inclusive understanding of culture-bound statements. Galderisi et al. (2015) defined mental health as follows:

> A dynamic state of internal equilibrium enables individuals to use their abilities in harmony with universal values of society. Basic cognitive and social skills; ability to recognize, express and modulate one's own emotions, as well as empathize with others; flexibility and ability to cope with adverse life events and function in social roles; and

> harmonious relationship between body and mind represent important components of mental health which contribute, to varying degrees, to the state of internal equilibrium. (p. 231-232).

It is important to note the equilibrium aspect in the definition stated above, as, with any equilibrium, mental health is not stable. Because of this, every individual will likely experience both positive and poor mental health throughout a lifetime. This definition is meant to accurately include the many facets that surround mental health while attempting to include comprehensive language (Galderisi et al., 2015).

Since mental healthcare professionals work firsthand with individuals seeking mental health support, their clients may benefit from using mental health apps. Mental healthcare professionals also possess specific knowledge about mental health and therefore would be able to give an educated opinion on mental health apps. Understanding how mental healthcare professionals evaluate these apps, including whether and to what extent they are using such apps with clients, would demonstrate whether these apps are being used in a clinical setting.

Mental Healthcare during COVID-19. Since its emergence, and the public health response, there has been a significant impact of the Coronavirus Disease 2019 (COVID-19) pandemic on mental health and mental health services (Aqeel et al., 2021; Cauberghe et al., 2021; O'Connor et al., 2021). Because of the lack of face-to-face contact, prolonged social isolation, loss, infection fears, overall stress, and uncertainty, there have been questions surrounding how individuals' mental health may continue to be affected by COVID-19 in the long term (Brooks et al., 2020; Wind et al., 2020). Current evolving research has shown that there are increasing levels of mental distress and anxiety globally (Szlamka, et al., 2021). Additionally, the effects of the public health response related to COVID-19 have affected how

mental health services have been delivered for the past few years, as lockdowns and isolation did not allow for many to participate in in-person services (Brooks et al., 2020; Wind et al., 2020). Distancing required mental health services to be delivered through online platforms such as Zoom, Google Meets, Microsoft Teams, and other web-based tools (Szlamka et al., 2021; Wind et al., 2020). The effects of the pandemic nature of COVID-19 may likely have an impact on long-term mental health as well as mental healthcare.

Digital Technologies in Mental Healthcare

E-mental health, also known as e-therapy, is when a mental healthcare professional provides mental health services via digital communication technology (Sucala et al., 2012). The forms of communication may include e-mail, video conferencing, virtual reality, live chats, or any combination of these Internet mediums (Sucala et al., 2012). Online counselling, broadly defined, is when professional mental health services are offered through such Internet mediums (Sucala et al., 2012). The use of Internet-based technology, such as computers, tablets, and smartphones, is growing worldwide with the intention to help improve the access and delivery of mental healthcare (Wozney et al., 2017). Online counselling specifically is becoming increasingly common (Bambling et al., 2008). Whether searching symptoms on the Internet or using smartphone apps that provide immediate access to a professional, individuals with mental health concerns are gradually turning to e-mental health for information, advice, support, and a place to share their experiences (Wozney et al., 2017).

A mental healthcare professional is an individual that offers services with the purpose of improving one's psychological health and treating related illnesses. There are many different types of mental healthcare professionals, primarily differing in areas of specialization and/or expertise, as well as educational background (Krans & Cafasso, 2016; Schulze, 2009). Some

common examples of mental healthcare professionals are psychologists, psychiatrists, social workers, psychiatric nurses, and counsellors (Dziegielewsk & Hollaman, 2019; Krans & Cafasso, 2016). Each position provides varying types of services; however, they all work within the field of mental health.

Predominantly therapist administered treatments. A form of e-therapy that is considered the closest to classic face-to-face therapy is an overarching set of predominantly therapist-administered treatments (Cavanagh & Millings, 2013). In this form of e-therapy clients have regular, scheduled contact with a therapist, and different forms of technology are used to supplement these sessions. There are two different methods in which technology can be used as a supplement: synchronous or asynchronous (Cavanagh & Millings, 2013). Synchronous supplements use technology such as videoconferencing or phone calling communication in real-time, and it is in this way similar to a typical face-to-face session. Asynchronous is when the therapist and client take their own time to reply whenever necessary by using forms of technology such as email or text messaging.

Predominantly therapist-administered treatments are usually implemented when there are barriers to accessing traditional services. For example, when individuals are not able to travel from home in rural areas or when there is an inability to travel for other reasons (Cavanagh & Millings, 2013). The public health responses and associated lockdowns related to COVID-19 also dramatically impacted the ability for individuals to meet face-to-face, which likewise created a significant barrier to an individual's ability to readily access mental healthcare (Al-Ashwal et al., 2020; Daniel & Begona 2020; De Witte et al., 2021; Turna et al., 2021; Wind et al., 2020). Due to this face-to-face barrier heightened by the COVID-19 pandemic and associated lockdowns, there was an increase in the use of this form of e-therapy, demonstrating the potential

further significance digital technology may serve when there are other barriers to providing face-to-face care (Al-Ashwal et al., 2020; Daniel & Begona 2020; De Witte et al., 2021; Turna et al., 2021; Wind et al., 2020).

Internet-based cognitive behavioral therapy. Cognitive behavioral therapy (CBT) emerged in the 1960s and has become one of the most practised and extensively researched forms of psychotherapy (Webb et al, 2017). The general form of delivery of CBT is face-to-face therapy; however, as Internet therapy continues to grow, the development of Internet-based cognitive behavioral therapy (ICBT) is becoming more prominent (Webb et al., 2017). Generally, in ICBT, the presentation of a web-based self-help program is integrated with minimal but consistent therapist direction (Berger, 2016), as opposed to predominantly therapist-administered treatments. Most of the research surrounding the therapeutic relationship concerning e-therapy has focused on ICBT (Berger, 2016). Specifically, studies have focused on mood disorders, such as anxiety and depression, with patients who tend toward a mild or moderate severity and typically are young to middle-aged adults (Andersson & Titov, 2014). Some studies have found ICBT to be effective for a range of conditions, with client outcome effect sizes that equal face-to-face cognitive behavioural therapy (Bergman et al., 2013).

Mobile e-therapy. Although ICBT and predominantly therapist-administered treatments are the two most common forms of e-therapy, delivering therapy through mobile phones is also an emerging form of e-therapy, wherein text messaging, phone calls, and other forms of communication can be used (Preziosa et al., 2009). However, most of the research surrounding e-mental health has excluded smartphone applications and therefore not a lot is currently known about how applications are being incorporated into mental healthcare (Donker et al., 2013; Olff, 2015). So, while there is extensive information on e-therapy, using mobile apps as a tool for e-

therapy requires more research to understand how it can be most effectively used to support mental health (Donker et al., 2013; Olff, 2015).

Mental Health Applications

A mobile application is a software program that is designed to run on devices such as a phone, tablet, or watch. Mobile medical apps (MMAs) are a fast-growing category of software that can be installed on personal smartphones (Terry & Gunter, 2018). More than 50% of mobile phone users have downloaded a health-related app at some point (Krebs & Duncan, 2015). Given that this number is from seven years ago, it is possible that the number of individuals that have downloaded a health-related app is presently even higher. A subset of MMAs are focused on helping individuals identify and treat mental illness and support overall mental health, and these are referred to as mental health apps (Terry & Gunter, 2018). Because of the growing prevalence of smartphones, there is an increasing number of mental health apps that are being designed to support the public (Rathbone & Prescott, 2017). A simple search for "mental health" on an app store results in over 10,000 results, with the highest performing apps receiving millions of downloads (Torous et al., 2019). Furthermore, the apps that one may encounter when searching "mental health" include the following categories: meditation and sleep, psychological tests, counselling services, mood journals, diagnostic services, recovery guides, mood tools, support groups, trackers, quotes, chatbots, self-harm prevention, suicide prevention, and mindfulness. Additionally, mental health apps are intended to provide support to individuals who are dealing with diagnoses such as stress, anxiety, depression, post-traumatic stress disorder (PTSD), and obsessive-compulsive disorder (OCD) (Olff, 2015; Rathbone & Prescott, 2017).

Because the development of mental health apps is relatively new, it is unknown how effective they are at supporting their intended users. Reports from users are primarily found only

on the review page of mental health apps and satisfaction rates seem to range quite drastically. As mental health apps are an emerging field, there is a lack of research regarding the effectiveness of these apps (Donker et al., 2015; Olff, 2015). Because of this gap in the literature, little is known about how they are being incorporated into the mental health profession, and whether professionals view them as a benefit to mental healthcare.

Advantages of Mental Health Applications

Less than 50% of all individuals diagnosed with one or more mental disorders see a physician and only 25% receive appropriate treatment (Andrews et al., 2010). While waiting lists for psychologists can be long, they are also expensive. Likewise, therapists can be unevenly distributed geographically. For example, in North America, many small towns throughout the continent do not have access to face-to-face counselling services (Rathbone & Prescott, 2017). Finally, there are often stigmas associated with traditional psychotherapy (Patten et al., 2016). These are only some of the reasons that individuals may not want or are unable to seek out face-to-face help (Grist et al., 2017).

Mental health apps offer a unique platform for delivering mental health interventions (Grist et al., 2017; Donker et al., 2013; Rathbone & Prescott, 2017). Advantages of mental health apps include constant availability, greater access, equity of mental health resources, immediate support, anonymity, tailored content, lower cost, and increasing service capacity and efficiency (Grist et al., 2017; Rathbone & Prescott, 2017). Moreover, apps may help to overcome previously mentioned geographical barriers to treatment and engage traditionally hard-to-reach groups. Furthermore, if an individual is from a culture or subculture that is skeptical of counselling, then a mental health app may afford the confidentiality and privacy needed to seek help. Additionally, technology-based approaches may be particularly suited for children,

adolescents, and young people, who may be more accepting of technology and have spent more of their lives using smartphones than not (Grist et al., 2017). Finally, studies have found that patients in psychiatric settings have an interest in using an app to supplement their clinical care (Torous, 2014). Thus, mental health apps may help to engage young people who typically would not seek help through traditional routes.

Research on Mental Health Apps

One of the main areas of research interest regarding mental health apps is whether they are clinically useful and scientifically supported or valid (Larsen et al., 2019; Torous et al., 2019; Wang et al., 2018). For example, Larsen et al. (2019), conducted a study in which they looked at the quality claims of mental health apps and found that less than 50% of mental health apps employed the use of scientific language, and only 2.7% provided direct evidence supporting app use, and only 1.3% cited a validation paper. However, in over 50% of the cases that were included, techniques were associated with good evidence from the literature (Larsen et al., 2019).

Since COVID-19 began, more research has been completed on mental health applications (Longyear & Kushlev, 2021; Strudwick et al., 2021). An increase in technology use over the pandemic has provoked an increase in research on apps. Wang et al. (2021) found that mental health apps showed an increase in downloads during the pandemic. The emerging research has opened doors on how mental health apps may be incorporated into mental healthcare and there is an opportunity for research to be continued.

Disadvantages of Mental Health Applications

Although there are many potential positive aspects associated with mental health apps, there are also some negative aspects as well. Some disadvantages are technical problems and other similar factors related to telecommunication. For example, battery failures, the reliability

and sustainability of connections, data security issues, and patient privacy issues (Donker et al., 2013). Likewise, a problem with most health-based apps is that they are usually neither research-based nor subject to regulatory assessments or evaluations, and, therefore, their effectiveness has not been verified (Kenny et al, 2016). A review of the former UK National Health Service (NHS) Health Apps Library found that of the mental health apps accredited by the NHS only 15% provided evidence of effectiveness (Larsen et al, 2019). Furthermore, Krebs & Duncan (2015) found that common reasons for not downloading apps generally include cost and concern about apps collecting user data. It is important to note that some of the current disadvantages and limitations could be remedied in the future if scholars and professionals developed further research on mental health apps. For example, if the development of mental health apps included input from mental healthcare workers, then these apps could become more effective. Furthermore, increasing and improving the regulation or rating of these apps by professionals may also enhance validity.

Supplemental Resources in Mental Healthcare

Supplemental resources are commonly implemented in traditional mental healthcare. It is crucial for clients to have access to resources that promote change outside of the time spent working with mental health professionals, as a key component of mental health support is working to promote individual autonomy. Therefore, supplemental resources, such as homework, exercises, and activities are often employed to support clients between sessions (Miller, 2010). Homework is often given to clients to complete between sessions and is tailored to each client's specific needs (Miller, 2010). Homework assignments may be completed by clients to practice new skills, enact coping strategies, and restructure destructive beliefs. Employing homework has been shown to predict positive psychotherapy outcomes for a variety of anxiety and affective

disorders (Decker et al., 2016; Miller, 2010; Riley, 2015). Oftentimes homework is utilised by mental health professionals who focus on brief psychotherapy, such as by those who use CBT and Solution Focused Therapy (SFT) (Decker et al., 2016; Riley, 2010). A key component of CBT and SFT is the acquisition and practice of new skills, therefore, the inclusion of homework is quite common (Riley, 2015)

Therapists have long sought ways to encourage clients to commit to out-of-session practices, such as by assigning homework (Riley, 2015). Currently, mental healthcare professionals have another potentially powerful resource in mental health apps. Because supplemental resources have shown to be so impactful in mental healthcare (Decker et al., 2016; Miller, 2010; Riley, 2015), mental health apps could expand this between-session support. For example, within the last 20 years, mindfulness has swiftly expanded into behavioural medicine, psychotherapy, and counselling, becoming a core tenant of many forms of mental health treatment (Christopher & Maris, 2010; Tomlinson et al., 2018). Nevertheless, it can be difficult for clients to commit to mindful practices and to complete such practices when not actively working with a professional (Brewster et al., 2013). However, with the continuous development of mental health apps, there are now a variety of mindfulness and meditation apps (Dauden Roquet & Sas, 2018), so there is the possibility for mental health professionals to teach the basics to clients in session, followed by client's implementation of an app afterwards to complete guided meditations, track compliance, and record how they have been affected or supported.

