Closing the Northern Gap: Care Provider Perspectives on the Suitability of an eHealth App for Maternal Mental Health in Northwestern Ontario

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Abigale Elizabeth Kent

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Abigale Elizabeth Kent

Closing the Northern Gap: Care Provider Perspectives on the Suitability of an eHealth App for Maternal Mental Health in Northwestern Ontario

Dr. Helle Møller, Department of Health Sciences, Supervisor

Dr. Jennifer Chisholm, Department of Women's Studies, Thesis Committee Member

Dr. Vicki Kristman, Department of Health Sciences, Thesis Committee Member

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Author's Declaration of Originality

I hereby declare that I am the sole author of this thesis.

This is a true copy of the thesis, including
any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Maternal depression affects up to 25% of women during the perinatal period; however, less than 10% of these women go on to receive adequate mental healthcare (Andersson et al., 2004; Bailey, 2001; Cox, Sowa, Meltzer-Brody, & Gaynes, 2016; De Tychey et al., 2005; Gavin et al., 2005; Hostetter & Newport, 2005). Women living in Northwestern Ontario (NWO) face a number of unique barriers that further restrict their access to maternal mental health supports. Technological advances in eHealth interfaces may represent novel solutions for overcoming these obstacles. The HOPE app is an e-screening, e-referral, and e-therapy tool with a single, virtual point of access that has been designed to screen, diagnose, monitor, and treat mood and anxiety disorders in pregnant and postpartum women. The primary objective of this qualitative study was to understand maternal care and social service providers' perspectives on potential barriers and facilitators to using the HOPE app in NWO. The providers were asked to share their perspectives on the following three research questions: (1) What barriers or facilitators currently exist in the delivery of, access to, and use of existing maternal care services and supports in NWO? (2) What barriers or facilitators exist in the delivery of, access to, and use of the HOPE app in NWO? (3) What changes could be made to the current HOPE app in order to facilitate an improved fit to the specific needs of care providers and women (as perceived by care providers) living in NWO? Semi-structured, in-depth interviews were conducted with ten service providers representing various maternal care disciplines in Thunder Bay and Kenora. Five major themes and twenty-one sub-themes were identified and analyzed using an Interpretive Description approach. Notably, the participants acknowledged twenty distinct obstacles to maternal care in Northern communities which could be organized under the following four subsets: individual-level factors, social determinants of health, ecological determinants of health, and structural barriers. Prominent obstacles to maternal care included – among others – the lack of specific maternal mental health services, limited transportation options, diminished internet access, and the shortage of primary care providers. Overall, the social service and care providers viewed the HOPE app as a helpful tool for improving maternal care delivery and access, with six strong stipulations: (1) the content and images must be modified to suit women in NWO; (2) the resource lists must be localized; (3) the content must be culturally expanded in consultation with the communities of interest; (4) the high-risk referral protocol must be re-evaluated for safety; (5) coaches must reside in NWO and should be representative of demographics if at all possible; and (6) coaches must be reachable by telephone, email, text message, and wifi-based chat. The principal concerns for using the app in NWO was the reliability of internet connectivity in smaller rural and remote communities. When asked if they would feel comfortable referring women to the HOPE platform, the response from service providers was overwhelmingly positive. These findings suggest that the HOPE app may represent a beneficial addition to the services currently offered in NWO, particularly after region-specific modifications have been made. The providers suggested that addendums to the app should focus on expanding its visuals and content to better represent the diverse populations of women living in the North. Following revision, further research should include direct input from women using this service.

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This thesis is the cumulative product of many collaborative partnerships both within and beyond Ontario. Conducting this research would not have been possible without the support and contributions of a number of incredible individuals whom have helped me grow my small project into something I am immensely proud of. I very much look forward to seeing our work continue to evolve in the coming years.

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Chapter 1: Introduction

Context

Approximately one in five Canadians seek professional assistance for mental health disorders each year (Statistics Canada, 2019b). Mood and anxiety disorders are amongst the most prevalent psychological health conditions and are particularly predominant in women living in Ontario (Statistics Canada, 2013; Statistics Canada 2014; Toews, McRae & O'Donnell, 2016). In fact, anxiety and mood disorders affect women approximately twice as often as men and Ontario has mental illness prevalence rates that are double the next highest province (Albert, 2015; Canadian Institute for Health Information, 2011; Grigoriadis et al., 2017; Statistics Canada, 2014). Pregnancy and motherhood represent crucial periods where women may be particularly vulnerable to developing these conditions, with as many as one in four women experiencing depressive symptoms during the perinatal period (Ali, Hall, Anderson & Willingham, 2013; Andersson et al., 2004; Bailey, 2001; De Tychey et al., 2005; Gavin et al., 2005; O'hara & Swain, 1996; Statistics Canada, 2019a; Stowe, Hostetter & Newport, 2005).

The Importance of Addressing Maternal Mental Health Conditions

Identification and management of pre-, peri-, and postnatal anxiety and depression is crucial because these conditions can have a large negative impact on the lives of women, their families, and their children. Anxiety and mood disorders may impede a person's ability to complete everyday tasks and often leads to strain in both the professional and personal sectors of one's life (O'Donnell et al., 2016). Suicidality is strongly associated with depression, which has been - and continues to be - one of the leading causes of death among pregnant women in developed countries (Austin, Kildae & Sullivan, 2007; Grigoriadis et al., 2017; Miranda & Patel, 2005; Oates, 2003b; Perinatal and Maternal Mortality Review Committee, 2016; Queensland Department of Health, 2015; Reddy, 2010). Untreated and undertreated maternal depression – through no fault of the mother - also has a number of developmental consequences for infants and children, including preterm births, neonatal abnormalities, low birth weights, growth delays, and childhood behavioural disorders (Dayan et al., 2006; Dole et al., 2003; Field, Diego & Hernandez-Reif, 2006; Grigoriadis et al., 2017; Hoffman & Hatch, 2000; Jarde et al., 2016; Kramer et al., 2009; Luoma et al., 2001; McDonald, Kingston, Bayrampour, Dolan & Tough, 2014; Miranda & Patel, 2005; Mancuso, Schetter, Rini, Roesch, & Hobel, 2004; Mughal et al., 2018; O'Connor, Heron & Glover, 2002b; O'Connor, Heron, Golding, Beveridge & Glover, 2002b; O'Connor, Heron, Golding & Glover, 2003). As a result, early diagnosis and treatment of pre, peri-, and postpartum depression and anxiety is critical for improving the health and quality of life for both mothers and children living in Ontario (Kingston, Tough, & Whitfield, 2012). Despite this fact, there are significant gaps in access to quality maternal care and mental health services in Northwestern Ontario and often women do not actively seek assistance due to internalized feels of guilt or fear of judgement (Al-Hamad & O'Gorman, 2017; Mauthner, 1990; Møller et al., 2015).

The Current State of Maternal Mental Health Services in Northwestern Ontario

Collectively, the Thunder Bay and Kenora districts cover nearly 511,000 km^2 of land mass and serve over 211,000 individuals (Statistics Canada, 2017a; Statistics Canada, 2017e). One-third (34.2%) of these individuals live within small rural areas, whereas nearly half (46.0%) live within larger municipalities such as Thunder Bay [population ~107,909], Kenora [population ~15,096], and Sioux Lookout [population ~5,272] (Health Quality Ontario, 2017;

Statistics Canada, 2017a; Statistics Canada, 2017c; Statistics Canada, 2017e). All of these cities and the many smaller communities surrounding them belong to the North West Local Health Integration Network (LHIN), with an average population density of less than one person per square-kilometer (Health Quality Ontario, 2017; Statistics Canada, 2017b). Additionally, approximately one in five people (21.4%) in the North West LHIN region identify as Indigenous; the highest proportion amongst all fourteen of Ontario's LHINs (North West Local Health Integration Network, 2017). Pre-existing maternal services in Thunder Bay, Kenora, and Sioux Lookout include a mixture of midwifery organizations, community health centres, social services, hospital-based programming, EarlyON centres, and District Health Units (The MotHERS Program, 2020a; The MotHERS Program, 2020b). This study was created in direct response to the lack of access to comprehensive mental health services and supports in Northwestern Ontario outlined previously in the 2009 Canadian Mental Health Association report *Rural and Northern Community Issues in Mental Health* , the ongoing *Northern Ontario Postpartum Mood Disorder Project* supported by the Ontario Trillium Foundation, and in response to the challenges in access to prenatal care expressed by women in the 2018 *Prenatal Knowledge Xchange: For Equity in Birthing Experiences and Outcomes* executive summary report (Canadian Mental Health Association, 2009; Møller, Alzghoul, Wakewich & Sameshima, 2018; Rankin & Gordon, 2015). There is currently a need for more comprehensive, available, and accessible community maternal mental health services and supports in Northwestern Ontario (Canadian Mental Health Association, 2009; Rankin & Gordon, 2015). Presently, no coordinated provincial or national strategy exists to address maternal mood disorders in Ontario (Rankin & Gordon, 2015). The range of services offered in rural and remote areas is limited, and often individuals must travel to urban centers in order to access care (Canadian Mental Health Association, 2009; Rankin & Gordon, 2015). Moreover, continuity of care has historically been fragmented in Northern Ontario and patients may ‘fall through the cracks’ and cease to receive the follow up care that they need (Canadian Collaborative Mental Health Initiative, 2006).

The prenatal care report summarized findings from a project that examined the state of prenatal knowledge and midwifery uptake among Indigenous, Euro-Canadian, immigrant, and refugee women living in Thunder Bay, Kenora, and Sioux Lookout, Ontario. During the initial qualitative study, forty women from Thunder Bay, Sioux Lookout, and Kenora were interviewed to better understand their prenatal education experiences, challenges, and preferences (Alzghoul, Moeller, Wakewich, & Sameshima, 2019). These women (18 Indigenous, 9 Immigrant and Refugee, and 13 Euro-Canadian women who had all given birth within two years of the study) were recruited through purposive, snowball sampling methods from maternal/infant care organizations and local Indigenous and multicultural organizations (Alzghoul et al., 2019). Although the focus of this study was not maternal mental health, the majority of women interviewed "identified a strong need for more information about mental health supports and resources” (Møller et al., 2018, p. 5). Those currently living with mental health conditions felt that they lacked guidance on management strategies, and suggested "increasing the focus on mental health resources and supports through the pre-, peri-, and post-natal periods, increasing prenatal education time in medical visits, and beginning prenatal education sessions at an earlier phase of pregnancy” (Møller et al., 2018, p. 5). It is clear from these first-hand accounts that innovative maternal mental health resources need to be created to support pregnant and new mothers living in rural, remote, and Northern Ontario.

The HOPE App May Provide a Supplementary Care Solution

Technological advances in eHealth interfaces can help provide solutions to overcoming barriers such as a lack of services or stigmatization (Helis & Dufour, 2018; Price et al., 2014). This study aimed to address the gap in access to maternal mental health care by exploring care providers' perspectives on the suitability of a digital eHealth application (app) for mothers living with peri- and postnatal anxiety and depression in Northwestern Ontario. The HOPE app is an e-screening, e-referral, and e-therapy tool with a single, virtual point of access (Kingston, 2013). The app has been designed to monitor, screen, diagnose, and treat mood and anxiety disorders during each trimester of pregnancy as well as at three and six months postnatally (Bright et al., 2019; Kingston, 2018; Kingston, 2013). Symptomatology and risk level are measured using four self-report questionnaires, and then women are provided with telephone-based coaching, contact information for local resources, suggestions for healthy daily habits, mood tracking, and online cognitive behavioural therapy and interpersonal therapy modules (HOPE Digital Platform, 2020). The modules aim to deliver helpful coping strategies and healthy behaviours for women struggling with depression and anxiety (Kingston, 2018). The HOPE project represents the culmination of fifteen years of maternal health research by Dr. Dawn Kingston and her various team members out of the University of Calgary (HOPE Digital Platform, 2019). Beginning with her interest in interactive computer-based programming as an intervention for behavioural change in 2005, Dr. Kingston has systematically designed each element of the HOPE app based upon careful consideration of the existing medical literature (Kingston, 2005). The quantitative support for the efficacy of the HOPE app is discussed in detail further down within the literature review section of this report. The HOPE app was chosen as the eHealth model in this study for a number of reasons. Firstly, the platform was specifically created for a Canadian audience (Alberta), with input from Canadian care providers (Alberta), and under the direction of Canada's first and only endowed Research Chair in the area of perinatal mental health (Kingston, 2018). Secondly, although other similar platforms exist globally – including the Australian Mindmum maternal mental health app (Ministers Department of Health, 2017) – the Equity in Access team felt that partnering with Dr. Kingston and her team created an important opportunity for inter-agency partnerships between Lakehead University and the University of Calgary. This partnership benefits both parties, since the qualitative research being completed in Northern Ontario will ultimately complement the quantitative research Dawn is leading in Southern Ontario and Alberta, and vice versa. And finally, in our search to assess potential solutions for the care disparities in the North, the Equity in Access team felt that it was important not to 'reinvent the wheel', in the sense that modifying the pre-existing HOPE platform – as opposed to creating a new app from the ground up – will result in a more timely and less expensive end product for the women and care providers of Northwestern Ontario. However, while the HOPE app - or a similar eHealth platform - appears to be a potentially useful intervention for women living in Northwestern Ontario, no existing research could be identified that focuses on eHealth interventions to address maternal mental health in this specific setting. Therefore, this study not only contributes to available research on maternal mental health technologies in Northern settings; it also acts as the foundation from which a new health care option can be developed to meet the specific needs that care providers identify for women living in Thunder Bay, Sioux Lookout, Kenora, and beyond.

Purpose of the Study

Recent research by Møller and colleagues (2018) has demonstrated an immense and immediate need for accessible maternal mental health supports and resources in Northwestern Ontario. These supports are especially important given that several regions in this area – particularly the Thunder Bay District – have elevated rates of mental illness, perceived life stress, and self-injury (Northwestern Health Unit, 2017; Statistics Canada, 2019c; Statistics Canada, 2019d). Women living in Northwestern Ontario face unique barriers in accessing health care when compared to those living outside of the North. Some of these barriers include geographical isolation, costs associated with travel, care provider shortages, and the limited range of quality services (Al-Hamad & O'Gorman, 2017; Angus et al., 2012; Association of Ontario Midwives, 2015; Canadian Mental Health Association, 2009; Møller et al., 2015; Sutherns et al., 2004). Early diagnosis and treatment of perinatal and postpartum depression leads to better health and quality of life for both mothers and children; therefore, services targeting the peri- and postnatal period represent crucial health interventions for improving quality of care in Northwestern Ontario (Kingston, Tough, & Whitfield, 2012). One promising new delivery method is the use of digital applications to provide screening, education, treatment, and prevention support remotely and discreetly (Women & Children's Health Research Institute, 2019). This study aimed to help address the gap in access to maternal mental health care and education by exploring the suitability of this eHealth intervention for both care providers themselves and the care-provider-perceived needs of women living in Thunder Bay, Kenora, and Sioux Lookout.

The purpose of this study was to understand care providers' perspectives on potential barriers and facilitators to the use of the HOPE app in Northwestern Ontario. The population of focus included maternal service providers, social services providers, and health care professionals from organizations located within Thunder Bay, Kenora, and Sioux Lookout. More specifically, physicians, nurses, midwives, social service providers, and lactation consultants providing maternal services to the general population were invited to participate. This study is nested within a larger, on-going Equity in Access study entitled *Acting on what mothers told us: evaluating the HOPE app to support the mental health of pregnant and postpartum women in Northwestern Ontario*. The larger study is being conducted by a team of interdisciplinary researchers at Lakehead University with principal investigator Dr. Helle Møller and research coordinator Abigale Kent. The larger study is exploring the suitability of the HOPE app in regard to the care-provider-perceived needs of the diverse demographics of women living in Northwestern Ontario, including Indigenous, Euro-Canadian, racialized, and other women. In order to maintain the scope and feasibility of this thesis project, only care providers that delivered services to the general public are included. Care providers that work at organizations actively and specifically serving Indigenous, racialized, or immigrant women are being approached as part of the larger Equity in Access study. The findings of this project, in combination with the Equity in Access study, will be used to inform adaptions to the HOPE app in order to facilitate an improved fit to the specific needs of care providers and women (as observed by care providers) living in Northwestern Ontario. It is our intention that three new extensions to the HOPE platform will be created based upon the recommendations of care providers; including versions specific to Indigenous, Arabic Muslim, and Euro-Canadian women living in rural, remote, and Northern communities. This study will directly inform the Euro-Canadian extension.

Focussing on Care Provider Perspectives

After a modified version of the HOPE app has been created, the Equity in Access team will pilot the new app with mothers living with pre-, peri-, and postnatal depression in Northwestern Ontario. This pilot will serve to ask women the same questions that we have asked care providers under this division of the project. Women will be able to share whether or not they feel the platform is appropriate in addressing their needs and will be invited to share suggestions for improving the HOPE platform's content and layout. Among other reasons, care providers' perceptions and opinions are being sought before those of potential users' in order to fulfill the ethical responsibility of ensuring the app content and layout is deemed medically appropriate, culturally safe, and easily comprehensible for women with moderate to severe depression. More importantly, providers' opinions are crucial in gauging whether or not maternal care and social service professionals will readily endorse the platform, have the capacity to embrace an online therapeutic tool, and would feel comfortable referring clients to the app if it were offered in Northwestern Ontario. Schueller and colleagues (2016) argue that care provider needs are often overlooked during the developmental stages of eHealth design, which can lead to low provider uptake and limited clinical use by the intended audience (patients). Care professionals represent trusted health information gatekeepers for their patients; therefore, when providers do not feel comfortable embracing web-based platforms, their patients are also less likely to use them (East & Havard, 2015; IMS Institute, 2015; Schueller et al., 2016; Wu & Wang, 2005). In fact, a report by the IMS Institute for Healthcare Informatics found that mental health apps hold the highest ratio of patient download frequency to care provider recommendation rate (72%); a finding that would seem to further demonstrate the importance of care provider approval for eHealth intervention success (IMS Institute, 2015).

The importance of including care provider perspectives in app design and evaluation is outlined in the mixed-methods study by Schueller, Washburn, and Price (2016) exploring care providers' interest in web-based health tools. In this work, they state, "understanding providers' interest, including their needs and concerns, is imperative to getting these tools in the hands of patients" (Schueller et al., 2016, p. 145). Using qualitative interviews to explore the eHealth challenges and preferences of 15 care providers from the United States and Canada, Schueller and colleagues (2016) found that providers were most likely to embrace web-based tools if they offered the ability to remotely monitor patients and promoted adherence to provider-prescribed health behaviours. Furthermore, eHealth platforms that promoted information exchange between health professionals - as well as those that were highly intuitive, easy to use, and did not add to provider workload - were valued by the participants (Schueller et al., 2016). During the quantitative portion of their study, Schueller and associates (2016) surveyed 132 care providers from a single health care organization about their interest in eHealth technologies and found that approximately one-quarter of the participants (25.4%) demonstrated at least some willingness to embrace clinical mobile apps. Furthermore, the majority of participants (80.9%) reported that they already recommended at least some form of technology-based health tool to their patients: most often websites from official health organizations (Schueller et al., 2016). One-fifth of the mobile apps recommended by these care providers included a Cognitive Behavioural Therapy component; however, the limitations of the sample - representative of a single organization of professionals with similar evidence-based professions - challenges the generalizability of these findings (Schueller et al., 2016). Barriers to provider uptake included privacy/confidentiality concerns (51.0%), fears that eHealth interventions disrupt patient-provider therapeutic relationships (22.1%), and disruption of workflow (6.7%). In conclusion, this study highlights the importance of designing eHealth interventions around the needs and preferences of care providers as well as intended users. In the case of the Equity in Access study, beginning the conversation with care providers - with women consulted in the next phase of research - also helps to ensure that the appropriate referral pathways will be available, ready, and in place before women begin to trial the app. The Equity in Access team hopes to ensure that a concrete network of in-person services will be prepared and willing to take in women who feel that the HOPE app is insufficient in meeting their mental health needs during pilot testing.

Unfortunately, the vast amount of eHealth technologies that show promising results during clinical trials fail to gain traction when applied to real-life practice (Granja, Janssen, & Johansen, 2018; Jung & Berthon, 2009; Shortliffe, 2005). The systematic review by Granja, Janssen, and Johansen (2018) examined 221 studies on eHealth interventions and found that 46.5% of the 844 reported technology-based interventions failed when implemented in clinical settings; only 53.6% (452/844) actually succeeded in achieving their intended outcomes (Granja et al., 2018). During their investigation on why so many interventions fall short, Granja and colleagues (2018) found that a failure to consult care providers during intervention design played a key role in whether a platform would succeed or not. One of the most common concerns that care providers had with integrating eHealth into their practice was a disruption of regular workflow; the technologies increased the amount of work that the clinicians needed to complete and placed unwanted stress on their already busy schedules (Granja et al., 2018). Similarly, the eHealth interventions often failed to align with clinical processes that were already in place, they created new and undefined roles that caused confusion or inconvenience, and the clinicians feared that they would disrupt the therapeutic bond that was built through face-to-face communication (Granja et al., 2018). These findings are critical, as they clearly underline the disastrous consequences of failing to properly consult care providers on the impacts that eHealth technologies will have on their everyday practice. This notion has also been emphasized by Flynn, Gregory, Makki, and Gabbay (2009), who asserts that "eHealth services will not be used unless both patients' and clinicians' expectations and experiences are taken into account during their design and adoption" (Flynn et al., 2009, p. 588). In support of Schueller and colleagues (2016) above, Gun, Titov, and Andrews (2011) point out that not only is this consultation important because care providers can offer their first-hand experience, but also because clinicians act as "mediators" for the attitude formation of their patients. Care provider engagement with maternal mental health research in Northwestern Ontario can help highlight the vital role that clinicians and service providers play in designing care delivery approaches. In fact, the Mental Health Commission of Canada [MHCC] (2014) lists care provider engagement as a key consideration for transforming the Canadian health system using e-Mental health technologies. In their 2014 briefing document, the MHCC stresses that having clinician input as early as possible when designing web-based interventions can help to overcome the reluctance some providers may feel towards adopting new technologies (Mental Health Commission of Canada, 2014). For all of the reasons outlined above, the Equity in Access team felt that it was important to showcase the perspectives of maternal care providers before seeking the perspective of potential app users. It is essential that PCPs be given the opportunity to assess the feasibility of integrating the HOPE app into their practice, as well as the usefulness that this intervention may have in decreasing their workload or providing them supplemental support. If the care providers evaluate the HOPE app to be a safe and suitable care option that they would feel comfortable referring their clients to - and appropriate in-person referral options can be arranged - potential users will be approached to share their perspectives on the platform. It is anticipated that the results of these combined studies will support the launch of a rural/remote/Northern-specific HOPE app in Northwestern Ontario, which will ultimately help enhance mental health care delivery and improve maternal and infant health outcomes.

Contribution to Health Sciences

While the impact of evaluating the HOPE app has important implications practically, the HOPE and Equity in Access studies also contribute valuable knowledge to the field of health sciences research. These studies help to fill knowledge gaps within the field of maternal mental health in Northwestern Ontario, which will ultimately contribute to providing medical stakeholders and decision makers with the scientific evidence they need to inform their practice. In addition to expanding our understandings of maternal mental health, these studies help to promote interorganizational relationships between Lakehead University and the various health organizations of Thunder Bay, Kenora, and Sioux Lookout. Constructing mutual trust and collaboration between the university and the greater community creates opportunities for advanced future partnerships and allows for strengthened and streamlined research prospects. Furthermore, these projects support interprofessional collaboration between several maternal care disciplines in order to generate an encompassing appreciation of the barriers and facilitators to providing maternal mental health care in rural, remote, and Northern settings. These partnerships are particularly important given the Faculty of Health and Behavioural Sciences' ongoing commitment to the advancement of interprofessional education and collaboration as outlined in the National Interprofessional Competency Framework (Canadian Interprofessional Health Collaborative, 2010; Lakehead University, 2020). Additionally, this project was completed using Interpretive Description: a methodological approach that is fairly recent in its conception (Thorne, Kirkham, & MacDonald-Emes, 1997). While this framework has been deemed feasible and operable by Teodoro and colleagues (2018) and Hunt (2009), its limited use creates challenges for the situation and interpretation of this methodology. Thus, any contribution to the use of Interpretive Descriptions expands our awareness on how it can be applied to different scientific settings and helps to further illuminate challenges that arise from its application. Since Interpretive Description was originally created for the field of nursing research, this study represented a unique opportunity to apply this method outside of its envisioned setting. Finally, as highlighted in the discussion on the importance of care provider perspectives above, continuing the discussion on pre-, peri, and postnatal health in Northwestern Ontario is invaluable for maintaining the important dialogue between health services providers, health care decision-makers, and expectant/new mothers.

Research Questions

This project was guided by the following three provider-perceived questions: (1) What barriers or facilitators currently exist in the delivery of, access to, and use of existing maternal care services and supports in NWO? (2) What barriers or facilitators exist in the delivery of, access to, and use of the HOPE app in NWO? (3) What changes could be made to the current

HOPE app in order to facilitate an improved fit to the specific needs of care providers and women (as perceived by care providers) living in NWO? These research questions formed the basis for ten semi-structured, in-depth interviews conducted either one-on-one or in small groups with care providers in Thunder Bay, Kenora, and Sioux Lookout (see Appendix H for Interview Guide). The research questions for this project were developed in consultation with the Equity in Access team, in order to incorporate the goals of this study within the scope of the larger project. The same interview guide is being used for both studies, but the focus areas for data analysis is broader within the larger project. This study focused on barriers, facilitators, and adaptions of the app for a primarily Euro-Canadian audience; the scope of the larger study expands this audience to include Indigenous, racialized and 'other' care providers and women. In addition to the three research questions above, an additional two research questions are being addressed by the larger project: (4) Are there parts of the HOPE app that are considered particularly useful for Indigenous, Euro-Canadian, racialized, or other care providers and women (as perceived by care providers) in Northwestern Ontario? (5) Are there parts of the HOPE app that could be improved for Indigenous, Euro-Canadian, racialized, or other care providers and women (as perceived by care providers) in Northwestern Ontario? I will speak to these last two questions briefly within this thesis (based entirely upon the perspectives of Euro-Canadian social service and care providers); however, a more in-depth exploration of these topics will be reserved for the Equity in Access project. The observations and opinions shared by the Euro-Canadian social service and care providers on the cultural-appropriateness of the app are primarily informed by their professional clinical encounters and some personal lived experiences. These experiences have been shaped through working with 'racialized' women of

Indigenous or ‘other’ descent over their years of practice in Northwestern Ontario. These perspectives are highlighted in this work (briefly) to help frame our ongoing conversation regarding HOPE app suitability; however, it is also important to note that this dialogue represents only a small portion of the voices that must be engaged in the larger discussion on cultural appropriateness.

Chapter 2: Literature Review

Introduction to the Topic

In 2011, the Canadian Mental Health Association estimated that approximately one in five Canadians are affected by mental health disorders each year (Smetanin et al., 2011). This estimate proved accurate in 2018, when nearly 20% of Canadians reported needing mental health care through the Canadian Community Health Survey (Statistics Canada, 2019b). In fact, approximately 5.3 million Canadians over the age of eleven required professional support for their mental health in 2018 (Statistics Canada, 2019b). Accounting for the individuals not captured within this survey, it is likely that somewhere between 5.3 million and 7 million Canadians are currently living with mental illness today (Statistics Canada, 2019b; Smetanin et al., 2011). Mood and anxiety disorders are among the most prevalent mental health disorders faced by Canadians and are characterized by abnormal elevations or depressions in an individual's baseline mood (O'Donnell et al., 2016; Pearson, Jan & Ali, 2016; Statistics Canada, 2013; Statistics Canada 2014; Toews, McRae & O'Donnell, 2016). Mood disorders are often categorized into the two overarching diagnoses of bipolar and depressive disorders. The medical community describes individuals living with bipolar and depressive disorders as residing along a spectrum from depressed to manic (Angst, Ajdacic-Gross & Rössler, 2015; American Psychiatric Association, 2013). In contrast, anxiety disorders include a wide range of diagnoses relating to excessive and prolonged feelings of anxiety, distress, fear, or worry (Government of Canada, 2002; Government of Canada, 2006). Examples of anxiety disorders include – but are not limited to – generalized anxiety disorder (GAD), social anxiety disorder (SAD), post-traumatic stress disorder (PTSD), and obsessive-compulsive disorder (OCD)

(American Psychiatric Association, 2013; Government of Canada, 2002; Government of Canada, 2006). Unfortunately, mood and anxiety disorders are not mutually exclusive, and often co-occur with each other or with other types of mental illness (Brown, Campbell, Lehman, Grisham & Mancill, 2001; de Graaf, Bijl, Spilker, Beekman & Vollebergh, 2003; Devane et al., 2005; Kessler et al., 2003; Kessler et al., 2006; Lamers et al., 2011; Lenze et al., 2000; Newman, Silva, Moffitt & Caspi, 1998; O'Donnell et al., 2014; Strine et al., 2008).

The Distribution of Mental Illness

The burden of mental illness is not evenly distributed amongst the Canadian population. In fact, Ontario has one of the highest prevalence rates of major depressive disorder across all provinces and has the highest incidence of suicidality (O'Donnell et al., 2016; Palay et la., 2019; Statistics Canada, 2014). Approximately 82% of mood and anxiety diagnoses are concentrated within urban settings; however, it is unknown whether the tendency for higher rates in urban settings is authentic, or whether it is due to underdiagnoses in rural areas as a result of the lack of mental health services or some other factor (O'Donnell et al., 2016; Statistics Canada, 2014). Mood and anxiety disorders also disproportionately impact one biological sex more frequently than the other. Globally, the prevalence of anxiety disorders in women is approximately twice as high as in men and women are three-times more likely to attempt suicide (Albert, 2015; Alonso et al., 2004; Bandelow & Michaelis, 2015; Baxter et al., 2014; Cyranowski et al., 2000; Ferrari et al., 2014; Findlay, 2017; Health Canada, 2002; Murray et al., 2013; O'Donnell et al., 2016; Whiteford et al., 2013; Wittchen & Jocobi, 2005). In Canada, it has been estimated that as many as 16% of women will be affected by an anxiety disorder within their lifetime (Government of Canada, 2006). The frequency of depression demonstrates similarly gendered patterns. In 2012, the prevalence for major depression in Canada was 5.8% for women compared to only 3.6% for men (Pearson, Janz & Ali, 2013). Young women between the ages of 14 and 25 show the highest rates of depression (Findlay, 2017; Patten et al., 2006; Pearson et al., 2013). It is also within this group that the largest disparity exists between biological sexes with a female-to-male ratio of more than 1.6 (Findlay, 2017; Patten et al., 2006; Pearson et al., 2013). Moreover, single mothers and women who are socially disadvantaged are at a heightened risk of developing depression (Bowen, Bowen, Maslany & Muhajarine, 2008; Bowen, Stewart, Baetz & Muhajarine, 2008; Cairney et al., 2003). While the prevalence of depressive symptoms seems to decrease slightly in both males and females with age (from 5.0% annual prevalence among 15-25 year-olds [95%CI 2.6–3.3] to an annual prevalence of 1.9% by age 65 and older [95% CI 1.5–2.4]), differences in the occurrence of depression between the biological sexes is consistently observed regardless of age group (Patten et al., 2006; Pearson et al., 2013). Additionally, episodes of anxiety and depression can be triggered by exposure to a stressful life event or dramatic changes in perceived sense of self (Burcusa & Iacono, 2007; Kingston, Heaman, Fell, Dzakpasu & Chalmers, 2012). Examples of life events that are uniquely experienced by women include pregnancy, birth, and motherhood.

Maternal Anxiety and Depression

The pre-, peri-, and postnatal periods represent significant transition stages for self-reflection and identity change for women (Ali, Hall, Anderson & Willingham, 2013; Bailey, 2001; Laney, Hall, Anderson & Willingham, 2015; Salmela-Aro, Nurmi, Saisto & Halmesmäki, 2000). As such, these periods may represent crucial time periods during which women are particularly vulnerable to developing mood and anxiety disorders. In fact, it has been estimated that as many as one in four women experience depression and anxiety during pregnancy and the postpartum period (Howard et al., 2018; Statistics Canada, 2019a). Anxiety is most prevalent in women around peak childbearing years, and it is generally accepted that a temporal relationship exists between anxiety and the development of secondary depression (Altshuler, Hendrick & Cohen, 2000; Beck, 2001; Dealy et al., 1981; Noyes, Clancy, Hoenk & Slymen, 1980; Pigott, 2003; Roth, Gurney, Garside & Kerr, 1972; Statistics Canada, 2019a; Wittchen, Kessler, Pfister & Lieb, 2000). Other risk factors, such as a personal history of depression, inadequate social support, intimate partner violence, and experiencing birth complications also contribute to an increased likelihood of emergent postnatal depression (Beydoun, Beydoun, Kaufman, Lo & Zonderman, 2012; Beydoun, Al-Sahab, Beydoun & Tamim, 2010; Cohen et al., 2002; Horowitz & Goodman, 2005; Myers & Johns, 2019). Consequently, assessment of risk factors and timely diagnosis and treatment of anxiety disorders during early pregnancy may help to prevent the subsequent development of maternal depression (Horowitz & Goodman, 2005). This is particularly poignant given that several studies have demonstrated that most postnatal depression cases are preceded by some form of antenatal anxiety and that women with prenatal anxiety are up to 2.7 times more likely to report severe depression during the postpartum period than are women without anxiety (Austin, Tully and Parker, 2007; Heron et al., 2004; Statistics Canada, 2019a; Sutter-Dallay et al., 2004).

Among perinatal women, the rate of depressive symptoms has been estimated at approximately 25%, and up to 15% of women battle a major depressive disorder (Andersson et al., 2004; De Tychey et al., 2005; Gavin et al., 2005; O’hara & Swain, 1996; Statistics Canada, 2019a; Stowe, Hostetter & Newport, 2005). Postnatally, approximately 10-15% of new mothers encounter periods of depression within the first 12 months following childbirth (Beck, 2002; Kendall-Tackett, 2005; Roux, Anderson & Roan, 2002). Postpartum depression affects women almost twice as often as men and suicide is a leading cause of death among pregnant women (Albert, 2015; Canadian Institute for Health Information, 2011; Grigoriadis et al., 2017). Evidently, mood and anxiety disorders during the pre-, peri-, and postnatal periods affect an enormous number of women in Canada each year. Despite this, many cases of depression remain undiagnosed; for example, two studies completed in 2003 found that approximately 79-86% of women with clinical depression have never received a formal diagnosis and accompanying treatment plan (Marcus, Flynn, Blow & Barry, 2003; Scholle et al., 2003; Thomson & Sharma, 2017; Thurgood, Avery & Williamson, 2009; Nielson, Videbech, Hedegaard, Dalby & Secher, 2000). Perhaps more conservatively, the study by Marcus and colleagues (2003) screened 3472 pregnant obstetric clinic patients and discovered that only 13.8% of women with depressive symptoms were receiving counselling, medication, or psychotherapy. These estimates frame calculations made in 2002 and 2010 by the United States Preventive Services Task Force and Chaudron and colleagues (2010); both of whom estimated that up to 50% of women experiencing maternal depression pre- and postpartum remain undiagnosed and untreated (Chaudron et al., 2010; U.S. Preventive Services Task Force, 2002). A more recent assessment completed during the systematic review by Cox, Sowa, Meltzer-Brody, and Gaynes (2016) analyzed 32 studies and maintained the estimate that over 50% of women with antenatal or postnatal depression are never diagnosed. Furthermore, they found that "50%–70% of women go undetected, approximately 85% go untreated, 91%–93% are not adequately treated, and 95%–97% continue to suffer from symptoms without remission" (Cox et al., 2016, p. 1197).

Reasons for underdiagnoses include time constraints, a deficiency in early screening, ill-defined or undefined indicators, an absence of universally accepted screening tools, the lack of official recommendations for screening, and social stigma (Austin & Lumley, 2003; Horowitz & Goodman, 2005; Kingston et al., 2015a; Thurgood et al., 2009). Additionally, women who live in remote and rural areas may face a number of further challenges to accessing clinical assistance such as lengthy referral times, travel expenses, and child care costs (Association of Ontario Midwives, 2015; Canadian Mental Health Association, 2009). Maternal judgement and stigma – discussed in further detail within subsequent sections – also prevent women from seeking an official diagnosis (Dennis & Chung-Lee, 2006; Fonseca, Moura-Ramos, & Canavarro, 2017; Fonseca, Gorayeb, & Canavarro, 2015; Hall, 2006; Sword, Busser, Ganann, McMillan & Swinton, 2008). In summary, it would seem that anywhere between 14% to 86% of women may be 'falling through the cracks' of our current health care system and are dealing with the symptoms of depression and anxiety without support from professional healthcare services. This broad and imprecise estimate demonstrates the current gaps in our understanding of the scope of depression and anxiety within Canada, Ontario, and Northwestern Ontario. Therefore, new health solutions need to be created in collaboration with health professionals, stakeholders, and patients to address current obstacles to holistic care.

Disparities in Health Care in the North

A number of practical challenges exist to providing primary care in rural, remote and Northern communities in Ontario. Encompassing more than 1 million square kilometers of land, Ontario is home to approximately 14 million people spread sparsely across the expansive land mass (Statistics Canada, 2018a). Northern residents often need to travel large distances in order to reach health resources that are located closer to urban centers (Sahai et al., 2000). Geographical isolation - exacerbated by the task of recruiting and retaining health care professionals – is a robust challenge for creating a comprehensive and accessible health care system (Registered Nurses' Association of Ontario, 2015). Care providers in these regions must constantly be recruited and reoriented to address Northern health issues with less resources than are typically afforded within urban settings (Baumann, Hunsberger, Blythe & Crea, 2006; Hunsberger, Baumann, Blythe & Crea, 2009; Montour, Baumann, Blythe & Hunsberger, 2008; Pitblado et al., 2013). As a result, health care professionals working in remote and rural communities often approach their care roles as generalists that can treat a wide range of disorders across multiple clinical domains (Registered Nurses' Association of Ontario, 2015). While isolated settings present a number of challenges to health care professionals and service providers, they also present a unique opportunity to develop new care delivery strategies in response to these obstacles (Montour, Baumann, Blythe, & Hunsberger, 2009). In particular, this project seeks to understand barriers and facilitators to using e-screening, e-referral, and e-therapy for primary care delivery at the junction between maternal and mental health domains.

Disparities in Maternal Care

During a recent project by Møller and colleagues (2018), forty women who had given birth in the past two years were interviewed about the state of prenatal knowledge and services offered in Northwestern Ontario. Overall, women in rural, remote, and Northern settings experience significant barriers in accessing pre, peri- and postnatal care and education despite the shared view that prenatal knowledge and education positively contributes to empowerment (Møller et al., 2018). Women who participated in the study expressed the desire to receive more information about pregnancy, labour, birthing, breastfeeding, and motherhood (Møller et al., 2018). When programs were made available, the timing of the classes (particularly in late second and third trimester) made attendance impractical for some women (Møller et al., 2018). Additionally, some mothers felt stigmatized due to their age or social circumstances, which prevented them from accessing available services (Møller et al., 2018). In addition to works produced by members of the Equity in Access team (Alzghoul et al, 2020; Møller et al, 2015; Møller et al, 2018), only five other studies could be located that examined the current state of maternal care in Northwestern Ontario (Association of Ontario Midwives, 2015; Dooley et al., 2009; Gaylord, Bailey & Haggarty, 2015; Haggarty, Ryan-Nicholls & Jarva, 2010; O'Driscoll et al., 2011). A brief literature search was performed in March 2020 using the Nursing & Allied Health Database, PsycInfo, PubMed, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) database in order to explore what research currently exists on maternal mental health in Northwestern Ontario. Search terms included an all text search of ["Northwestern Ontario" or "Northern Ontario" or "Thunder Bay" or "Sioux Lookout" or "Kenora" or "Dryden" or "Fort Frances" or "Greenstone" or "Red Lake" or "Marathon" or "Atikokan"] and abstract terms ["maternal health" or "maternal mental health" or "maternal anxiety" or "maternal depression" or "postpartum depression" or "perinatal" or "postnatal" or "prenatal depression" or "postpartum anxiety" or "perinatal anxiety" or "postnatal anxiety" or "prenatal anxiety" or “access to care”]. Results were then limited to academic journals published after December 31, 1999. Results yielded 42 articles from the Nursing & Allied Health Database, 11 articles from PsycInfo, 40 articles from PubMed, and 19 articles from CINAHL. The 112 articles were then reduced to 22 articles upon title review and were further reduced to 4 articles following abstract review (Dooley et al., 2009; Gaylord et al., 2015; Haggarty et al., 2010; O'Driscoll et al., 2011). Two of these studies addressed maternal care (discussed below) and two addressed maternal mental health care (discussed in the next section). The Association of Ontario Midwives (2015) report on *Rural and Remote Maternity Care in Ontario* was also consulted as part of this literature review. In total, the state of maternal mental health in Northwestern Ontario is captured across ten studies and reports identified within the published literature (Alzghoul et al., 2020; Canadian Mental Health Association, 2009; Dooley et al., 2009; Gaylord et al., 2015; Haggarty et al., 2010; Møller et al., 2015; Møller et al., 2018; O'Driscoll et al., 2011; Rankin & Gordon, 2015; The Association of Ontario Midwives, 2015).

The study by O'Driscoll and colleagues (2011) explored the perinatal knowledge and birthing experiences of First Nations women from Northwestern Ontario. Women from remote communities who were required to travel great geographical distances to give birth reported negative experiences of loneliness, boredom and stress from leaving behind other young children (O'Driscoll et al., 2011) Medical evacuation also meant that these women could not bring family members to support them through the birthing process, which they felt was a time when social familial support was essential (O'Driscoll et al., 2011). Women interviewed during this study largely agreed that more supports and services needed to be created specifically for rural and remote communities (O'Driscoll et al., 2011). Similarly, the study by Dooley and Colleagues (2011) asserts that rural and remote obstetric services need additional financial and staffing support in order to overcome challenges related to high patient volume and remote location. However, recruiting physicians to rural and remote health care facilities has proven challenging in the past, in part because low caseloads may threaten financial sustainability

(Association of Ontario Midwives, 2015). Therefore, remotely delivered eHealth options such as the HOPE app may provide an attractive solution for providing primary care without the need for health care providers to be physically present (Dooley et al., 2011). These findings are consistent with the Association of Ontario Midwives (2015) report which described a "growing trend in rural Ontario [towards] the centralization of health services [in] regional centres" (Association of Ontario Midwives, 2015, p. 3). The centralization of maternal services forces women living in rural and remote communities to travel, causing undue stress, trauma, and emotional strain (Association of Ontario Midwives, 2015).

Disparities in Maternal Mental Health Care

The availability of primary care providers is particularly important to the mental health of women in Northwestern Ontario because these professionals represent the first contact point for nearly half of all Canadians seeking mental health services (Haggarty, Ryan-Nicholls & Jarva, 2010; Lin, Goering, Offord, Campbell, & Boyle, 1996; Vasiliadis, Lesage, Adair, Wang & Kessler, 2007). Unfortunately, individuals with mental health disorders often face lengthy wait times for diagnosis and even when they do receive care, mental health disorders are often under-detected by primary care providers (anywhere from 14-86%) and patients are never referred to secondary care (Bijl et al., 2003; Haggarty, Ryan-Nicholls & Jarva, 2010; Pelletier, O'Donnell, Dykxhoorn, McRae & Patten, 2017; Wittchen, Mühlig & Beesdo, 2003). In order to improve the detection and treatment rates, Family Health Teams in Northwestern Ontario have adopted a shared mental health care (SMHC) model that emphasizes interprofessional collaboration between family physicians, psychiatrists, and other care professionals (Gaylord, Bailey & Haggerty, 2015; Haggarty, Ryan-Nicholls & Jarva, 2010). The final two articles identified during the literature review examined SMHC models and their contribution to changing referral patterns of primary care providers in Northwestern Ontario (Gaylord, Bailey & Haggerty, 2015;). The synopsis by Haggarty and colleagues (2010) found that collaborative care models are most useful for rural and remote care settings if they emphasize flexibility, local adaption, informal collaboration, allow for multiple generalized roles within multidisciplinary teams, and seek to overcome gaps in existing services using resourceful solutions. When these requirements are met, SMHC models allow care providers to capitalize on local collaborative opportunities in order to identify and treat mental health disorders within rural and remote settings (Haggarty, Ryan-Nicholls & Jarva, 2010). Similarly, Gaylord and colleagues (2015) found that SMHC models led to increased access to primary mental health services and to earlier detection and treatment of mental health disorders in Northwestern Ontario (Gaylord, Bailey & Haggerty, 2015). The number of referrals to secondary care was much higher for primary care providers that were co-located with SMHC facilities versus those who were not; lending support for the use of the SMHC model to improve mental health care in rural, remote, and Northern settings (Gaylord, Bailey & Haggerty, 2015).

The lack of consistent and accessible mental health supports in Northwestern Ontario was also mentioned by women taking part in the study by Møller and colleagues (2018). During the interviews, more than 50% of women reported that they experienced mental health challenges during pregnancy, postpartum, or both (Møller et al., 2018). Those who were currently managing an existing mental health condition felt that they lacked guidance on coping and management strategies. Additionally, more than half of the women interviewed expressed an immediate need for more mental health supports and resources in Northwestern

Ontario, both during pregnancy and the postpartum period (Møller et al., 2018). In addition to an overall lack of resources, women communicated a lack of knowledge about the types of resources that already existed and were available to them (Møller et al., 2018). While the Ontario Telemedicine Network (OTN) has made some advances in the use of technology to reach underserviced rural and remote parts of Ontario, individuals may still be forced to drive large distances in order to access this service (O'Gorman & Hogenbirk, 2016). In fact, 14% of the communities in Northern Ontario require a 60-minute drive or longer to reach the nearest OTN unit and total travel time tends to increase as community population size decreases (O'Gorman & Hogenbirk, 2016). The lack of resources for mental health care in Northern Ontario is particularly troubling given the elevated rates of mental health disorders in these areas. Hospitalizations for mental health and self-injury in Northwestern Ontario were double the national rate in 2015 (Northwestern Health Unit, 2017). Within the Thunder Bay District, mental health and wellbeing among 20 to 34-year-olds compares unfavorably to provincial and national rates, and perceived life stress – particularly among women – is markedly elevated (Statistics Canada, 2019c; Statistics Canada, 2019d). When maternal mental health programs are available, they may not be accessed by women due to fears of stigmatization or judgement, lack of transportation, or cost of child care supports (Kingston et al., 2015). Therefore, providing a care option that can be accessed within the comfort of one's own home may provide the security, privacy, and convenience that women have previously identified as barriers to seeking traditional care.

Summarizing the Existing Literature

In summary, maternal mental health care has been reported to be most effective when it is geographically accessible to women and does not require long-distance travel. Additionally, mental health care requires institutional infrastructure that emphasizes collaboration between medical and psychological experts; however, funding and staffing such facilities in Northwestern Ontario has proven challenging in the past. Large gaps still exist in our understanding of many aspects of maternal mental health in Northwestern Ontario; no articles could be located that examined eHealth interventions for maternal care in this particular setting and only singular studies could be identified that approached aspects of the maternal health experience from the perspectives of women and care providers in the North respectively. Therefore, this thesis project – which has been created in direct response to the gaps in maternal mental health resources brought forward by women in Northwestern Ontario – is critical for advancing our understanding of maternal mental health care-delivery and care-seeking behaviours in rural, remote, and Northern Ontario settings. Not only will this investigation fill an existing research gap, but it will also act as a foundation from which a new health care option can be developed to meet the specific needs of care providers and mothers (as identified by care providers) living in Thunder Bay, Sioux Lookout, Kenora, and beyond.

The Importance of Maternal Mental Health

The burdens associated with depression and anxiety can have profound effects on the lives of individuals. Anxiety and mood disorders may impede a person's ability to complete everyday tasks and often leads to strain in both professional and personal sectors of one's life, such as through loss of employment or disruption of social relationships with friends and family (Knudson-Martin & Silverstein, 2009; O'Donnell et al., 2016). Women with depression and anxiety report feelings of isolation, despair, intense worry, and incompetence surrounding motherhood (Knudson-Martin & Silverstein, 2009). Suicidality is strongly associated with depression and is one of the leading causes of maternal death in developed countries (Austin, Kildae & Sullivan, 2007; Grigoriadis et al., 2017; Miranda & Patel, 2005; Oates, 2003b; Perinatal and Maternal Mortality Review Committee, 2016; Queensland Department of Health, 2015; Reddy, 2010). Estimates posit that anywhere between 5-21% of women with prenatal or postpartum neurosis have self-harm ideation, roughly 5% successfully commit suicide, and nearly 4% commit infanticide (Barr & Beck, 2008; Bowen, Stewart, Baetz & Muhajarine, 2009; Fairbrother & Woody, 2008; Lindahl, Pearson & Colpe, 2005; Pope, Xie, Sharma & Campbell, 2013; Sit et al., 2015; Wisner et al., 2013). In fact, in the first postnatal year, women with diagnosed postpartum psychosis have a 70-fold increased suicide risk compared to the pre-pregnancy period (Appleby, Mortensen & Faragher, 1998; Oates, 2003a). Despite some conflicting reports, several studies have shown that pregnancy does not have a protective effect against suicide attempts (Gavin, Tabb, Melville, Guo & Katon, 2011; Vaiva, Tiessier, Cottencin & Goudemand, 1997). Because mood disorders co-occur with the large majority of suicides, it follows that effective treatment of pre-, peri, and postpartum depression should lead to a decrease in the number of maternal deaths (Reddy, 2010).

Often cases of depression and anxiety are viewed by healthcare professionals and health science researchers through a medical lens that emphasizes epidemiology and etiology (Mauthner, 1999; Thangadurai & Jacob, 2014; Ussher, 2010). While this perspective is useful for developing screening tools and treatment programs, it does little to validate the subjective experiences of individuals (Thangadurai & Jacob, 2014; Ussher, 2010). Alternatively, social science and feminist perspectives on postpartum depression focus on the particular experiences of women, which are largely influenced by socio-political contexts (Choi, Henshaw, Baker, & Tree, 2003; Mauthner, 1999; Ussher, 2010). Through this lens, the development of anxiety and depression is not classified as a pathological response, but rather a social response to the imbalanced pressures posed on women by pregnancy and motherhood (Choi et al., 2003; Mauthner, 1999; Ussher, 2010). These pressures include loss of identity, autonomy, independence, and power (Mauthner, 1999). Women may experience conflict between their own beliefs of what motherhood ‘should be’ and the reality of their own experiences, which leads to feelings of helplessness and worry (Choi et al., 2003; Mauthner, 1999). Social constructs also play a role in the help-seeking behaviours of women with anxiety and depression (Dennis & Chung-Lee, 2006; Fonseca, Moura-Ramos, & Canavarro, 2017; Fonseca, Gorayeb, & Canavarro, 2015; Sword, Busser, Ganann, McMillan & Swinton, 2008). When women fail to live up to their own expectations of the ‘ideal’ mother, they fear they will be criticized as ‘bad’ mothers by health care professionals (Dennis & Chung-Lee, 2006; Mauthner, 1999; Sword et al., 2008). Women may also fail to seek help due to fears of becoming ‘burdensome’ to their families if they admit to struggling (Dennis & Chung-Lee, 2006). Understanding and addressing these fears is one way in which care providers can support women in their care (Sword et al., 2008). Under social and feminist theory, depression is a social construct that can only be addressed by exploring the social determinants of health and returning agency back to women (Mauthner, 1999).

The Effects of Maternal Depression on Family

Postnatal depression and anxiety also place a large social burden on the family of the individual (Burke, 2003; Letourneau et al., 2012). Women with depression have elevated rates of marital conflict, dissatisfaction, and divorce (Benazon & Coyne, 2000; Burke, 2003; Leinonen, Solantaus & Punamaeki, 2003; Meadows, McLanahan & Brooks-Gunn, 2007; Whisman, Uebelacker & Weinstock, 2004). In a study by Davey and colleagues (2006), husbands of women with postnatal depression expressed feelings of helplessness because they perceived their loved one to be suffering and felt powerless to assist them. The added burden of stress and fatigue can eventually contribute to feelings of anger, resentment, and dissatisfaction towards spousal partners with depression (Davey et al., 2006; Logan, 2011; Whisman, Uebelacker, & Weinstock, 2004). Mothers with depression are less likely to seek or provoke positive social interactions from others, which can further contribute to an environment of rejection between spouses (Burke, 2003; Feldman et al., 2009). Maternal depression and anxiety also have a number of consequences for infants and children. High anxiety and depression during pregnancy is strongly correlated with preterm births and low birth weights, which is a leading cause of fetal morbidity and mortality even after adjustment for age, education and socioeconomic status (Dayan et al., 2006; Dole et al., 2003; Field et al., 2006; Jarde et al., 2016; Hoffman & Hatch, 2000; Jesse, Seaver & Wallace, 2003; Kramer et al., 2009; McDonald et al., 2014; Mancuso et al., 2004; Orr, James & Blackmore Prince 2002; Orr et al., 2007; Reddy, 2010; Roesch et al., 2004; Statistics Canada, 2019c; Steer, Scholl, Orr, James & Blackmore, 2002). Up to 20% of infants with extremely low birth weights experience growth delays throughout their first year of life, and between 2012 and 2016 low birth weight represented the second leading cause of death for infants under one year of age in Canada (Patel, Rodrigues & DeSouza, 2002; Rahman, Bunn, Lovel & Creed, 2003; Statistics Canada, 2019c). Maternal depression is associated with increased prenatal, perinatal, and postnatal complications, such as elevated rates of preeclampsia, placental abnormalities, neonatal abnormalities, and spontaneous abortion, (Chung, Lau, Yip, Chiu & Lee, 2001; Field et al., 2006; Jablesky et al., 2005; Kurki, Hiilesmaa, Raitasalo, Mattila & Ylikorkala, 2000; Sugiura-Ogasawara et al., 2002). Furthermore, women with prenatal depression are at an elevated risk of operative deliveries (Chung, Lau, Yip, Chiu & Lee, 2001; Hu, Li, Zhang & Yan, 2015).

Fetuses and newborns born to women with depression possess biochemical and physiological profiles that are similar to their mothers (Allister, Lester, Carr & Liu, 2001; Field et al., 2006; Monk et al., 2004). Chemical imbalances – such as elevated levels of cortisol and norepinephrine and lower levels of dopamine and serotonin – can contribute to delayed mental, emotional, cognitive, social, and motor development later in life (Abdollahi, Etemadinezhad & Lye, 2016; Choi et al., 2017; Kerstis et al., 2016; Luoma et al., 2001; Mughal et al., 2018; O'Connor, et al., 2002a; O'Connor, et al., 2002b; O'Connor, et al., 2003; Patel, Rodriguez & DeSouza, 2002; Søndergaard et al., 2003). Developmental and intellectual delays and disabilities may stretch as far as childhood and have been linked to a range of childhood behavioural disorders including inappropriate internalizing and externalizing psychopathology and extreme emotionality (Goodman et al., 2011; Kingston et al., 2018; Luoma et al., 2001; O'Connor et al., 2002a; O'Connor et al., 2002b; O'Connor et al., 2003). In some cases, the development of behavioural disorders may be attributable, in part, to the deterioration of the mother-infant bond. Mother-infant attachment can be challenging to initiate and maintain for women experiencing depressive symptoms (Behrendt et al., 2016; Deave, Heron, Evans, & Emond, 2008; Laurent &

Ablow, 2012; Miklush & Connelly, 2013; Nieto, Lara, & Navarrete, 2017; Tietz, Zietlow, & Reck, 2014). The burden of depression may cause mothers to engage less positively and less sensitively with their infants (Field, 2010). For example, while non-depressed mothers engage in vocalizing, smiling, and playing with their babies, mothers with depression may struggle with performing these developmentally important behaviours (Field et al., 2006). Breastfeeding, sleep routines, and safety practices are also less likely to be followed by mothers with depression (Dennis & McQueen, 2007; Hiscock & Wake, 2001; McLearn et al., 2006a; McLearn et al., 2006b).

The Effects of Maternal Depression on Communities and Care Systems

Beyond individuals and their families, the costs associated with mental illness have a significant impact on communities and health care systems. The burden of a disease can be quantified using measures such as the Years Lived with Disability (YLD) or Disability-Adjusted Life Years (DALY). YLD are a product of the prevalence of a disease and the long-term loss of health associated with it (National Institute of Mental Health, 2019; Murray et al., 2013). DALY can then be calculated by factoring in the number of years of life lost to premature death (Murray et al., 2013). Major depressive disorders were the fourth leading cause of global disease burden and the leading cause of disability in 1990 (Üstün et al., 2004). Between 1990 and 2007, the YLD for mental health disorders increased globally by 32.1%, and then increased a further 12.6% between 2007 and 2017 (GBD 2017 Disease and Injury Incidence and Prevalence Collaborators, 2018). Over two decades later, depressive disorders have now become the single largest contributor of non-fatal health loss worldwide with an estimated fifty-four thousand YLD (World Health Organization, 2017). Anxiety disorders rank sixth for health loss and are estimated to contribute to a combined twenty-four thousand YLD (World Health Organization, 2017). The direct costs of mental illness on the Canadian economy is over $50 billion dollars annually (Lim, Jacobs, Ohinmaa, Schopflocher & Dewa, 2008; Smetanin et al., 2011). This is a cost increase of more than $41 billion dollars since 1998 (Lim et al., 2008; Moore, Mao, Zhang & Clarke, 1997). The Mental Health Commission of Canada has estimated that the direct cost of mental illness will exceed $2.5 trillion dollars by the year 2046 (Mental Health Commission of Canada, 2016). This increase is attributable to the expected growth and aging of Canada's population over the next three decades, as well as advances in the diagnosis of mental disorders. In conclusion, even moderate maternal distress can have serious adverse effects on individuals, children, families, communities, and health care systems; therefore, services targeting the pre-, peri- and postnatal period are crucial for improving quality of life and quality of care in Ontario.