Mobile App Rating Scale

Because the use of mobile apps for health and well-being is actively increasing, it can be difficult for users, health professionals, and researchers to assess which apps are of high quality (Stoyanov et al., 2015). Besides looking at reviews and star rating systems, there is not a lot of

information from objective sources (Stoyanov et al., 2015). Because of the lack of objective sources, the mobile app rating scale (MARS) was created to provide a multidimensional measure of mobile applications. This scale employs 23-items and contains four objective quality subscales: 1) engagement, 2) functionality, 3) aesthetics, and 4) information quality, plus a subjective quality rating (Stoyanov et al, 2015). Furthermore, there is an additional version of the MARS called the User Mobile Rating Scale (uMARS), which includes an additional subscale, consisting of 6 items added to measure users' perceived impact effectiveness of the evaluated app. Although there is some difficulty in assessing mental health apps, such as whether they are of high quality, the MARS is one option that can be utilised to assess app usefulness in a mental health context.

Since one of the disadvantages of mental health apps is uncertainty regarding how they perform, the MARS provides a simple, flexible, and standardized tool that can help mental health workers classify and assess the quality of mobile health apps (Stoyanov et al, 2015). This rating scale has the potential to assist mental health professionals with deciding which apps to bring into practice. Currently, however, it is unknown if mental health professionals are aware of this technology.

Mental Health App Use by Mental Health Professionals

Although not many studies have looked at mental health professionals' perceptions and use of mental health apps in general, Liu et al. (2014) examined what factors affect the acceptance behaviour and use of new technologies for rehabilitation by therapists at a large rehabilitation hospital in Canada, with a target population of occupational therapists and physical therapists involved with the provision of therapeutic interventions at the hospital. Performance expectancy, which is how the technology can help aid professionals' work, was the most

important factor in determining therapists' acceptance and use of technologies (Liu et al., 2014). Effort expectancy and social influence constructs, such as the degree of difficulty or social pressures to use technologies, were not found to be important factors in determining technology acceptance (Liu et al., 2014). Likewise, Kuhn et al. (2014) investigated mental health clinicians' perceptions of patient-facing smartphone apps, specifically for prolonged exposure therapy for posttraumatic stress disorder (Kuhn et al., 2014). Younger participants tended to rate the app significantly more favourably than older participants and reported greater intention to use the specific app and recommend it to colleagues if it were available (Kuhn et al., 2014; Torous et al., 2014). Similarly, smartphone owners also had more favourable views of the app, compared to those that did not possess smartphones.

Currently, there is little known about what mental health professionals think of apps, and whether they think apps could, or should, be incorporated more often into the mental healthcare field (Kuhn et al., 2014; Leigh & Flatt, 2015; Olff, 2015).

The Unified Theory of Acceptance and Use of Technology.

Mobile technology possesses the potential to transform a wide variety of aspects of everyday life. However, for this technology to make a positive impact, it must first be accepted and utilised.

The aim of the Unified Theory of Acceptance and Use of Technology (UTAUT-2), (see Appendix 6), is to understand the variety of factors that determine users' intentions to adopt technology (Sun et al., 2013). This model combines a multitude of components from eight different models: 1) Theory of Reasoned Action, 2) the Technology Acceptance Model, 3) the Motivational Model, 4) the Theory of Planned Behavior, 5) the Combined TAM and TPB, 6) the Model of PC Utilization, 7) the Innovation Diffusion Theory, and 8) Social Cognitive Theory

(Wang & Wang, 2010). These contributing models have been extensively employed by many preceding studies throughout a variety of disciplines including information systems, marketing, social psychology, and management (Williams et al., 2015).

The UTAUT-2 suggests that there are seven core constructs that act as direct determinants of behavioural intentions, and ultimately behaviour, in relation to the acceptance of technology (Venkatesh et al., 2003). These determinates are 1) performance expectancy, 2) effort expectancy, 3) social influence, 4) facilitating condition, 5) hedonic motivation, 6) price value, and 7) habit (Venkatesh et al., 2012). Additionally, these seven determinants are moderated by gender, age, experience, and voluntariness of use (Williams et al., 2015).

Regarding mental health apps, this theory is relevant for two main reasons: 1) users must be willing to accept these apps for them to be useful, and 2) mental health professionals must also first be willing to accept an app before implementing it into their practice. Because this theory suggests that specific determinants are moderated by gender, age, experience, and voluntariness of use, it could therefore be extended to predict that the acceptance of apps by mental health professionals would be affected by these as well. This theory may be useful to help understand which apps users are accepting of, as well as which mental healthcare professionals are willing to utilise. Finally, this theory could help professionals determine the likelihood of a client's willingness to accept a specific app that they may want to implement into their sessions.

Purpose

While multiple forms of mental healthcare involve the use of technology, this study will specifically focus on mental health apps because there is so little known about them. Although mental health apps seem to be in abundance, it is unknown how mental healthcare professionals are employing these applications with their clients, and what they think about them. The current

literature is unclear on issues regarding whether practitioners are employing the use of apps in their practice, how often mental health apps are currently being used/recommended, what barriers professionals encounter, and what mobile app features are important. Additionally, if professionals are implementing mental health apps, then one may inquire into which apps they tend to gravitate toward and why. A greater comprehension of these issues could enable the broader or more effective incorporation of mobile apps into mental healthcare. An understanding of the perceived benefits, barriers, and expectations of mental health apps among professionals may aid in the creation of more effective apps that are more likely to be implemented. In summary, the purpose of this study is to better understand how mental health professionals use mental health apps in their practice and their experiences in doing so. Therefore, the primary questions are:

1) What are mental health professionals' perceptions of mental health apps?

2) How are mental health professionals using mental health apps in their practices with clients?

CHAPTER 3: Method

Chapter 3 discusses the methods and procedure of this study which includes a description of the research design, participants, instruments, procedure, and data analysis.

Research Design

A cross-sectional survey design was used to collect information that is used to describe participants' current perceptions regarding mental health apps. Data was gathered using an online survey that included both Likert-based and open-ended questions. This method was selected for ease of distribution and data analyses, in addition to accessing a larger participant sample. The survey was officially opened in April 2020 and closed at the start of January 2021.

Participants

Participants were all individuals who self-identified as mental health professionals, including counsellors and psychologists, psychiatric nurses, social workers, and others who self-identified as working as a mental health professional with clients. Additionally, the participants were located in Canada or the United States of America. There were no other exclusionary criteria.

The target for this study was to have a minimum of 100 qualified participants. One hundred and five individuals participated in the study, and after cleaning the data, there were 69 eligible participants. The recruitment procedure employed two primary strategies: 1) social media recruitment, and 2) opportunity sampling. Links to the survey would be posted on social media sites, such as Twitter, Facebook, and Reddit, as well as in the comment sections of social media accounts that are likely to be viewed by mental healthcare professionals. Mental health organizations and clinics were also contacted by email and provided with a link to the survey. Finally, different mental health associations distributed the survey through their listservs, as well

as on their organization's websites. Ethical approval was sought from the University of Lethbridge's Office of Research Ethics and approved on September 25, 2020 ((HPRC Protocol# 2020-086).

Instrument

Data was collected using an online self-report Likert survey. The 50-item survey was created using Qualtrics, and a shareable link was used to distribute the survey. The survey was created by the researcher because there were no available measures at that time (see Appendix 1 for the instrument).

Open-ended questions were used to allow for participants to go more in depth with their answers, and to enrich the findings of the study. Because this study was looking at perceptions, it was important to allow for the participants to be able to express themselves in their own words, and hopefully provide further information that has not been previously asked throughout the survey.

Participants were given a consent form before gaining access to the survey, in order to state their agreement to participate, and for their data to be used afterwards. If at any time during the survey the participant wished to exit the study, they were able to do so, and their data was not saved.

Demographic Information. The first part of the survey was a seven-question demographics section that included age, gender identification, country, province/state, education level, career type, and length of career. The demographic section allows for the researcher to understand participants' background and profile (i.e., their age; gender identification which included male, female, non-binary, transgender, other, and prefer not to say). For location, they were provided with two drop-down questions, one for the country, and one for province/state.

Participants were also asked to select their highest level of completed education, ranging from Bachelor's degree to Ph.D. Finally, they were asked to specify their career title, as well as length of career, ranging from 1 to 40+ years.

Counselling Background. The second section of the survey consisted of seven questions regarding the participant's counselling background and experience. The participants were asked if they practised counselling, what type of counselling they most often practised, what theoretical framework they practised from, what population of clients they typically worked with, what issues they primarily worked with, if they practised counselling online, and if they practised counselling online prior to COVID-19.

Mental Health Apps. The third and final section of the survey included 32 items and focused on the participant's experience with and perceptions of mental health applications. To begin with, participants were asked if they owned a Smart Phone. The participants were asked two *yes* or *no* questions: if they had heard of mental health apps, and if they use mental health apps with their clients. On a five-point scale ranging from definitely yes to definitely not, participants were asked if they felt as though they have operational knowledge of mental health apps. Moreover, participants were given a list of six types of mental health apps with examples and asked to select their experience using them ranging from *use regularly with clients*, to *have never heard of*. In this section, participants were also asked regarding the apps they had heard of, how did they hear about them, how useful were they, what made them useful or not useful, and do you plan to continue using them with clients. After the above question, they were given a short-answer, open-ended question asking what made them decide to continue or discontinue using the apps. The participants were also asked what percentage of clients they typically recommended mental health apps to during treatment, if their workplace required or prohibited

the use of mental health apps, what type of diagnoses did they typically recommend apps for, if they had ever had training on mental health apps, what they liked about mental health apps, what they did not like about mental health apps, what would make them want to use mental health apps more, what app features were most important to them, if they think mental health apps should be incorporated into mental healthcare more, and if they were familiar with any guidelines or tools to evaluate mental health apps. Throughout this section, there were also add-ons in which they were asked to explain answers in more detail.

Data Analysis

When the survey closed, all the responses were recorded and finalized on Qualtrics.xm, and the data was coded. Next, the data was exported into SPSS. Once in SPSS, the survey data was categorized, and any errors found were excluded before conducting the statistical analyses. To begin with, all unnecessary categories in SPSS such as location, IP address, Personal info, were all removed immediately. Next, any data from a participant that selected that they were not a mental health professional was removed. Additionally, any participant data that did not fully submit the survey, or had less than 100% progress was removed. All responses to both long and short answer questions were exported into a word document, for categorical summarization of open-ended data.

Descriptive Statistics. After the data was exported and parsed through on SPSS, descriptive statistics were calculated to describe the basic features of the data in a study. It is important to note that, the purpose of the survey was exploratory of an emerging area of interest and technology usage versus one that is causal-comparative or correlational. Therefore, the questions were descriptive and not conducive for inferential analyses. Reported herein are descriptive statistics presented in a series of tables. . This method was used to demonstrate what

we know about the specific individuals that participated in this study and their usage of emerging technology.

Categorical Summarization of Open-Ended Data. Open-ended, short-answer questions were summarized based on relevant categories. Once all the responses were exported into a word document, the data was closely examined to identify topics, ideas, and patterns of meaning that come up repeatedly. The first step was familiarization with the data to possess a thorough overview of what has been collected. The next step was coding the data, which included highlighting sections of the text and coming up with labels to describe the content. Next, categories were created by looking at the codes and identifying patterns. Finally, the categories were reviewed to ensure they accurately represented the data.

CHAPTER 4: Results

The aim of this study is to gather the perceptions of mental health professionals regarding what mental health apps are, and how they can use them with clients. This chapter includes the quantitative and qualitative results of an online survey-based study. The first section will address the quantitative data and the second section will present the qualitative answers to the short-answer questions from the survey. Frequencies and descriptive statistics are presented for relevant items.

Demographics

Of the 105 participants that attempted to complete the study, 11 participants were not eligible as they were not located in Canada or the United States. An additional 25 participants were excluded because they did not complete the study thereby leaving 69 eligible participants.

Participants were asked to share their demographic information, specifically, their age, gender, country, and education. The demographic results can be seen in Table 1.

Table 1

Demographical Information

	Frequency	Percentage
Age		
18 - 24	1	1.4
25 - 30	12	17.4
31 - 36	10	14.5
37 - 41	12	17.4
42 - 47	7	10.1
48 - 53	10	14.5
54 - 59	9	13.0
60 - 65	3	4.3
66+	5	7.2
Gender		
Male	12	17.4
Female	54	78.3
Non-binary	2	2.9
Country		
Canada	47	68.1
United State of America	21	30.4
Education		
Bachelor's degree	4	5.8

Master's degree	51	73.9
PhD	10	14.5
Other	4	5.8

Participants were additionally asked to share experience relating to their profession. This included the length of their career. Professional title, whether they practice counselling, theoretical framework, client population, and common issues that they have experience treating. The professional designation and experience results can be seen in Table 2.

Table 2

Professional Designation and Experience

	Frequency	Percent
Length of Career		
1 - 5 years	16	23.2
6 - 10 years	20	29.0
11 - 20 years	17	24.6
21 - 30 years	12	17.4
31 - 40 years	2	2.9
40+ years	2	2.9
Professional Title		
Other	5	7.2
Counsellor	19	27.5
Psychologist	27	39.1
Clinical social worker	17	24.6
Non-clinical social worker	1	1.4
Do you practice counselling?		
Yes	63	91.3
No	6	8.7
Counselling type practised		
Couples	28	40.6
Family	18	26.1
Group	11	15.9
Individual	61	88.4
Psycho-ed	12	17.4
Other	3	4.3
Theoretical Framework		
Other	12	17.4
Adlerian	1	1.4
Cognitive Behavioural	16	23.2
Person-Centred	11	15.9
Feminist	2	2.9
Integrative	8	11.6
Postmodern	2	2.9

	Frequency	Percent
Behavioural	1	1.4
Family Systems	6	8.7
Gestalt	1	1.4
Choice Theory/Reality Therapy	1	1.4
Psychoanalytic	2	2.9
Client Population		
Children (1-9)	14	20.3
Adolescents (10-17)	26	37.7
Young Adults (18-24)	40	58.0
Adults (25-59)	62	89.9
Older Adults (60+)	22	31.9
Common Issues		
Addictions	22	31.9
Anger Management	29	42.0
Anxiety	63	91.3
Career	14	20.3
Depression	64	92.8
Eating Disorders	13	18.8
Grief	40	58.0
Self-esteem	49	71.0
Trauma	50	72.5
Other	9	13.0

Table 3 indicates whether the participants have practised online counselling in the past. Most participants answered that they do practice online counselling, especially after COVID-19.