E-health Options for Maternal Mental Health Care

The Canadian health care system has historically faced – and continues to face – a number of challenges in delivering quality care to a population so sparsely distributed over 9.985 million square kilometers of land (Alvarez, 2002); Martin et al., 2018). In response, the remote technological delivery of medical care represents an attractive solution to some of these challenges; for example, eHealth resources can help to reduce geographical isolation, the need for weather-dependent travel, time commitments associated with care-seeking, travel costs, staffing resources, stigmatization, language barriers, low population densities, traditional geographical health system divides, and allow for discrete and anonymous support (Alvarez, 2002; Griffiths et al., 2006). The term e-Health lacks a concrete, universal definition; however, it is generally accepted to refer to “the delivery of health care services using electronic systems, processes, and information and communication technology, to facilitate the availability and exchange of health information between patients, providers, and other authorized users” (eHealth Ontario, 2014, p. 5; Oh, Rizo, Enkin & Jadad, 2005). Using information and communication technologies to deliver health care has a number of potential advantages over traditional health care delivery; however, there are persistent questions around whether eHealth interventions can successfully provide substitutes for face-to-face interactions (Griffiths et al., 2006). Correspondingly, while eHealth interventions have the potential to increase equitable access to care, the efficacy of new interventions should be thoroughly tested using reliable scientific methods in order to ensure their effectiveness. There are a number of eHealth interventions that have been developed for depression and anxiety globally (Carlbring et al., 2006; Christensen, Griffiths & Jorm, 2004; Clarke et al., 2002; Hirai & Clum, 2005; Meyer et al., 2009; Perini, Titov & Andrews, 2009; Spek et al., 2007; Spence, Holmes, March & Lipp, 2006; Warmerdam et al., 2008). A study by Griffiths, Farrer and Christensen (2010) examined twenty-six randomized controlled trials for internet interventions aimed at the treatment of depression and anxiety disorders and found twenty-three of these interventions demonstrated evidence of effectiveness relative to controls. This review lends substantial evidence to suggest that eHealth interventions can effectively be used to reduce the symptoms of mood and anxiety disorders (Griffiths et al., 2010).

Benefits of Routine Prenatal Mental Health Screening

A large barrier to early detection and treatment of mood and anxiety disorders is the lack of routine prenatal mental health screening in Canada (Kingston et al., 2015a). While

Australia, the United Kingdom, and the United States all formally recommend perinatal mental health screening, Canada does not currently implement such guidelines; although, the Canadian Task Force on Preventative Health Care is currently reviewing this need (Tomasi, 2018). In fact, routine screening for depression is explicitly not recommended within the Canadian Family-Centred Maternity and Newborn Care National Guidelines (Public Health Agency of Canada, 2018; Tomasi, 2018). Provincially, Ontario does include two mental health questions and the Edinburgh Postnatal Depression Scale in the Ontario Perinatal Record; however, these tools are not mandatory and it is left to the discretion of the primary care provider to decide whether or not they are needed on a case-by-case basis (Provincial Council for Maternal and Child Health, The Better Outcomes Registry & Network, & Ontario Perinatal Record Working Group, 2018; Tomasi, 2018). One reason why health care providers may be hesitant to initiate early screening is the belief that the psychological harms of such assessments – such as stigmatization or false-positive reporting – outweigh the potential benefits of diagnosis (Joffres et al., 2013; Kingston et al., 2017a). A study by Kingston and colleagues (2014b) addressed these concerns by interviewing women about their perceptions on the feasibility, acceptability, clinical effectiveness, and cost-effectiveness of mental health e-screening. Of the four-hundred-and-sixty study participants, most women (96.2% who were screened and 99.1% who were not screened) perceived the benefits of screening to be very high, while the potential harms were perceived as low (Kingston et al., 2015a). The most common harm reported by women was embarrassment, which was reported by less than 7% of the participants (Kingston et al., 2015a). In contrast, 63% of the women viewed screening as a positive experience and 69% were glad to be approached to take part in the screening process

(Kingston et al., 2015a). Despite its potential benefits, a study by Leddy and colleagues (2011) surveying members of the American College of Obstetricians and Gynecologists found that only one-third of care providers routinely conduct mental health screenings using validated questionnaires. In the same study, approximately half of the 400 care providers surveyed (50.6%) had never used a validated assessment tool (Leddy, Haaga, Gray & Schulkin, 2011).

Digital eHealth platforms provide a medium through which routine screening can take place remotely. Although questions about the acceptance and uptake of computer-based screening persist, studies have demonstrated that women actually have high comfort levels when it comes to digital screening (Kingston et al., 2015b; Kingston et al., 2015c; Renker, 2008). A subgroup analysis of the study by Kingston and colleagues (2014b) found that more than 82% of the 460 women interviewed were comfortable with computer-based screening as opposed to paper-based (>90%) or telephone-based screening (62%) (Kingston et al., 2015c). Another sub-study found that web-based mental health screening tools were both acceptable and feasible alternatives to paper-based screening (Kingston et al., 2017a). Among the 305 women in a web-delivered screening intervention group, 57.9% expressed that they would enjoy answering screening questions through a digital platform and 46% expressed their preference for the digital platform over a traditional paper-based method (Kingston et al., 2017a). Some of the perceived benefits of e-screening included privacy, anonymity, and time efficiency (Kingston et al., 2017a). An additional randomized controlled trial by Kingston and colleagues (2017b) found no statistically significant differences in the way that women respond to paper-based and e-screening tests; women were equally as likely to respond truthfully during an online questionnaire as they were when disclosing information to a health care provider. Disclosure risk and benefit analysis were also similar between women using a digital tool versus in-person screening (Kingston et al., 2017b). These findings are important, because they support the notion that women perceive prenatal screening as valuable, regardless of the mode of screening. Furthermore, the perceived benefits of early screening often outweigh any risks associated with the screening process; therefore, e-screening represents a viable option for assessing maternal mental health routinely during and after pregnancy. Incorporating timely and routine mental health screening during the prenatal period may be one practical way to increase health outcomes for women at risk of developing anxiety and depression. This study will focus specifically on the HOPE digital health platform created by Dr. Dawn Kingston and her team at the University of Calgary.

The HOPE Project

The HOPE project was created as a solution for improving perinatal mental health and wellbeing for women and their families in Alberta, Canada. The app is an e-screening, e-referral, and e-therapy tool with a single, virtual point of access. Primary care providers provide pregnant women with the URL link to the app at their first prenatal checkup, and then women are free to access this resource at any time throughout their pregnancy or first year of motherhood. The app offers the following six features for users: (1) a Risk Assessment; (2) Online CBT/IPT Modules; (3) a Healthy Habits section; (4) Mood Tracking; (5) Telephone-based Coaching; and (6) a Local Resource List. When women login to the app for the first time, their symptomatology is measured using a risk assessment composed of the Antenatal Risk Questionnaire, the Edinburgh Postnatal Depression Scale, the Depression Anxiety Stress Scales, and the Understanding Relationships scale (HOPE Digital Platform, 2020). These assessment tools are also used to monitor for signs of mood disorders during each trimester of pregnancy, at 3- and 6-months postnatally, or at any time that the patient feels she may need reassessment. When women show signs of highly elevated symptomology on any single questionnaire, they are asked to speak with an online coach immediately and are recommended additional local emergency resources to seek direct, one-on-one assistance. At this point in time, the HOPE app is not considered a sufficient or appropriate care option for women identified as high-risk; therefore, these individuals are currently prevented from accessing the rest of the app's features until in-person care can be achieved.

Women who are classified as moderate or low risk may use the HOPE app as a therapeutic tool and are encouraged to complete the seven online course modules that have been designed using Cognitive Behavioural Therapy and Interpersonal Psychotherapy. These modules focus on social and behavioural aspects of the patient's life, such as attachment, communication, interpersonal relationship, disputes, role transitions, and grief and loss (HOPE Digital Platform, 2020). Through these modules, women are given the opportunity to reflect on their emotions and are provided with strategies for coping with symptoms of anxiety and depression. Potentially harmful or negative behaviours can be substituted out for positive, beneficial activities found under the healthy habits section of the app. As women work through the online courses, they may choose to connect with a telephone-based coach on a weekly or biweekly basis in order to receive extra support and discuss their progress through the modules (HOPE Digital Platform, 2020). The daily mood tracking feature allows the online coaches to monitor the natural fluctuations in the patient's mood and provides a potential indicator for when extra support may be needed. When telephone-based coaching is insufficient to support a particular client, women can use the comprehensive list of health, wellness, and social support resources from the local resource list to reach out for additional in-person care. The physical layout and content of the HOPE app are discussed in further detail below.

The HOPE App Assessment of Risk

The HOPE digital app platform begins with a login page where women can sign up for a new account or can enter their secure email and password combinations in order to access an existing account (see Appendix B – HOPE App Platform). When signing up, women are asked to describe themselves using one of the following categories: "currently pregnant", "have had a baby in the last 12 months", or simply "curious about prenatal emotional wellbeing" (HOPE Digital Platform, 2020). Currently, the application is only accessible to carefully selected residents of Alberta and Ontario on a trial basis, so women looking to start a new account are asked to confirm that they are permanent residents over the age of 18. Once confirmation has been obtained, each new patient is classified into one of four symptom levels: low risk, moderate risk, high risk, and very high risk. This algorithm-based scoring system combines four short screening questionnaires that must be completed by women upon creating an account. The questionnaires include the Antenatal Risk Questionnaire (ANRQ), the Edinburgh Postnatal Depression Scale (EPDS), the Depression Anxiety Stress Scales (DASS-21), and the Understanding Relationships scale (MacLeans Scale).

The ANRQ is a twelve-item, self-report questionnaire that was developed in consultation with mental health care professionals and midwives as a predictor of postnatal depression (Austin, Colton, Pries, Reilly & Hadzi-Pavlovic, 2013). The questionnaire was designed as a briefer version of the 18-item Pregnancy Risk Questionnaire and the 23-item

Postnatal Risk Questionnaire. The ANQR is devised to take no longer than 5 minutes to complete and focusses on a number of psychosocial risks to women during pregnancy including degree of emotional and social support, past history of mental illness, life stresses, personality style, and abuse history (Austin et al., 2013). All ordinal items are scored on a Likert scale of 1-5 or 1-6, whereas categorical variables are given a score of 0 or 5. The final score produced has a possible range of 5 to 62, and a cut-off score of 23 or higher is used to flag women as potentially at-risk for developing depression postnatally (Austin et al., 2013). At this cut-off point, the original psychometric assessment produced a sensitivity of 62%, a specificity of 64%, and a positive predictive value of 30% (Austin et al., 2013). Given the significant limitations of the psychometric properties of this test, it is important to note that the ANRQ has only been designed for use in combination with a symptom-based screening measure such as the EPDS.

The EPDS is a ten-item, self-report questionnaire used to evaluate common symptoms of depression postnatally (Cox, Holden & Sagovsky, 1987). The EPDS takes approximately 5 minutes to complete and focusses on acute symptoms that have been experienced within the past seven days. Women are asked a series of questions relating to both positive and negative emotions and are asked to answer using a Likert scale (Cox et al., 1987). Each question is scored on a four-point scale and all questions are summed to give an overall score within a range of 0 to 30 points (Cox et al., 1987). A score of 9 or 10 is generally recognized to signify minor depression, whereas a score of 13 or higher is a well-established cut-off point for a major depressive episode (Cox et al., 1987; Matthey, 2004). Original psychometric testing of the EPDS instrument produced a sensitivity of 85%, a specificity of 77%, and a positive predictive value of

83% (Cox, Chapman, Murray & Jones, 1995). The EPDS has also been used successfully to screen for depression during pregnancy, although there is some disagreement as to whether or not the cut-off score remains appropriate at 13 points (Bergink et al., 2011; Bunevicius et al., 2008; Kuan-Pin Su et al., 2007). The range of suggested cut-off scores for the antenatal period tend to fall within 10 to 14 points, with differences observed between the first, second, and third trimester (Bergink et al., 2011; Bunevicius et al., 2008; Kuan-Pin Su et al., 2007).

Similarly, the DASS-21 is a 21-item, self-report questionnaire that was designed to cover a wide range of depression and anxiety core symptoms (Lovibond & Lovibond, 1994). This questionnaire is a combined assessment of dysphoric mood states, arousal states, and negative emotional reactions to stressors (Norton, 2007). Each item in the questionnaire focusses on physical, mental or emotional symptoms that may have been experienced by the patient over the past seven days. Questions are answered using a four-point Likert scale indicating levels of severity for the particular symptom. The scores from each question are then summed to give a final anxiety score within the range of 0 to 42 points (Lovibond & Lovibond, 1994). Severe to very severe depression, anxiety, and stress are represented by minimum scores of 21, 15, and 26 respectively (Lovibond & Lovibond, 1994). Mild to moderate cases of depression, anxiety, and stress fall into score ranges of 10-20, 8-14, and 15-25 respectively (Lovibond & Lovibond, 1994). A study by Tran, Tran and Fisher (2013) found that the DASS-21 was able to detect depression and anxiety in women with a sensitivity of 79% and a specificity of 77%.

The final scale utilized by the HOPE app is the McLean's screening instrument for borderline personality disorder. The McLean scale is a ten-item, self-report questionnaire that is used to evaluate common symptoms of borderline personality disorder. Questions center around internal emotional conflict and social relationships, including questions such as "have you often been distrustful of others" and "do you frequently feel out of control" (Zanarini et al., 2003, pg. 569). Each affirmative answer is worth one point for a total score within the range of 0 and 10 points. The cut-off score for individuals with borderline personality disorder is 7, with original psychometric scores of 81% for sensitivity and 85% for specificity (Zanarini et al., 2003). Much like the ANQR, the McLean's scale is not designed to represent the sole diagnostic measure in reaching a diagnosis and should only be used in conjunction with other reliable tests.

The HOPE App Online Therapy Modules

The main page of the app has four tabs: "Online Course", "Mood Tracking", "Healthy Habits", and "Emotional Health" (HOPE Digital Platform, 2020). There are currently seven courses available for women to complete online. Each of these modules were designed using a Cognitive Behavioural Therapy (CBT) and Interpersonal Psychotherapy (IPT) integrated approach that concentrates on identifying and providing strategies for improving interpersonal relationships. CBT is a highly effective, nonpharmacologic psychotherapy treatment that focusses on short-term goals in order to change patterns of behaviour (Beck, Broder & Hindman, 2016; Beck, Rush, Shaw & Emery, 1987). This therapy approach uses self-reflection on one's attitudes and beliefs in order to understand behaviour and make beneficial adjustments (Beck, Rush, Shaw & Emery, 1987). CBT has proven to be effective in the treatment of both anxiety and depression (Proudfoot et al., 2003; Proudfoot, 2004; Proudfoot et al., 2004; Sockol, Epperson & Barber, 2011). Similarly, IPT recognizes life situations as directly related to mood and seeks to identify and resolve disturbing or disruptive life events that are connected to the onset of a mood disorder (Markowitz & Weissman, 2004). This therapy option is designed to be delivered as three sections over an acute time period of 16 weeks (Markowitz & Weissman, 2004). Within the HOPE app, the first IPT section includes three modules: “Attachment”, “Communication”, and “Interpersonal Relationships” (HOPE Digital Platform, 2020). Each module takes approximately 30 minutes to complete and must be completed in chronological order. The Attachment module introduces the patient to the four common attachment styles associated with Attachment Theory: secure, preoccupied, dismissing, and fearful attachment. Through various homework tasks, the patient is then tasked with identifying their own attachment style and reflecting on how it impacts their personal relationships (HOPE Digital Platform, 2020). The Communication module introduces passive, aggressive, passive aggressive, and assertive communication styles. The patient is given the definition of each type of communication style and works towards understanding how each of these styles reflects their own situation. Finally, the Interpersonal Relationships module is used to create a Relationship Circle that visually depicts the social supports that the patient has in her life. Once the Relationship circle is complete, the patient is asked to reflect on which supports currently exist and which are lacking. Suggestions are given on how to build new support systems and how to reach out and ask for help from support systems that may not have been accessed (HOPE Digital Platform, 2020).

The middle section of the HOPE IPT process consists of an additional 3 modules that can be completed selectively by patients. These modules include “Understanding Disputes”, “Role Transition”, and “Grief and Loss”. Much like the first three modules, these sections take approximately 30 minutes to complete and contain both informational and practical application components. The Understanding Disputes module is designed for women who have relationship struggles related to ineffectual dispute resolution. In this section, patients are taught how to construct a disagreement graph that can be presented to their partner as a strategy for conflict resolution. The Role Transition module is most appropriate for women who experience stress as a result of major life transitions. This section uses a life events timeline as a tool for reducing stress, anxiety, and depression. The process of reconstructing one's story can provide fresh insights into the significance of new transitions and can add context to major life transitions that have already been overcome. Finally, the Grief and Loss module is designed for women who are experiencing grief as the result of a significant loss. This loss can represent any number of events, such as a death, divorce, miscarriage, injury, or employment termination. Several reflective questions are presented to patients in this segment and women are urged to reach out for support with their feelings of loss. The final IPT section of the HOPE online program is represented by a single module. The "Keeping it Going" module is the seventh and final course offered through the online program. This conclusion sums up the toolkit that has been built throughout the other modules and offers printable Portable Document Format versions that can be used and reused at any time. Extra support options are also offered at this point in the program including local referral contacts, the online HOPE coach, and a crisis telephone line. Upon program completion, the modules remain accessible so that they can be repeated whenever the patient desires. For each module, a glossary of terms is provided to clarify key terms used and a notes section is provided so that the patient can document their thoughts and progress throughout the module (HOPE Digital Platform, 2020).

The HOPE App Healthy Habits & Mood Tracking Features

The Healthy Habits section of the app suggests physical activities that demonstrate a scientific link to improved emotional health (HOPE Digital Platform, 2020). Some of the activities listed include getting out into nature, meditation, journaling, or talking with a trusted friend (see Appendix B – HOPE App Platform). Each activity link in the list can be expanded for a brief description of the activity, as well as a short summary of the scientific findings supporting improved mental wellness after consistent participation. Women who have existing medical complications are encouraged to select activities from the list of 'safe exercises' approved by the American College of Obstetricians and Gynecologists (HOPE Digital Platform, 2020). The Mood Tracking feature has been designed to allow women to follow their emotional health day-by-day and familiarize themselves with the normal ebb and flow of their mood (HOPE Digital Platform, 2020). This feature also serves as a conversational tool for the online coaches, whom may recognize a sudden negative drop in mood as a red flag and probe the user to self-reflect on why she was feeling emotionally poorly on a certain day. Women can choose to enter their daily mood from a 5-point picturized Likert scale ranging from 'awesome' to 'terrible' (see Appendix B – HOPE App Platform). Chronological mood can then be viewed on a seven-day graph or over the course of an entire month.

The HOPE App Telephone-based Coaching Service & Local Resource List

Women are prompted to connect with the telephone-based coach on a weekly or biweekly basis, but they can also access this service any time they feel they need extra support (HOPE Digital Platform, 2020). The online coaching service is provided as a confidential and supportive way for women to ask questions, seek new mental health strategies, and get connected to local external supports. Under the "Connecting with a Coach" tab, users choose a time block that works best for their schedule, enter whatever secure phone number they would like the coach to call, and indicate whether or not they would like the coach to leave a voicemail if they are unreachable (see Appendix B – HOPE App Platform). Currently, the HOPE app has one full-time coach with a professional social work background who has been trained in providing telephone counselling through a 2-day course offered by Dr. Dawn Kingston (HOPE Digital Platform, 2020). At this point in time, one coach has been sufficient to support over one thousand women. One of the most potentially useful applications of the coach in Northwestern Ontario is their ability to connect women with external local services that exist within their own community. The "Support Agencies" tab uses geolocation to populate a list of local maternal health organizations based upon the user's postal code (HOPE Digital Platform, 2020). This list contains organizations that provide health, counselling, childcare, and social services to the general public (see Appendix B – HOPE App Platform). Under this section, there is also an opportunity for women to personalize the list by adding the contact information for any missing organizations that they use.

The HOPE App's Efficacy

Each therapeutic element of the HOPE app has been designed using clinically-tested and scientifically-based assessment tools and psychosocial interventions. The HOPE platform itself represents an integrated maternal mental health care instrument that systematically links assessment, referral, and treatment for perinatal mood and anxiety disorders (Kingston et al., 2014a). During their systematic review of integrated care trials in North American primary care settings, Butler and Kane (2011) found this approach to be an efficient and effective method to improving care access, adherence, and treatment outcomes for patients diagnosed with depression (Butler et al., 2008; Butler & Kane, 2011). While the degree of integration was not significantly related to outcomes, the use of an integrated approach for primary care patients did appear to significantly improve depression management across all studies (Butler & Kane, 2011). These results indicate that the HOPE app's organization as an integrated eHealth platform should represent an acceptable, effective, feasible, and cost-effective approach to perinatal mental health care (Butler & Kane, 2011). Beyond the organization structure of the app, each therapeutic element of the platform - the psychosocial Risk Assessment, CBT/IPT course modules, and telephone-based coaching service - has quantitative support to endorse their safe and effective use for women with perinatal depression and anxiety (Choo, Ranney, Aggarwal, & Boudreaux, 2012; Gilbody, Whitty, Grimshaw, & Thomas, 2003; Le, Perry, & Sheng, 2008; Milgrom, Negri, Gemmill, McNeil, & Martin, 2005; Mohr et al., 2013). There is evidence that computer-based psychosocial assessment - including the EPDS, ANQR, DASS-21, and MacLean's Scale – is viewed by both patients and care providers as acceptable and feasible alternatives to in-person assessment (Choo et al., 2012; Le et al., 2008). For example, the study by Le and colleagues (2008) screened 142 women using an internet-based EPDS and Postpartum Depression Screening Scale (PDSS) and found that the internet-based tools had excellent reliability (PDSS $\alpha = .97$, EPDS $\alpha = .87$) and moderate to excellent internal consistency (PDSS $\alpha = .77$ to .95, EDPS $\alpha = .87$) compared to in-person assessment ($.83 < \alpha < .94$). However, psychosocial assessment on its own – whether deliver in-person or via computer-based technologies – is ineffective in the prevention and treatment of depression-related disorders unless paired with clinical treatment programs (Gilbody et al., 2003). To this end, the HOPE platform offers cognitive behavioural therapy and interpersonal therapy modules to individuals after the completion of their online Risk Assessment.

As discussed in the therapy module section above, CBT and IPT have been reported to be very effective treatments for individuals with depression or anxiety disorders (Andrews, 2010; Austin et al., 2008; Cape et al., 2010; Chabrol, 2005; Cho, Kwon, & Lee, 2008; Kozinszky et al., 2012; Milgrom et al., 2005). The randomized controlled trial by Milgrom and colleagues (2005) delivered CBT, group counselling, individual counselling, or routine primary care to 192 patients and found that CBT produced the highest proportion of positive post-intervention health outcomes. Specifically, 55% of the women who were given CBT produced Beck Depression Inventory scores that fell below the threshold for clinical depression post-intervention (Milgrom et al., 2005). This was in contrast to only 29% of the women in the control group (Milgrom et al., 2005). Furthermore, a meta-analysis by Andrews (2010) examined twenty-two studies and found online CBT to have an overall effect size of 0.88 ($p < 0.001$), an effect size of 0.78 for major depression (95% CI 0.59–0.96), and lower overall attrition rates (20%) than in-person, group-based CBT (40-50%). As a result, Andrews (2010) asserts that online CBT is an effective, acceptable, safe, and practical intervention for clinical depression. Finally, telephone-based coaching has also shown promise as an effective approach to supporting patients with depression (Mohr et al., 2013). A randomized controlled trial by Mohr and colleagues (2013) examining the use of telephone-based coaching to improve web-based treatment adherence for clinical depression found that phone-based coaching produced significantly higher adherence rates (logged in nearly twice as often, % $p=0.01$), greater use of online course content (3.8 more courses viewed on average, *p*=0.03), and significantly lower PHQ-9 scores at six weeks post-intervention (9.84 vs 10.41, *p*=0.04). While each therapeutic element of the HOPE app has been evaluated independently, the platform in its entirety has yet to be quantitatively assessed. Fortunately, this research is currently being completed by the HOPE research teams out of Alberta and Southern Ontario through the Integrated Maternal Psychosocial Assessment to Care Trial (IMPACT) study (Kingston et al., 2014a). The purpose of this randomized, controlled superiority trial is to evaluate the effectiveness of the HOPE app (described in the official study protocol as an online psychosocial assessment, referral, and CBT/IPT tool) for pregnant women compared to usual prenatal care with no formal screening or specialized care (Kingston et al., 2014a). IMPACT is also seeking to compare the clinical effectiveness of the HOPE app versus usual prenatal care on postnatal mental health, psychosocial resources, infant health, and family health (Kingston et al., 2014a). A cost-effectiveness evaluation is also being completed as part of the study (Kingston et al., 2014a).

The IMPACT study is being completed in two stages, with the first stage currently on track for completion by December of 2020. Phase one is composed of a randomized controlled trial designed to evaluate the clinical and cost-effectiveness of the app (Kingston et al., 2014a). The primary outcomes being collected from users are self-reported prenatal depression, anxiety, and stress symptoms at 6- and 8-weeks post-randomization and 3-, 6-, and 12-months postpartum (Kingston et al., 2014a). A wide range of secondary outcomes are also being collected, including: “postpartum depression, anxiety, and stress symptoms; self-efficacy; mastery; self-esteem; sleep; relationship quality; coping; resilience; Apgar score; gestational age; birth weight; maternal-infant attachment; infant behavior and development; parenting stress/competence; and intervention cost-effectiveness, efficiency, feasibility, and acceptability" (Kingston et al., 2014a, p. 5). The recruitment of over 800 women eligible for IMPACT was achieved through four primary care clinics located in Alberta and Southern Ontario (Kingston et al., 2014a). Women have been randomly assigned to either the intervention group (the HOPE app) or regular care and are being monitored by the HOPE team until the completion of this project at the end of this year (Kingston et al., 2014a). The second phase of the IMPACT study will involve a qualitative study on care providers' and women's opinions on the efficiency, utility, usability, feasibility, acceptability, and mechanisms of the app (Kingston et al., 2014a). Interviews will be conducted with 8 to 10 healthcare providers and 15 to 30 intervention group women in order to capture their experiences with using the app (Kingston et al., 2014a). If the HOPE app is deemed cost-effective, efficient, feasible, and acceptable through the results of the IMPACT study, the Equity in Access team will have both qualitative and quantitative evidence to support its use in Northwestern Ontario. Once this evidence is in place, the app will be ready for further, specific assessment by women living in rural, remote, and North communities. It is at this point that the Equity in Access team will move on to the next stage of our research.

Chapter 3: Methodology

Situating the Researcher

Reflexivity is a cornerstone of qualitative research and allows the researcher to systematically attend to situating the production of knowledge (Creswell & Poth, 2018). Researchers influence - and in turn are influenced by - the reality in which they exist. Therefore, the production and reproduction of meaning is heavily influenced by social, cultural, political, historical and rational contextual features (Creswell & Poth, 2018). Meaning is nondefinitive, unfixed, and unstable. As a result, this study did not assume to seek a singular, objective truth, but rather sought to collect and compare multiple, subjective truths as experienced by individuals in a specific time and place. The interviews conducted in this study involved mutual, interactive meaning-making between the participants and myself. Therefore, reflection upon my own preconceptions and situational dynamics was – and is - extremely important to the inquiry process. Reflexivity served as a lens through which I could view this project in a self-critical light and allowed me to understand my own relationship to the participants (Oliver, 2012; Thorne, 2009). Not only was this process important to my own meaning-making, but it also allows the reader to make sense of the context from which data were collected, interpreted, and analyzed. This reflexive approach to data collection, analysis, and interpretation was carried out in alignment with the interpretive description methodology used in this study. Epistemological assumptions of interpretive description include that individuals experience multiple realities of health constructs; however, common experiences of a shared phenomenon can be used to inform the practical application of novel health interventions (Thorne. 2008).

My Personal Connections to the Research Topic

Maternal mental health in Northwestern Ontario represents an important area of research for me personally, as both a woman living in Thunder Bay, as well as a hopeful future health care provider. As a woman, I believe that access to female-specific health care is extremely important. Sex and gender exclusive health organizations aim to provide safe spaces for women where the care focus is both comprehensive and tailored. This is particularly significant given that past studies have supported the notion that women often struggle to be viewed as credible by health care professionals (Annandale & Hunt, 2000; Dennis & Chung-Lee, 2006; Dusenbery, 2017; Johanson, Newburn & Macfarlane, 2002; Lorber, 1997; Söderberg, Lundman & Norberg, 1999; Sword et al., 2008). In fact, studies by Sword and colleagues (2008) and Dennis and Chung-Lee (2006) identified the minimization and dismissal of symptoms by healthcare professionals as key barriers for women seeking help for maternal depression. This disregard by physicians and nurses who do not work specifically in women-only settings is something that I have experienced in my own life. As an individual living with chronic pain, there have been times when I have felt that my perspective has gone unheard by care professionals largely due to my age and biological sex. It can be difficult as a woman to report chronic pain – whether physical, mental, emotional, or spiritual – to medical professionals without feeling forced to justify this discomfort outside of overreaction or oversensitivity. This can be an intensely frustrating experience and I can only imagine what it must feel like to not only face the possibility of being disbelieved, but also the stigmatization associated with mental illness. Given the minimization and dismissal of symptoms that women may face in accessing generalized care, I believe that female-specific care services play an essential role in overcoming medical sexism, by providing services specifically oriented towards women-centric health problems. Because these services have been created using a female-specific lens, they help to reduce the stigma and disbelief that women may face when accessing general health supports and services (Dusenbery, 2017; Govender & Penn-Kakana, 2007). In fact, in their 2007 report on gender biases and discrimination in healthcare, the Women and Gender Equity Knowledge Network of the WHO Commission on Social Determinants of Health suggests that the creation of 'women centred services' is a key intervention for reducing gender biases and discrimination in the patient-provider interaction (Govender & Penn-Kakana, 2007).

As a woman of Euro-Canadian descent who has lived in Canada for my entire life, my cultural beliefs on medicine and mental health have been shaped and privileged by the prevailing Western culture in Canada. The birthing process has progressively shifted towards medicalization over the past two centuries, and this has led to increased interference with the natural birthing process (Johanson, Newburn & Macfarlane, 2002). Although some aspects of pregnancy and birth medicalization – such as the increased focus on antenatal care – have led to reduced maternal morbidity and mortality, the singular focus on the biomedical aspects of pregnancy and birth can also lead to the neglect of social and emotional aspects (Institute of Medicine (US) Committee on Improving Birth Outcomes, 2012). As a result, women may feel emotionally and socially constrained by Western birthing culture, leading to feelings of loss of control over their own body (Johanson, Newburn & Macfarlane, 2002). Both of my sisters gave birth to their sons via emergency Caesarean section in traditional hospital settings following chemically-induced labour. These medically invasive interventions were contrary to both sisters' birth plans, contributing to periods of depression and post-traumatic stress. These experiences have led me to believe that the perinatal period is a vital point at which women in traditional hospital settings should be provided with resources to help support them emotionally and mentally. However, it is important to note that my sisters also had positive experiences while giving birth in traditional hospital settings. Both were attended to by nurses that were knowledgeable and empathetic during times of vulnerability. A particularly competent nurse was able to assist one sister with breastfeeding and swaddling techniques, which gave her confidence in her own ability to provide for her infant. The other sister received emotional support from a nurse who was extremely empathetic of her post-surgery pain; she would go on to later say that her nurse saved her life when she was feeling most defeated. It would seem from their experiences that competent and compassionate support from a trusted professional can make very important impacts on a new mother's sense of self-esteem and self-worth during the perinatal period.

My Status as an Insider and Outsider

Qualitative researchers can approach the topics of their research through the membership role of an insider, an outsider, or as possessing qualities from both factions (Dwyer & Buckle, 2009). Individuals that share the commonality of interest with study participants are considered to have insider status, whereas those with little personal experience with the phenomenon are considered outsiders (Dwyer & Buckle, 2009). Furthermore, Dwyer and Buckle (2009) argue that a third position exists between the dichotomy of insider and outsider status; the 'space between' allows the researcher to recognize the complexity of the similarities and differences that one may have with the participants. In many respects, I approached this research as an outsider. I myself have never been pregnant nor given birth, and I have never worked in the capacity of a caregiver or service provider for pregnant women or new mothers.

As a middle-class, educated, Euro-Canadian, heterosexual, able-bodied, cisgender woman I have been privileged in many ways. I cannot speak to the realities of mental illness, domestic violence, poverty, or addiction from personal experience; however, I have seen the influences and implications of each of these realities in family and friends. The care providers that I interviewed may or may not have had direct experience with these realities, but their professions brought many of them into repeated contact with women who did. Although I was an outsider in some respects, I also retained insider status in relation to this research in some ways. As a Master of Health Sciences student with a specialization in Northern and Indigenous health, my academic career has allowed me to focus on the importance of a holistic care approach. Additionally, many of my classes have been oriented towards the specific challenges faced when delivering health care to Northern and rural populations. As a hopeful future physician, I anticipate the privilege to one day serve women in Northwestern Ontario to the best of my ability, and I have the utmost respect for all of the professionals included in this project. Physicians, nurses, midwives, social service providers, and lactation consultants often act as the primary contact point between many women and the Canadian health care system (Canadian Institute for Health Information, 2016; Ministry of Health & Ministry of Long-Term Care, 2019), and I humbly respect the vast amounts of knowledge that these experts possess. Without any direct experience as a health care professional, I will never truly be able to grasp the nature of my participants' realities. However, through partnered co-construction, and in my role as a learner, I have tried to represent these realities to the best of my abilities. As such, the knowledge constructed during this project was generated with the depth and breadth of our combined experiences, in an attempt to yield invaluable insights into the potential applications of the HOPE app.

Interpretive Description

The methodological approach adopted for this project was interpretive description. Originally proposed for use in nursing research by Thorne, Kirkham, and MacDonald-Emes (1997), interpretive description is a non-categorical, inductive, qualitative approach to knowledge construction about human health and aspects of the illness experience that draws from other methods such as grounded theory, ethnography, and phenomenology. In creating ways of understanding these phenomena, interpretive description seeks to apply generated knowledge practically to clinical contexts in applied health disciplines. Interpretive description not only recognizes knowledge stemming from shared experiences among groups of similar persons, but also strives to understand and validate the particular lived experiences of the individual (Thorne et al., 1997). This focus on the particular over the generalizable becomes important when the goal of the research is to apply accumulated knowledge to individual cases. In this case, we are both interested in customizing the HOPE app to reach general 'groups' of women (including persons identifying as Indigenous, racialized, or marginalized), as well as understanding how the app might be suitable or ill-suited at the individual-level (due to a variety of social determinants of health). For example, at the particular level, the ways in which a married, middle-class woman of Euro-Canadian descent living in urban Thunder Bay interacts with the app may be different than a single, marginalized woman of Euro-Canadian descent living in rural Laclu, even though both of these women experience the symptoms of anxiety and depression in similar ways (the generalizable). Understanding these nuances through the eyes of care providers will help us to create a ‘semi-customizable’ platform that appeals to a wide range of women living in the North. By alternating between a focus on the general and specific, a full picture can be formed that acknowledges the contextual nature of the data as crucial to overall understanding (Thorne, Kirkham & O’Flynn-Magee, 2004). Foundational concepts underlying interpretive description can be broken down into the following three statements: psychosocial and biological phenomena interact in complex ways to produce human health and illness experiences, shared patterns within these experiences represent the core of disciplinary nursing knowledge, and any practically applied principles generated from these shared experiences must always possess the potential for individualistic application at the case level (Thorne et al., 1997). Following nursing epistemology, interpretive description seeks to understand a set of truths that possess practical application potential yet are also adaptable to contextual and conceptual reinterpretation. This clear and coherent epistemological foundation speaks to the theoretical and methodological integrity of this qualitative approach (Hunt, 2009). Further evaluation of Interpretive Description’s appropriateness for this particular study are discussed in more detail below.

Interpretive Description Analytical Framework

Generally speaking, trustworthy qualitative research methodologies follow well-defined, rational inductive reasoning processes within clearly defined analytical frameworks (Creswell & Poth, 2018; Sandelowski, 1986). The analytical framework of interpretive description is grounded within the existing knowledge base and relies heavily on the linked construction of knowledge between formal research and clinical knowledge experts (Mitchell & Cody, 1992; Mitchell & Cody, 1993; Thorne et al., 1997). The epistemological positionings of Interpretive

Description are consistent with a number of disciplinary "truths" fundamental to the hardwiring of clinical nursing fields (International Institute for Qualitative methodology, 2020). These "truths" include a set of ideas that have both "application potential", yet "remain amenable to reconsideration in light of varying contexts, new concepts, new ways of understanding, and new meanings" (Thorne et al., 1997, p. 172). Through Interpretive Description, researchers recognize the human illness experience as existing in both wholes and parts; when a woman seeks treatment for maternal depression, she is not treated as an inventory of symptoms, but rather, as a whole person navigating complex biological, psychological, and social environments (International Institute for Qualitative methodology, 2020; Thorne et al., 2015). Moving back-and-forth between wholes and parts - the general and the particular - is fundamental to creating semi-customizable care approaches within the applied nursing field (International Institute for Qualitative methodology, 2020; Thorne et al., 2015). To this end, when using an Interpretive Description epistemological lens, we must never assume that the knowledge developed during this study represents a finale and definitive "truth", rather, knowledge and understandings are ever-evolving and the understandings we have today may be vastly different than the understandings we may have in five-years' time (International Institute for Qualitative methodology, 2020; Thorne et al., 2015). Since knowledge generation is an iterative, ongoing, and evolving process, researchers employing Interpretive Description should aim to demonstrate infinite flexibility and adaptability (International Institute for Qualitative methodology, 2020). While patterns and processes are essential for informing clinical reasoning, researchers should never lose sight of the infinite variations that branch from these patterns to produce endless variation at the patient-level (International

Institute for Qualitative methodology, 2020; Thorne et al., 2015). These understandings are captured across the following three epistemological "truths" of Interpretive Description studies: (1) there are multiple constructed realities - that are complex, contextual, and subjective - and can only be studied holistically; (2) the researcher and participants interact to influence one another through the co-construction of knowledge; and (3) no *a priori* theory can possibly encompass the multitude of realities encountered, therefore all theories must be contextually grounded within that specific data set (Hunt, 2009). Before data collection can begin, the study must be designed to achieve integrity of purpose by understanding what is 'known' and 'not known' given all existing empirical evidence (Thorne, 2009). Critical analysis of the pre-existing knowledge, whether it be formal or clinical, provides a foundational platform from which new inquiry propagates. To this end, the literature review section of this project was completed well in advance of any study design; knowledge and philosophies surrounding the HOPE app were sought from Dr. Dawn Kingston; and all aspects of the project were devised in collaboration with the members of the Equity in Access group. Having a rich understanding of current clinical practices and existing literature allowed me to orient, frame and design my study. Other methods rooted in the fields of anthropology (ethnography), sociology (grounded theory), and psychology (phenomenology) could have alternatively been used to address the "real-world" health problems central to this project; however, the origins of these methods "within human philosophical curiosity ensures that [their] scholarship remains quite solidly grounded in theoretical and empirical rather than practical problems" (Thorne, 2016, p. 26). In contrast, interpretive description has developed as an applied science research methodology for specific application to the clinical realities experienced in the nursing field. As a result, interpretive description is able to transcend the "theoretical baggage" that other methodologies carry with them and focus its entirety on creating new and informed best practice solutions for health problems (Thorne, 2016). Sally Thorne (2016) argues that the theorizing of ethnography, grounded theory, and phenomenology are not sufficient to create new health policy and practice, because these methodologies assume ideal prototypical human clients. In contrast, clinical epistemology operates within a world view in which realism, objectivity, idealism, and subjectivity must coexist in order to develop general medical approaches, yet apply them intuitively and subjectively to individual patient cases (Thorne, 2009). Nevertheless, it is important to note that this framework was merely a starting point for inquiry, and I anticipated the possibility that it might potentially be challenged or re-adapted over the course of the inductive analysis (Thorne et al., 1997).

The Appropriateness of the Methodology

Interpretive description developed from the need for qualitative methods to provide a means to address practical questions about human health and illness phenomena (Teodoro et al., 2018; Thorne et al., 1997). As noted above, the epistemological assumptions of the method include that individuals experience multiple realities of health constructs; however, common experiences can be used to inform innovative health solutions. In addition to its original focus in the field of nursing, adopting this methodology for use in applied public health and health science is appropriate, since these disciplines share a common applied component. The aim of this study was not to provide an explanatory model for the experience of maternal mood disorders – nor for the shared experience of treating them – but rather, it attempted to understand the suitability of an intervention given the contextual nuances influencing care delivery strategies, help seeking behaviours (as perceived by care providers), and local referral practices. Interpretiveve description has been used previously in the evaluation of care providers' perspectives on an eHealth app. The study by Lindgreen, Clausen, and Lomborg (2017) sought to understand interdisciplinary clinicians' perspectives on the Recovery Record smartphone app for patients recovering from eating disorders. Parallel to the HOPE study, the aim of the Recovery Record research project was to inform and improve clinical practice; therefore, interpretive description was an appropriate methodological choice (Lindgreen, Clausen & Lomborg, 2017). Data were generated through semi-structured interviews and participant observations during treatment sessions and clinician preparation (Lindgreen et al., 2017). Data analysis then involved a coding process that moved from general observations to diminutive themes and back again using NVivo 11® (Lindgreen et al., 2017). The largest barriers to using the app were that it could be time-consuming for care providers to monitor patients both online and in-person (especially outside of office hours), it had the potential to increase clinician stress and decrease work satisfaction, and it could damage the relationship or therapeutic alliance between the patient and care provider (Lindgreen et al., 2017). These findings were important to note, as they allowed me to anticipate potential barriers that may be brought up by care providers in my own study. However, I also noted before beginning my own study that the underlying differences between the functions of the Recovery Record app and the HOPE app meant that these conclusions were likely not transferrable between the two projects; and in fact, I had to be very cautious that these results did not bias my interpretation To account for this, comparisons were not drawn between the two studies until after the completion of data analysis, at which point it became clear that the contextual differences between Lindgreen's study and my own resulted in dissimilar findings (Lindgreen et al., 2017). A number of other studies focusing on aspects of maternal health care have also used an Interpretive Description approach (Montgomery, Bailey, Purdon, Snelling & Kauppi, 2009; Sadler, Novick & Meadows-Oliver, 2015), mental health care (Bove, Midtgaard, Kaldan, Overgaard & Lomborg, 2017; Chong, 2012; Furniaux, 2018; Goosen, 2002; Montgomery et al., 2009) and several other aspects of health care from the perspectives of care professionals (Faustine et al., 2015; Goosen, 2002; Hanson et al., 2017; Kalengayi, Hurtig, Nordstrand, Ahlm & Ahlberg, 2015). Collectively, these studies lend legitimacy to my decision to use interpretive description as the methodology for this research project.

Research Sample and Recruitment

While no singular, rigid sampling procedure has been established for interpretive description, sample selection must strike a balance between predictable and maximal variation (Teodoro et al., 2018). Thorne (2016) suggests that the research sample should include anywhere between five and thirty individuals that have direct experience with the topic of interest. Often, participant selection is achieved through purposeful theoretical sampling (Thorne, 2016). On one hand, theoretical sampling allows the researcher to capture the most predictable variations of interest within the study population because the individuals in the sample cohesively share characteristics that are important in addressing the research question (Morse, 1995; Thorne et al., 1997). This method assumes that individuals who have lived the experience of interest possess expert knowledge on them. While theoretical sampling can be useful for achieving saturation quickly, it also decreases the generalizability of the findings because it imperfectly assumes that participants can singly represent the experiences of a population (Morse, 1995). On the other hand, when new and unanticipated variables emerge within the course of the study, they can contribute increased complexity to the process of pattern analysis. Therefore, while purposeful theoretical sampling is the preferred sampling method of interpretive description studies, researchers are encouraged to draw their sample from sufficiently large, inclusive populations and should clearly articulate any probable limitations to the generalizability of their findings (Thorne et al., 1997).

Target Population and Sampling Method

This study aimed to understand key social service and care providers' perspectives on the suitability of the HOPE app; therefore, the inclusion of a wide range of applicable health care service providers and professionals was imperative for proper representation. I used a purposive theoretical sample of professionals working as registered physicians, nurses, social service workers, midwives, and lactation consultants located in Thunder Bay, Kenora, and Sioux Lookout. Individuals were considered eligible for participation if they worked in any of the above capacities at organizations that did not deliberately orient their care towards women belonging to visible minorities. Care providers – and their respective organizations – were screened for inclusion in this project using two strategies. The first strategy involved scanning the mission statements and websites of organizations located in Thunder Bay, Kenora, and Sioux Lookout. If these organizations clearly oriented their care towards women from non-Euro-Canadian backgrounds, they were excluded from this thesis (and instead were approached as part of the larger Equity in Access study). For example, care providers working at the Anishnawbe Mushkiki Aboriginal Health Access Centre in Thunder Bay were not included among the participants in my thesis, due to the organizations direct and specific orientation of care towards Indigenous individuals (Anishnawbe Mushkiki, 2020). The organization's mission, found on their website, reads, "Anishnawbe Mushkiki serves all Indigenous people throughout their life cycle. We provide holistic healthcare including primary, traditional and alternative approaches" (Anishnawbe Mushkiki, 2020). The second strategy for the exclusion of care providers specifically orienting their care towards non-Euro-Canadian patients involved asking care providers directly what types of cultural, ethnic, and linguistic representation they saw within their own client base. At the start of each interview, the care providers were asked to describe how their work intersected with maternal, mental, and maternal mental health, as well as the proportion of Euro-Canadian and non-Euro-Canadian women they served through their work. Care providers who indicated they saw mostly women from Euro-Canadian backgrounds were included in this project, whereas those who indicated primarily serving women from other backgrounds were included under the larger Equity in Access study. Purposive theoretical sampling is a non-random sampling strategy that is often used in qualitative research to yield cases or participants that are 'information rich' based on "their potential manifestation or representation of important theoretical constructs" (Patton, 2001, p. 238). This is particularly important when the individuals considered information rich are scarce or scattered throughout a large population. Because this project focused on maternal-specific care – a small subset falling under the social service, health, and medicine umbrella – purposive theoretical sampling permitted me to gather a rich and reliable breadth of data from the limited number of experts in the field practicing in Thunder Bay, Kenora, and Sioux Lookout. Recruitment for this project was achieved partially through the existing community connections that Dr. Møller and her team have meticulously built during their past and current projects on maternal health in Northwestern Ontario. These established relationships have been built on mutual trust and allowed me access to individuals that may otherwise have been unwilling to participate in this study. In addition to these existing community connections, a comprehensive list of organizations in Thunder Bay, Kenora, and Sioux Lookout dealing with maternal care was compiled (see Appendix C – List of Organizations).

Recruitment Strategy

Recruitment for this project began in early July 2019. Between July 12, 2019 and March 10, 2020, recruitment emails with attached digital information letters were sent to 69 organizations/individuals in Thunder Bay, 26 organizations/individuals in Kenora, and 8 organizations/individuals in Sioux Lookout. Some of these recruitment communications were sent to care providers that had participated in projects for the Equity in Access group in the past and had maintained contact since that time, while others were sent to organizations without any existing relationship. The staff at these organizations then forwarded the information letter to eligible individuals in order to inform them about the project, including its risks, benefits, and privacy measures (see Appendix E – Information Letter). The information letter contained direct contact information for the research team, allowing individuals to interact with the researchers only when interested. Additional recruitment was carried out at three separate Thunder Bay Prenatal Coalition meetings and the St. Joseph's Care Group Research Showcase, where one or more members of the Equity in Access team shared verbal information or distributed information cards for the project (see Appendix F – Information Card). When individuals expressed their interest in participating in the project, they were sent a link to the

HOPE app via email at least one week before their scheduled interview so that they could familiarize themselves with the platform. In total, ten individuals were recruited for interviews: nine from organizations located in Thunder Bay, and one from an organization in Kenora. The participants represented a range of maternal and mental health disciplines including: one physician, three public health professionals, one health promotion planner, one nurse practitioner, two addictions counsellors, and two social service workers.

Data Collection

Data collection for this project was achieved through in-depth, semi-structured interviews with one or two participants that lasted between 1-2 hours. Most took place in-person at a location of the interviewee's preference; however, two sessions were completed via the distance-technology software Zoom Video Communications™. Qualitative interviews were chosen for this project in order to capture the subjective nature of the care providers' experiences with the HOPE platform. The semi-structured questions allowed for valuable in-depth discussions of the care providers' perceptions, without the restrictions imposed by predetermined, rigid interview questions. Instead, the interview process was approached conversationally, with the interview guide loosely outlining major topic questions but still allowing for the expansion, clarification, and reassessment of important discussion topics. In this way, care providers were given control over conversational flow and could speak freely about any topic they wished to address without attempts at redirection by the interviewer. The majority of the care providers chose to complete the interview in one sitting, with two providers opting to break the conversation into two sessions to better accommodate their busy schedules or because of difficulties in initially accessing the HOPE platform. Ten interviews were completed in total, consisting of eight one-on-one interviews and two small group sessions (with two care providers present at each). The group interview strategy was incorporated into the project as a way to encourage collaborative knowledge sharing between colleagues, allow for as many interested participants to be involved as possible, and inspire busy care providers to volunteer their time to this research. In both group interview cases, the participants specifically requested that they be allowed to complete the interview with their colleagues. Each session began with the interviewer reading the information letter and consent form aloud to the participant(s), and reminding them of the risks, benefits, privacy measures, and their rights when participating in the project [See Appendix E – Information Letter and Appendix G – Consent Form]. Care providers were reassured that their involvement was completely voluntary, meaning that they could stop the interview at any time. Each participant then signed a consent waiver and the audiotaped interview session officially began (see Appendix G – Consent Form). An interview guide was used to loosely organize the sessions (see Appendix H – Interview Guide) (Creswell & Poth, 2018; Kvale, 1996). The guide was created in consultation with the Equity in Access group, and included questions centered around existing maternal services in Northwestern Ontario, perceptions of the app's target audience, and the logistical incorporation of the app in regard to connectivity, human resources, and willingness to embrace technology. Additionally, conversations about the accessibility, physical layout, visual presentation, and content of the app were conducted. The semi-structured nature of these interviews allowed me to flexibly adapt and reorient the conversation to best address the research questions. In some cases, this meant exploring something a care provider had said using a line of questioning that was not explicitly indicated within the original interview guide.

All interview sessions were attended by two members of the research team. Throughout the data collection phase, a reflective journal was kept in order to record my evolving thought process. This method has been suggested by Thorne (2016) as a tool for increasing researcher transparency and supporting the critical reflection process. The journal was filled out after each interview - in order to keep from distracting the participants – and included any thoughts, opinions, or initial connections to the data that I may have had. For example, if a participant brought up a particularly interesting point within their interview (such as one participant suggesting that nearly 100% of her patients who have used in vitro fertilization to achieve pregnancy have subsequently developed maternal depression), a note would be made in the reflective journal to ask care providers in successive interviews if their experiences were similar. Similarly, if a particularly interesting word was used (such as the term "healthscape", which is discussed later in this work), the reflective journal would be used to document the word, explore its meaning, and expand upon its relevance to the project. It is important to note that the reflective journal was not considered data itself – it merely contextualized the interview experience, allowed for me to challenge the research process, and represented a forum through which I could make note of concepts I felt were important - and therefore was not explored during the subsequent data analysis phase.

Ethical Considerations

In accordance with the standards outlined in the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2), this project was approved by the Lakehead University Research Ethics Board (REB) on June 27, 2019 (see Appendix I – Lakehead University REB Approval). The REB ensures that the guiding ethical principles defined in the TCPS2 are met, including respect for persons, concern for welfare, and justice (Government of Canada, 2014). Each of these complementary principles was carefully considered during the planning phase of this research project in order to ensure that all actions carried out by the researchers – whether intentional or not – met the highest ethical standards.

Respect for persons

Respect for persons includes recognizing the value that participants bring to research and respecting their autonomous right to participate or not (Government of Canada, 2014). Participant autonomy is established when individuals are able to give their free, informed, and ongoing consent (Government of Canada, 2014). Several design decisions for this project were made with respect for persons in mind. As described above, the information letter was created to include the study's goals and objectives, any foreseeable risks and benefits to the participants, and direct contact information so that only individuals who chose to participate had any direct interaction with the research team. Before the start of each interview, participants were required to indicate that they had been given enough information about the study, that they understood their right to withdraw from the study at any time without consequence, and that they understood how their privacy and confidentiality was being protected. The information letter was read out loud and written consent was sought from all individuals who chose to participate (see Appendix G – Consent Form).

Concern for Welfare

The second principle of the TCPS2 is concern for welfare. When designing a study, researchers should contemplate the impact that the study could have on the participants' wellbeing (Government of Canada, 2014). This can include aspects of their immediate health (physical, mental, emotional, or spiritual), or aspects of their lived circumstances, such as their physical, economic, or social conditions (Government of Canada, 2014). Researchers must strive to achieve their research goals with as little harm to individuals or the greater community as possible. This project aimed to be both accountable and transparent in its representations of participants. Additionally, although this study was centered around the potentially sensitive subject of mental illness, given the proposed demographics of the target population, minimal risk to participants was expected. Another potential concern for the welfare of research participants was how much control they had over the information they contributed and how this information was represented within the final research products (Government of Canada, 2014). The privacy of participants and the control of information within this project was safeguarded by a number of design elements. Each interview session was audio recorded and transcribed verbatim in order to ensure accurate representation of the participants. During transcription, all identifiers were replaced with pseudonyms in order to protect the identity of all involved participants. All other identifiers – including place of work, titles of programs, and specific community names – were de-identified using alternative language captured within square brackets. The audio recordings, typed transcripts, and pseudonym key have been stored separately as encrypted digital files that are only accessible to members of the Equity in Access team, and all physical consent forms are stored in a locked cabinet in Dr. Møller's office on the Lakehead University campus. The collective data related to this project will be securely stored for five years and then destroyed. After the first round of transcription took place, the transcripts were sent back to each participant via email to give care providers the opportunity to correct any errors, raise any concerns they may have, or remove sections of the interview that they were not comfortable with. This member checking process was used to ensure the accuracy, credibility, and validity of my representation of their experiences (Creswell & Poth, 2018). Four participants chose to take part in the member checking process and several added additional information that they felt would be important during analysis. All requested changes were added until a collaborative, satisfactory representation was achieved.

Achieving Justice

The final ethical principle that was considered during the design of this study was justice. Researchers must strive to create projects that are inclusive, fair, and equitable to all individuals involved (Government of Canada, 2014). In an effort to be as inclusive as possible, I chose to include maternal providers with experience from a range of disciplines including primary health care, mental health and addictions, maternal care, public health, and social services. The experts in each of these maternal health fields had unique experiences and outlooks on mental health treatment, and thus brought distinctive, yet complimentary, knowledge to the study. It is also important to comment on one aspect of my study design that could be viewed as restrictive: the focus on the suitability of the app for Euro-Canadian women at the exclusion of all other ethnic groups. The reasons for this focus are both practical and moral. After thorough discussion with the Equity in Access team, we decided that it was simply not feasible for me - given the time constraints of my master’s program - to consider the literature and analyze the providers’ perspectives on suitability, barriers and facilitators of the HOPE app for three diverse groups of women: women identifying as Euro-Canadian, women identifying as Indigenous, and women identifying as Arabic Muslim. I feared that trying to speak to the realities of all of these women comprehensively would cause the quality of my data analysis to suffer and would fail to do justice to the care providers that generously donated their time to this project. Furthermore, I have no personal experience as an Indigenous, marginalized, or racialized woman; therefore, I did not feel that it would be appropriate to expect my participants to share the details of these realities with me. Instead, members of the Equity in Access team whom have worked with Indigenous, marginalized, and racialized women in the past - and whom have existing connections to these communities - are focusing on these parts of the project. Finally, justice in research also refers to equally disseminating the final products of a project so that no one is denied its benefits (Government of Canada, 2014). The knowledge generated during this study will be disseminated back to the community in a number of ways. Once the larger project has concluded, several workshops focussed on research findings will be hosted in Thunder Bay, Kenora, and Sioux Lookout. My final thesis report will be sent to each of the research participants I have interviewed, and a final report will be shared with all project participants. Finally, a number of conference presentations and academic journal articles are expected as dissemination products of the Equity in Access project as a whole.

Data Analysis

Interpretive description requires that the researcher work from large, abstract concepts toward the minutiae of the data (Thorne et al., 1997). There are numerous analytical techniques that can be used to complete this goal; however, it is important that the method chosen is appropriate in addressing the study’s purpose. In this case, the analytical method that I chose was consistent with the process described by Thorne, Kirkham and O’Flynn-Magee (2004). The steps involved in this process included “moving beyond the self-evident”, “engaging the mechanisms of interpretation”, and “envisioning the research product” (Thorne, Kirkham & O’Flynn-Magee, 2004. pg. 5-7). As previously mentioned, current knowledge and practice largely influences the preliminary analytical framework basis for interpretive description studies. Integrity of purpose is achieved by fully exploring what is already ‘known’ and ‘unknown’ about the topic of study (Thorne, 2009). However, while this knowledge is important for shaping the sampling strategy, study design, and early analysis, all current knowledge must be considered flexible by the researcher in order to allow for fresh interpretations outside of the current scope of understanding (Thorne, Kirkham & O’Flynn-Magee, 2004). During this study, data collection and analysis were not discrete processes, but rather used a continuous and cyclical process to inform each other in order to shape and reshape the direction of inquiry (Thorne, Kirkham & O’Flynn-Magee, 2004). For example, the first two interviews were coded before the third interview took place, resulting in the development of a new probe that asked care providers their thoughts on the course module activities.