Table 3

Online Counselling

	Frequency	Percent
Do you practice online counselling?		
Often	40	58.0
Sometimes	21	30.4
Never	7	10.1
If yes, how often did you practice online before COVID-19?		
Often	5	7.2
Sometimes	22	31.9
Never	41	59.4

They were then asked if they owned a smartphone, and all answered yes. The results can be seen in Table 4 below.

Table 4

Do You Currently Own a Smartphone?

		Frequency	Percent
Valid	Yes	69	100.0

Mental Health Apps

The following section of the survey focused on mental health apps and explored the participant's experience using mental health apps.

Participants were asked if they had heard of mental health apps, and these results are demonstrated in Table 5. It appears from the results that most participants had heard of mental health apps.

Table 5

Have You Heard of Mental Health Apps?

		Frequency	Percent
Valid	Yes	63	91.3
	No	6	8.7
	Total	69	100.0

Table 6 indicates whether the participants use mental health apps with their clients and more than half of participants answered that they did not.

Table 6

Do You Use Mental Health Apps With Clients?

		Frequency	Percent
Valid	Yes	27	39.1
	No	35	50.7
	Total	62	89.9
Missing	System	7	10.1
Total		69	100.0

Looking at whether participants felt as though they had a suitable working knowledge of mental health apps, the answers varied quite a bit between the five possible options. The highest-ranking answer being that they probably do not have suitable operation knowledge. The reported results can be seen in Table 7.

Table 7

Do You Feel as Though You Have Suitable Operational Knowledge of Mental Health Apps?

		Frequency	Percent
Valid	Definitely yes	10	14.5
	Probably yes	18	26.1
	Might or might not	13	18.8
	Probably not	21	30.4
	Definitely not	1	1.4
	Total	63	91.3
Missing	System	6	8.7
Total		69	100.0

The following six sets of questions asked participants to select their experience using specific categories of mental health applications with the options: *use regularly with clients, use sometimes with client*s, *had heard of and would like to try with clients, have heard of but have no interest in trying them with clients*, and *have never heard of*. Meditation and mindfulness apps were the most utilized, while coaching apps were reported as being the least utilized. The results of this set of questions can be seen in Tables 8 through 13.

Table 8

Please Select Your Experience Using Each Category of Mental Health Apps: - Tracker/Journal Apps

		Frequency	Percent
Valid	Use regularly with clients	2	2.9
	Use sometimes with clients	10	14.5
	Have heard of and would like to try with clients	19	27.5
	Have heard of but have no interest in trying with clients	6	8.7
	Have never heard of	21	30.4
	Total	58	84.1
Missing	System	11	15.9
Total		69	100.0

Table 9

Please Select Your Experience Using Each Category of Mental Health Apps: - Meditation/Mindfulness Apps

		Frequency	Percent
Valid	Use regularly with clients	19	27.5
	Use sometimes with clients	26	37.7
	Have heard of and would like to try with clients	10	14.5
	Have heard of but have no interest in trying with clients	7	10.1
	Total	62	89.9
Missing	System	7	10.1
Total		69	100.0

Table 10

Please Select Your Experience Using Each Category of Mental Health Apps: - Diagnostic/Assessment Apps

		Frequency	Percent
Valid	Use regularly with clients	3	4.3

		Frequency	Percent
	Use sometimes with clients	3	4.3
	Have heard of and would like to try with clients	13	18.8
	Have heard of but have no interest in trying with clients	13	18.8
	Have never heard of	22	31.9
	Total	54	78.3
Missing	System	15	21.7
Total		69	100.0

Table 11

Please Select Your Experience Using Each Category of Mental Health Apps: - Counselling/Chatbot Apps

		Frequency	Percent
Valid	Use sometimes with clients	4	5.8
	Have heard of and would like to try with clients	8	11.6
	Have heard of but have no interest in trying with clients	27	39.1
	Have never heard of	15	21.7
	Total	54	78.3
Missing	System	15	21.7
Total		69	100.0

Table 12

Please Select Your Experience Using Each Category of Mental Health Apps - Coaching Apps

		Frequency	Percent
Valid	Use regularly with clients	1	1.4
	Use sometimes with clients	4	5.8

	Have heard of and would like to try with clients	15	21.7
	Have heard of but have no interest in trying with clients	10	14.5
	Have never heard of	24	34.8
	Total	54	78.3
Missing	System	15	21.7
Total		69	100.0

Table 13

Please Select Your Experience Using Each Category of Mental Health Apps - Self-help/Self-Management Apps

		Frequency	Percent
Valid	Use regularly with clients	4	5.8
	Use sometimes with clients	13	18.8
	Have heard of and would like to try with clients	15	21.7
	Have heard of but have no interest in trying with clients	7	10.1
	Have never heard of	17	24.6
	Total	56	81.2
Missing	System	13	18.8
Total		69	100.0

Participants were asked how they had heard of the apps that they had used with clients. The results show that these participants primarily learned of the apps through their own research. The results can be found in Table 14 and Table 15.

Table 14

Regarding the Apps That You Have Heard of, How did You Learn About Them?

	Frequency	Percent

Valid	Co-worker	25	Co-worker
	Own Research	45	Own Research
	Workplace/professional organization	20	Workplace/professional organization
	Other	12	Other

Table 15

Regarding the Apps That You Have Heard of, How did You Learn About Them?

		Frequency	Percent
Valid	Ads, Clients themselves	1	1.4
	clients	2	2.9
	Clients	1	1.4
	Clients' friends	1	1.4
	clients who use them	1	1.4
	Clients, news articles	1	1.4
	Colleagues	1	1.4
	From clients!	1	1.4
	Industry magazines	1	1.4
	Online or from clients, then I explored	1	1.4
	Own research	1	1.4

Participants were asked, *of the apps they had used, how useful were they?* Most participants reported that apps were moderately useful, and only one felt that the apps they had used were not useful at all. The results for usefulness of apps can be seen in Table 16.

Table 16

Regarding The Apps That You Have Used, How Useful Were They?

		Frequency	Percent
Valid	Extremely useful	4	5.8
	Very useful	16	23.2
	Moderately useful	23	33.3
	Slightly useful	11	15.9

	Not at all useful	1	1.4
	Not applicable	7	10.1
	Total	62	89.9
Missing	System	7	10.1
Total		69	100.0

Participants were then asked if they had a plan to continue using apps with clients and most of them answered *yes*. The results can be seen in Table 17.

Table 17

Regarding Apps That You Have Used, Do You Plan to Continue Using Them With Clients?

		Frequency	Percent
Valid	Yes	34	49.3
	Maybe	17	24.6
	No	4	5.8
	Not applicable	7	10.1
	Total	62	89.9
Missing	System	7	10.1
Total		69	100.0

When asked what percentage of clients the participants typically recommend the use of apps, the results varied quite a bit. The most common responses were *10%* and *25%*. These results are shown in Table 18.

Table 18

What Percentage of Your Clients do You Typically Recommend the use of Mental Health Apps at Some Point During Treatment?

		Frequency	Percent
Valid	0%	9	13.0
	10%	20	29.0

	25%	19	27.5
	50%	6	8.7
	75%	6	8.7
	100%	2	2.9
	Total	62	89.9
Missing	System	7	10.1
Total		69	100.0

When asked if the participants workplace required the use of mental health apps, only one participant responded that their workplace required them to use apps with their clients. Responses to this question are listed in Table 19.

Table 19

Does Your Workplace Require You to use any Apps With Clients?

		Frequency	Percent
Valid	Yes	1	1.4
	No	61	88.4
	Total	62	89.9
Missing	System	7	10.1
Total		69	100.0

When asked if the participants workplace prohibited the use of mental health apps, only one participant responded *yes*. The results are reported in Table 20 below.

Table 20

Does Your Workplace Prohibit the use of Apps With Clients?

		Frequency	Percent
Valid	Yes	1	1.4
	No	61	88.4

	Total	62	89.9
Missing	System	7	10.1
Total		69	100.0

In a “select all that apply” question, regarding what types of diagnoses participants typically use mental health apps for, *anxiety* and *depression* were the most common responses, with career and eating disorders as the least common. The results for this question can be found in Table 21 and Table 22.

Table 21

What Types of Diagnoses do you Typically use Mental Health Apps for?

		Frequency	Percent
Valid	Anxiety	46	66.7
	Career	1	1.4
	Depression	35	50.7
	Eating disorders	3	4.3
	Grief	4	5.8
	Self-esteem	9	13.0
	Trauma	12	17.4
	Not applicable	12	17.4
	Other	8	11.6

Table 22

What Types of Diagnoses do you Typically use Mental Health Apps For?

		Frequency	Percent
Valid		61	88.4
	ADHD	1	1.4
	Adjustment, ADHD	1	1.4
	Executive functioning	1	1.4
	OCD	1	1.4
	Sleep	2	2.8
	Sleep issues	1	1.4

	Suggest clients look into apps for mindfulness meditation	1	1.4
	Total	69	100.0

When asked if the participants had ever received training on mental health apps, the majority of the participants answered *no*. The reported results can be found in Table 23 below.

Table 23

Have You Ever had any Training on Mental Health Apps?

		Frequency	Percent
Valid	Yes	7	10.1
	No	55	79.7
	Total	62	89.9
Missing	System	7	10.1
Total		69	100.0

In a ‘select all that apply’ question, regarding what the participants like about mental health apps, the results varied across the possible answers. The most common likes were *portability* and *affordability*. *Anonymity* was the least commonly liked app feature. The results can be seen in Table 24.

Table 24

What do You Like About Mental Health Apps?

		Frequency	Percent
Valid	Symptom tracking	10	14.5
	Geographic isolation	9	13.0
	Anonymity	8	11.6
	Tailored content	13	18.8
	Portability	36	52.2
	Affordability	32	46.4
	Not applicable	17	24.6

In a ‘select all that apply’ question, regarding what the participants do not like about mental health apps, most participants selected that they did not have training. The least common answer selected was that apps are *hard to use*. The results are shown in Table 25.

Table 25

What do You Not Like About Mental Health Apps?

		Frequency	Percent
Valid	No training	24	34.8
	Lack of confidentiality/privacy	11	15.9
	Hard to use	7	10.1
	Not research based	11	15.9
	Too expensive	13	18.8
	Not applicable	17	24.6

In a ‘select all that apply’ question, regarding what would make participants want to use mental health apps more, other than *not applicable*, the most common answers were *I had more training*, and if the *cost was not a barrier*. The results are reported in Table 26.

Table 26

I would use Mental Health Apps More if

		Frequency	Percent

Valid	I was confident that the client's privacy was not at risk	21	30.4
	There was no advertising on app	21	30.4
	I was confident that client information would not be shared	26	37.7
	They were evidence-based	25	36.2
	I had more training	29	42.0
	It did not make clients symptoms worse	10	14.5
	Cost was not a barrier	29	42.0
	They were easy to use	23	33.3
	Other professionals were using them	7	10.1
	Clients enjoyed them		
	Not applicable	34	49.3
		6	8.7

In a 'select all that apply question' regarding what app features are most important, most participants selected *user-friendly* and *affordability*. The responses of those who answered are listed in Table 27.

Table 27

What App Features are Important to You?

		Frequency	Percent
Valid	Affordability	42	60.9
	Efficacy	44	53.8
	Privacy	34	49.3
	Research-based	31	44.9
	Transparency	17	24.6
	User-friendly	49	71.0
	Other	4	5.8

Of the 69 participants, 33 believe that mental health apps should be incorporated more into mental health care, five participants do not believe that apps should be incorporated more

into mental healthcare, and 24 participants were not sure whether apps should be incorporated more. Table 28 demonstrates these results.

Table 28

Do You Think Mental Health Apps Should be Incorporated More into Mental Healthcare?

		Frequency	Percent
Valid	Yes	33	47.8
	No	5	7.2
	Not sure	24	34.8
	Total	62	89.9
Missing	System	7	10.1
Total		69	100.0

Concerning guidelines and tools to help users evaluate the quality of mental health apps most of the participants were not familiar with any. The results are listed below in Table 29.

Table 29

Are you familiar with guidelines or tools that would help you evaluate the quality of mental health apps?

		Frequency	Percent
Valid	Yes	6	8.7
	Somewhat	5	7.2
	No	51	73.9
	Total	62	89.9
Missing	System	7	10.1
Total		69	100.0

Qualitative/Short-Answers

The next section of the results focuses on the short answer replies from participants. The replies are broken down into common categories that emerged from the participants' responses.

Usefulness

Participants were asked to reflect on the mental health applications that they have used and provide short answers regarding what made those apps useful or not useful. Of the 69 participants, 52 participants responded. Four common categories emerged from the answers provided by the participants for this question: (1) ease of use, (2) accessibility, (3) between-session support, and (4) client engagement.

Ease of use. Ease of use was a common topic that emerged among the participants' short answer responses when asked what features made a mental health app useful. For participants to view a mental health app as therapeutically useful, the app had to be perceived as easy to use. Participants emphasized the importance of an app being "simple" and straightforward for their clients to implement into their everyday lives. For example, one client noted, "I've mainly used mindfulness apps, and these have been helpful because they're very easy to use."

Accessibility. Accessibility of mental health apps was a recurring topic in participants' short answer responses. Participants commonly found mental health apps to be therapeutically useful with clients because of the greater accessibility to mental health support that they present. For example, one client wrote: "I think meditation apps help make meditation accessible to lots of people. Many people don't want to read a book etc. but downloading an app that gives them a guided experience is great and accessible."

Between session support. The ability of a mental health app to support a client between sessions was another commonly reported topic in the short answer responses. Specifically, between-session support was one of the most reported topics by participants. If participants found apps to be helpful for clients between sessions, they were more likely to view those apps as useful. For example, one participant wrote: "I think the idea of Apps is great in terms of

keeping clients engaged in their process in between meetings." Additionally, another participant expressed: "I think clients benefit from being provided with a variety of tools for between sessions,"

Client engagement. Client engagement with mental health apps was another common topic reported by participants. When participants' clients enjoyed, engaged with, and had a preference toward apps, participants were more likely to view that app as useful. If the participants' clients were not interested, or had low compliance with app use, then participants perceived the apps to be less useful. For example, when asked about the usefulness of mental health apps, one client wrote: "In my limited experience of using them, clients do not regularly engage with them."

Reasons for Continued Use or Disuse

Participants were asked to explain what made them decide to continue or discontinue using apps that they have tried implementing with clients in the past. Of the 69 participants, 32 participants provided short-answer responses. Two common ideas emerged from the responses provided by the participants: (1) client feedback, (and 2) cost.

Client feedback. Client feedback was a commonly reported category in the short answer responses. Participants answered that client feedback helped influence what made them continue or discontinue app use. For example, one participant wrote: "I have gotten positive feedback with clients that require support when not in session find them helpful." Another participant expressed that "client response and outcomes" were an important factor in whether they continued or discontinued use. For these participants, if they received positive feedback from the clients, and saw a positive effect from their use, then they continued using the mental health apps. However,

if the clients reported negative feedback, or they did not notice any positive effect, then they would discontinue using the mental health apps.

Cost. Cost was another common topic mentioned in the short answer replies. Multiple participants mentioned that cost played a role in whether they continued using apps. For these participants, it was important that the apps they were using with their clients were of no cost at all to the client. For these participants, if the price of the app was free then they may continue using the app. However, if there was an additional expense to their clients then they would discontinue use. For example, one participant reported that they discontinued use because there were "no free trials/expense to my clients."

Training

Participants were asked why they had not pursued training in mental health apps. Of the 69 participants, 12 participants provided short-answer responses. Two common topics emerged from the responses provided: (1) unaware of training, and (2) price of training.

Unaware of training. Five participants responded that they had not received any training in mental health applications because they were unaware of any trainings pertaining to mental health apps. One participant wrote: "I haven't seen/heard of any mental health app trainings." Another participant answered that there were "not many experiences for training on apps." Lack of training and knowledge of training in-app use was a common topic throughout this study, and repeatedly surfaced in the short answer responses. Many participants expressed that they would like to explore training in-app use for mental health practice, however, they were unaware of any.

Price of training. Price of training was another commonly mentioned topic throughout this short answer question. Some participants answered that the reason they had not received

training on mental health apps was primarily because of the price of training. One participant reported: “they are geared toward higher S.E.S. populations.” Another participant expressed: “there are lots of trainings I'd like to do, but the cost can be prohibitive sometimes.” While these participants would have liked to participate in trainings, they found that cost could be a dissuading factor.

Likes of Mental Health Apps

Participants were asked to elaborate on what they liked about mental health apps. Of the 69 participants, 10 provided short-answer responses. One common topic emerged: (1) between session support.

Between session support. Similar to other short answer responses, **w**hen asked to elaborate on what they like about mental health applications, seven participants mentioned between session support. The responses were: “It is something clients can do without feeling like they're being monitored or watched (e.g., by me) and they can engage with the apps whenever they feel they need it. It is also very accessible to most clients. It is something they can use between sessions if they are feeling overwhelmed or stressed.” “I think they can be a great tool to help clients stay engaged in their process vs reserving their process for in-person meetings only. I also think they can be a fantastic way for clients to develop more awareness about the extent of their challenges.” “I think they can be a great tool to help clients stay engaged in their process vs reserving their process for in-person meetings only.” Many participants mentioned that mental health apps could be used for between-session support, when paired with what they are getting from sessions.

Dislikes of Mental Health Apps

Participants were asked to elaborate on what they do not like about mental health apps. Of the 69 participants, 21 provided short-answer responses. Three common topics emerged from the response to this question: (1) lack of research, (2) privacy, and (3) lack of interest/knowledge.

Lack of research. Lack of research was a recurring topicwhen asked about app dislikes. While elaborating on what participants did not like about mental health apps, three participants brought up the lack of research and evidence. Participants were concerned about the lack of research surrounding mental health apps, and the fact that anyone can create an app. For example, one participant stated that "everyone and anyone is creating apps these days, information may or may not be research-based, accurate, or safe." Another participant expressed their fear by reporting: "my biggest concerns with some mental health apps are that shoddy research will be used to propose them as a cheaper alternative to actual therapy by insurance companies."

Privacy. Privacy was another commonly reported topic in this short answer question. Participants explained their concerns about the possible lack of privacy that mental health apps may provide. In mental healthcare, confidentiality and privacy are taken very seriously. These participants wanted to ensure that their clients would have full privacy when using mental health apps, and they do not feel as though they have that complete certainty. For example, one participant wrote: "I worry about the potential marketing information being collected from my clients and the ensuing lack of privacy related to those ends," Another expressed that their main concern was "client information staying private. It is difficult to trust apps and I would never compromise client confidentiality/privacy."

Lack of interest or knowledge. Participants expressed that a lack of interest or knowledge surrounding mental health applications was something that they disliked about

mental health apps. For example, one participant disliked “taking the time to research them thoroughly and learning how to use them,” These participants expressed concern about how busy they currently were, and how learning to implement mental health apps was low on their list of priorities. Multiple participants expressed a lack of interest in wanting to learn more or introduce themselves to their clients.

Incorporation of Mental Health Apps

Participants were asked whether they believed mental health apps should be incorporated more into the mental health field. Of the 69 participants, 23 participants provided short-answer responses. Of the responses provided three common categories emerged (1) the presence of technology in everyday life, (2) fear of what apps may create, and (3) screen time/technology dependence.

The presence of technology in everyday life. When asked to elaborate on whether mental health apps should be incorporated more into mental health care, four participants brought up how modern technology plays a significant role in everyday life. The responses were: “Everyone seems to have a smartphone now so it will always be tools they can have with them and use without people questioning what they are doing. We all look at our phones often, so it is a private way to use tools.” Many participants reported that we were moving toward technology in most aspects of life, and that they believed mental health would move in that direction as well. For these participants, because most individuals have Smartphones, and incorporate different forms of technology into their lives, mental health applications were likely to follow as well. Participants expressed that technology already plays such a large role in society that the use of mental health apps should, or will be, incorporated more into mental health care.

Fear. Participants brought up the fear of what mental health application may create in the mental health field. One participant wrote “I can see some utility for them but shudder to think of how they could be misused in more acute situations or in ways for which I don't believe they were intended. I am also concerned that EFAPs or Insurance providers could be using them in place of in-person counselling.” Another participant reported they “worry that capitalist interests will decide they are cheaper than counsellors and use them as a way to pay homage to mental health in the workplace while actually removing access to mental health professionals. (This already happened to me at a previous job - could download a useless app instead of the EFAP program.” Some participants expressed a fear that technology, and mental health apps included, could take the place of in-person mental health services.

Screen time and technology dependence. Some participants did not believe mental health apps should be incorporated more into mental health care because of screen time and technology dependence. One participant wrote: “I think that our constant use of screens is part of the reason why people feel busy & overwhelmed... so I’m not sure that adding more screen time is a good solution.” Another participant expressed that they “believe most people are on their cell phones too much, so I rarely suggest more screen time (with the exception of prolonged exposure therapy or clients who explicitly ask for relaxation tools to practice outside of session). Social media and excessive screen time appear to worsen overall wellbeing, as opposed to improving it.” For these participants, the dependence on technology, as well as the consequences of screen time, are reasons why mental health apps should not be incorporated more into mental health care. Many participants felt that individuals’ technology use and addiction were already very prevalent and that implementing mental health apps with their clients would exacerbate what they view as a problem.

Mindfulness

Finally, when looking at the answers of all the short-answer responses, a common theme surrounding meditation and mindfulness was apparent. Of the short answer questions, mindfulness and meditation were mentioned 18 different times, and were always viewed favourably. For example, some of the responses regarding meditation and mindfulness apps were: “I've mainly used mindfulness apps, and these have been helpful because they're very easy to use and low maintenance. Clients can generally use the apps wherever they are which is convenient.” “A lot of apps, like mindfulness apps, target anxiety and so their use is more geared towards/tailored to these concerns. This makes them more effective in my opinion. Also, a lot of people who have depression may experience low motivation, and a phone app is easy and convenient to use and requires little energy.” Many participants also viewed mindfulness apps as “safer” and “more private” than other apps: “there is always a concern about confidentiality; but if an app is not linked back to me and is something that is fairly safe (e.g., a mindfulness app), then I do not usually see this as a concern.” Participants also felt as though mindfulness apps were more “evidence based” than other forms of mental health apps. The participants that included responses in the short answer questions often reported positive aspects and experiences with mindfulness apps. Overall, they were viewed very favourably, and continued to be mentioned.

CHAPTER 5: Discussion

Perceptions of Mental Health Apps

The first research question posed in this study was what are mental health professionals' perceptions of mental health apps? To gain an understanding of the participants' perceptions of mental health apps, it is important to evaluate what they take to be the potential benefits, barriers, and limitations.

Benefits. First, looking at perceived benefits, two main categories stood out for these mental health professionals: 1) portability and 2) affordability. Regarding portability, over half of the participants selected this as what they liked most about mental health apps. Because most individuals have smartphones currently, these participants recognised that the portability of mental health apps provided an accessible platform for clients. Furthermore, these participants also liked that mental health apps provide an affordable option for individuals to access mental health care. Given that mental healthcare can be out of reach for a lot of individuals (Grist et al., 2017), for example, therapy and social support is not always affordable for clients, a lot of apps are free or of very little cost. Financial concerns are frequently cited as one of the most common barriers to accessing mental healthcare (Miranda et al., 2015). Therefore, it makes sense that mental health professionals would not want to suggest a supplementary resource that costs more money and would favour and appreciate the affordability of mental health apps. These perceived benefits generally support and agree with previous understandings of mental health apps, and how they have the potential to provide unique benefits as mental healthcare platforms (Grist et al., 2017; Jones et al., 2021; Rathbone & Prescott, 2017). Both portability and affordability can fit into the umbrella category of accessibility, which was a common theme among short-response answers. Mental health apps are accessible to individuals because of factors such as the cost and

portability, demonstrating that accessibility was something that these mental health professionals perceived as a benefit of mental health apps. This concept of accessibility, and mental health apps possibly providing a more accessible platform for mental health care, is significant because there are multiple barriers when it comes to seeking treatment for mental health (Brenes et al., 2015; Jones et al., 2021; Price, 1994; Rathbone & Prescott, 2017; Sorkin, et al., 2016; Titzler et al., 2018). If mental health apps can provide accessibility to individuals dealing with accessibility barriers, there may be a place for them in mental health care.

Dislikes, Limitations, and Barriers

When looking at perceived dislikes, limitations, and barriers of mental health apps, two main factors surfaced 1) training, and 2) confidentiality/privacy, which supports concerns others have had (Donker et al., 2013; Jones et al., 2021; Kenny et al, 2016).

Training. Beginning with training, one of the most common dislikes about mental health apps was that participants did not have any training on them. Most participants did not have any training on mental health apps, primarily because 1) they were unaware of training on mental health apps, or 2) the training that they were aware of were outside of their price range. This elaborates on a common theme that arose among the short-answer responses, regarding how participants were unlikely to incorporate mental health apps because of the amount of research they would need to undertake on their own time. These mental health professionals did not want to introduce their clients to apps without being aware of what they are like and how to use them, which can add a lot of extra time to professional planning. Training could possibly help decrease that problem, because the professionals would not be attempting to learn on their own, rather they would be introduced and instructed, which could help decrease that personal research time. This lack of training elaborates on the Mobile App Rating Scale (MARS) (Stoyanov et al, 2015).

Although the MARS has the potential to help professionals examine apps (Stoyanov et al, 2015), it did not seem as though participants were aware of any support in understanding and evaluating the apps. Of the specific mental health professionals that participated in this study, a majority of them had never heard of the MARS, or any type of other support or training that could be used to help better understand mental health apps.

Chatbot/App-Based Counselling Apps. Regarding perceptions of specific types of mental health apps, these participants were primarily against chatbot/app-based counselling apps (e.g. Betterhelp and Talkspace Online Therapy). When participants were asked about their experience in using different types of mental health apps, 27 participants selected that they had heard of chatbot style apps but had no interest in trying them, making that the type of app participants were least interested in trying. This dislike of chatbot style apps surfaced a few times in the open-ended questions as well. From the perspective of these specific mental health professionals, the primary concerns that were raised surrounded privacy and confidentiality. For these mental health professionals, the possibility of privacy breaches meant that they were wary of mental health apps.

Confidentiality and privacy. Confidentiality and privacy were both also viewed as some of the most common dislikes of and limitations to mental health apps. Some of the participants worried about apps potentially collecting the client's personal information, and possibly using personal information for marketing purposes as well.

The participants did not like that they were unsure of how private and confidential these apps really were, and for them, they would be more inclined to recommend an app if they were certain that it was safe for their clients' use. It should be noted that there is a possibility that mental health apps do tend to lack reliable security and, because of the data they may collect,

there is a possibility of transmitting unencrypted personal data over insecure network connections (Njie, 2013; Harris, 2013; Giota & Kleftaras. 2014). This all raises serious concerns over the ability of mental health apps, specifically chat-bot/counselling apps to protect the privacy and confidentiality of users.