Coding and Rigor

The concept of rigor – or research reliability, truth, and validity – is often a topic of great discussion when designing and implementing qualitative research (Cypress, 2017). In fact, the entire foundation of qualitative research projects as ‘journey[s] of explanation and discovery” (Cypress, 2017, p. 254) would seem to run contrary to the stiff boundaries imposed by academic rigor. This is particularly true of Interpretive Description, since this methodology’s emergent design not only recognizes subjectivity, but actively seeks it (Thorne et al., 1997). Because of this, Thorne and colleagues emphasize that “attention to rigor in the process [of ID studies] and the reporting of that process is critical" (Thorne et al., 1997, p. 175). Thorne and colleagues go on to argue that eliminating all researcher bias is both futile and counterintuitive to the epistemological underpinnings of Interpretive Description; therefore, instead of seeking to 'bracket out' subjectivity, researchers are encouraged to actively consider and reconsider the ways in which they shape – and in turn are shaped by – the research project (Thorne et al., 1997). In addition to explicitly situating the researcher, qualitative rigor is also ensured through the strength of the research design and the appropriateness of the study's methods to address the research questions of interest (Cypress, 2007). The rigor of data interpretation in this study was strengthened in three ways: (1) my position was explicitly situated and re-situated within the research; (2) care providers were emailed back their transcripts in order to validate that they had been accurately represented; and (3) a second researcher on the Equity team independently coded the data to ensure intercoder reliability (Burla et al., 2008). In contrast to other methodological approaches, recognized knowledge in Interpretive Description studies is co-constructed between the researcher and the participants, reducing the need for researchers to 'bracket out' preconceptions to account for potential biases. Thorne argues that the act of 'bracketing out' researcher biases works counterintuitively to the goal of Interpretive Description – and indeed the field of nursing – which is to produce findings with translational applicability right from the very first phases of the research project (Thorne et al., 1997). During data collection, the reflective journal served this very purpose: I was able to discuss the preconceived ideas that I myself brought to the research project, as well as the ways in which my preconceived biases were challenged and changed throughout the inquiry. The journal also served to establish a timeline of critical reflection and emerging themes, which then assisted me in contextualizing the data during later stages of the analytical process. Due to the applied nature of interpretive description, the analysis process must also be undertaken with the ultimate goal of practically applying the research findings to a particular audience. As such, it is important to anticipate the needs of this audience and to understand the real-life consequences that erroneous findings could have on these individuals (Thorne, Kirkham & O'Flynn-Magee, 2004). For example, modifying the app based upon incorrect interpretations of the data could result in the platform becoming unacceptable, unsuitable, and culturally inappropriate for women in Northwestern Ontario. This could not only result in low uptake for the women of this area, but worse, could also result in harmful health outcomes – such as increased feelings of stigmatization or even suicidal thoughts or actions - if scientific rigor is not ensured.

The journal also provided a running commentary through which I could reflect on my own position within the research and could elaborate on biases I felt I may have brought with me when designing this project. Many of the subjective biases I brought to the study aligned with those already implicit to the fields of nursing and health care. For example, as a hopeful future healthcare provider and physician, I hold a number of opinions surrounding the value of common social good and the importance of care provider role in contributing positively to society. Additionally, I felt strongly entering this project that human suffering can and should be ameliorated by care professionals wherever possible and these providers should always seek to do no harm in the patients they serve. Finally, as a Canadian citizen and member of the Canadian health care system, I entered this project with a strong opinion that all individuals – regardless of their varying social backgrounds – are deserving of equitable and sufficient access to quality resources for ensuring health and wellbeing. While the reflective journal acts as a documented timeline for the theoretical though process that can be retraced to ensure the validity of the findings, Thorne suggests that further steps are needed to ensure the truth value of qualitative research results (Thorne et al., 1997). It is particularly important that data analysis proceeds using ‘safeguards’ to ensure researcher bias does not misrepresent the information that participants have provided (Thorne et al., 1997). In this case, member checking and intercoder reliability measures were used to increase the academic rigor of the findings. Member checking is a process by which participants themselves confirm the credibility of their portrayal within the analytical description of the data set (Crewell & Poth, 2018). It consists of presenting the data back to participants so that they can correct errors and challenge the researcher’s inaccurate interpretations (Crewell & Poth, 2018). Member checking also provides an opportunity for further discussion with the participants, leading to new or additional information (Crewell & Poth, 2018). On the other hand, intercoder (or inter-rater) reliability relies on two or more researchers coding the same data independently and arriving at exact or similar coding schemes (Crewell & Poth, 2018). Wherever discrepancies exist between the two researchers, a discussion takes place surrounding the ways in which the data could be interpreted, and a final compromised coding scheme emerges (Crewell & Poth, 2018). The early stages of interpretation involved repeated immersion in the data on multiple occasions before attempting to code or organize. My first exploration began as early as during the interview process, when new ideas and connections were noted during conversations with care providers and were added to my reflective journal in order to contextualize the information. Next, I closely familiarized myself with each of the care providers’ interviews during the transcription process. The interview audio tapes were listened to several times and the transcripts were read in succession in order to develop a sense of the whole beyond the immediate. The process of intimately knowing one’s data before sorting discourages premature, superficial understanding and instead encourages deeper and more meaningful analytical interpretations (Thorne et al., 1997).Each of the participants was given the opportunity to read their own transcripts and to discuss the ways in which they felt this information should be represented in the final thesis document (Creswell & Poth, 2018). Four participants to part in this process, and two participants chose to add new information to their transcripts or represent old information in a new way. Five major themes were used to structurally organize the data in chronological order consistent with the major question sections of the interview guide (see Appendix H – Interview Guide). Beyond these major ‘containers’, smaller sub-themes (such as each of the care barriers) were developed and re-developed through repeated engagement with the data. Finally, the transcripts were uploaded into the software program Nvivo™ and the formal coding process began. At first, codes were kept simple and focussed on broadly related groups of data, such as the five major themes (Thorne, Kirkham & O’Flynn-Magee, 2004). Parallels and dissimilarities were then noted both within and between these top-level nodes in order to develop more intricate sub-themes and patterns. In order to ensure the validity of these themes, a second researcher from the Equity in Access team independently coded the data (Creswell & Poth, 2018). This process led to discussions on new mechanisms of interpretation and the rearrangement of several sub-themes. In summary, it is true that preconceptions that I brought to this study are likely to have contributed to the ways in which the data was interpreted; however, I am hopeful that the steps taken to frame these biases and to hold myself accountable to the realities of my study's participants has ultimately contributed to more rigorous, valid, and truthful conclusions (Thorne et al., 1997).

Chapter 4: Findings

Over the course of this project, ten care providers from organizations located in Thunder Bay and Kenora were interviewed about current maternal mental health services available in their area and their perceptions of the potential for the HOPE app to offer their clients, their colleagues, and themselves additional support. Since no care providers working in Sioux Lookout could be reached for an interview, the results of this project will be interpreted within the context of Thunder Bay and Kenora only. The ten participants were women that worked in a wide range of maternal and mental health capacities offered through health units, counselling centers, hospital programs, and social service organizations within the two communities. To protect the anonymity of these care providers – and to encourage honest and unabated discussions about their experiences – all participants were assigned pseudonyms, which will be used throughout the remainder of this document to indicate direct citations. A table outlining these pseudonyms and their associated professions can be found under Appendix J – Care Provider Profiles. Five major topics were discussed: (1) barriers to existing services and supports; (2) suggestions for app content and layout; (3) the uptake and marketing of the HOPE app; (4) potential obstacles to using the app in Northwestern Ontario; and (5) potential benefits to using the app in Northwestern Ontario. Within these five overarching 'containers', twenty-one subthemes were identified. The "barriers to existing services and supports" theme produced five subthemes: (1) structural barriers; (2) environmental determinants of health; (3) social determinants of health; (4) individual-level barriers; and (5) current screening practices. The "suggestions for app content and layout" container produced six sub-themes: (6) ease of use; (7) suggestions for physical layout; (8) suggestions for risk assessment; (9) suggestions for therapy modules; (10) suggestions for healthy habits; and (11) suggestions for mood tracker. The "uptake and marketing of the HOPE app" container produced four sub-themes: (12) care provider uptake; (13) user uptake; (14) existing online supports; and (15) marketing strategies. The potential obstacles to using the app in Northwestern Ontario" container produced three sub-themes: (16) restrictions to audience; (17) cultural sensitivity; and (18) access to internet and devices. Finally, the "potential benefits to using the app in Northwestern Ontario: container produced three sub-themes: (19) building a comprehensive care network; (20) reducing stigma; and (21) HOPE for the future. Each of these themes and sub-themes are broken down below with supporting anonymized quotes. Throughout the findings section it is important for the reader to be mindful of the voices that have been privileged through this work. This project consulted care providers with direct professional experience working in a maternal or mental health capacity; however, 'patients' or 'potential users of the app' were not approached at this stage of the Equity in Access project. All of the care providers were women, and several (at least four) were also mothers themselves; at times these individuals would extend beyond their professional client-provider experiences to offer personal stories and anecdotes relating to their own experiences as care providers, women, and mothers. Emily summarized the unique insider/outsider status that some of the care providers held when she shared, "I'm also a mother myself and so, I think I have a special interest in maternal mental health and infant and child health. As a mom (as well as a care provider), it's important to me". Nevertheless, it is vital to note that we interviewed these participants as care providers first and foremost, and we asked them to share their care-provider-perceived needs of women living in Northwestern Ontario; as a result, their opinions and perceptions may not fully represent the experiences and needs of women living in the North. That does not mean that these perceptions are without merit; in fact, care providers (particularly those who are mothers themselves) are well positioned to be able to speak towards structural, political, physical, and environmental barriers to our current care system. Ultimately, care providers' opinions on the needs of their patients will provide us with valuable insights towards creating a more accessible HOPE platform. Importantly, care providers will also be able to share with us their willingness to embrace the HOPE app technology, a factor previously identified by the MHCC as vital to eHealth success (Mental Health Commission of Canada, 2014). Not only is care provider willingness to embrace the HOPE app important, but they will also need to establish whether or not they have the capacity to take on the potential new roles and responsibilities that come with referring their clients to the online platform. Further still, it is vital that a referral network for in-person services be created so that successful in-person care can be provided in the case that online care is insufficient. Nonetheless, the perceptions and experiences of potential users' will also need to be sought and compared with what providers have shared below before the HOPE app is truly ready for launch in Northwestern Ontario.

Barriers to Existing Services and Supports

During the discussion on existing maternal/mental health services and supports available to women living in Thunder Bay, Kenora, and Northern rural communities, the care providers identified twenty complex multilevel barriers to care access. These barriers have been grouped into four organizational levels adapted from Reid and colleagues' (2005) 'delivery system' model, Ferlie and Shortell's (2001) 'framework for change', and Smith and associates' (2019) 'theoretical multilevel conceptual framework'. This modified model organizes the barriers under the following levels of influence: structural (staffing, policy, funding, and political aspects), environmental (geographical and ecological factors), social (economic and social determinants influencing health status), and individual (care-provider-perceived knowledge, attitudes, perceptions and personal characteristics of women). Some of these barriers primarily affect care providers in their delivery of quality maternal mental health services, whereas others are care-provider-perceived needs of women living in the North. These multilevel barriers interact in complex and compounding ways to reduce access to maternal mental health education and treatment for women living in Northwestern Ontario.

Structural Barriers to Maternal Mental Health Care

(1) Lack of Specific Maternal Mental Health Services.

All ten care providers spoke at length about the maternal supports and mental health services currently offered within their communities. Many felt that the quantity and quality of the maternal programs available – such as childbirth courses, breastfeeding supports, and exercise classes – were a marked improvement from what had been offered in the past; however, mental health supports were still largely unavailable and inaccessible. There were not enough general mental health services available in their communities, let alone services that were specifically oriented towards mothers. This made it incredibly difficult to "find specific resources… specific to pregnancy and specific to postpartum" (Nicole). Several participants mentioned the "gaps" and "underdevelopments" in counselling services, with Kelly capturing the frustration felt when trying to get help for the women in their care: "mental health services; they tell me there's tons out there… so why can't I get my women in to see people?". These "gaps" meant that care providers could refer women to maternal care, or they refer them to mental health care, but they were unable to refer them to maternal mental health care resources specifically. Furthermore, organizations did not have the capacity to offer one-on-one counselling services unless prearranged partnerships had been established with other community counselling organizations. Similarly, care providers did not have the capacity to seek formal therapeutic counselling training due to time constraints and high patient volumes. The lack of local mental health services left care providers feeling as though they were "working [in] silos" (Jennifer) with nowhere to refer their clients for the additional support that they needed. Importantly, Rita pointed out that "it is not only about availability of resources, it's also about a resource that will work for that particular patient", she went on to explain:

> I have a lot of people who I think should be accessing resources, but who won't. Be it that they don't have time, they can't make it work within their complicated lives, or if it's that they see it as some kind of failing or weakness…Or they just don't want somebody else knowing about their lives. It can be any one of those things. So, I don't have an absolute sense of "oh, my goodness! I can't get help for women when I need it". But, I do think that we probably lose a bunch of people through the cracks. And, I don't see an obvious solution to that, because as I've mentioned, we can offer the resources, but I often feel like I am turned down when I offer the resources.

Rita went on to point out that it can be difficult for care providers to speculate on what is 'best' for their patients, highlighting the crucial need for direct end-user input in the next phases of this research project. Often, providers had to work outside of their official roles to try and provide mental health support for clients over long periods of times. Alice - whom works in an organization providing services to women with addictions challenges - explained that although their allotted time with clients was officially only eight weeks, they often ended up treating some individuals for much longer. In fact, she told us that her colleague had been seeing a client for eight months**, "**because it is difficult when that relationship has been built… But, that's the problem. That is why this patient is here still… we have no place to send her. She has already developed that therapeutic relationship" (Alice). The providers called for "more mental health services in general and specifically for pregnant women and postpartum" (Hannah). Many felt that more specific resources focusing on early stage prevention – rather than late-stage treatment – were needed to improve maternal and child health outcomes in Northwestern Ontario. One care provider pointed to midwifery as an example of an integrated holistic care approach for the prevention of mental health disorders; she recalled that her own experiences with her midwife had left her feeling supported in reaching out whenever she had concerns. Although this continuity of care was fundamental for her own mental wellness, the participant also reiterated that the time needed to provide such care was a luxury that most care providers working in Northwestern Ontario were unable to afford. All of the care providers agreed that both care providers and women would benefit from having "a menu of services" that women could choose from based upon their own preferences, beliefs, and values, since "what works for me might not work for you, right?" (Hannah) and "there isn't one resource that is the right resource for every patient" (Rita). Access to specific services was perceived to decline even further within the smaller Northern communities outside of urban centres.

In addition to the overall availability of services, the care providers also talked about the inaccessibility of existing programs due to formats that they felt created barriers for some types of women. Of particular concern was the lack of supports offering concurrent treatment for comorbid addictions and mental health disorders. Although some comorbid treatment programs did exist within the communities, they often did not have the capacity to follow women long-term and there were no family therapy programs available for comprehensive household support. Increased peer support programs, services addressing multiple comorbid addictions, and facilities able to accommodate whole families during treatment were recognized needs within the participant's communities. Group therapy programs – used in the interest of conserving resources and reaching as many women as possible – were also perceived as problematic formats. This was primarily true because organized classes, courses, and programs required women to identify themselves to several other women in their community, which the care providers felt discouraged participation. One participant felt that group formats may be inadequate to fit the needs of women with mental health challenges because they prevent anonymity, perpetuate stigma, and provoke feelings of abnormality. She referred to this as "the small-town factor" where "no one wants to be identified or labelled with [mental illness] … they just don't want to be painted with that brush" (Alice). Hannah added that:

> women that have had mental health challenges [don't] want to go to a group where women feel great, there're engaging with their babies, and life is great. They want to go somewhere where they can… be with other people that are feeling sad.

Creating opportunities specifically for women living with depression or anxiety was seen as one way to normalize the realities of maternal mental health disorders while also providing support and treatment. Care providers felt that women were most likely to seek services where they felt represented by the content, program format, care staff, and other participants. One social service provider, Alice, said she thought "that there is a lot of segregation in… what services people feel comfortable accessing and I feel that that is very strong in [my community]". She then went on to give the following example: "the [children's health center] at the library … that is predominately white, upper-class, middle-class women who access that service" (Alice). Others had similar observations, noting that it was generally women from presumed middle-class Euro-Canadian backgrounds – as opposed to women of Indigenous background - who accessed the services offered by the local health units and hospitals. Alice continued, "many of the First Nation women, if they were to access a [children's health center] or a family support program, [they] would do so through the [Indigenous health center]. There's a lot of segregation" (Alice). Despite several of the care provider's organizations attempting to extend their services to Indigenous women, they felt that the women accessing their programs were generally limited to women of Euro-Canadian backgrounds. Therefore, not only did care providers feel that more maternal mental health resources needed to be created for Northwestern Ontario, but it was also vital to them that these services be culturally appropriate and culturally safe. However, while cultural clusters were convenient for describing usage patterns among existing services, care providers warned against trying to organize women into discrete groups and assuming that one care option would meet all of their needs. Instead, they emphasized the heterogeneous nature of the women living in Northwestern Ontario and stressed that multiple care options available under a 'menu' of services would best serve the diverse women and other care providers within their communities.

(2) Waitlists and Capacity.

Much like the overall availability and accessibility of services, waitlists for programs were divisible by program type. Maternal services generally tended to have the capacity to meet all community demand without lengthy wait times; however, mental health services could have backlogs that stretched as long as “six months” (Alice). Other organizations did not operate with waitlists for some of their programs but were unable to “take on counselling and direct client services” (Nicole) as a result. Seven of the ten care providers offered at least some maternal programming without any waitlist. Prenatal courses, exercise classes, and breastfeeding groups consistently offered enough spots to accommodate all interested clients and some care providers even had challenges “getting enough numbers to run the group” (Hannah). These classes were most often attended by – what Alice described as - the “worried-well”; a term which refers to largely healthy patients who have high levels of anxiety about the process of pregnancy, childbirth, and child rearing despite having no recognizable risk for adverse health or social outcomes. Although these women require elevated amounts of reassurance from their care providers, Alice was careful not to “discredit the worries that they have, because to them, those are their health concerns”, however, she did point out that, “in the [grand scheme] of what risk looks like, it’s not the root of where we want to support family health” (Alice). The short turnaround of prenatal courses, exercise classes, and breastfeeding groups meant that care providers never had to turn women away; at most, they may have to push their clients to a different week of classes. Minimal long-term follow-up with patients meant that women who had been in the program for some time could cycle out as new women entered. Conversely, other types of programs – particularly those with addictions, counselling, childcare, or therapy components – were often “jammed full” (Kelly) and care providers had to adjust their work schedules and program layouts to accommodate all women. Marie described the scope of the childcare barrier as having “to be on that waitlist [right] when you get pregnant” while Alice described the “ebb and flow” of most maternal programming as “waves of access”. During “peak times”, Alice explained that care providers had to “scramble to do [their] best to meet everybody’s needs”. These were periods of high stress, when providers found themselves asking “how [will] we [be] able to offer support effectively to everybody?” (Alice). Providers felt a lot of pressure to maintain the quality of their supports while also increasing their caseload, which was particularly challenging if there was only one designated professional running the program. Moreover, wait times could be significantly extended if that individual went on holidays. Interprofessional and intersectoral collaboration were emphasized by several care providers as tools to decrease patient wait times and connect them to services as quickly as possible. Situation Tables (available in both Thunder Bay and Kenora) were brought forward as successful examples of collaboration between diverse sectors to deliver the best possible care to patients with multiple complex risk factors. These Situation Tables bring together community partners from diverse sectors (including public health, social services, mental health, addictions, law enforcement, employment, and education) in order to help individuals facing complex circumstances (Canadian Mental Health Association, 2017). Through the support of interagency discussion and resource sharing, Situation Tables allow community organizations to assist individuals with multiple risk factors beyond the capacity of each independent agency (Canadian Mental Health Association, 2017). Different health sectors can “call on [their] partners to assist [them] with… [getting individuals] the service that they need when they reach an acutely elevated risk” (Maria). Maria went on to clarify that she “doesn’t mean to say that [the Situation Table] has taken away the waitlist, but, in times of crisis I think it has really assisted us”.

Out of all the services discussed, mental health counselling seemed to have the longest wait time for clients. Care providers estimated the average wait for therapy to be anywhere between "three” (Nicole) and "seven" months (Hannah). Women asking for referrals for prescription medications could face even longer delays. Furthermore, care providers pointed out that even when women were able to get on a patient list for therapy, they still might have to wait several weeks to get an in-person appointment. When asked whether her past clients had talked about having to wait for needed services Nicole responded, “Yes there is often a waitlist for counselling services. Or, if it’s not a waitlist, then to get into counselling services they might have to wait for their appointment and that can take multiple weeks to get into**”.** Another provider with experience working in other provinces stressed that finding available, accessible, and specific mental health resources in Northwestern Ontario was significantly more challenging than it had been elsewhere in Canada. In the meantime, care providers did their best to provide women with alternative supports in order to monitor their emotional state: “Sometimes people have to wait for an appointment, but they are given the appointment and services to help them in the meantime… The waits come from the other piece… if you want to go to [long-term therapy] or if you want some programming at [the hospital] or stuff like that” (Jennifer). This was a sentiment echoed by Linda who stressed that “referrals to other community services” was what created the longest wait for clients in her care. Therefore, while general perinatal and postpartum services were perceived by the care providers to be available and accessible, they once again stressed the pressing need for more specific maternal mental health services that would allow their clients to access care in a timely manner. Expanding existing services and encouraging partnerships between community organizations were reiterated as essential tools for reducing the lengthy wait times for mental health services. While these collaborations did not eliminate waitlists completely, they did help to ensure that women had at least some supports in place while awaiting therapeutic counselling.

(3) Shortage of Primary Care Providers and Medical Insurance.

Women without a registered primary care provider (PCPs) – such as a family physician, nurse practitioner, or midwife - do not get the benefits of early mental health screening and intervention. Care providers stressed that without continuous care, there is no one in a professional capacity to flag women as high-risk at the beginning of their pregnancy. As a result, the responsibility was placed entirely on individuals to "recognize [their] own signs and symptoms of mental illness or mental health challenges" (Emily) and bring them forward to whichever care provider they happen to see at their next prenatal appointment. Emily noted the challenges of working with women without primary providers:

> I struggle with the fact that a lot of women are hard to reach; because unless they have a care provider who directly asks them in the postpartum or pregnancy period if they're having issues and unless they self-identify and raise their hand and say, 'I need help with this', they're in isolation… and how do we find those people?... I think a lot of women just struggle in silence and don't ever ask for help… [This] is really the main challenge for me.

By one care provider's estimation as many as "40%" (Kelly) of the women that she saw in her practice were not registered with PCPs. Furthermore, Rita's experience was that women without PCPs were also at a greater risk of experiencing mental health challenges:

> I often [see] women [who] don’t have primary care physicians… [Social and emotional issues] are much higher in that group. Now… most of those people see a nurse practitioner…before they are referred to us and… I suspect that there might be some selection going on there. But, if I had to average it… I would say well over 50% of my people that I see… have social and emotional issues. Whereas, with the group of people [that have PCPs] that I see at the [clinic]… I would say that it’s probably closer to 20% there.

The participants listed multiple reasons for why they felt there was a lack of primary care, including a shortage of general practitioners, the transient nature of the Northern population, and a waitlist of up to two years to be rostered. One particular concern was that the absence of formal PCPs created barriers for women when accessing private therapeutic supports. One provider’s experience was that many therapists within her town were unwilling to see patients unless they were connected to a family physician. Although private therapeutic supports were perceived to be more available than public services, care providers had encountered experiences in their personal and professional lives that led them to believe that “many [programs] do not want to see the patient unless they're connected to a primary care provider” (Kelly). In Kelly’s opinion, psychiatrists were hesitant to take on patients without the additional support of a general practitioner or a nurse practitioner because these PCPs acted as the primary contact in times of acute crisis.

Another important perceived barrier to care was the incredibly high expense of seeking private mental health services. Care providers emphasized that women only had access to private counselling if they were able to afford costly private insurance, “and even then, it’s hard to figure out the avenue in which to access private services because you would need to… be able to find the right provider" (Nicole). Maria described her personal experience with the high costs of private services, stating: "I know myself, I have $50 coverage for mental health, we've paid over $1000 for my daughter for mental health in this city, because there's no coverage!". Unfortunately, finding "the right provider" was perceived to often be "a difficult thing to even establish in itself" (Nicole). People with an Employee Assistance Program through their workplace may have partial coverage, but the rest of the expense must be paid out of pocket. Furthermore, one care provider felt that women with insurance coverage may still face the barrier of having to pay for some services upfront and then waiting for a rebate. Another care provider indicated that while Indigenous individuals with Status received coverage for public services, many did not have coverage for private services with shorter waitlists. It was her opinion that this meant that those who were able to access private counselling were usually from middle-class, white backgrounds, while mothers with lower socioeconomic status or from diverse racial, cultural, and ethnic backgrounds were forced to wait for services. In these communities, nurse practitioners and midwives had to step into the PCP role on a short-term basis for some women. This process was described by Kelly:

> In the past I have taken on [the PCP] role temporarily just so that [my clients] get services. Recently, I have accepted a client for mental health assessment and medication initiation at the request of the [Obstetrician/Gynaecologist]. When the client is no longer part of our service I will need to try to find her a [PCP]. Not having a primary health care provider is the biggest concern for us. It would be nice if we could have a [nurse practitioner] who did women's mental health and [Cognitive Behavioural Therapy].

While some nurse practitioners were able to fill the role of a PCP long enough to get some women into services, Kelly simply did not have the capacity or the resources to take on this role long-term.

(4) **Lack of Funding & Billing codes.**

The existing maternal health, mental health, and social services organizations available in both communities were almost exclusively reliant on government funding to maintain staffing levels and conserve programming. While reliable and consistent core funding provided some of the care providers with opportunities to expand their maternal services long-term, other providers expressed that less reliable government funding meant that programs were often cut year-to-year. Some programs were subject to abrupt change due to governmental shifts in the prioritization of health care costs as legislative power changed from one political party to another. As Emily stated: "I think the challenge is that in many of these [communities] there is nowhere to refer… and Doug Ford isn't helping anything in our current climate". Hannah agreed, stating "this provincial government right now… I don't know how many new initiatives they would consider". At least four of the care providers worked at organizations that had lost programs "cut by the ministry" (Maria) over the past twelve months due to funds being redirected. When financial aid was channelled out of mental health programs, care providers were forced to 'trim the fat' and could not always do everything they wanted to in order to reach marginalized women. Even when funding was made available, sometimes complex payment structures and billing codes created further barriers to the creation of new initiatives. For example, Hannah pointed out that "there's no billing code for that preconception health screening" which created "a challenge" for pushing forward new initiatives prioritizing proactive anxiety, stress, and trauma screening. Kelly also spoke to the complications that payment structures create, noting:

> it's difficult [to get funding regardless of] the political platform… [and] the challenge is, if you [spend money funding a Northern psychiatrist] once a month and they only get paid by OHIP and nobody comes, then they've lost a day. So [payment] is a barrier too.

Several participants also pointed out that First Nations communities may be particularly affected by unstable funding because of the ways in which monies are governed federally, provincially and regionally. Self-governed First Nations communities may get very little financial support in the first place, and then they must decide how to best spread these sparse funds over many high priority areas. Maria skillfully summarized this point during her following statement:

> It depends on the First Nation, it depends on the funds, it depends on where they are deciding [to use the money]. At times within the community, the needs are [shifting] and they are deciding to put a lot of their monies into housing and maybe a little less into… the social services. And other times, there is lots put into health services.

She went on to point out that "it all depends on how the First Nations is functioning and what they are deciding is their own priorities" (Maria). If there are more pressing issues within the community, maternal mental health will be deprioritized, and funding will be redirected elsewhere in order to manage issues more at the forefront of public consciousness. Additionally, the ways in which Indigenous communities can use funds is distinct from 'mainstream' health organizations because "they don't have infrastructure funding" (Maria). This was a structural barrier that Maria had personal experience with through her past work in a First Nations community, when:

> right off the top of our budget for addictions and mental health came 10% that had to pay for road services, our building, that kind of stuff… so, you're not really comparing services in the same way because there is a disadvantage right from the get-go (Maria).

Alice then articulated that the chronic underfunding of Indigenous communities was particularly unfortunate given that - in her experience - culturally appropriate, Indigenous-led programs were often the supports that Indigenous women felt most comfortable accessing.

(5) Lack of Interprofessional and Intersectoral Collaboration.

Many of the care providers were unaware of all of the other maternal and mental health services offered within their communities. For example, new physicians or NPs may not be aware of the different types of maternal supports available to women through midwives, or Indigenous organizations unless their respective organizations actively sought open communication and partnership with one another. As mentioned previously, this was a problem because the participants felt as though they were working in "silos" (Jennifer) and they didn't know where to refer women if they needed additional support. As a result, the participants called for increased communication between organizations, professions, colleagues, and sectors. Kelly highlighted the need for a "comprehensive list of services … that says, 'here's all the places that you can access mental health services in [your community]. And who takes Status and who doesn't". The Status and funding piece was particularly important to her because, "I have… this particular girl [who] is not status, she's Caucasian, so I can't send her to see most of the private clinics, because she has no coverage". Providers suggested that a "menu" of local service be created that detailed the "range" of different supports offered by each organization and the cost – if any - associated with accessing them.

Environmental Determinants of Health Barriers

(6) Geographical Distance.