App Efficacy

One of the most common features that these mental health professionals looked for and valued in an app was efficacy. For these participants, an app's ability to do precisely what it is intended to do was essential. They wanted mental health apps to be research-based so they could be confident in what they were recommending. If an app has research supporting it, then the professionals were more likely to believe that the app is efficacious. However, although this was clearly an important factor for these mental health professionals, there is research demonstrating a clear lack of research put into mental health apps (Kenny et al, 2016; Larsen et al, 2019; Lecomte et al., 2020). Therefore, there is a significant disconnect here between what mental health professionals are looking for and what is available.

UTAUT-2.

The Unified Theory of Acceptance and Use of Technology (UTAUT-2) suggests that seven core constructs act as direct determinants of behavioural intentions and. ultimately. behaviour in relation to an acceptance of technology (Venkatesh et al., 2003). These determinates are: 1) performance expectancy, 2) effort expectancy, 3) social influence, 4) facilitating condition, 5) hedonic motivation, 6) price value and 7) habit (Venkatesh et al., 2012). Regarding these mental health professionals, there were two clear determinants, namely price value and performance expectancy. These mental health professionals work with diverse individuals of all different backgrounds, whose experience with technology varies greatly.

Therefore, it is essential for these participants that mental health apps be user-friendly. Participants want to be able to suggest supplementary resources, like apps, that are going to be easy for their clients to incorporate into their lives. If the clients do not find the app user friendly, then it would be unlikely for them to utilise said apps, and this would likely affect the professional's perception of the apps. Finally, participants viewed affordability as another top app feature. As discussed previously, mental health support can be quite expensive and mental health professionals are working with individuals of different backgrounds, meaning that a lot of individuals struggle to afford proper mental health care or avoid care at all for fear of it being too expensive (Grist et al., 2017). For individuals with low socioeconomic status, they must receive adequate care at an affordable, accessible price (Jones et al., 2020). Because of this, an app being low-cost, preferably free, is an imperative for these mental health professionals. It is important to note that the original these seven determinants are moderated by gender, age, experience, and voluntariness of use (Williams et al., 2015), however, because this study has a small sample size, it is difficult to identify any significant moderators. These participants do seem to value some of the core constructs identified in the UTAUT-2.

Research Question One Summary

Overall, what are mental health professionals' perceptions of mental health apps? For the mental health professionals that participated in this study, it seems as though many of them share similar likes and concerns. They generally favour the possible accessibility that apps can provide, specifically portability and affordability. On the other hand, their own lack of understanding and training of apps, as well as privacy and confidentiality concerns, manifest as perceived limitations. Just over half of these mental health professionals believe that apps should be more incorporated into mental health care, with just under half being unsure and only a few

that were against the idea. Overall, the results demonstrate that these specific mental health professionals' perceptions of mental health apps include a lot of uncertainty. It appears they recognise possible benefits and limitations to mental health apps, however, there is a lot that remains unknown about mental health apps and what their place in mental healthcare looks like.

Implementation of Apps

The second research question posed in this study is how are mental health professionals using the mental health apps in their practices with clients? To understand how mental health professionals are using mental health apps in their practice, it is first important to know whether they are using them or have heard of them. A strong majority of these mental health professionals, 63 out of the 69 participants, have heard of mental health apps (91.3%).

Regarding this specific group of mental health professionals, 27 of them (39.1%) reported that they use them in their practice, while 35 reported that they do not use them in their practice (50.7%). It is important to point out that, when asked about their experience using mindfulness and meditation mental health apps, 19 participants said that they use them regularly with clients (27.5%), and 26 said they sometimes use them with clients (37.7%). This response rate demonstrates that 48 participants use mindfulness or meditation apps with at least some of their clients. If this is self-reported percentage is accurate, then that would mean 69.5% of these participants use apps with their clients, rather than the initially reported 43%. This contradiction is also evident later in the survey. When asked what type of client diagnoses they typically use mental health apps for, 46 participants selected anxiety (66.7%) and 35 participants selected depression (50.7%). Notably, both percentages were higher than the 43% that said they use mental health apps with their clients. It is possible that some of the participants may have misunderstood one or both questions posed, which resulted in this contradiction. Another

possibility is that these mental health professionals may have previously used them with clients but do not use them anymore, which may have also resulted in these contradictory results. A final possibility may be that the participants did not realise, or recall, their implementation of mental health apps until reflecting on specific examples of apps.

Mindfulness. Over the past couple of decades, there has been a strong shift to incorporating mindfulness and meditation into counselling, with many mental health professionals utilising these practices in their theoretical framework (Christopher & Maris, 2010; Tomlinson et al., 2018). For example, Mindfulness-Based Cognitive Therapy (MBCT) is increasingly being incorporated into the treatment planning for individuals dealing with anxiety, depression, and stress (Burgess et al., 2021; Frostadottir & Dorjee, 2019; Kulz et al., 2019; Mackenzie et al., 2018). Similar to the recent popularity of western psychotherapy, mindfulness and meditation apps are the most common type of mental health apps implemented by these participants in their practice. The promotion of meditation and mental health apps by these mental health professionals was a common recurring theme throughout the short-answer responses as well. It makes sense that these participants reflect the general trend of support for mindfulness and meditation in current counselling practices. Generally, these professionals felt as though meditation and mindfulness apps were easy to use, effective, low risk and safer than other mental health apps on the market. Given these reasons, these professionals generally replied positively regarding this type of mental health app. Although mindfulness and meditation are becoming widespread throughout the mental health world, implementation can sometimes be difficult for individuals who have no background or experience in these practices (Brewer et al., 2013). While it would need to be explored further, it is possible that employing an app can assist

a client in committing to practising mindfulness skills more often between sessions than if they did not have any tools to assist them.

Mental health diagnoses. Depression, anxiety, and trauma were the most common diagnoses that these mental health professionals used mental health apps for. It is important to note that these were also the most common issues that these participants worked with overall. Additionally, the participants reported that they preferred to use interventions like mindfulness and meditation for anxiety and depression, therefore, it would make sense that, if anxiety and depression were the most common diagnoses they used mental health apps for, that mindfulness and meditation apps could be the most implemented mental health apps. This aligns with mental health rates in Canada and The United States. In both countries, depression and anxiety disorders are the most common forms of mental illness (Anxiety and Depression Association of America [ADAA], 2021; Government of Canada, 2014; Knoll & MacLennan, 2017; Watterson et al, 2016; Weinberger et al., 2017). Therefore, it follows that the mental health professionals who participated in this survey primarily promoted mental health apps to individuals dealing with anxiety and depression, as they are the most common.

Between session support. Throughout the short-answer responses, as well as the quantitative questions, the use of mental health apps as a form of between-session support was a notable recurrent theme. As discussed in the literature review, homework is often given to clients to complete between sessions, to allow for continual growth even when not in session with a mental health professional (Conklin et al., 2021; Decker et al., 2016; Miller, 2010; Riley, 2015). Clients spend more time outside of sessions than they do in them, so it is important for mental health professionals to provide clients with tools and supplementary resources to continue working on skills between sessions. However, homework compliance rates are often found to be

quite low (Conklin et al., 2021; Helbig & Feh, 2004; Kazantis et al., 2005; Tang & Kriendler, 2017). The continuous escalation of smartphone rates offers an opportunity to enhance homework compliance, and there is a growing interest in whether app inclusion could enhance homework compliance rates (Tang & Kreindler 2017). Because most individuals now possess smartphones, and are on them quite frequently, there is a possibility for these smartphones to be implemented and incorporated into the therapeutic process. For these mental health professionals, it seems as though they are also attempting to utilise the popularisation of smartphones in an individual's everyday life to provide between-session support for their clients. With that being said, these participants have found that client engagement with, and preference towards, mental health apps played a large role in whether these participants were for or against app integration in their practice. For this group of mental health professionals, they found that a lot of their clients had low engagement when advised to incorporate mental health apps into their lives. In these professionals' experience, when they did attempt to recommend mental health apps to clients, the clients were unlikely to utilise them outside of sessions. However, some of the participants had learned about mental health apps through their clients and, when this was the case, the clients enjoyed utilising the apps as a form of between-session support. Therefore, these participants found that client preference played a significant role in whether they would recommend, or attempt to integrate, apps into their practice. Something to consider looking at in the future is whether implementing smartphones and mental health apps do make a difference in homework compliance rates.

Research Question Two Summary

How are mental health professionals using mental health apps in their practice? To begin with, it was discovered that a little more than half of the mental health professionals that

participated in this study utilise mental health apps in their practice. The professionals are primarily employing mental health apps for between session support with clients dealing with depression, anxiety and trauma, and they tend to utilise mindfulness and mediation type apps.

Limitations

There were several limitations to this study. First, there is a limitation concerning sample size. Because the sample size for this study was only 69 participants, we cannot generalise the findings to the broader population of all mental health professionals. The lack of participants results in an insufficient sample size for thorough and advanced statistical measurement.

Second, this study only included mental health professionals from Canada and the United States of America. It is possible that mental health professionals from other areas of the world may have very different views on mental health applications. For example, other countries that use technology more, or less, may have different perceptions and experiences with mental health apps.

Third, there is a possible self-selection bias. Because the participants were given the option to participate, there is a possibility of this causing a biased sample with non-probability sampling. Mental health professionals that have already heard of, and have developed feelings toward mental health apps, may have been more likely to complete the survey. It is possible that a mental health professional who does not use mental health apps at all may have been less likely to complete the survey.

Fourth, there may be a limitation to the response rate of the short-answer questions. Although all the participants completed and submitted the survey, it was often a minority of the participants that responded to the short-answer questions. The participants that did respond to the

short-answer questions may have more extreme views that those that did not complete the short-answer questions, which may leave the qualitative data slightly skewed.

Fifth, and finally, the findings of this study may be limited by the nature of self-reporting surveys and the disadvantages that accompany this form of data collection. The participants' responses may be skewed based on their interpretation of the questions, willingness to disclose, personal biases and other factors. For example, only 27 participants reported that they use mental health apps with clients, however, in a different question 48 participants said that they use mindfulness apps with their clients. This example demonstrates that self-reporting can result in contradictions and other limitations.

Implications

These results may be useful for future mental health app development and training. Furthermore, further investigation into health care workers' perceptions of mental health apps could enable broader or more effective incorporation of mobile apps, and digital technology in general, into mental healthcare.

App creation. Regarding app creation, this study investigated what is most important to these professionals and what is most valued in a mental health app. An understanding of the perceived benefits, barriers, and expectations of mental health apps among professionals has the potential to aid in the creation of more effective apps that are more likely to be implemented by these mental health professionals. This study helps address what some professionals are looking for in a mental health app and what would make them more likely to utilise said apps. Therefore, these results could aid in the development of mental health apps that could potentially help broaden the mental health sector.

Training. Looking at training, when asked what would make these participants more likely to use mental health apps, 29 participants (42.0%), making this the most chosen answer, selected that they would use them more if they had training on them. These mental health professionals elaborated that they were overall unaware of any training in mental health apps, and the ones that they were aware of were too expensive for consideration. These results show that some mental health professionals would be interested in attending affordable, or likely free, training in mental health applications if available. Furthermore, after the required shift to online platforms during COVID-19, the importance of understanding and being able to implement technology into mental healthcare has become evident. These results may be useful for graduate training programs and mental health continuing education programs that may want to incorporate training in mental health and technology into their programs.

Training recommendations. When reviewing the findings from this study, participants are lacking training in mental health apps, and it is something they are interested in learning more about. As the implementation of mental health apps into mental healthcare is an emerging topic, knowledge surrounding aspects of training on app utilization is uncommon. Based on the current literature, as well as the results from this study, two primary areas of focus are 1) App selection, and 2) App implementation.

For mental health professionals to implement mental health apps with clients, the first step is to decide which apps to use with clients, therefore, this could likely be a primary focus for training. It can be difficult for new users of mental health apps to decide which apps use, because of this, training could help professionals identify apps that are secure, and research based. Another area could focus on app rating scales, such as the MARS (Stoyanov et al, 2015).

Training on app selection could also teach which literature to keep up to date on, and different bodies, such as the Food and Drug Administration (FDA), that recommend mobile health apps.

Once an app has been selected, the mental health professional must implement the app with clients. If apps were to be used in a mental health professional's practice, it would be important for the mental health professional to have experience with the app, to ensure they possess the skills and understanding needed to implement the app. Training could focus on how to ethically introduce and implement an app to a client. It is essential for the mental health professional to walk the client through the app and teach them how to implement it into their life. Similar to implementing any form of therapeutic intervention, it is essential for mental health professionals to assess the effectiveness of apps with each individual client, and to make changes based on clients feedback.

Finally, this research helps provide a greater overall understanding of the participants' perceptions of mental health apps which may enable a more effective incorporation of mobile apps into mental healthcare.

Mental healthcare after COVID-19. For these participants, and like a lot of mental health professionals, the effects of the COVID-19 pandemic have made online practice much more common. There has been a switch to online counselling sessions, as well as professionals having to learn new strategies to best support their clients when they are not able to meet face-to-face. Regarding these mental health professionals, most of them had never practised online prior to the COVID-19 pandemic and associated lockdowns, however, that has completely flipped and now most of them practice online daily. Currently, these mental health professionals' perceptions of mental health apps remain lukewarm. However, the past year and a half impacted the mental health field and required it to shift to a technology-based practice. Professionals are continuing to

understand different platforms and resources that can best support their clients' needs in diverse and unique ways. Understanding more about different forms of mental health technology, and what professionals think about and want from that technology, has the potential to help incorporate digital technology into mental healthcare. More than half of the participants thought that mental health apps should be incorporated more into mental healthcare, a little less than half were unsure and only a few did not believe they should be. Although the current views of mental health apps are mixed, it is possible that this shift to practising online, and exposure to different resources, could affect mental health professionals' views of technology being incorporated into mental health care overall.

Future Research

There are several suggestions regarding possible future research. First, future research should be extended to include a much larger sample size for higher statistical significance so as to identify possible relationships and generalisability. Second, future research could include other countries to help gain a broader understanding of mental health professionals' perceptions of mental health apps outside of Canada and the United States. Third, future research could include a deeper qualitative portion. Including a follow-up interview portion would enrich the findings and allow for a more thorough understanding of the qualitative data. Because the participants were less likely to respond to the short-answer questions, a full interview could help fill in the gaps for that portion of the data. Fourth, because this research found that mental health professionals primarily implement mental health apps for between sessions support, it could be interesting to look at client utilisation of apps for between session support. For example, does implementing mental health apps help with homework compliance? Finally, future research could implement an experimental study in which mental health professionals utilise mental

health apps in their practice and then compare their perceptions of mental health apps to a control group.

Conclusion

Technology, specifically mobile technology, is everywhere. These forms of technology permeate every aspect of modern-day society, and individuals have become used to turning to technology for support. With this growing reliance and incorporation of technology into our everyday lives, it appears as though mobile technology is here to stay. There is a great potential for technology, specifically apps, to be integrated into the field of mental healthcare. It is clear that mental health applications are being implemented by individuals and, by extension, there is an opportunity for mental health professionals to have a voice in this field to ensure the safety and efficacy of the apps that are being developed. Based on the findings from these participants, it is apparent that further work needs to be done, and that there is room for the development of training and continued research.

References

Al-Ashwal, F. Y., Kubas, M., Zawiah, M., Bitar, A. N., Mukred Saeed, R., Sulaiman, S. A. S., ... & Ghadzi, S. M. S. (2020). Healthcare workers' knowledge, preparedness, counselling practices, and perceived barriers to confront COVID-19: A cross-sectional study from a war-torn country, Yemen. *PloS one*, *15*(12), e0243962. https://doi.org/10.1371/journal.pone.0243962

American College Health Association. (2008). Reference group executive summary. Retrieved from http://www.achancha.or/docs/ACHANCHA_Reference_Group_ExecutiveSummary_Fall2008. pdf

Anderson, M., & Jiang, J. (2018). Teens, social media & technology 2018. *Pew Research Center*, *31*, 2018.

Andrews, G., Basu, A., Cuijpers, P., Craske, M., Mcevoy, P., English, C., & Newby, J. (2010). Computer therapy for the anxiety and depression disorders is effective, acceptable and practical health care: An updated meta-analysis. *Journal of Anxiety Disorders*, *55*, 70–78. https://doi.org/10.1016/j.janxdis.2018.01.001

Aqeel, M., Abbas, J., Shuja, K. H., Rehna, T., Ziapour, A., Yousaf, I., & Karamat, T. (2021). The influence of illness perception, anxiety and depression disorders on students' mental health during COVID-19 outbreak in Pakistan: a web-based cross-sectional survey. *International Journal of Human Rights in Healthcare*. https://doi.org/10.1108/IJHRH-10-2020-0095

Baig, M. M., GholamHosseini, H., & Connolly, M. J. (2015). Mobile healthcare applications: System design review, critical issues, and challenges. *Australasian Physical &*

Engineering Sciences in Medicine, *38*(1), 23-38. https://doi.org/10.1007/s13246-014-0315-4

Bakker, D., Kazantzis, N., Rickwood, D., & Rickard, N. (2016). Mental health smartphone apps: review and evidence-based recommendations for future developments. *JMIR Mental Health*, *3*(1), e7. https://doi.org/10.2196/mental.4984

Bambling, M., King, R., Reid, W., & Wegner, K. (2008). Online counselling: The experience of counsellors providing synchronous single-session counselling to young people. *Counselling and Psychotherapy Research*, *8*(2), 110-116. https://doi.org/10.1080/14733140802055011

Barton, E. E., Pustejovsky, J. E., Maggin, D. M., & Reichow, B. (2017). Technology-aided instruction and intervention for students with ASD: A meta-analysis using novel methods of estimating effect sizes for single-case research. *Remedial and Special Education,38*(6), 371–386. https://doi.org/10.1177/0741932517729508

Berger, T. (2016). The therapeutic alliance in Internet interventions: A narrative review and suggestions for future research. *Psychotherapy Research*, *27*(5), 511-524. https://doi.org/10.1080/10503307.2015.1119908

Bergman Nordgren, L., Carlbring, P., Linna, E., & Andersson, G. (2013). Role of the working alliance on treatment outcome in tailored internet-based cognitive behavioural therapy for anxiety disorders: randomized controlled pilot trial. *JMIR Research Protocols*, *2*(1), e4. https://doi.org/10.2196/resprot.2292

Bhavnani, S. P., Narula, J., & Sengupta, P. P. (2016). Mobile technology and the digitization of healthcare. *European Heart Journal*, *37*(18), 1428-1438. https://doi.org/10.1093/eurheartj/ehv770

Blackwell, C. K., Lauricella, A. R., Wartella, E., Robb, M., & Schomburg, R. (2013). Adoption and use of technology in early education: The interplay of extrinsic barriers and teacher attitudes. *Computers & Education*, *69*, 310-319. https://doi.org/10.1016/j.compedu.2013.07.024

Boulianne, S. (2015). Social media use and participation: A meta-analysis of current research. *Information, Communication & Society*, *18*(5), 524-538. https://doi.org/10.1080/1369118X.2015.1008542

Brenes, G. A., Danhauer, S. C., Lyles, M. F., Hogan, P. E., & Miller, M. E. (2015). Barriers to mental health treatment in rural older adults. *The American Journal of Geriatric Psychiatry*, *23*(11), 1172-1178. https://doi.org/10.1016/j.jagp.2015.06.002

Brewer, J. A., Davis, J. H., & Goldstein, J. (2013). Why is it so hard to pay attention, or is it? Mindfulness, the factors of awakening and reward-based learning. *Mindfulness*, *4*(1), 75-80. https://doi.org/10.1007/s12671-012-0164-8

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The lancet*, *395*(10227), 912-920. https://doi.org/10.1016/S0140-6736(20)30460-8

Burgess, E. E., Selchen, S., Diplock, B. D., & Rector, N. A. (2021). A Brief Mindfulness-Based Cognitive Therapy (MBCT) Intervention as a Population-Level Strategy for Anxiety and Depression. *International Journal of Cognitive Therapy*, *14*(2), 380-398. https://doi.org/10.1007/s41811-021-00105-x

Carroll, L. S. L. (2017). A comprehensive definition of technology from an ethological perspective. *Social Sciences*, *6*(4), 126. https://doi.org/10.3390/socsci6040126

Cauberghe, V., Van Wesenbeeck, I., De Jans, S., Hudders, L., & Ponnet, K. (2021). How adolescents use social media to cope with feelings of loneliness and anxiety during COVID-19 lockdown. *Cyberpsychology, Behavior, and Social Networking*, *24*(4), 250-257. https://doi.org/10.1089/cyber.2020.0478

Cavanagh, K., & Millings, A. (2013). (Inter)personal computing: the role of the therapeutic relationship in e-mental health. *Journal of Contemporary Psychotherapy*, *43*(4), 197–206. https://doi.org/10.1007/s10879-013-9242-z

Chaudron, S., Beutel, M. E., Donoso Navarrete, V., Dreier, M., Fletcher-Watson, B., Heikkilä, A. S., & Mascheroni, G. (2015). *Young children (0-8) and digital technology: A qualitative exploratory study across seven countries*. JRC; ISPRA, Italy.

Cheng, S. C., & Lai, C. L. (2019). Facilitating learning for students with special needs: a review of technology-supported special education studies. *Journal of Computers in Education*, 1-23. https://doi.org/10.1007/s40692-019-00150-8

Christopher, J. C., & Maris, J. A. (2010). Integrating mindfulness as self-care into counselling and psychotherapy training. *Counselling and Psychotherapy Research*, *10*(2), 114-125.https://doi-org.ezproxy.uleth.ca/10.1080/14733141003750285

Conklin, L. R., Curreri, A. J., Farchione, T. J., & Barlow, D. H. (2021). Homework Compliance and Quality in Cognitive Behavioral Therapies for Anxiety Disorders and Obsessive-Compulsive Disorder. *Behavior therapy*, *52*(4), 1008-1018. https://doi.org/10.1016/j.beth.2021.01.001

Correa, T., Hinsley, A. W., & De Zuniga, H. G. (2010). Who interacts on the Web?: The intersection of users' personality and social media use. *Computers in Human Behavior*, *26*(2), 247-253. https://doi.org/10.1016/j.chb.2009.09.003

Cumming, T. M., & Draper Rodríguez, C. (2017). A meta-analysis of mobile technology supporting individuals with disabilities. *The Journal of Special Education,51*(3), 164–176. https://doi.org/10.1177/0022466917713983

Daniel, H. H., & Begoña, A. S. E. (2020). Access barriers to electroconvulsive therapy during COVID-19 pandemic. *Psychiatry research*, *289*, 113057. https://doi.org/10.1016/j.psychres.2020.113057

Daudén Roquet, C., & Sas, C. (2018, April). Evaluating mindfulness meditation apps. In *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems* (pp. 1-6). https://doi.org/10.1145/3170427.3188616

Davies, Z. (2015). *Definition of: Smartphone*. USA: PCMag Digital Group. Retrieved on April 16, 2015, from http://www.pcmag.com/encyclopedia/term/51537/smartphone

De Witte, N. A., Carlbring, P., Etzelmueller, A., Nordgreen, T., Karekla, M., Haddouk, L., ... & Van Daele, T. (2021). Online consultations in mental healthcare during the COVID-19 outbreak: An international survey study on professionals' motivations and perceived barriers. *Internet Interventions*, 100405. https://doi.org/10.1016/j.invent.2021.100405

Decker, S. E., Kiluk, B. D., Frankforter, T., Babuscio, T., Nich, C., & Carroll, K. M. (2016). Just showing up is not enough: Homework adherence and outcome in cognitive–behavioral therapy for cocaine dependence. *Journal of Consulting and Clinical Psychology*, *84*(10), 907. https://doi.org/10.1037/ccp0000126

Donker, T., Petrie, K., Proudfoot, J., Clarke, J., Birch, M. R., & Christensen, H. (2013). Smartphones for smarter delivery of mental health programs: a systematic review. *Journal of Medical Internet Research*, *15*(11), e247. https://doi.org/10.2196/jmir.2791

Dziegielewski, S., & Holliman, D. C. (2019). *The changing face of health care social work: Opportunities and challenges for professional practice*. Springer Publishing Company.

Firth, J., & Torous, J. (2015). Smartphone apps for schizophrenia: a systematic review. *JMIR mHealth and uHealth*, *3*(4), e102. https://doi.org/10.2196/mhealth.4930

Fitzgerald, M., Kruschwitz, N., Bonnet, D., & Welch, M. (2014). Embracing digital technology: A new strategic imperative. *MIT Sloan Management review*, *55*(2), 1.

Free, C., Phillips, G., Felix, L., Galli, L., Patel, V., & Edwards, P. (2013). The effectiveness of M-health technologies for improving health and health services: a systematic review protocol. *BMC Research Notes*, *3*(1), 250. https://doi.org/10.1186/1756-0500-3-250

Frostadottir, A. D., & Dorjee, D. (2019). Effects of mindfulness based cognitive therapy (MBCT) and compassion focused therapy (CFT) on symptom change, mindfulness, self-compassion, and rumination in clients with depression, anxiety, and stress. *Frontiers in Psychology*, *10*, 1099. https://doi.org/10.3389/fpsyg.2019.01099

Galderisi, S., Heinz, A., Kastrup, M., Beezhold, J., & Sartorius, N. (2015). Toward a new definition of mental health. *World Psychiatry*, *14*(2), 231-233. https://doi.org/10.1002/wps.20231

Gagnon, M. P., Ngangue, P., Payne-Gagnon, J., & Desmartis, M. (2016). m-Health adoption by healthcare professionals: A systematic review. *Journal of the American Medical Informatics Association*, *23*(1), 212-220. https://doi.org/10.1093/jamia/ocv052

Grist, R., Porter, J., & Stallard, P. (2017). Mental health mobile apps for preadolescents and adolescents: A systematic review. *Journal of Medical Internet Research*, *19*(5), e176. https://doi.org/10.2196/jmir.7332

Hajli, M. N. (2014). A study of the impact of social media on consumers. *International Journal of Market Research*, *56*(3), 387-404. https://doi.org/10.2501/IJMR-2014-025

Harris, K. D., & General, A. (2013). Privacy on the go. *California Department of Justice*, 1-27.