The vast and sometimes isolated geography of Northwestern Ontario created challenges for maternal and mental health care delivery, through the creation of high-demand areas with low population densities. Communities such as Thunder Bay and Kenora were considered by the care providers to be central hubs for service access with supports in these areas responsible for the health and wellbeing of both urban residents as well asindividuals within the larger district. When considering the needs of all people in the district, Hannah pointed out, "I feel like our geography [is a barrier] … we have unique challenges around meeting our community's needs; what [services] do those small communities have [and what do they need from us]?". Emily agreed, saying:

> geographic distance is a problem for a lot of our Northern communities [because] if you're living in remote communities… you would … sometimes have no access to [mental health] counsellors there. You may have to fly to Thunder Bay if you lived on an Indigenous community…. people that live on reserve in Indigenous communities might have a very hard time getting here"

Several care providers were confident that some individuals living in rural and remote communities were required to drive or fly long distances in order to access services in urban centers. Many of these smaller communities also did not have hospitals equipped for labour and delivery, as Maria outlined:

> Not all communities deliver babies and I think that is difficult for a lot of people, and it’s even more difficult for people who are marginalized because they don’t have transportation… There is no public transportation… and they worry about it. Often times if there are [pregnancy] complications they actually have to come to [the city]. They have no money. They have no way to support [themselves], but they have to come and live in [the city for] a week or two… before they are able to deliver. All of those things add to worries and mental health. You aren’t getting the same care as a person who lives in the city, yet, we are all in Northwestern Ontario. Or even needing to drive from one community to another to be able to deliver…. hour and a half away. But, it’s not an hour and a half where there is public transportation. There isn’t [any]. It’s an hour and a half where there’s no public transportation and where at times roads can be closed [and] weather affects everything. All of those are added worries that occur to our women within the district.

The geographical barrier was also perceived to be closely tied with socioeconomic status, since trips into the city could be very costly: “we have people that have to come to [the city] and they don’t have a place to stay. They have to come for a couple of weeks or whatever, and they don’t have funding” (Maria). Susan added, “and they don’t know anybody here… there are no supports here”.

(7) Hazardous Weather.

Similar to Maria quoted above Alice also mentioned the sometimes harsh and unpredictable weather of Northwestern Ontario as a disruptor of maternal mental health care. The icy road conditions and heavy snowfall in the winter time could limit transportation to and from outlying communities, which she felt might make it even more challenging for women living in these areas to receive timely support. Furthermore, Alice felt that the weather itself could have negative effects on women’s mental health, pointing out that “when it gets cold, no one wants to go anywhere”. In her experience, “even the amount of daylight” (Alice) could contribute to negative mental health outcomes, with the short and dark days of mid-winter amplifying symptoms of depression and anxiety in some individuals. During the summer months, "its darker later” and – in her experience - women were less at risk of developing depressive thoughts. Alice also pointed out that the weather in Northern Ontario might create safety hazards for women trying to access services. For example, women that “don’t have the gear to go out” (Alice) – such as winter coats, gloves, and boots – might not be able to access services without potential frostbite.

Social Determinants of Health Barriers

(8) Transportation.

Restrictions in access to safe, reliable, and affordable transportation to and from services was perceived by the care providers as a major barrier for women in Northwestern Ontario. As outlined above, several of the providers emphasized that women living in rural and remote communities might have to fly or drive to the nearest urban center in order to receive care. In their opinion, these trips could be incredibly costly, and could potentially discourage women from seeking specialized help outside of their communities. In addition to this, two providers mentioned that undertaking long trips with one or more small children would likely be unmanageable for most mothers living in rural areas. Even for women living in urban centers, the providers emphasized that transportation might not always available or accessible. Care providers spoke about the costs associated with having a car, purchasing gas, taking a taxi, or buying a bus pass. One care provider pointed out that women from lower socioeconomic backgrounds might not be able to afford a car and would rely entirely on walking, procuring rides from family/friends, or taking public transportation to get to and from appointments. Both Thunder Bay and Kenora have public transit systems; however, Alice stressed that the bus system could be "very confusing and only goes certain routes". Therefore, if services were not located on a bus route, care providers feared that women could still face a lengthy walk to care centers. Furthermore, she pointed out that bus passes could be "very expensive" and she was unsure "if any other [smaller surrounding] communities [even had] bus systems" (Alice) at all. When asked how people usually access her agency's services Alice replied: "They take a taxi, they would walk… They would try to find someone to give them a ride, and/or we go to them". The providers supposed that taking public transit might have additional consequences for new mothers who would have to "put [their] baby in a carriage, and dress it, and drive to somewhere" (Alice) or push heavy strollers onto the bus. Several participants noted that in their personal experience, travelling with small children was a taxing ordeal even without the added complexities of depression and anxiety. Logistically, the city buses were only able to accommodate so many strollers at one time, which Emily feared could force women to wait at the bus stop for multiple bus cycles until stroller space became available; resulting in them missing their appointments altogether. In order to avoid this outcome, many of the providers we spoke to had implemented transportation accommodation programs at their organizations including providing bus or cab fare, issuing bus tokens, or even meeting women at a location of their preference in the community. Some care providers even went as far as picking women up in their own personal vehicles so that they did not miss their appointments.

(9) Blacklisting.

The practice of 'blacklisting' clients was only brought up by two care providers; however, given the potential implications that blacklisting could have on vulnerable women, it is important to include a discussion on it here. 'Blacklisting' is the practice of denying patients future medical care based upon past actions that were deemed to be harmful, detrimental, or wasteful to the health care system by the care provider. When patients are 'blacklisted', they may face increased resistance or scrutiny from care providers regarding their health claims, or they may be barred from receiving care altogether. Nicole mentioned the possibility of blacklisting in passing. She had heard that if women "can't get to [their] appointment on time" due to unreliable transportation and "don't have a way to contact [the PCPs office] because [they don't] have a phone… [they] could be told 'you're not getting services here anymore'" (Nicole). Another care provider – Alice – spoke to the practice of blacklisting more directly; however, upon reviewing her interview transcript, she asked that the following disclaimer be noted in regard to the quotes used below: this information came to her anecdotally from families who said that they hadn't been invited back to certain organizations after a certain number of missed visits. Alice emphasized - and added to her transcript - that this information may not accurately represent the practices of these organizations and blacklisting is most likely not a formally recognized practice or policy at those agencies. Alice cautiously suggested that blacklisting may still be a pervasive – yet concealed – practice that some organizations in her community used when women missed too many appointments in a row. She described the experiences of some of her clients by saying, “I know that if women miss a certain number of appointments, then they are blacklisted, right? They are not able to… go back. So, that’s a barrier” (Alice). Alice found these practices “discouraging” because it can “take a couple tries for someone to go in, and if they don’t like the counsellor they have been assigned to, they don’t want to go back. They are going to feel bad, trying to ask for someone else”.

(10) Stigma.

Another barrier that care providers felt that women faced when accessing mental health services was the stigmatization and discrimination surrounding mental illness. Care providers felt that even when women were able to “identified within [themselves] that there are some mental health needs” (Alice) that require professional support, the negative “stigma is still so great” (Alice) that it may prevent them from actually reaching out to services. Women living in rural and remote communities were perceived to be particularly at risk of being stigmatized because the care providers felt that members of small communities were often hyperaware of the activities of all their neighbours. For example, Alice pointed out that “if you said that there was a postpartum mental health group [in a small Northern community] no one would come, because of the small-town factor. No one wants to be identified or labelled with [mental illness]”. Multiple participants brought up that – in their opinion - women may feel uncomfortable sharing intimate aspects of their life with the counsellors in their towns, because they are likely to run into these care professionals on a daily basis within non-professional settings. As a result, care providers felt that concealing the fact that they were receiving therapy would be virtually impossible for most women living in rural, remote, and Northern communities. While anonymity was perceived as important for giving women the courage to speak up about their mental health, care providers also spoke to the opposing position that anonymity could lead to increased loneliness and isolation. Participants agreed that it was easier to remain anonymous in larger cities; however, stigma was still seen as a huge barrier to care within urban centers. Some care providers even shared their personal experiences with maternal depression, including Emily who expressed "I work in mental health and I remember feeling symptoms of postpartum depression and not saying anything about it because of feelings of shame, and feelings of 'am I a bad mother because I'm feeling this way?'". She went on to say:

> it's sometimes difficult for women to feel attached to their babies when they're first born and then you start to wonder if you're inadequate and… you add hormones to the mix… it is a very complicated mix of things happening. I was reluctant to ask for help even though people were asking me if I was okay. (Emily)

Another care provider – Alice – spoke about the intense "pressure to be a 'good mom'" that she presumed many women may feel and the lack of "focus on mom's health during these times because moms are just giving all of themselves to their children" (Alice). She also pointed to changing community structures as potentially naturally isolating women from other moms. For example, it was her opinion that "we no longer raise our children as part of communities", so women are "not getting that socialization that they use to get. Whereas, they may not have suffered as much in the past because they've had [maternal] support from other moms" (Alice). Unfortunately, the providers feared that 'failing' to meet personal or societal expectations of a 'good mom' could lead to internalized feelings of shame, guilt, and inadequacy. Some of the care providers felt that increasing community awareness about the prevalence of maternal mood and anxiety disorders could help women realize that what they were feeling was not abnormal or deviant. Many times, providers were under the impression that women in their care were unaware of how common emotional changes, the “Baby Blues”, and even postpartum depression were in pregnant and postpartum women. Simply put, the care providers felt that maternal depression and anxiety were not talked about enough.

(11) Language.

Two of the care providers mentioned language as a barrier to current care options. Both had experiences in which women were unable to access services within their own language, and were forced to use family members or professional interpreters in order to communicate with their care provider. The providers emphasized that this had obvious implications for patient privacy, which they felt deterred women of diverse cultural backgrounds from accessing maternal services. As Nicole pointed out “if you don’t speak the language and you’re experiencing postpartum mood disorder, then finding a counsellor that speaks the same language as you would be very, very challenging”. This was something Nicole had experience firsthand, since she has “had several clients that didn’t speak English [well and] their partner was the only person that translated for them]. She felt strongly that having to share the intimate details of one’s mental health with a care provider was one thing, but having to also share these sensitive thoughts with a family member or stranger was an entirely different matter. Furthermore, using third parties to relay information back and forth between care providers and clients was perceived to also increase the risk of misinformation and miscommunication during clinical encounters.

(12) Mistrust.

Suspicion and distrust of healthcare workers was identified as another reason why care providers presumed women with depression and/or anxiety may not wish to seek in-person care. Two providers - Nicole and Susan - discussed the mistrust that new immigrants may feel towards care providers that are unable to speak their language or come from ethnic backgrounds different from their own. Susan emphasized that in her experience, "very often refugees or immigrants new to the country don't speak to [care providers] about [mental health]". She felt that immigrant women may already face a number of internal and external shame-promoting stressors in accessing services, and building therapeutic trust was a process that took time and patience. For this reason, Susan felt that "a lot of [women who are] immigrants would not trust the app [unless] they had the same language". Similarly, a few of the care providers were of the opinion that marginalized individuals may avoid interacting with physicians and nurses because of past negative experiences associated with prejudice and stigmatization. For example, Maria felt strongly that marginalized individuals often "get more closed doors than they do open ones" because "even though they have access to [services, they may not always… feel free [and comfortable] in going to those services" (Maria). In these situations, they felt that it was important that care providers be conscientious of how they introduced women to the program so as not to overwhelm and discourage them. This slow and persistent process was described by two of the care providers with Jennifer recounting “we have had women show up [at our drop-in centre] that we don’t know. We don’t get them to fill out forms or any [personal] information until the second or third time they come. We don’t want to bombard them...”. This slow and delicate trust-building process was very successful in one client’s case, which Jennifer recalled fondly:

> I always talk about one client who would just come in the door, and then [one day] she would sit on the arm of the couch, and then [the next time] she would sit on the couch, but she wouldn't come in to the kitchen… and then [finally one day] she'd come into the kitchen. It was such a slow, slow process, but we got her in… and got her coming to groups.

Another fear was that women may not trust care providers to uphold the high standards of patient confidentiality. Alice felt that this was particularly true within small communities, where a breach in patient privacy could have devastating and lasting consequences. Even within urban communities, some health workers – and their affiliated organizations – had bad reputations for 'gossiping' about patients and breaking their therapeutic trust. This sentiment even stretched as far as the care providers themselves, with Kelly indicating, "I personally wouldn't tell a therapist at [one of our local organizations] anything. I wouldn't trust that it was going to stay confidential". Alice pointed out that creating trust between women and the online coaches was key, stating

> They need to feel that they are going to trust them. Who are these people that I'm telling all of my personal stuff to? Because of that small-town mentality… is it going to get back to my friends? To [anyone] else?

Finally, one care provider discussed the mistrust that she felt that some women of Indigenous descent may have towards Euro-Canadian or 'Western' care providers. As Susan summarized, "when it comes to the Indigenous people, [discrimination] is a given… They are discriminated against. It's [part of] their life and we don't understand it at all… because we have the white privilege". Although Susan herself was conscientious of how racism may impact the lived experiences of her clients, she also pointed out that the potential to face racism and discrimination from health care workers may discourage some peoples of Indigenous descent from accessing 'mainstream' services. Collectively, the participants agreed that encouraging women to share intimate information about their mental health required that mutual trust and respect be built between patients and care providers. This was a process that could only be achieved over time with consistent, gentle encouragement and reciprocal communication.

(13) Fear of Child Protective Services.

One barrier that care providers felt was somewhat unique to maternal mental health diagnoses was the fear of Child Protective Services (CPS) involvement. The providers sensed that one reason why women did not access services their services was because **"**women [felt] that if they were to be recognized [as] struggling with their mental health postnatally or postpartum that… their capacity to parent might be taken away from them" (Alice). In the PCPs' opinions, the fear was that if CPS concluded that "they can't take care of themselves or can't take care of their children" (Alice), this could result in their children being apprehended. Providers emphasized that this might be particularly true for women who had already had encounters with CPS in the past, or women who lived with addictions or mental health disorders:

> I think for our women - specifically with the substance use piece - it can be really scary to access services at all, because you're talking about children and the potential for child welfare, if they're not already involved. So, it's hard to know who we're missing, right? We know we are missing people. (Jennifer)

Care providers feared that the suspected link between addictions services and CPS could potentially discourage women from seeking care at all. For example, they felt that women may fear that anything they share with their care provider will automatically be passed along to child protection agencies. For this reason, some of the participants identified organizations within their communities that had developed a negative public reputation for their affiliation with CPS. Alice stressed that when women do seek help for mood disorders and CPS is involved, these women are fundamentally punished for seeking help, which can exacerbate pre-existing depression or anxiety. She shared with us the following story from one of her past clients:

> I think she had a two-year old and a ten-month old or something and she had a lot of external stresses going on in her life with housing things and relationship stresses and what not. And she started hearing voices that said 'drive your van off of the road'… these types of things. So, that alerted her to say, 'Oh! That's not right, I need to figure out what's going on'. (Alice)

When the woman reached out for professional support, CPS became involved: "she went to counselling [and] talked about [her harmful thoughts]. Somewhere along the line [CPS] was contacted because there was a concern for the safety of the children. [CPS] was brought into the house" (Alice). Alice went on to describe the ways in which this impacted the mother, who had taken it upon herself to ask for assistance:

> "she said, 'I was already so vulnerable, and I was already trying to hold it together for myself and my family. And then to have [CPS] come in and look over me like big brother,

> I felt like I was being punished. I didn't need to have punishment and extra stress in that time, I needed to be supported', and that was a shame". (Alice).

Although these fears had been expressed to her from patients in the past, Alice also stated that she had never actually seen a case where children were taken away from their mothers as a result of maternal mental health concerns.

(14) No Childcare.

Another barrier to care delivery that was briefly mentioned by participants was the lack of consistent free or low-cost childcare at maternal health organizations. As previously mentioned, the potential effort required to dress, pack up, and transport small children for a 15-minute appointment was perceived as a deterrent for new mothers accessing local supports. Moreover, it was several providers' opinion that having to care for an infant during a group therapy session might be distracting or overwhelming for women dealing with depression and/or anxiety. External private childcare may be extremely expensive and licenced childcare centers had waitlists that could stretch to nearly 12-months. Consequently, several care providers highlighted the need for childcare supports to be created at all organizations offering maternal programming. It is important to note that some organizations did offer childcare in the communities and had experienced success with this model in the past. Jennifer felt the childcare at her organization was very important for reaching women, emphasizing "[women] can bring their children [to our organization]. We have child welfare. You can go [else]where and do parenting, you can go somewhere else and do substance use, or [you can] come here… but you can't [find addictions treatment and childcare] together". She went on to say that "even if we refer someone to the [addictions treatment center], for example, there's no childcare so women can't go, right? They're not going to... they don't want to leave their children" (Jennifer). Other organizations also had childcare, but age restrictions could mean that women with multiple young children were still prevented from access. To overcome this perceived barrier, some care providers physically brought their care to women. For example, Linda made sure that women did not:

> Have to come and meet me in the office because… it's difficult for them to get out, pack up all their kids, [and] get on the bus. So, I meet with them. I'm able to provide transportation for them and the kids so if they need to get to appointments I can help.

A few of the participants even travelled around their community to offer one-on-one sessions in patient's homes or at accessible locations across the community.

(15) Minimal Internet and Phone Access.

One care provider briefly mentioned internet and phone access as a perceived barrier to current services for women living in rural, remote, and Northern communities. Nicole was concerned that women that lacked basic internet coverage at their homes would be unable to seek services online and would be unaware of what supports might be available to them within their community. When services were available, she assumed that women without internet coverage could not search for organizational contact information online and may not be able to email or call care providers to set up appointments. Additionally, providers feared that women without internet would not be connected to social media, which was a primary form of advertisement for the care provider's organization. As Nicole pointed out,

> if you're trying to find resources and you don't even have access to the internet, or the internet access is spotty, or you don't have a phone, or you don't have a computer, then you wouldn't even be able to find those services.

Nicole also stressed that when women did not have a cellphone it was likely that they were unable to update their care providers in the case of an emergency. This directly tied in to the perceived blacklisting barrier, since she pointed out that if women experienced a delay on the way to their appointment – such as missing the bus due to overcrowding – they may not be able to notify their PCP, potentially causing them to be labelled as unreliable and blacklisted. Later on, internet connectivity and internet-enabled device access was also brought up as a potential obstacle to using the HOPE app in Northwestern Ontario. This barrier will be discussed in further detail later on.

(16) Sobriety Requirements.

Some mental health programs within the communities required that women achieve sobriety before they were able to seek treatment. As Jennifer pointed out, "even to go to treatment – it sounds funny – for addictions you have to be sober". The care providers felt strongly that this restriction created an insurmountable barrier for some women with comorbid addictions and mental health disorders. Counterintuitively, even some local addictions programs required that patients achieve sobriety for a period of time before they were able to receive care. When asked if sobriety restrictions were something that Jennifer experienced regularly through her work, she responded "yes… because sometimes [addictions treatment centres will] say 'yes, you have to be sober to do the work' and then how do we get them sober?" (Jennifer). When this was the case, care providers had to work diligently to support their patient's sobriety before they were able to refer them to therapy.

(17) Poverty and Marginalization.

Marginalized individuals – particularly those who are poor – were perceived to have a particularly hard time in accessing maternal and mental health services. For example, the care providers emphasized that women from lower socioeconomic backgrounds may not have the time required to access supports or may struggle to find access pathways. Nicole emphasized that:

> people who experience the biggest burden of mental health in our community are people who experience a lot of social determinants of health that make it hard for them to access any kind of services. Those people often experience poverty as well, which makes it hard for them to access any of these services, to even find the services, [and] to find the time to get to services.

Furthermore, care providers stressed that in their experience marginalized individuals tended to use services differently than the general population and often only accessed supports during crisis situations. The providers feared that women with compounding social determinants of health may not feel welcome accessing services or may be apprehensive about facing racism or discrimination from health care workers if they do. Additionally, the PCPs assumed that marginalized women may not 'comply' with 'traditional' care systems such as scheduled appointment times because these systems are often incongruent with their lived experiences. Maria pointed out that people who are marginalized may not feel 'entitled' to services even when they are free and accessible. She pointed out that even when these individuals:

> have access to these walk-in clinics, they may not always get the service that they need or feel free in going to those services. They definitely get more closed doors than they do open ones. And it's not necessarily that they don't belong there, because they do belong there. It's just systemic. (Maria)

Although at least some women were accessing existing maternal supports with high frequency, all of the care providers felt that there were undoubtedly others that these services were failing to reach. For example, when asked if she felt that all mental health needs in her community were currently being met, Maria responded, "I would say probably not. … a lot of it has to do with the fact that some of the… people that we serve don't tend to use services in the same way". When asked whom she was speaking about specifically, she explained:

> I'm speaking about some of our people who are in poverty, some of our people who are homeless, some of our people who are quite marginalized. Even though they could have access… they don't always go through those doors. If they [do], it will often be in a crisis situation. (Maria)

Other providers stressed that the programs offered by their organizations were extremely underutilized by Indigenous women, and they suggested that cultural appropriateness may also play a factor in who accesses supports. Unfortunately, it was "hard to know" (Jennifer) just how many women were 'falling through the cracks'.

Even when supports were considered by care providers to be accessible and available, they feared that women with complex social determinants may be unaware that these programs existed, leading to low attendance numbers that could potentially threaten future funding. One care provider - Nicole - skillfully summed up the scope of the multifaceted, interwoven care delivery barriers described by care providers when she said:

> [In] Northern Ontario… if you're living in very remote communities [you] would sometimes have no access to [counsellors]. You may have to fly to [an urban center] if you lived on an Indigenous community. You might not… want to see the counsellor that's in your community even if there is one, because you might not want to talk about the things that you're feeling with someone that you see every single day. If you're trying to find resources and you don't have even access to the internet, or the internet access is spotty, or you don't have a phone, or you don't have a computer, then you wouldn't even be able to find those services. And I find [that] a lot of our people who experience the biggest burden of mental health in our community are people who experience a lot of social determinants of health that make it hard for them to access any kind of services. And so… those people often experience poverty as well, which makes it hard for them to access any of these services, to even find the services, to find the time to get to services. Even accessing the services when you don't have a vehicle in our community… even in [the city] people have a very hard time taking public transit to get places. You hear stories… where women are waiting with a stroller and they're not picked up by the bus for hours because the bus doesn't have to accommodate… or they can only accommodate so many strollers or wheelchairs or… and so they reserve those spaces or if their full the bus will just pass people by, so they can't even get to appointments on time. And then if you can't get to your appointment on time and you don't have a way to contact that place because you didn't have a phone, you would just be bumped, or you could be told, "you're not

> getting services here anymore". And that's within the city, so if you live outside of the city in a rural community, then it can be very hard to access services.

Once again, care providers highlighted the need for a variety of supports to be created that are specifically designed for the unique and diverse preferences of PCPs and women living in Northwestern Ontario. These services should be collaborative and complimentary to the 'menu' of maternal mental health services already available to women and care providers in these areas.

(18) Cultural Preferences.

Despite working with women primarily from Euro-Canadian backgrounds, all ten care providers brought up the lack of culturally-specific services as a perceived barrier to maternal and mental care access in Northwestern Ontario. I have chosen not to highlight this barrier here, as it will be discussed in greater detail in the Cultural Sensitivity section further down.

Individual-level Barriers

(19) Time Commitments.

During pregnancy and new motherhood, the care providers felt that women with maternal depression or anxiety may be unable to access services that demand high levels of time commitment. They emphasized that – in their own experiences - brand new mothers are often very busy caring for their infants, going to pediatric medical appointments, and running a household. As a result, it was assumed that women may feel too busy to spend time on their own health and wellness or they may even feel guilty putting their own health before that of their infant's. As a result, the providers feared that women may "just push [depression or anxiety] aside and keep going." (Alice). When women did reach out and seek in-person services, the care providers faced the challenge of trying to convince these women to attend supports from start to finish. In their professional experience, the drive and incentive to "stay connected" (Hannah) diminished even further when women eventually finished maternity leave and re-entered the work force. Although the providers were confident that many women enjoyed maternity groups or baby classes, providers also felt that the time required to take part in these weekly activities might be too much for some women to sustain in the long-term.

(20) **Lack of Incentives, Promotion, and Lack of Interest.**

In addition to facing time requirement pressures, generating incentive to join (and fully complete) maternal programming was a significant challenge for many of the care providers. Alice pointed out that all of the programming provided by her organization was voluntary, meaning that women could leave at any time, even if care providers tried to convince them that leaving the support prematurely was inadvisable. Sometimes the way that the program was set up was perceived to be a deterrent to women; especially if there was a lot of connecting by phone or email to confirm enrolment. This was assumed to be a contributor to why many of the maternal courses operated at much lower attendance than what was originally predicted by the number of referrals. Hannah speaks to this perceived barrier at length in the quote below:

> We only run the [maternal mental health group therapy program] so many times a year, so there's not necessarily a waitlist, but it's a matter of getting enough numbers to run the group… And then connecting with those women because [the local doctor] who gets all of our referrals… it's a lot of back-and-forth. Because she needs to connect with those women, sometimes they don't phone her back, sometimes they don't understand that someone's made this referral, what's this about? [And] she has to commit to coming. So,

> she might have 15 referrals for group and only five women end up committing to come, which is very common.

Some of the care providers spent a lot of their time using social media promotion and word-of-mouth to try and convince women to join their maternal health courses. Once again, Hannah spoke eloquently to this barrier when she summarized:

> It's a matter of getting [program] information out and it's a lot of convincing because sometimes women say 'I'm not interested in going to a group' … [and I say] 'just come! Just come and meet [the local doctor]. Just come see [how it goes], see how your baby does [with our childcare] … [while] you're meeting with the other women'. And a lot of women after that first session will say 'you know, it wasn't that bad…. It was much better than I expected'… So, it's just getting them out the door. That's the hard part. We've got to do more on promotion, more engagement of women, and more resource development.

Even when the providers were successful in convincing women to join classes, long-term, continuity was another challenge. The PCPs were under the impression that most women tended to 'fizzle' out after a few weeks as they became busy with their personal lives.

Current Screening Practices and Lack of Data

In addition to the many perceived barriers that care providers and women may face in delivering and accessing maternal mental health care in Northwestern Ontario, the lack of consistent mental health screening and data collection at organizations across the North created another challenge for PCPs. While four of the providers highlighted successful prenatal screening programs within their communities, several other participants expressed concerns that mental health screening tended to be inconsistent and was sometimes absent altogether.

Rita – a physician working in maternal care – shared that she “was trained before all of these scoring systems came out”, and as a result, she did not “always feel a great need to do them” (Rita). However, Rita went on to also point out that a lot of her colleagues did use the questionnaires and care providers that choose not to screen their clients regularly ran the risk of “miss[ing] some information because of that… now and again” (Rita). Another worry was that some care providers “just don’t want to ask about postpartum depression because they don’t have time in their practice to deal with the answer”, which Nicole described as “true and awful” (Nicole). Another concern – originally brought up by a member of the research team based upon past conversations with care providers – was that health professionals in the community may purposefully choose to forego screening when they do not have the capacity to deal with confirmed cases of depression and anxiety. When the researcher recalled that doctors in a past study had admitted to this practice, Hannah confirmed that this may be the case in Northwestern Ontario, saying “I’m glad they’re [at least] truthful”. The problem was that if a woman was flagged as high-risk by the Edinburgh Postnatal Depression Scale, the care provider would have nowhere to refer them to for immediate in-person therapy. As a result, the nurse or physician faced the ethical dilemma of either trying to provide therapeutic care outside of their professional capacity or letting women with mental health disorders carry on without any treatment at all. This ‘don’t ask, don’t tell’ attitude placed the responsibility on women to self-identify mental health symptoms and bring them to the attention of their primary health provider. Unfortunately, even if these concerns were brought forward, the care providers felt that that lengthy waitlists of most counselling services may prevent women from accessing the help they need. Other perceived barriers preventing physicians and nurses from screening included payment policies, high volume caseloads, and care provider capacity. Hannah described the lack of screening as “a missed opportunity” to intervene during the earliest stages of depression and prevent further decline:

> I think [perinatal suicide] the fourth leading cause of death for women… it’s impactful. But, I think of [those women] as… missed opportunities, right? Maybe they had a major depressive disorder, so that to me says they should have been connected, some way, shape, or form with some sort of service. You know? … If there’s depression or anxiety and depression in pregnancy, there’s a very good chance that it will be happening in the postpartum… but that tells me that there was a history somewhere as well. So, if there was a preconception health screening done, some healthcare provider would have had that conversation with that woman and said, ‘you know, mental health is a really important part of preparing for pregnancy… So, let’s make sure that you’re on the proper medication if you’re thinking about getting pregnant’, or have those conversations regardless if she’s of reproductive age [or not] because we know that 50% of pregnancies are unplanned… So, those are missed opportunities in my mind.

Because regular screening was not being completed within their communities, the care providers were unsure of how many women in their region (if any) had taken their own lives as a direct result of maternal mood disorders. The providers could only rely on their own patient base and anecdotal accounts of community suicides, as Kelly did when she said “I have no idea [how many women have committed suicide]. I don’t even know where you would get those statistics. I can’t think of any in thirteen years of my clients that have successfully committed suicide afterward”. As one provider pointed out, even if they themselves had only one patient that had committed suicide successfully, the lack of concrete data meant that they were unaware of the significance of maternal depression and suicide in their wider community. Alice was "familiar with one mother who [committed suicide]" but could not speak to her wider community, asking "does [suicide] happen more? I don't know. I don't have the information about that… I only have the awareness of one". Some participants felt that having a tool like the HOPE app to track data might give care providers a better idea of the state of maternal mental health in Northwestern Ontario. Additionally, all of the care providers mutually agreed that having women complete consistent, monitored maternal mental health screening through the app would help alleviate some of the barriers to care delivery that they had described.