Heflin, H., Shewmaker, J., & Nguyen, J. (2017). Impact of mobile technology on student attitudes, engagement, and learning. *Computers & Education*, *107*, 91-99. https://doi.org/10.1016/j.compedu.2017.01.006

Helbig, S., & Fehm, L. (2004). Problems with homework in CBT: Rare exception or rather frequent? *Behavioural and Cognitive Psychotherapy*, *32*(3), 291-301. https://doi.org/10.1017/S1352465804001365

Holte, A. J., & Ferraro, F. R. (2018). Tethered to texting: Reliance on texting and emotional attachment to cell phones. *Current Psychology*, 1-8. https://doi.org/10.1007/s12144-018-0037-y

Jones, N. M., Johnson, M., Sathappan, A. V., & Torous, J. (2021). Benefits and Limitations of Implementing Mental Health Apps Among the Working Population. *Psychiatric Annals*, *51*(2), 76-83. https://doi.org/10.3928/00485713-20210112-01

Kazantzis, N., Arntz, A. R., Borkovec, T., Holmes, E. A., & Wade, T. (2010). Unresolved issues regarding homework assignments in cognitive and behavioural therapies: an expert panel discussion at AACBT. *Behaviour Change*, *27*(3), 119-129. https://doi.org/10.1375/bech.27.3.119

Kenny, R., Dooley, B., & Fitzgerald, A. (2016). Developing mental health mobile apps: Exploring adolescents' perspectives. *Health Informatics Journal*, *22*(2), 265-275. https://doi.org/10.1177/1460458214555041

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: what is ‘enhanced ‘and how do we know? A critical literature review. *Learning, Media and Technology*, *39*(1), 6-36. https://doi.org/10.1080/17439884.2013.770404

Knoll, A. D., & MacLennan, R. N. (2017). Prevalence and correlates of depression in Canada: Findings from the Canadian Community Health Survey. *Canadian Psychology/Psychologie Canadienne*, *58*(2), 116. https://doi.org/10.1037/cap0000103

Krans, B., & Cafasso, J. (2016, February 9). *Types of mental health professionals.* Healthline. https://www.healthline.com/health/mental-health-professionals-types

Krebs, P., & Duncan, D. T. (2015). Health app use among US mobile phone owners: a national survey. *JMIR mHealth and uHealth*, *3*(4), e101. https://doi.org/10.2196/mhealth.4924

Kuhn, E., Eftekhari, A., Hoffman, J. E., Crowley, J. J., Ramsey, K. M., Reger, G. M., & Ruzek, J. I. (2014). Clinician perceptions of using a smartphone app with prolonged exposure therapy. *Administration and Policy in Mental Health and Mental Health Services Research*, *41*(6), 800-807. https://doi-org.ezproxy.uleth.ca/10.1007/s10488-013-0532-2

Külz, A. K., Landmann, S., Cludius, B., Rose, N., Heidenreich, T., Jelinek, L., ... & Moritz, S. (2019). Mindfulness-based cognitive therapy (MBCT) in patients with obsessive–compulsive disorder (OCD) and residual symptoms after cognitive behavioral therapy (CBT): a randomized controlled trial. *European Archives of Psychiatry and Clinical Neuroscience*, *269*(2), 223-233. https://doi.org/10.1007/s00406-018-0957-4

Larsen, M.E., Huckvale, K., Nicholas, J. *et al.* Using science to sell apps: Evaluation of mental health app store quality claims. *NPI Digit. Med.* 2, 18 (2019) https://doi.org/10.1038/s41746-019-0093-1

Larsen, M. E., Nicholas, J., & Christensen, H. (2016). Quantifying app store dynamics: longitudinal tracking of mental health apps. *JMIR mHealth and uHealth*, *4*(3), e96. https://doi.org/10.2196/mhealth.6020.

Lecomte, T., Potvin, S., Corbière, M., Guay, S., Samson, C., Cloutier, B., ... & Khazaal, Y. (2020). Mobile apps for mental health issues: meta-review of meta-analyses. *JMIR mHealth and uHealth*, *8*(5), e17458. https://doi.org/10.2196/17458

Lee, D. Y., & Lehto, M. R. (2013). User acceptance of YouTube for procedural learning: An extension of the Technology Acceptance Model. *Computers & Education*, *61*, 193-208. https://doi.org/10.1016/j.compedu.2012.10.001

Leigh, S., & Flatt, S. (2015). App-based psychological interventions: Friend or foe? *Evidence-Based Mental Health*, *18*(4), 97-99.

Linke, C. (2013). Mobile media and communication in everyday life: Milestones and challenges. *Mobile Media & Communication*, *1*(1), 32-37. https://doi.org/10.1177/2050157912459501

Liu, L., Miguel Cruz, A., Rios Rincon, A., Buttar, V., Ranson, Q., & Goertzen, D. (2015). What factors determine therapists' acceptance of new technologies for rehabilitation–a study using the Unified Theory of Acceptance and Use of Technology (UTAUT). *Disability and Rehabilitation*, *37*(5), 447-455.https://doi-org.ezproxy.uleth.ca/10.3109/09638288.2014.923529

Longyear, R. L., & Kushlev, K. (2021). Can mental health apps be effective for depression, anxiety, and stress during a pandemic? *Practice Innovations*, *6*(2), 131–137. https://doi.org/10.1037/pri0000142

MacKenzie, M. B., Abbott, K. A., & Kocovski, N. L. (2018). Mindfulness-based cognitive therapy in patients with depression: current perspectives. *Neuropsychiatric disease and treatment*. *14*, Article 1599-1605.

Mani, M., Kavanagh, D. J., Hides, L., & Stoyanov, S. R. (2015). Review and evaluation of mindfulness-based iPhone apps. *JMIR mHealth and uHealth*, *3*(3), e82. https://doir.org/10.2196/mhealth.4328

Mantha, B. R. (2018). Canada's prolific smartphone market skews to iOS: study. Retrieved from http://mediaincanada.com/2018/01/23/canadas-prolific-smartphone-market-skews-to-ios-study/

Mantilla, A., & Edwards, S. (2019). Digital technology use by and with young children: A systematic review for the Statement on Young Children and Digital Technologies. *Australasian Journal of Early Childhood*, *44*(2), 182-195. https://doi.org/10.1177/1836939119832744

Marcolino, M. S., Oliveira, J. A. Q., D'Agostino, M., Ribeiro, A. L., Alkmim, M. B. M., & Novillo-Ortiz, D. (2018). The impact of mHealth interventions: systematic review of systematic reviews. *JMIR mHealth and uHealth*, *6*(1), e23. https://doi.org/10.2196/mhealth.8873

Miller, J. (2010). Current views on the therapeutic value of homework in counselling and psychotherapy. *Counselling Psychology Quarterly*, *23*(2), 235-238. https://doi.org/10.1080/09515071003798121

Miranda, R., Soffer, A., Polanco-Roman, L., Wheeler, A., & Moore, A. (2015). Mental health treatment barriers among racial/ethnic minority versus white young adults 6 months after

intake at a college counseling center. *Journal of American College Health, 63*(5), 291-298. https://doi.org/10.1080/07448481.2015.1015024

Oss, M. E. (2021). More Mental Health Advertising, Less Mental Health Stigma? *Open Minds Daily Executive Briefing*.

O'Connor, R. C., Wetherall, K., Cleare, S., McClelland, H., Melson, A. J., Niedzwiedz, C. L., ... & Robb, K. A. (2021). Mental health and well-being during the COVID-19 pandemic: longitudinal analyses of adults in the UK COVID-19 Mental Health & Wellbeing study. *The British Journal of Psychiatry*, *218*(6), 326-333. https://doi.org/10.1192/bjp.2020.212

O'Dea, S. (2022, February 28). *Number of smartphone users worldwide from 2016 to 2021.* Statista. https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/

O'Dea, S. (2020, December 7). *Number of smartphone users in the Canada from 2018 to 2024.* Statista. https://www.statista.com/statistics/467190/forecast-of-smartphone-users-in-canada/

O'Dea, S. (2020, April 8). *Number of smartphone users in the United States from 2010 to 2024.* Statista. https://www.statista.com/statistics/201182/forecast-of-smartphone-users-in-the-us

Ofcom. (2017). Children and parents: Media use and attitudes report. Retrieved from www.ofcom.org.uk/__data/assets/pdf_file/0020/108182/children-parents-media-use-attitudes-2017.pdf

Olff, M. (2015). Mobile mental health: a challenging research agenda. *European Journal of Psychotraumatology, 6*(1), 278-282. https://doi.org/10.3402/ejpt.v6.27882

Patten, S. B., Williams, J. V., Lavorato, D. H., Bulloch, A. G., Charbonneau, M., Gautam, M., & Stuart, H. (2016). Perceived stigma among recipients of mental health care in the general Canadian population. *The Canadian Journal of Psychiatry*, *61*(8), 480-488. https://doi.org/10.1177/0706743716639928.

Pew Research Center (2019, June 12). *Mobile Fact Sheet.* Pew Research Center Internet and Technology. https://www.pewresearch.org/internet/fact-sheet/mobile/

Plowman, L., McPake, J., & Stephen, C. (2010). The technologisation of childhood? Young children and technology in the home. *Children & Society*, *24*(1), 63-74. https://doi.org/10.1111/j.1099-0860.2008.00180.x

Preziosa, A., Grassi, A., Gaggioli, A., & Riva, G. (2009). Therapeutic applications of the mobile phone. *British Journal of Guidance & Counselling*, *37*(3), 313-325. https://doi.org/10.1080/03069880902957031

Price, C. (1994). Open days making family therapy accessible in working class suburbs. *Australian and New Zealand Journal of Family Therapy*, *15*(4), 191-196. https://doi.org/10.1002/j.1467-8438.1994.tb01011.x

Rathbone, A. L., & Prescott, J. (2017). The use of mobile apps and SMS messaging as physical and mental health interventions: Systematic review. *Journal of Medical Internet Research*, *19*(8), e295. https://doi.org/10.2196/jmir.7740

Riley, B. J. (2015). The role of homework in exposure-based CBT outcome for problem gambling. *International Gambling Studies*, *15*(3), 394-407. https://doi-org.ezproxy.uleth.ca/10.1080/14459795.2015.1062532

Schulze, B. (2007). Stigma and mental health professionals: a review of the evidence on an intricate relationship. *International review of Psychiatry*, *19*(2), 137-155. https://doi.org/10.1080/09540260701278929

Sorkin, D. H., Murphy, M., Nguyen, H., & Biegler, K. A. (2016). Barriers to mental health care for an ethnically and racially diverse sample of older adults. *Journal of the American Geriatrics Society*, *64*(10), 2138-2143. https://doi.org/10.1111/jgs.14420

Sheng, H., Siau, K., & Nah, F. F. H. (2010). Understanding the values of mobile technology in education: a value-focused thinking approach. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, *41*(2), 25-44. https://doi.org/10.1145/1795377.1795380

Shih, C. H., Wang, S. H., & Wang, Y. T. (2014). Assisting children with attention deficit hyperactivity disorder to reduce the hyperactive behavior of arbitrary standing in class with a Nintendo Wii remote controller through an active reminder and preferred reward stimulation. *Research in Developmental Disabilities,35*(9), 2069–2076. https://doi.org/10.1016/j.ridd.2014.05.007

Shirky, C. (2011). The political power of social media: Technology, the public sphere, and political change. *Foreign affairs*, 28-41. www.jstor.org/stable/25800379

Silva, B. M., Rodrigues, J. J., de la Torre Díez, I., López-Coronado, M., & Saleem, K. (2015). Mobile-health: A review of current state in 2015. *Journal of Biomedical Informatics*, *56*, 265-272. https://doi.org/10.1016/j.jbi.2015.06.003

Simon, G. E., & Ludman, E. J. (2009). It's time for disruptive innovation in psychotherapy. *The Lancet*. 594-595. https://doi.org/10.1016/S0140-6736(09)61415-X

Standing, S., & Standing, C. (2008). Mobile technology and healthcare: the adoption issues and systemic problems. *International Journal of Electronic Healthcare*, *4*(3-4), 221-235. https://doi.org/10.1504/IJEH.2008.022661

Statista Research Department. (2020, February 24). *Share of adults who own a smartphone in the United Kingdom (UK) in 2008 and 2019, by demographics.* Statista. https://www.statista.com/statistics/956297/ownership-of-smartphones-uk/

Stoyanov, S. R., Hides, L., Kavanagh, D. J., Zelenko, O., Tjondronegoro, D., & Mani, M. (2015). Mobile app rating scale: a new tool for assessing the quality of health mobile apps. *JMIR mHealth and uHealth*, *3*(1), e27. https://doi.org/10.2196/mhealth.3422

Stoyanov, S. R., Hides, L., Kavanagh, D. J., & Wilson, H. (2016). Development and validation of the user version of the Mobile Application Rating Scale (uMARS). *JMIR mHealth and uHealth*, *4*(2), e72. https://doi.org/10.2196/mhealth.5849

Strudwick, G., Sockalingam, S., Kassam, I., Sequeira, L., Bonato, S., Youssef, A., ... & Crawford, A. (2021). Digital interventions to support population mental health in Canada during the COVID-19 pandemic: rapid review. *JMIR mental health*, *8*(3), e26550. https://doi.org/10.2196/26550

Sucala M, Schnur JB, Constantino MJ, Miller SJ, Brackman EH, Montgomery GH. (2012). The therapeutic relationship in e-therapy for mental health: a systematic review. *J Med Internet*, 14(4). https://doi.org/10.2196/jmir.2084

Sun, Y., Wang, N., Guo, X., & Peng, Z. (2013). Understanding the acceptance of mobile health services: a comparison and integration of alternative models. *Journal of Electronic Commerce Research*, *14*(2), 183.

Szlamka, Z., Kiss, M., Bernáth, S., Kámán, P., Lubani, A., Karner, O., & Demetrovics, Z. (2021). Mental health support in the time of crisis: Are we prepared? Experiences with the COVID-19 counselling programme in Hungary. *Frontiers in psychiatry*, *12*, 792. ttps://doi.org/10.3389/fpsyt.2021.655211

Tang, W., & Kreindler, D. (2017). Supporting homework compliance in cognitive behavioural therapy: essential features of mobile apps. *JMIR mental health*, *4*(2), e20. doi: 10.2196/mental.5283

Terry, N. P., & Gunter, T. D. (2018). Regulating mobile mental health apps. *Behavioral Sciences & the Law*, *36*(2), 136-144. https://doi.org/10.1002/bsl.2339

Titzler, I., Saruhanjan, K., Berking, M., Riper, H., & Ebert, D. D. (2018). Barriers and facilitators for the implementation of blended psychotherapy for depression: A qualitative pilot study of therapists' perspective. *Internet interventions*, *12*, 150-164. https://doi.org/10.1016/j.invent.2018.01.002

Tomlinson, E. R., Yousaf, O., Vittersø, A. D., & Jones, L. (2018). Dispositional mindfulness and psychological health: a systematic review. *Mindfulness*, *9*(1), 23-43.https://doi-org.ezproxy.uleth.ca/10.1007/s12671-017-0762-6

Torous, J., Andersson, G., Bertagnoli, A., Christensen, H., Cuijpers, P., Firth, J., & Mohr, D. C. (2019). Towards a consensus around standards for smartphone apps and digital mental health. *World Psychiatry*, *18*(1), 97. https://doi.org/10.1002/wps.20592

Torous, J., Chan, S. R., Tan, S. Y. M., Behrens, J., Mathew, I., Conrad, E. J., ... & Keshavan, M. (2014). Patient smartphone ownership and interest in mobile apps to monitor symptoms of mental health conditions: a survey in four geographically distinct psychiatric clinics. *JMIR Mental Health*, *1*(1), e5. https://doi.org/10.2196/mental.4004

Turna, J., Zhang, J., Lamberti, N., Patterson, B., Simpson, W., Francisco, A. P., ... & Van Ameringen, M. (2021). Anxiety, depression and stress during the COVID-19 pandemic: Results from a cross-sectional survey. *Journal of Psychiatric Research, 137*, 96-10 https://doi.org/10.1016/j.jpsychires.2021.02.059

Van Ameringen, M., Turna, J., Khalesi, Z., Pullia, K., & Patterson, B. (2017). There is an app for that! The current state of mobile applications (apps) for DSM-5 obsessive-compulsive disorder, posttraumatic stress disorder, anxiety and mood disorders. *Depression and Anxiety*, *34*(6), 526-539. https://doi-org.ezproxy.uleth.ca/10.1002/da.22657

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS quarterly*, 157-178. https://doi.org/10.2307/41410412

Xu, G. F., & Guo, J. X. (2019). *Mobile technology. New top technologies every librarian needs to know: A LITA guide.* American Library Association.

Wang, K., Varma, D. S., & Prosperi, M. (2018). A systematic review of the effectiveness of mobile apps for monitoring and management of mental health symptoms or disorders. *Journal of Psychiatric Research*, *107*, 73-78.

https://doi.org/10.1016/j.jpsychires.2018.10.006

Wang, H. Y., & Wang, S. H. (2010). User acceptance of mobile Internet based on the unified theory of acceptance and use of technology: Investigating the determinants and gender

differences. *Social Behavior and Personality: An International Journal*, *38*(3), 415-426. https://doi.org/10.2224/sbp.2010.38.3.415

Wang, X., Markert, C., & Sasangohar, F. (2021). Investigating Popular Mental Health Mobile Application Downloads and Activity During the COVID-19 Pandemic. *Human Factors*, 0018720821998110. https://doi.org/10.1177/0018720821998110

Watterson, R. A., Williams, J. V., Lavorato, D. H., & Patten, S. B. (2017). Descriptive epidemiology of generalized anxiety disorder in Canada. *The Canadian Journal of Psychiatry*, *62*(1), 24-29. https://doi.org/10.1177/0706743716645304

Webb, C., Rosso, I., & Rauch, S. (2017). Internet-based cognitive-behavioural therapy for depression. *Harvard Review of Psychiatry, 2*5(3), 114-122. https://doi.org/10.1097/hrp.0000000000000139

Weinberger, A. H., Gbedemah, M., Martinez, A. M., Nash, D., Galea, S., & Goodwin, R. D. (2018). Trends in depression prevalence in the USA from 2005 to 2015: widening disparities in vulnerable groups. *Psychological Medicine, 48*(8), 1308-1315. https://doi.org/10.1017/S0033291717002781

Williams, M. D., Rana, N. P., & Dwivedi, Y. K. (2015). The unified theory of acceptance and use of technology (UTAUT): A literature review. *Journal of Enterprise Information Management*. *28*, 443-488. https://doi.org/10.1108/JEIM-09-2014-0088

Wind, T. R., Rijkeboer, M., Andersson, G., & Riper, H. (2020). The COVID-19 pandemic: The 'black swan' for mental health care and a turning point for e-health. *Internet interventions, 20*. https://doi.org/10.1016/j.invent.2020.100317

World Health Organization. Department of Mental Health, Substance Abuse, World Health Organization, World Health Organization. Department of Mental Health, Substance

Abuse. Mental Health, World Health Organization. Mental Health Evidence, & Research Team. (2005). *Mental Health Atlas 2005*. World Health Organization.

Wozney, L., Newton, A. S., Gehring, N. D., Bennett, K., Huguet, A., Hartling, L., Mcgrath, P. (2017). Implementation of e-mental health care: viewpoints from key informants from organizations and agencies with eHealth mandates. *BMC Medical Informatics and Decision Making*, *17*(1). https://doi.org/10.1186/s12911-017-0474-9

APPENDIX 1: RESEARCH SURVEY

INFORMED CONSENT

You are invited to participate in a research project conducted by master's student Toni Labadie of the Education department at the University of Lethbridge. In this study, we are interested in looking at mental health professionals' perceptions of mental health apps. Through your participation I hope to better understand how mental health professionals are using apps in with their client's, and what they think about mental health apps.

REPSONSE WILL BE KEPT CONFIDENTIAL, WITH ALL DATA BEING AGGREGATED

About the Survey

This survey should take approximately 15 minutes to complete. Please only complete the survey once. There are no potential risks or discomforts associated with participation in this study. Benefits include the opportunity to participate in a research study. You may also feel as though you are contributing significantly to research. The scientific community may benefit from the proposed study, as the research is innovative and novel. Outside of these, you will not benefit directly from participation in this research.

This survey closes: January 1, 2021.

ALL RESPONSES WILL BE CONFIDENTIAL

Research Survey Participation

Your participation in this study is completely voluntary; you may decline to participate or skip some of the questions without penalty. All responses are anonymous and confidential.
You are free to withdraw from the study at any point up until the submission of your responses. As your answers are anonymous and confidential, once submitted your data will be impossible to identify, retrieve, and remove.

Privacy Protection

The researchers acknowledge that the host of the online survey (e.g., Qualtrics) may automatically collect participant data without their knowledge (i.e., IP addresses). Please note that confidentiality of data cannot be entirely guaranteed while in transit over the Internet. Although this information may be provided or made accessible, the researchers will not use or save this information. The privacy policy for Qualtrics is available at https://www.qualtrics.com/privacy-statement/

The collected information will be stored confidentially on a password protected computer in a locked office, with access restricted to the primary researcher Toni Labadie and thesis

supervisor Dr. Elaine Greidanus in the Faculty of Education at the University of Lethbridge. The results will appear in a written thesis document. They may also be presented at conferences and published in peer-reviewed journals. If you have questions at any time about the study or the procedures, you may contact the primary researcher Toni Labadie, email Labadie@uleth.ca. This project has been reviewed and approved by the University of Lethbridge Human Subject Research Committee. If you feel you have not been treated per the descriptions in this form, or your rights as a participant in research have been violated during this project, you may contact Susan Entz, ethics officer, Office of Research Ethics, University of Lethbridge, (403) 329-2747, or susan.entz@uleth.ca.

If you wish to participate in the survey, please check "I agree to participate in this study and have my data used" and then proceed to the questions.

Thank you in advance for your participation.

☐ Accept ☐ Decline

Mental Health Apps

For this survey you will be asked about mental health applications (apps). For the purpose of this study a mental health app can be defined as: a fast-growing category of software that can be installed on personal smartphones that are aimed at helping consumers identify and treat mental health concerns and/or mental illness. For the purpose of this research, mental health apps do not include apps relating to fitness, including yoga apps. However, will include thought/behaviour trackers/journals, diagnostic material, treatment, counselling/chat bots, meditations, mindfulness, and coaches.

1) Gender

- Male
- Female
- Non-binary
- Transgender
- Prefer not to say
- Other, please specify:

2) Age

- Please specify:
    - 18-24
    - 25-30
    - 31-36
    - 37-42
    - 43-49
    - 50-55

- 56-61
- 62-67
- 68+

3) Location

- Please specify:

4) What is the highest level of education you have completed?

- Bachelor's degree
- Master's degree
- PhD
- Other, please specify: _____

5) How long have you been a mental health professional?

- 1 - 5 years
- 6 - 10 years
- 11 - 20 years
- 21 - 30 years
- 31 - 40 years
- 40+ years

6) What is your identified mental health profession:

- Psychologist
- Psychiatrist
- Counsellor
- Psychiatric Nurse
- Pastoral Counsellor

- Social Worker
- Other, please specify: _____

7) What type of counselling do you most often use:

- Individual
- Family
- Couples
- Group
- Psychoeducational
- Other: please specify: _____

8) What population of clients do you generally work with? Select all that apply.

- Children (1-9)
- Adolescents (10-17)
- Young adults (18-24)
- Adults (25 - 59)
- Older Adults (60+)
- Other, please specify:

9) What theoretical framework do you primarily practice from?

- Cognitive Behavioural Theory
- Humanistic
- Gestalt
- Adlerian
- Solution-Focused
- Other, please specify: _____

10) What issues do you commonly work with? Select all that apply.

- Addictions
- Grief
- Trauma
- Anxiety
- Depression
- Anger
- Career
- Self-esteem
- Family violence
- Other, please specify:

11) Do you currently own a Smartphone?

- Yes
- No

11) Have you heard of mental health apps?

- Yes
- No

12) Do you use mental health apps with your clients?

- Yes
- No

17) Do you feel as though you have a general knowledge of mental health apps?

- Definitely yes
- Probably yes

- Kind of
- Probably not
- Definitely not

12) Please drag the items on the following list of mental health apps into the most applicable category 1) Use regularly with clients, 2) Use sometimes with clients, 3) Have heard of and would like to try with clients, 4) Have heard of but have no interest in trying with clients, 5) Have never heard of.

13) For the apps that you used regularly and use sometimes, how did you learn about the apps?

- Co-worker
- Workplace/Professional organization
- Own research
- Not applicable
- Other, please specify: _____

14) For the apps that you have used, how useful were they?

- Very useful
- Somewhat useful
- Not at all useful
- Not applicable

Follow up: What made the app useful or not useful?

_____

15) For the apps that you have used, do you plan to continue using them with clients?

- Yes
- No

- Not applicable

Follow up: If you answered yes, why did you decide to continue using it? If you answered no, why did you decide not to continue using it?

_____

16) With what percentage of your clients do you integrate the use of mental health apps at some point in the treatment?

- 0%
- 10%
- 25%
- 50%
- 75%
- 100%

18) Does the agency you work for require you to use any Apps in your work?

- Yes
- No
- Not sure

(If yes, would you use them if you were not required to):

  - Yes
  - No
  - Not sure
  - Please Explain: _____

19) Does the agency you work for prohibit you from using Apps in your work?

- Yes

- No
- Not sure

(If yes, would you use apps if you were allowed):

  - Yes
  - No
  - Not sure
  - Please Explain:_____

21) Do you find mental health apps to be useful with clients?

- Yes, with all clients
- Yes, with some clients
- Yes, it depends on the presenting issue
- No
- Not applicable

Please explain:_____?

22) What type of diagnoses do you use mental health apps for the most?

- Depression
- Anxiety
- Addictions
- Grief
- PTSD
- Eating disorders
- Not applicable
- Other: _____

- Please explain: _____

22) Have you had any training on mental health apps (workshops, professional development, etc.)?

- Yes
- No

Follow up: If yes, was the training useful? If no, why? Please explain your response:

23) What do you like about mental health apps? Select all that apply.

- Portability/Availability
- Content can be tailored specifically for clients
- Provides an affordable option for clients
- Allows me to work with clients who are geographically isolated
- Client anonymity
- Allows me to keep track of client's symptoms better
- Not applicable
- Please explain: _____

24) What do you not like about mental health apps? (Select all that apply)

- They are too expensive
- They are hard to use
- They are not research based
- I do not have training on how to use them
- Lack of confidentiality/privacy
- Please explain: _____

24) I would use mental health apps more if (select all that apply):

- I was confident that the client's privacy was not at risk
- I was confident that there was no advertising on the apps
- I was confident that client information would not be shared with third parties
- There was more evidence that they were beneficial to clients
- I had more training on them
- I was confident that it would not make the client's symptoms worse
- Cost was not a barrier for clients
- They were easy to use
- Other professionals were using them
- Clients enjoyed using them
- Not applicable
- Please explain: _____

What app feature do you find most important? (Select all that apply):

-

25) Are you familiar with guidelines or tools that would help you evaluate the quality of mental health apps? (Example: Mobile App Rating Scale)

- Yes
- No
- Somewhat

26) If yes, have you ever used a checklist or instrument to evaluate mental health apps before using them with clients?

- Yes
- No

27) If you have used any apps with clients that were not mentioned, please list them now

_____

APPENDIX 2: EMAIL RECRUITMENT LETTER

Email Recruitment letters. Intended to be sent out by the researcher, as well as mental health organizations to the members of their listservs.

Ethics Email Recruitment

Email Subject Line: University of Lethbridge Study – Mental Health Professionals' Perceptions of Mental Health apps.

Dear _____,

My name is Toni Labadie. I am a graduate student in the Faculty of Education at the University of Lethbridge (Canada) studying Counselling Psychology. I am inviting mental health professionals in Canada or North America to participate in a brief survey that would take approximately 15 minutes to complete. In this study, we are interested in looking at mental health professionals' perceptions of mental health apps. Through your participation, we hope to gain a better understanding of how mental health professionals are using apps with their clients.

Participation is also anonymous and confidential. You will not be asked to provide any personal identifying information. There are no anticipated risks to taking part in this survey and you can stop at any time. Any incomplete responses will not be included in the dataset.

If you would be interested in completing the survey, please go to the following URL:
https://uleth.qualtrics.com/jfe/form/SV_6zesbrbxh2N16dL

Thank you in advance for your participation.

Toni Labadie
Graduate Student
University of Lethbridge
403-363-3498
labadie@uleth.ca

APPENDIX 3: SOCIAL MEDIA RECRUITMENT

Social Media Recruitment Message

Social Media Recruitment

The following message will be posted on social media websites and in the comment sections of relevant pages relating to mental health. For the purpose of Instagram and Twitter, a picture of this message (see below) with a link to the survey will be posted.

Call for participants! Looking for mental health professionals over the age of 18 to participate in a study on mental health applications. You will be asked to complete a survey which will take approximately 15 minutes to complete. In this study, we are interested in looking at mental health professionals' perceptions of mental health apps. Through your participation, we hope to gain a better understanding of how mental health professionals are using apps with their clients.

All information will be kept strictly confidential. There will be no consequences if you decide to withdraw from the study at any point.

If you wish to participate in this study, please click here:
https://uleth.qualtrics.com/jfe/form/SV_6zesbrbxh2N16dL

Should any questions arise, please contact Toni Labadie at labadie@uleth.ca.

APPENDIX 4: UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY-2 MODEL