Suggestions for App Content and Layout

Ease of Use

Each of the participants was given online access to the HOPE app at least one week prior to their interview. This advanced access gave the providers a chance to comprehensively explore the platform's features and familiarize themselves with its layout. Care providers were asked about the general ease with which they were able to navigate through the app and then were asked to share their presumptions on how their clients might feel about the platform. Positive feedback included that the platform was user-friendly, intuitively laid out, and fairly easy to navigate. Jennifer described the platform as "very gentle", "easy to use", and "comforting", which she felt made it easy to click in and out of the courses, supports, and online coaching page. She also pointed out that the "wording was very strength-based" and suggested that this might "help people to explore somethings about themselves, [by providing] techniques and strategies [to help] without saying, 'oh wow, you're this… you're that… you're labelled with this' (Jennifer). Linda agreed that she thought "women would like the way that it's outlined and the information that it provides because… it's easy to follow and… easy to navigate". In contrast, some participants felt that improvements could be made to the general layout to ease navigation through the platform. One of the most commonly suggested area of enhancement was navigation through the online courses. Part of the problem was that the participants were using a pilot version of the app; so, every time they entered an online course, the module started on whatever page was left open by the previous user. As a result, some care providers started the online courses mid-way through and became confused about what they needed to do next. While this feature should be less of a barrier for women who have their own personal accounts, the participants still suggested that once women have completed an entire module, it should reset to the introduction page the next time it is accessed. One care provider pointed out that this would be particularly helpful if women wished to re-visit courses they had already completed. Another proposed way to increase navigation flow between courses was to embed links in the final toolkit module back to the original courses that each of the coping 'tools' came from. This was suggested as a way to allow women to refresh their knowledge after completing all courses and was perceived to encourage them to continue to practice and enhance their coping skills. One provider also recommended that simpler movement through the courses could also be achieved by modifying the navigation bar found under the title of each course module page (see Appendix B; Figure 4.0). Several care providers asserted that the circles used in the navigation bar did not obviously represent page numbers and suggested that this feature be made bigger to clearly state the total number of pages left in each course. It was also suggested that the navigation arrows used to move backwards and forwards through the content be increased in size in order to make “the text stand out for those directions” (Alice) (see Appendix B; Figure 4.0). Alice also suggested “labelling the directions” with “more direct instructions” and adding the module navigation bar at both the top and the bottom of the course pages. Similar suggestions were made for the master navigation bar, which is located at the very top of all pages of the app (See Appendix B; Figure 2.0). One provider felt that there needed to be more options added to the current selections, which list the ‘homepage’, ‘online courses’, ‘mood tracking’, ‘healthy habits’, and ‘emotional health’ as well as an expansion bar for further features. She did not specify what additional options she felt should be available. Another participant recommended that the text for the master navigation bar should be increased. In fact, it was suggested that all of the text for the computer-display version of the app needed to be enlarged to increase readability. Alice also pointed out that “there’s a lot of white space on the side [of the homepage] with this really skinny column of text in the center”, which she felt was visually “awkward”. To remedy this, she suggested that we add more border space around the course tabs in order to differentiate the different buttons.

Another common recommendation made by the participants was to create an introductory tutorial for the app when users first logged in. Nicole pointed out that it wasn’t always obvious where to go next when a course had been completed, saying “at the end, I didn’t get a good idea of what I should do next. I went through all the questions…so now where do I go?”. She suggested that building in a tutorial for first-time users – whether they are care providers or clients/women - may help to explain how to use the app and how often women should be logging on to the platform. This tutorial could briefly explain what the app is trying to accomplish, how to use each of the features, and how these tools will ultimately assist women in achieving better health outcomes. She advised that the tutorial should include an interactive ‘click through’ to demonstrate how to navigate to different features from the main page. However, care providers also stressed that the tutorial feature should be supplemented with a live-chat option, through which care providers or coaches could assist women navigating the app for the first time. Similarly, participants suggested that an explanatory introduction was needed for the Risk Assessment, including a brief description of how the questions were evaluating women and why the evaluation was important. They proposed that a navigation bar should be added to this section to make it clear how many questions were left to be completed. Finally, the care providers felt that user navigation could be improved through the addition of checklists and notifications. Since some of the participants were unsure of what order tasks should be completed in, they suggested that users should be prompted with a task checklist after first logging in each day. This list would clearly layout all of the suggested activities that women should complete that day. Notifications – either by text, email, or app - were also brought forward as a way to potentially incentivize women and make sure they know what steps to complete. This was particularly important to Emily, who shared with us:

> I remember my brain stopped working as a new mom and also in pregnancy… there are all kinds of disruptions to your ability to focus and concentrate…. Cognitively, I was not myself for a lot of that time, and so, a reminder would probably be helpful.

One care provider recommended that notifications be sent to user’s phones summarizing their weekly accomplishments and suggesting things to try next. App-based notifications could also appear when users first logged on to the app if there were privacy concerns over using text alerts.

Physical Layout

In addition to the app's general ease of use, care providers were asked their opinions on the visual layout and images displayed on the HOPE platform. Once again, they were also asked their perceptions on what their clients' opinions might be in regard to the app's physical layout. The care providers opinions on visual layout were at times discordant; some praised the images used by the app, while others felt that extreme modification was needed. Encouragingly, some care providers used words such as "calming" (Kelly), "comforting" (Jennifer), "mellow" (Alice), and "aesthetically pleasing" (Jennifer) to describe the app's colour scheme. Many felt that the nature backgrounds promoted a soothing atmosphere. Susan felt that the visuals included were "really, really good. I was quite impressed". Some of the care providers also complimented the images of women used for each course module (see Appendix B; Figure 3.0). Participants described these portraits as pleasant and appreciated that an effort had been made to represent various racial backgrounds. However, the majority of providers also emphasized that this was not enough to properly represent the diverse women of Northwestern Ontario. In fact, Kelly worried that this obvious attempt may be negatively viewed as tokenism. She asked, "do we even have to have people?" and then suggested, "if we want to avoid the culture piece… don't have people. … We could have Northern Ontario animals. ... Or scenery". Replacing all images of people with cartoon images, avatars, or pictures of animals and scenery was brought up by several other care providers. Yet another suggestion was to replace the portraits with more 'realistic' photos of women from Northwestern Ontario. A few of the care providers suggested that women be given the opportunity to choose their preferred cultural/racial/ethnic representation when entering the app, and then have all the visuals shift to personalize the experience. Susan – and several other care providers – called specifically for “more Indigenous representation”. Another issue that care providers had with the portraits was that all of the women featured were smiling, appeared happy, seemed to be middle-class, and looked ‘put together’. Nicole pointed out that their hair and makeup looked perfect, which she felt simply did not represent the realities of depression. Furthermore, some of the more ‘spa-like’ nature images were perceived as targeting white, upper/middle-class women over all others. Participants emphasized that more relatable images and videos needed to be added, with Maria emphasizing, “we have an amazing landscape here that would allow people to be able to identify [with the app]”. Some of the images proposed by care providers included blueberries, eagles, and boreal forest landscapes.

Suggestions for Risk Assessments

When asked their thoughts on the current risk questionnaires, most of the care providers recognized these assessment tools as “evidence-based tools that are used in healthcare” (Emily) and as best practice screening guidelines appropriate for diagnosing depression, anxiety, and stress. In addition to helping to identify risk in women, the Risk Assessment was viewed as a great tool for supporting local health professionals with prenatal and postpartum mental health screening. Almost all of the participants felt that the length of the questionnaires was feasible for women with depression and “found the questions were very … easy to understand” (Emily). Benefits included that most of the questions were “non-intimidating” and “quick” (Maria) so that the entire screening process could potentially be achieved in one sitting. The explanation given at the conclusion of the assessment – that outlines which answers were flagged as high-risk and why – was also viewed as useful for building self-reflective understanding. Despite its many benefits, some of the care providers had outstanding reservations about the assessment system. The biggest problem identified was the protocol for women classified as ‘high-risk’ in relation to severe mental health challenges. Currently women who are high risk are prompted to contact in-person emergency service (such as calling 911), a telephone crisis line, and their primary care provider (if they have one). In the meantime, these women are restricted from using the app - which has been deemed insufficient for supporting women flagged as high-risk – and are left without any support while awaiting in-person or secondary emergency services. The participants were most concerned that there was little to no follow-up to see if these women had actually sought in-person services. They were also troubled that high-risk women would be denied a credible support tool (even if the HOPE app was not the greatest fit for individuals contemplating suicide). One care provider pointed out that not only would we not know whether women who were classified as ‘high-risk’ made it to secondary care, we would also not know “how they [were] treated or what kinds of [care/treatment] they would receive when they [got] there” (Maria). Additionally, calling an ambulance could have costly charges associated with it and the providers felt that women may not want to travel to emerge in the middle of the night. Care providers pointed out that this was particularly unlikely if women had small children sleeping in the house and were worried about child protective services getting involved. Furthermore, the care providers pointed out that for women in rural and remote communities, going to the emergency room may not be feasible without long distance travel. One provider wondered whether it would be possible to connect individuals in crisis to the Ontario Telehealth Nursing Hotline to circumvent this barrier, noting that “if it’s high risk, then it [would be] an automatic connection to the nurse…” (Maria).

Another potential shortcoming of the Risk Assessment mentioned by providers was the rigid structure of the Likert scales. One provider felt that there were a lot of questions that seemed repetitive and interminable over time because the wording was only slightly changed. Alice felt that the Likert scales could be “kind of ambiguous” and “confusing”, so she suggested that an online coach or in-person care provider should be on-hand to help clarify questions and guide women through this feature. Additionally, several participants brought up the possibility of adding a “neutral” option to the Likert scales. For example, the question responses of ‘strongly agree’, ‘agree’, ‘disagree’, and ‘strongly disagree’ would have a fifth option of ‘neutral’ or ‘neither agree nor disagree’. This was suggested because some of the questions did not produce a committed response in either direction; as Hannah pointed out, “I don’t feel strongly this way… Or that way…So, I felt like it needed something in between”. Providers also suggested adding in an option to skip certain questions if they were triggering to women. The key recommendation here was that – in their professional opinions - too many strong, probing questions right away could scare women away from using the app. Although the length of the questionnaires was seen as manageable, care providers did point out that “everyone is different” (Alice) and it is hard to estimate “what everyone’s individual capacity is going to be” (Alice). As a result, two care providers suggested that a “pause and resume” feature be added into the questionnaires so that they didn’t need to be completed within a single sitting. As Maria said: “you might… choose to do it and then be interrupted, and knowing that [you] don’t have to start all over if you are already down and depressed, would be…" (Maria), Susan interjected 'frustrating" and Maria continued:

> Probably a good option if you thought you could just… save [it and] come back to it, … within a certain period of time and finish it off. So, maybe I'll finish it off before bed tonight or whatever… because right now kids are here or whatever. Or my spouse is here, and I don't want anyone to know. What I like about [the Risk Assessment] is the fact that you can do it without needing to talk to anybody. You can just pull it up, and do it, and it's just a quick, 'wow, I'm just kind of checking in because I'm worried', or, 'things aren't right', or, 'is this just what being pregnant is? That I'm crying all the time', you know? "

However, Maria and Susan also conceded that doing sections of the questionnaires at different times could undermine the validity of the screening tools. Finally, one care provider highlighted the importance of carefully reviewing the Risk Assessment section for potentially triggering words. For example, as Emily described:

> There was one point where… I was going through [the Risk Assessment] 'worst-case scenario' and I finished… and the response that came up was 'fantastic!' with an exclamation point… and I think [what it meant] was, 'fantastic! You're done the module', but I had just gone through saying my life is misery, I feel terrible all the time… I don't have any will to go on… and then it said 'fantastic!'… so maybe [you should just go] through it to make sure those kinds of bugs are worked out, because it didn't feel fantastic.

The care provider felt it was extremely important to ensure women were not accidentally alienated by the platform.

Suggestions for Therapy Modules

Many benefits to the online therapy modules were identified during interviews. Care providers felt that the courses were comprehensive, helpful, streamlined, and time-efficient, which they felt was important for engaging women and holding their interest. Nicole stressed that keeping content limited was vital because, in her experience running prenatal classes, women often only have 3.5-minute attention span. She then suggested that adding videos to the courses may be one way to keep women engaged beyond the three-and-a-half-minute mark. Similarly, the schedule of one module a week was praised by participants because they felt that there wasn't "an overwhelming amount of information on the app" (Hannah). Many of the care providers agreed that the app struck a good balance between providing just enough information for support, but not enough information to cause further anxiety. For the most part, the exercises at the ends of the modules – such as the interpersonal relationship circle - were also commended (See Appendix B; Figure 4.0). Most agreed that these activities were great, visual tools for promoting self-reflective understanding; although, some providers worried that women with advanced depression may not be motivated enough to complete them. For example, Kelly felt that the conflict resolution module "has its merits" but was unsure:

> how many people would have the confidence in a conflict resolution scenario to go up to the person they are in conflict with – despite going through all of this… and [say] to them, 'here, I did this module, and… this is what came out of it and this is what I am concerned about'.

She went on to point out that it was likely that "you would have to be pretty motivated to do that" (Kelly). One recommendation for overcoming this perceived obstacle was to add an introduction on why these exercises were important. The toolkit laid out in the eighth module was also complimented, although care providers felt that the activity pages should be printable so that women could complete them offline and bring them to their primary care provider**.** Another big concern for the participants was that the read-only format of the modules meant that there were "lots of just words and you have to read everything" (Nicole), which they felt could privilege some women over others. This was particularly true given that the literacy level in some of the courses was observed to be too high. For example, Alice pointed out that the word 'glossary' might be confusing to some individuals and should be changed to something more understandable. Care providers stressed that depressed women with young infants may not have the time to read course content, and lengthy paragraphs could be a barrier for those who could not or did not enjoy reading. Furthermore, it was the provider's opinion that women who have high literacy levels may still prefer to listen while they multitasked or relaxed, as Nicole pointed out:

> maybe it would be more helpful [for women] to put on something that I could listen to while I'm doing all of the things I need to be doing… or even if somebody could read it to you like an audiobook… and then have a visual one too... if [you learn better] from a video or something.

Suggested remedial actions included adding a listening option, creating podcasts, adding videos, or changing some of the content to be more visual.

Some providers viewed other aspects of the app as potentially restrictive, for example the lack of culturally appropriate content. Moreover, some of the examples used in the exercises – such as those with the heteronormative couple Rachel and Steve – did not seem to represent the women that care providers interacted with in their daily practice. Participants did point out that women that were single, divorced, or in unhealthy/violent relationships may not see themselves reflected in this content. Furthermore, they feared that using tools like the disagreement graph for conflict resolution could even be dangerous for some users. Jennifer speaks to this point in the quote below:

> When I think of the example of Rachel and Steve, that would not be all of our women by any stretch of the imagination. Most of them are in violent relationships, or they don't have the father with them… You can't tell women how to communicate with their partner if they're in a violent relationship because that's not going to work, right? So, you want to be gentle and careful that you're not going to put them in harm's way.

For women that did have partners, the care providers suggested that the Attachment and Communications topics could be improved by adding in a section on communicating with one's partner. Specifically, participants pointed out that romantic relationships often change after a baby is born and they felt that women may need help in developing communicating skills to ease this transition. Another group of users that the providers felt could benefit from more representation under the app were women with multiple small children. As Hannah pointed out, "I feel like [the modules] were very much geared towards new parents. Not families with multiple children, because the scenarios were around new families, right?". She went on to acknowledge that "[first-time mothers] tend to be [the ones] who need support… but I feel like women that have had second or third children also need support. And they… need a scenario that targets them or speaks to what they're going through" (Hannah). A few of the care providers suggested that a substance-involvement module could be developed to link women to local resources such as methadone treatment centers and Neonatal Abstinence Syndrome brochures. However, they also cautioned that probing about drug use might trigger fear in women and cause them to abandon the app. Other potential module topics included domestic violence, poverty, child apprehension, addictions, racism, social isolation, and single parenthood. Care providers also suggested embedding external links to supplementary resources, modifying the exercises so that they could be completed online, and creating a live-chat to help guide women through the module activities. Kelly proposed that women should be able to plot their graphs or create their relationship circles right on the course page and that each module should be linked together in order to promote a more comprehensive, interwoven experience. For example, after creating their interpersonal relationship circle, women could be directed towards the conflict resolution module in order to address any tension within their social circle.

Suggestions for Healthy Habits

The care providers had a number of suggestions for activities that could be added to the Healthy Habits section including listening to audiobooks, reading stories, watching videos, creating artwork, practicing mindfulness, and engaging in music therapy. Regardless of the habit, it was recommended that the activities should be kept time efficient – one provider advised no more than five minutes – and should be achievable for novices. To this end, several participants suggested that the activities should have external links to videos breaking them down into easy, attainable steps, which may allow women to “actually go further than what is there” (Jennifer). Nicole also added that there had to be balanced between “giving people too much” and not wanting to “overwhelm” them, but “if you’re really interested in something” and it has been helpful, links could support women in learning more. External links could also be used to connect women to local resources offering in-person yoga classes or could be used to allow users to further explore habits that they particularly enjoyed. Lastly, care providers suggested that women should be able to add their own health habits to the list. While most care providers agreed that adding external links would enhance the platform, one participant pointed out that this would mean constant technical web development support to make sure the linked websites were up-to-date. Her chief concern was that the resources and manpower needed to maintain these links may not be practical. Another potential perceived drawback was the resources and research required to make the Health Habits section truly culturally informed. For example, Emily suggested adding an “eat a healthy meal” option and then supplying culturally appropriate recipes, suggested “grocery lists”, and links for “ordering your groceries online and then just having to drive to pick them up”; however, she also conceded that competently developing this content was likely not feasible for the small Equity in Access research team. Other recommendations for this feature included building in a substance-involvement piece, providing advice for quitting “unhealthy habits” such as smoking cigarettes, referencing the Canadian Society for Obstetrics and Gynaecology instead of the American College, and changing the names of certain activities – such as “yoga” – to less intimidating substitutes – like “stretching”- in order to encourage women to try them. Finally, Kelly recommended changing the name of the Healthy Habits section altogether. She proposed that we rename this feature the “Self-Care Section” (Kelly) because she felt ‘Healthy Habits’ was “pointing fingers" and misplacing responsibility of good mental wellness solely upon the users. In her opinion, the term “Healthy Habits” insinuated that maintaining health was a personal choice entirely governable by women's 'controllable' actions; an allusion that could further harm women through stigmatization and victim blaming.

Suggestions for Mood Tracker

Care providers were strongly polarized in their opinions of the Mood Tracking feature. Some felt that the tracker was a very good visual depiction of mental health and would promote understanding and self-reflection in users. Daily tracking was highlighted as an important step for self-identifying red-flags and recognizing the need for additional in-person support. When asked their thoughts on the Mood Tracker, Maria exclaimed "I love your little mood thing, I think that was good", and Susan agreed "Yeah! I love that! That was very good". Prompted further on what features they were most enthused about, Maria and Susan explained in the back-and-forth exchange below:

> It's a visual! Right? (Susan)

Maria replied:

> It's a visual and… pretty much everyone can identify to that… and I thought it was good that they can track it on a regular basis, you know? Because usually when you… start to feel that, 'oh, things aren't quite right'" or, 'maybe they aren't right', you want to be able to confirm that you're as bad as you [think you] are. And by doing [the Mood Tracker] for even a week, you're able to see, 'oh wow! … I didn't realize that really, I've been down in the dumps for … five days… And I actually keep telling myself that things are good but … maybe I need to [seek help]' (Maria)

Susan added:

> It can pin point the day… 'Oh! That's why I felt that way' … this was happening, I had this extra stress going on that day or whatever. (Susan)

Maria concluded:

> Plus… when you are carrying a child you… have the opportunity to look at the world a little differently because you're responsible for someone else… right? It's not just you. Because often times … you won't care about yourself … for a long time. You'll put that on the back burner. But, because you are childbearing, you… pay that little bit more attention, and I think this helps people be able to keep track a little more. I like it. (Maria)

The tracker was also viewed by some care providers as an incredibly helpful talking point for coaches and health professionals to bring up during their appointments with women. Kelly felt strongly that the Risk Assessment, Mood Tracker and Healthy Habits sections were the most important features of the app for reducing the overwhelming workload experienced by providers in Northwestern Ontario. Participants felt strongly that women should be prompted to fill out the tracker on a daily basis, before completing any other task. Hannah stressed that finishing the tracker first was essential because it "frames" all subsequent engagement with the app. She further explained that:

> If you're a coach and you're following [the tracker], you're going to say, 'it looks like this was a tough day for this gal'… and then you could acknowledge that, right? "I noticed you had a low mood and I noticed you did these screening tools today". Establishing mood from the get-go... is a good way to frame the experience. (Hannah)

Contrarily, some care providers felt strongly that the tracker was not a valuable feature of the app. Several participants were confused as to what the purpose of this tool was and felt that women were unlikely to enter their mood on a daily basis. For example, Nicole “just didn’t really get it. I got that I should enter it, but … is it to tell me that I felt better on some days? Or is it to tell me that I’m feeling really bad for five days in a row? Maybe that [should] be part of the introduction to the course”. Incentive to complete the tracker on a daily basis would also need to be built into this introduction. For example, the providers felt that women would need to feel that there was some underlying motivation – such as improved health and wellness – that made filling out the tracker each day worthwhile. Finally, one participant worried that if women were already on a downward trend and then saw their mood declining visually on the tracker, they may be triggered by it. She cautioned that the incentive for women to use this tool would need to be carefully weighed against any potential risks. Emily suggested that one mitigating idea was to link the Mood Tracker to the Healthy Habits section through an “auto-response” which suggested activities that might help lift their mood, such as “’have you gone for a walk?’ or, ‘have you taken a nice bath?’ or, ‘have you listened to your favorite song?’ or, ‘have you [tried] any of those things that [usually] make you feel better” (Emily).

Suggestions for Coaching Service

While most care providers agreed that the telephone-based coaching was a helpful feature of the app, their opinions on whether or not women would embrace this service was split. Some felt that having a coach would be a benefit because women may feel more comfortable sharing information anonymously. Many providers agreed that anonymity was particularly highly valued within smaller rural and remote communities. When asked if she thought women would feel comfortable talking about something as personal as anxiety and depression over the phone, Susan replied:

> if it’s an anonymous person, I don’t know if they would have an issue with it. If they are not sure who they are speaking with, but they know that it is someone who will help, I think that they will open up.

Others felt that women may not feel comfortable sharing personal information with a stranger over the phone. In fact, some felt that building trust through a therapeutic relationship was more important than maintaining anonymity. One suggestion for building this trust was to include a biography page for the coaches, so women know who they are speaking to and what their credentials were. Once again, care providers expressed their concern over the current protocol for referring high-risk women to in-person emergency services. They emphasized the need for a clear crisis response plan. One participant discussed the liability and privacy measures that would need to be put in place to protect women in crisis and speculated about the possibility of “connecting to crisis response directly” without their consent. Others proposed that the coaches connect women who are evaluated as high-risk to existing crisis hotlines or local in-person support services. Jennifer recommended that “if somebody is coming back as really high [risk] it would be… good practice and comforting to know that somebody would respond immediately”. She then suggested that a side chat should pop up with the coach right away so that they can continuously engage with them until crisis response arrives. Many providers felt that the 24-hour period for contact from a coach in high-risk situations was not sufficient, and that someone would need to be on-call 24/7 for emergencies. Linda’s suggestion was to partner with local general practitioners so that they could be contacted in case of a crisis. In fact, one participant recommended that we add a “can we notify your care provider for you?” option and, if checked, the Risk Assessments and Mood Tracker results were sent directly to care providers using email. She noted that this would be particularly useful in the case that women felt more comfortable talking to someone they had a pre-established therapeutic relationship with, as opposed to a stranger over the phone. Nevertheless, all care providers agreed that coaches would need to be properly trained for suicide intervention and should have a comprehensive knowledge of the local services that women in crisis can be referred to.

The current call-only format was also a major concern for care providers. Several agreed that relying solely on telephone calls was restrictive "because not everyone has minutes" (Alice). The providers felt that many women of lower socioeconomic status may not be able to afford to consistently maintain their phone plans, meaning that there could be large spans each month when they would not be able to connect with a coach by telephone. Some of the providers highlighted that women who did not have consistent cellphone minutes may be able to use wifi-based chatting services to communicate periodically, however, they suspected that many of these individuals may not even have consistent wifi with which to send and receive messages. For example, Rita shared her suspicion that:

> Some of my people who could benefit the most from [the app] would not have good access… I have a reasonable number of people who we have a hard time getting a hold of by phone. Which makes me very suspicious of whether or not they would have wifi access [or phone minutes]... I mean, a fair number of people that come in a clearly have a phone on them while they are in there. But, whether they actually have service, or whether they rely on free wifi in certain location… I am not clear on that.

Others may simply find telephone calls uncomfortable, as Hannah captured when she said:

> I feel [connecting with a coach] can't just be by phone… because… you have to leave your phone number. I feel like there should be the opportunity to email or text… And I do know, depending on the age of women, they tend to not want to phone.

Therefore, participants suggested that users should be given the choice to call, text, email, or wifi-chat through the HOPE app. As an added benefit to these options some care providers felt that some women might find it easier to write out how they were feeling instead of saying it out loud. However, one provider warned that "there's lots of confidentiality stuff" (Alice) to work through with texting and chat that will need to be further explored. Potential challenges with the different time zones in Ontario were also noted. Finally, care providers were asked what credentials they felt the online HOPE coaches should have. Common replies included social workers, nurses, psychologists, nurse practitioners, social work students, and peers with personal maternal mental health experience. With regard to students taking on the coaching role, the participants were divided in their opinions. Two felt very strongly that undergraduate and college students did not have the skill set to deal with mental health crises over the phone. Additionally, they were concerned that women might be less likely to trust students, especially if they had no or little personal experience with depression. However, one of the two providers felt that master's students or student with advanced degrees may be effective if given proper training in crisis response. Care providers were also divided in their opinions on community members becoming coaches. Some felt that anyone with lived experience could be trained for the position, including Elders, kokums, peers, and religious leaders. Some providers particularly expressed that Elders could be valuable for the coaching role because they were perceived to be closely connected to community health organizations, schools, and local governments. These providers felt that having highly respected local coaches was more important than maintaining anonymity for women using the app. Kelly captures the diverse suggestions for coach qualifications below:

> I think [coaches] need to be social work trained… [with a] master's. I don't know enough about the social work… diploma program and how qualified they are to actually offer counselling support and services, but definitely social work, psychology… [nurse practitioners]. Anybody who is willing to train. It doesn't have to be a specific person. I don't think they have [to have] specific degrees… it just has to be the right person. A person who is compassionate.

Conversely, some care providers worried that anonymity was a fundamental feature of the app and suggested that coaches should not be well-known local residents. Instead, it was recommended that coaches be hired regionally, but not necessarily from each and every community. Under this model, one coach from Northwestern Ontario would be hired to meet the needs of every woman using the app in rural, remote, and Northern communities. Finally, the care providers agreed that - regardless of their academic or professional backgrounds - proper training was essential for producing high quality coaches.

Uptake and Marketing of the HOPE App

Care Provider Uptake

If the HOPE app is going to be successful in Northwestern Ontario, care provider buy-in is imperative. When asked if they would feel comfortable referring women to an online resource such as the HOPE app, all ten of the care providers agreed that the online tool was useful for supporting women in their care. Many felt that internet-based therapy would help to overcome some of the traditional care delivery barriers that they observed within their everyday practice. As mentioned above perceived benefits of the app included that it was “easy to use”, “aesthetically pleasing”, “comforting”, and did not use stigmatizing labels. The platform was particularly valued as a health promotion and screening tool. Some of the care providers even articulated that they would incorporate the app into their own care practices; such as introducing women to the platform during an appointment and helping them to navigate the online layout. Kelly pointed out that the risk questionnaire could be “tons of help” if it were completed by patients in the waiting room – where there was free wifi - before their appointment; thereby saving the care provider precious time during a 15-minute appointment. She described using the platform for the following applications:

> My appointments are half an hour… So, if I know that they are coming in and I’m monitoring for postpartum mood… I have fifteen minutes to say, ‘okay, let’s go through [the app together], because it’s probably going to give me information too.’ At my postpartum visit I might introduce [the app] and say, ‘okay, so there’s this HOPE app… and I am just going to take a few minutes to navigate it and show you a little bit about it’.

When asked if she felt that other care providers and women would feel the same way she did, Kelly responded:

> Not every health care provider is going to take the time to do that… The mood tracking is very important, the online courses [are] important to go through, [and] the emotional assessment. And maybe that is what we do [together], if they are willing. Or if you’d prefer that I not know anything about your results, please go home and do this health check-in.

For care providers with 30-minute appointment sessions, it was suggested that the time required to go through the questionnaires and talk about mood tracking results was feasible; however, this practice was viewed as less feasible for physicians with 10-minute patient-provider sessions. Because of this, some of the care providers believed that physicians would only embrace the HOPE app if it could be used by women independently from their homes; however, this seemed to be contradicted by the single physician participant who felt her colleagues would readily embrace the technology. One provider suggested that local organizations could designate one resource person to support women using the platform over the phone and several of the care providers volunteered their organizations to assist with the telephone-based counselling and in-person emergency referral process. While some of the care providers felt that the unmodified app would benefit a certain subset of women in their communities, almost all of them agreed that modifications and regional supports needed to be added before it would be ready for use in Northwestern Ontario. For example, Alice felt that:

> It's better than nothing. And I think that some women might appreciate it, but I think it's also very high literacy and I think that in order to start using it, you need to have a basic understanding of… what all of these tools on there are and why they're important. There isn't a lot a back information or kind of building block information.

Another care provider was concerned that the online coach might not be enough support for someone without a primary care provider. Yet another noted that there were other online supports that she would refer women to before the app because they better represented the lived realities of women from rural, remote, and Northern populations. The biggest reservation that the care providers had was the current emergency referral system for women who screened as high-risk. Care providers felt strongly that prompting women to reach out for emergency care without actually following-up to make sure they had received that care could have disastrous consequences for their communities. They wanted assurances that their neighbourhoods had care providers and organizations in place for emergency referral when women were flagged as high-risk. Emily said she would refer women to the app with the following three caveats: 1) women identified as high-risk must be given immediate telephone-based help while they are being referred to in-person emergency services; 2) it is imperative that local in-person supports be pre-arranged so that they have the capacity to take in emergency high-risk cases immediately; and 3) we must ensure that the referral process is safe in the respect that someone is following up with women identified as high-risk to ensure that they received appropriate in-person emergency care. Once region-specific modifications were made, all of the care providers were confident that they would use the app as a maternal mental health resource for their patients. Importantly, the HOPE app was not viewed as an ultimate solution for perinatal/postnatal depression and anxiety in Northwestern Ontario, rather it was seen as a complimentary and supplementary tool to be used in combination with existing services. One care provider perceived the app to be another great avenue for women who did not feel that their needs were being met by in-person services.

When asked whether they thought that other care providers in their community would embrace the HOPE app, the opinions of the participants were mixed. Some felt that young physicians and nurses that had grown up around technology may be more willing to embrace online therapy, whereas, care providers that were closer to retirement may be less comfortable with relying upon eHealth. When Nicole was asked whether other care providers would be as enthusiastic about the app as she was, she said:

> I hope so. I think it's hard with new technology. People may be… mistrusting of technology at first. I think that when people have access to something though, and they've looked at it, and they've used it, and… [it is] proven to be effective, and they see that it's been embraced by other people, then I think that it's more likely to be used. I think that initially any new service is sometimes a little bit hard to get people on board with.

Similarly, Jennifer expressed her hope that the platform would be embraced:

> I really like [the app]. I think it's another avenue for women to scope some things out on their own without any judgement or anything. And then you've got the support available if you need it. So, I would hope [other care providers would embrace it].

Suggestions for increasing care provider uptake within Northwestern Ontario included having the participants champion the app within their own organizations. Many felt that technology was more likely to be embraced by health workers if they were encouraged to use it by colleagues. Additionally, care providers felt that physicians and nurses were more likely to embrace the app if they had proof that it was effective in scientific trials.

User Uptake

Care providers were also asked to share their opinions on whether or not they felt their clients would readily embrace the HOPE app. Most care providers felt that women in Northwestern Ontario would embrace an online maternal mental health tool, however, the app in its current form would only appeal to a very specific subset of women. In particular, they felt that the “white, worried-well” (Alice) would find the current app useful while women outside of this group may not feel represented by the existing platform. For example, Alice felt that:

> There is probably a group that it would be a good tool [for] if I identified there was a problem and then there is probably a group [of women] that would say they would [use it] … but, I am not convinced they [actually] will. You get busy and you forget… or life just gets in the way.

Although some thought that the app in its current form was strength-based, gentle, and easy to follow, many of the participants agreed that culturally safe content and local in-person referral services need to be added in order to reach a wider audience. Once modifications have been made, the care providers were confident that women would feel comfortable using the online resource as long as they had access to reliable internet and enough purchased data. Participants particularly felt that the concept of ‘one-stop-shopping’ for supports without having to leave home would appeal to women in the region. It was also important to the participants that we "specifically ask women" (Kelly) to share their perceptions and opinions on whether or not the app is suitable to them in its current form. There were two stipulations that the care providers felt must be met for women to use the HOPE app as their primary form of medical care. Firstly, accessing the app was perceived to require motivation and incentive to seek care online. As mentioned previously, one care provider suggested that women were unlikely to print off the online therapy activities and show their results to their care provider unless they had strong provocation to do so. Another pointed out that new mothers were likely to be so incredibly busy that they may pick and choose which parts of the app appeal to them the most unless they are convinced that all sections are equally important. Gamifying aspects of the app through online achievement badges, stickers, and point systems were incentive-generating ideas brought forward by the providers. Once again, the importance of seeking women's voices was emphasize; as one provider suggested asking women in the community for examples of what motivates them. The second stipulation was that women would need to be introduced to the HOPE app by an in-person care provider. Some felt that marginalized women would particularly benefit from a health expert referring them to the online resource. Having care providers promote the app was viewed as important for instilling trust in women that the intervention was effective, useful, and science-based. Susan suggested that care providers will need to periodically remind women about this care option and discuss their progress with them to renew their motivation, stating:

> You've got to promote it and it has got to be something that's used on a regular basis, because sometimes you start things off and then it goes by the wayside. So, someone has to continue to… remind [the user] to use the app. I think the one-stop-shopping with the resources is a big benefit as well, for specifically pregnant women, I think if you can just go online and it's all about supports for pregnancy, that's helpful. It's helpful for me as a [care provider].

Maria pointed out that promotion through health care professional had been successful in the past; citing the telehealth system as a widely utilized eHealth option for patients in Northwestern Ontario. In her opinion, telehealth was not only successful because it was convenient and useful, but also because it had been widely championed by care providers working in rural, remote, and Northern communities. Although in-person care providers were regarded as the best individuals for app promotion and patient motivation, one provider did note that the online coach could also potentially act as the advocator and motivator for women.

Existing Online Supports

The consensus among the care providers was that women were already using different types of e-resources in order to find information and support networks online. Nicole said that many of her clients "find most of their information online… whether it's an actual, validated, online app or whether they're looking at webpages… there's so many forums." The internet was perceived as providing a significant amount of prenatal and postnatal information to women and allowing them to connect with others through a "support network" (Nicole) that normalized their experiences with depression and anxiety. However, one perceived drawback of using online information was that "it's hard to know what of that information is valid or invalid" (Nicole). Some of the online formats that care providers were aware of women using included social media, Facebook, websites, videos, chatrooms, blogs, and online support groups. It is important to note that Kelly felt strongly that internet-based resources were most commonly accessed by "the worried-well". In her experience, white, middle-class women tended to use online services and apps, whereas some of her less privileged patients seemed to use these formats less often. However, she did also stress that social media seemed to be widely utilized by all groups of women. Some of the care providers actively referred women in their care to online supports such as Big White Wall, the Pacific Postpartum Support Society, Postpartum Support International, and the Mother Matters program. These resources offered peer-to-peer networking, educational tools, online group support, and telephone crisis lines. Some of the participants' local organizations also capitalized on the popularity of e-resources by posting educational tools on their own webpages; however, their ability to offer e-content was largely limited by the unavailability of stable funding. While online support groups seemed to be a popular among women, one care provider felt confident that no clinical apps comparable to the HOPE platform were currently being used in Northwestern Ontario.

Marketing Strategies

The care providers came up with a wide range of marketing strategies for increasing uptake of the HOPE among women living in Northwestern Ontario, including social media posts, pamphlets, posters, radio advertisements, and word-of-mouth campaigns. All of the participants stressed that marketing strategies should consider the ways in which women normally connect with one another and with local services. As Jennifer succinctly put, "you've got to have it in the places that the women are coming". To the PCPs, this meant putting up advertisements online as well as at doctors' offices, community centers, mental health services, libraries, recreations facilities, maternal health organizations, bloodwork labs, diagnostic imaging departments, social services, drop-in centers, addictions services, swimming pools, playgroups, delivery hospitals, EarlyON centers, housing programs, washroom stalls, as well as at any public organizations that provided free wifi. Travelling health services run out of buses owned by the local health units were also suggested as potential resources to spread information about the app to small, remote communities. Social media was a popular marketing tool for many of the local maternal health organizations in both Thunder Bay and Kenora. When using platforms such as Facebook, care providers suggested that advertisements be kept simple with easy access to additional information though a single Uniform Resource Locator link. Care providers stressed that signing up for the app should be easy, without the added barriers of email or telephone communication. It was their opinion that women should not have to identify themselves at any stage in the process. A ‘blitz’ style advertising campaign was generally agreed upon as the optimal strategy for marketing the app in Northwestern Ontario, as described by Alice:

> Yeah, I think it would have to be plastered everywhere, you know? It would have to be on those blitz adds on the back of the bathroom stalls, you would have to hear on the radio, you would have to see posters of it at EarlyON centers, you’d have to see posts of it on Facebook and social media from [central] health pages. All… simultaneously so they see, ‘Oh, ya, this isn’t just a random thing, it’s legit, and it’s out there’. And if many agencies are promoting it, then I think that reinforces its legitimacy as well.

In addition to public advertising, the participants emphasized that care provider buy-in would be essential to the app’s success in the region. Most felt that health care professionals should be the first point of contact for the app by referring women to the online resource in the early stages of pregnancy. Some even suggested that the app should be advertised to all women proactively, regardless of whether or not they had immediate plans to become pregnant. The participants envisioned that primary care providers would offer the app to women during their very first maternal appointment and then would periodically remind women about the resource as they moved through each new stage of pregnancy. However, as discussed above, getting buy-in from physicians was perceived by the participants as the most difficult part of advertising the app. Hannah spoke to this barrier at length:

> The health care providers are hard. They’re such a hard group to engage. They have the best practices, they’re set in their ways, it’s really hard to reach them, you know? I don’t

> know… If you can get someone's attention and connect with one doctor at the clinic… if you have buy-in in from that one person, then it kind of spreads that way.

Hannah suggested that a physician from each local organization needed to be recruited to champion the app to their colleagues. Reaching medical students before they entered the workforces was also suggested as a potential strategy. Finally, care providers suggested that the HOPE team would need to connect with individuals that were highly respected and influential within each regional community. These individuals could include nurses, midwives, Elders, and kokums. First Nations health centers were also highlighted as core organizations within Northern districts. Care providers emphasized that these health centers act as central hubs for community information and should be approached as potential partners for spreading the news about this new maternal care option.

Potential Obstacles to Using the App in Northwestern Ontario

Restrictions to Audience

Care-provider-perceived restrictions to audience could be one obstacle that the HOPE team will face in encouraging user uptake. During the interview process, care providers were asked who they supposed the target audience of the current HOPE platform was. Their responses to this question were mixed; some felt that the app could be used equally by all women and others felt that the current content and layout privileged certain groups over others. Those who felt that the app was inclusive cited its accessibility as an online tool and the culturally ambiguous information that it provided. These care providers expressed that the app's generic courses and anti-stigma educational tools could be beneficial to anyone, regardless of their background. Four of the providers felt that the majority of women in their care would use the app without modification. Hannah, for example, felt that the app was not restrictive in a flagrant sense, but “there'd be certain groups that would be drawn to it” over others. Others felt that the app was specifically built to target educated, middle-class, settler women. Several felt that the ‘bourgie’ or ‘spa-like’ appearance did little to engage vulnerable women who were most at-risk. Many – including Alice - expressed that it was possible that marginalized women would be less likely to use the app when compared to women who already had access to in-person services:

> [The app] was kind of bourgie. It was very white, upper-middle class. [It had a] ‘let's duplicate a spa’ kind sensation, because that is what you need when you're depressed. And I think that that kind of appearance alone would turn a lot of people away.

Emily agreed, stating:

> [The app is] targeting… fairly educated middle-class, probably settler-focused [women]. Although, I did appreciate that there are different colored people … an indigenous-focused one would be excellent. And [a version for] newcomers.

Some aspects of the app were perceived as acutely restrictive. Of particular concern was the high literacy level. Some care providers felt that women might need a liaison to guide them through the app and interpret information for them. This liaison could be an in-person care provider or an online coach. Language was another perceived restriction since the app is only currently offered in English. Finally, several care providers felt that the app concept in itself may be restrictive to those with low technological literacy, unreliable internet access, and/or little money to buy data for their phones.

Another concern that some participants had was that the app does not currently do enough to address the social determinants of health; including race, age, housing, income, education, marital status, and social support. For example, as discussed in previous sections, the providers felt that some of the case studies in the modules – such as those using heteronormative couple Rachel and Steve – were not representative of all the women in their care. Jennifer pointed out that: "most of [our clients] are in violent relationships, or they don't have the father with them… we're talking about women at the extreme end, right?". Another group of women on the 'extreme' end included teenage mothers. One care provider felt that the images of women used on the app looked 'older' and no teen mothers were noticeably visually represented. She suggested that the app could be modified to project a more 'youthful' atmosphere, however she was unsure of exactly what this might look like. Similarly, Alice felt confident that no 16-year-old would use the current app without a care provider helping them through it. Single mothers and women in violent relationships were two more groups that the PCPs felt were not represented, as Alice explained:

> There are different demographics of women having babies, right? There're teen single moms, there's single forty-year old moms who have chosen to have IVF on their own, there's so many different populations of women who are mothers. … And I don't think that there's one blanket. Even though they are all mothers, and that's the common denominator, there are so many other variables and factors that separate them from each other. And we know that women who take prenatal classes, for example… who are police officers, or who are teachers, don't want to take it with teens who are in their class or people who they run into professionally. …So, there almost needs to be different apps…

> You know? Like, there needs to be the teen one, there needs to be… the middle-class one… There needs to be a culturally-based one. Because, if it's going to work, people need to be able to identify to it.

It was suggested that a delicate balance needed to be found between representing women at the 'extreme' ends while also meeting the care-provider-perceived needs of women in the 'middle'. The final restriction to audience that care providers noted was a lack of cultural representation. Many of the care providers worked with clients from Indigenous backgrounds, and felt the app was not appropriate for these women in its current form. It was strongly suggested that culturally appropriate content be added for some of the most highly represented minority groups living within Northwestern Ontario. This recommendation is discussed in the next section in further detail. Overall, many different suggestions were made for the inclusion of a wide variety of different demographic factors including age, socioeconomic status, ethnicity, relationship status, cultural group, linguistic background, race, housing status, and education level. One provider warned that even these broad 'containers' did not represent the heterogenous nature of women in Northwestern Ontario. She cautioned that anything less than offering an assortment of personalized options would be restrictive to at least some individuals. However, she also recognized that the realities of limited funding and capacity would restrict the HOPE team from being able to design options to meet the care-provider-perceived needs of all women. Therefore, she felt that some restriction was unavoidable. Nevertheless, the HOPE team should not stop trying to reach as many women as possible, and the app should - at the very least - be modified to reflect the population demographics of women living in rural, remote, and Northern communities across Northwestern Ontario.

Cultural Sensitivity

The lack of cultural representation on the app was a perceived barrier brought up by all ten of the care providers. Many felt that the app's content needed to be translated into several of the region's most commonly used dialects, including Anishinaabemowin (Ojibway and Oji-Cree) and French. However, it is important to note that care providers were unsure of how many Indigenous youth spoke Ojibway or Oji-Cree as their primary language, and as a result, they were uncertain whether offering these languages would increase uptake among these populations. Care providers suggested that instead of translating all of the content into Anishinaabemowin, only snippets of these languages be added to supplement information offered in English. Other suggested languages included Chinese (unspecified), Spanish, Arabic, Finnish, and Italian. Several participants agreed that users should be given the opportunity to identify themselves as belonging to a particular cultural-linguistic group when first logging onto the app. According to the providers, once users have identified themselves, all of the content should shift to deliver culturally-personalized care. One care provider suggested that cultural foods and recipes would be a welcome addition to the Healthy Habits section. Susan recommended that we add Indigenous videos, artwork, powwows, medicine wheel teachings, traditional healings, and cultural stories as well. It was extremely important to care providers that we not simply translate Western resources into Indigenous languages. Rather, they felt that the app content itself needed to be co-created with Indigenous communities to be culturally-grounded. When asked specifically what changes to content and layout would be needed to achieve cultural representation, care providers overwhelmingly responded that the cultural groups of interest needed to be consulted. These groups should be involved during all stages of development of the new adaptions. Most of the care providers were not comfortable speaking on behalf of other cultural groups, including Emily who said, “I think you really need to ask those community members and I don’t really feel comfortable speaking to what other people’s needs are”.

Access to Internet and Devices

According to the care providers, the reliance on internet and internet-enabled devices could prove one of the biggest challenges for launching the HOPE app in Northwestern Ontario. All of the care providers felt that women had at least some access to phones at least “sometimes of the month” (Jennifer); however, access to internet was perceived to be much less consistent. Within urban centers, the care providers were confident that even marginalized women had access to devices due to city-wide programs offering refurbished phones at low or no cost. One care provider pointed out that women who did not have personal phones still often had access to an internet-enabled iPod or tablet. Although web-supported devices were assumed to be common, minutes on phones were perceived to be a potential challenge for women from lower socioeconomic backgrounds. The PCPs had observed in their practice that women had the ability to receive calls for some periods during the month but were unable to call or text using their devices. While regular SMS texting required a contracted phone plan, the providers observed that some women were able to access “free texting” (Maria) through wifi-based applications. Care providers expressed their concern that women without phone minutes would be unable to connect with the telephone-base coaching service offered through the HOPE app. One organization used Facebook messenger to reach clients since phone calls and emails required costly telecommunications contracts that it seemed many of their clients could not afford. Fortunately, when women did not have access to minutes, they seemed to be able to use free public wifi spaces to chat or text without charge. Participants described the quality and accessibility of internet in both Thunder Bay and Kenora as high to moderate. The city of Thunder Bay was particularly well connected, with municipally-owned telecommunications companies providing free wifi to most of the city's regions. Care providers reported that most of the women that they worked with seemed to have at least some internet connectivity in their own homes, and women who were transient or who could not afford home internet seemed to be able to access free wifi at the public library. For example, when asked about internet availability in her community Nicole said "I would say [that] the majority of people in [my community] have access to the internet. So, even if they don't have minutes on their phone, they can go to wifi hotspots… and they'll use the internet there". Additionally, care providers emphasized that the waiting rooms of most maternal health care organizations had free wifi available for women to use. They felt that this was particularly important for individuals travelling in from outlying communities to receive care. However, participants also stressed that free wifi may have slow connection speeds and public libraries weren't always open on a regular basis. Furthermore, they feared that women may have to leave the comfort of their homes to find free wifi, which negated the convenience of the app. While wifi was viewed as easily accessible within large urban centers, the PCPs felt that connectivity sharply declined in smaller, outlying, rural communities. Care providers expressed the belief that people living in these rural areas may have unreliable internet or – in some cases -- no connection at all. Some of the care providers – like Emily - even experienced spotty internet connections at their own homes:

> I don’t have a reliable internet connection [where I live] and we are technically part of [the city]. And so, I wouldn’t guarantee [connectivity even in the city]. And then when you go way up North, there are people that live there, and they may not have … internet access [at all]. (Emily).

One solution care providers suggested to overcoming unreliable internet was to offer offline content so that women could continue to work through the courses even when they were not connected to a network.

Potential Benefits to using the App in Northwestern Ontario

Building a Comprehensive Care Network

One of the largest care-provider-perceived benefits of the app was its ability to connect women and care providers with other local health and social services organizations. Care providers had previously expressed that it was difficult to know where to refer women for additional in-person services unless formal inter-agency partnerships had been pre-established. The local resource list tab under the HOPE app provided an opportunity to develop a comprehensive care network for both health workers and women to use. Hannah felt that “once it’s up-and-running and it’s an option, I feel like it will complement the services nicely in [our community]. I feel like any resource for the district is helpful”. Care providers envisioned using the app primarily as a tool for interagency referral and in-person maternal mental health screening. They also had high hopes that it might increase the therapeutic and informatic connection between women and their doctors. As for care-provider-perceived user benefits, the participants articulated the fantastic potential for women to find their community’s ‘menu’ of services in one online location, including easily accessible agency contact information. Almost all of the care providers expressed their interest in becoming a part of this comprehensive care network. Many providers also volunteered their services to offer online counselling through the app, while others agreed that their organizations should be listed for second-hand in-person referral.

Reducing Stigma

Another care-provider-perceived user benefit of the app was its ability to reduce stigma by potentially creating opportunities for women to access help anonymously. One care provider felt that women would see themselves reflected in the app's content and layout, which would help to normalize their experiences and make them feel less alienated. It was suggested that adding statistics about the high prevalence of maternal depression and anxiety in Northwestern Ontario might further encourage women to seek professional help. Alice spoke about fighting stigma through the app by speaking openly about how common it is to experience maternal depression and anxiety:

> I think it's a step in the right direction to offering supportive information and screening. I liked the screening piece because it offers some legitimacy to, not a diagnosis, but to recognizing that their struggles are legit… And that there may need to be some more language around how this screening tool is validated. So, they know that it's not just a Cosmo quiz, it's a legit screening tool that's telling you something important about yourself. So, I thought that that was a good awareness piece that is going to help with the buy in. I think that it would [also] be helpful to have some stats specific to their areas; 'people who live up here do not jive with lives in Toronto', right? It's very different. I think that people get tired of being lumped into the province of Ontario when the regions

> are so different because… Ontario is not Toronto, as much as they like to think it is. And having some specific stats about your community… are ways to normalize [maternal mental health disorders] and women to maybe not feel so ostracized. If they read, '50% of women in [my community] have suffered from postpartum depression or situations of depression after having a baby', they'll think, 'maybe I'm not so crazy. It's not just me'. That would go a long way towards normalizing the conversation.

Linda agreed that representation was vital, saying:

> [One benefit to the app is] maybe women just being able to discover more about themselves. Maybe reading the information and being like, "'that applies to me' [and] just becoming more self-aware. And maybe more inclined to seek help if they do see that there are some struggles that they can identify when they're going through the questions.

Jennifer added:

> And I love that… it links to a doctor. … or links to [a PCP]. I think it's just another tool that they have with them … right away. That's really nice.

It was the PCPs' opinion that offering the app in rural and remote communities would ensure that women had an option to seek anonymous care without the added barrier of long-distance travel. Finally, care providers felt that promoting dialogue around symptoms of maternal mood disorders and different options for treatment could help to reduce the stigma that some women may feel when reaching out for assistance.

HOPE for the Future

The care providers could see a wide range of benefits for launching the app in Northwestern Ontario. The most obvious advantage was that they felt that the app would increase access to maternal mental health services which they had identified as greatly needed within the region. This was perceived as particularly important for smaller rural and remote communities which they felt may also have limited availability of maternal resources and mental health supports. When asked what benefits she felt there were to offering the HOPE app in Northwestern Ontario, Hannah replied, “I feel like it increases access to… a needed service. We have the highest rates [of depression and anxiety] in the province”. The convenience of the app was also a care-provider-perceived benefit. Participants felt that it was important for women in Northern communities to access care right from the comfort of their own homes, because – in their opinion - it reduced the barriers of transportation, stigma, and childcare. Nicole emphasized that the app could be great for reaching women with advanced depression and anxiety because she felt that very little energy was required to access care online. Another perceived advantage was that the app could help to support practitioners by offering a convenient platform for maternal mental health screening. Care providers emphasized the benefits that they felt consistent and valid screening would have for understanding the prevalence of maternal mood disorders in Northwestern Ontario. Identifying depression and anxiety early in women was also perceived as vital for increasing positive health outcomes for women, children, and their families. Emily also pointed out that the app promoted preventative medicine over reactive treatment, saying “I think investing early and often… in families in particular and in babies and children is where we’re going to get our biggest bang for a buck in terms of prevention of mental illness”. She went on to outline several other benefits to offering the app in the North:

> I think just even talking about mental wellness as a part of the… human experience in general is valuable and beneficial. And acknowledging for women that it's okay to feel this way. And having a space where they can connect with someone and just go through the… exercise of thinking through… where they're at and what they could do on their own to benefit, but then also reaching out to get help is huge. Obviously not every woman has a care provider, and not every woman has a care provider who has the skills and competencies around mental health to ask the right questions and refer appropriately and so… I think there's a lot of complexities that we've talked about, but I think it has huge potential too.

In the future, Kelly even saw the potential to broaden use for the app beyond pregnancy. For example, she suggested that the app could offer help for depression and anxiety across the life course:

> I would use this for someone not pregnant. There is some really good information in here. I know it is meant for mood postpartum, but it's also mood [in general]. Maybe there is a broader use for it than just postpartum... than just pregnancy.

In conclusion, care providers perceived a wide range of potential benefits for both care professionals and women from offering the HOPE app in Northwestern Ontario. These provider-perceived benefits included improving access to maternal-specific mental health supports; creating a comprehensive care network to facilitate streamlined inter-agency referral; improving access to normalizing, promoting anti-stigma information; overcoming many of the traditional barriers to care experienced in the North; and increasing consistent mental health screening and data collection.

Chapter 5: Discussion

Summary of Findings

The purpose of this study was to capture social service and health care providers' perspectives on the suitability of the HOPE app for addressing the specific needs of care providers and women (as perceived by care providers) living with pre- and postpartum depression and anxiety in Northwestern Ontario. The inquiry process was framed around the following three research questions: (1) What barriers or facilitators currently exist in the delivery of, access to, and use of existing maternal care services and supports in NWO? (2) What barriers or facilitators exist in the delivery of, access to, and use of the HOPE app in NWO? (3) What changes could be made to the current HOPE app in order to facilitate an improved fit to the specific needs of care providers and women (as perceived by care providers) living in NWO? Maternal health care professionals and social service providers located in Thunder Bay and Kenora at organizations primarily serving women from Euro-Canadian backgrounds were consulted. Their diverse academic and professional backgrounds as nurses, public and health experts, addictions counsellors, physicians, policy specialists, health promoters, and social service workers contributed to the rich tapestry of information that they were able to contribute to our investigation. Many of the health care providers were also mothers themselves and were able to share their pregnancy and motherhood experiences with us. I will begin this discussion by breaking down the provider-perceived barriers, facilitators, and modifications suggested by the participants, followed by an in-depth exploration of internet connectivity in Northwestern Ontario. Concluding discourse will emphasize care providers' HOPEful outlooks for the evolving 'healthscape' of maternal mental health in the future. Headings for this section include: (1) Barriers and Facilitators to Maternal Care & the HOPE App; (2) Addendums to the HOPE app; (3) Investigating the Connectivity Barrier; and (4) HOPE for the Future Reprised. Subsequent dialogue will highlight the strengths and limitations of this project, as well as prospective areas for future research.

Barriers and Facilitators to Maternal Care & the HOPE App

Health care and social service providers working in Northwestern Ontario face many unique obstacles to care and service delivery in large part due to population dispersion, geographical isolation, and the diverse cultural makeup of the region's populace (Association of Ontario Midwives, 2015; Health Quality Ontario, 2017). The providers interviewed for this study highlighted four types of barriers that they faced in delivering services or that they felt women in Northwestern Ontario may face when attempting to access maternal and mental health supports: structural barriers, environmental determinants of health, social determinants of health, and individual-level barriers. The care providers discussed five structural barriers to maternal mental health care [(1) the lack of specific maternal mental health services; (2) waitlists and capacity; (3) the shortage of PCPs and insurance; (4) funding and billing code obstacles; and the (5) lack of interprofessional and intersectoral collaboration], two environmental determinants of health [(6) geographical distance; and (7) hazardous weather], eleven social determinants of health [(8) lack of transportation; (9) blacklisting; (10) stigma; (11) language; (12) mistrust; (13) fear of child protective services; (14) lack of childcare; (15) minimal internet and phone access; (16) sobriety requirements; (17) poverty and marginalization; and (18) cultural preferences], and two individual-level barriers [(19) time commitments; and (20) a lack of incentive, promotion, and interest]. Several of the barriers that the care providers perceived women may face mirrored the findings outlined by women in the *Prenatal Knowledge Xchange: For Equity in Birthing Experiences and Outcomes* executive summary (Møller et al., 2018). In particular, women communicated to Møller and colleagues (2018) that the lack of specific mental health services, the timing of some prenatal classes, and fears over potential stigmatization prevented them from accessing pre, peri- and postnatal services. Furthermore, more than half of the women interviewed during the Xchange study expressed an immediate need for more maternal mental health supports and resources in Northwestern Ontario (Møller et al., 2018). Correspondingly, the lack of specific maternal mental health resources available in rural, remote, and Northern communities was a major theme brought up by the participants of this study. While the range of maternal supports and mental health services has increased in urban centers over time, very few services exist that solely address mental health concerns in pregnant women and new mothers. Access to specific services is even further restricted within the smaller Northern communities surrounding these metropolitan areas. Unfortunately, for the care providers in this study, this meant that they often had nowhere to send clients for additional therapeutic support that fit women's needs more specifically than the scope of their general practice. The *Prenatal Knowledge Xchange* executive summary would seem to lend support to the notion that this is a barrier experienced at both ends of the care spectrum: women who self-identify mental health needs within themselves struggle to find services to meet those needs (Møller et al., 2018) and care providers who identify mental health needs within their patients also face challenges in referring women to specialized care. When services are made available, waitlists for mental health supports – particularly those offering addictions, counselling, childcare, or therapy components – can further delay care for several months. The disconnect between maternal and mental health fields has contributed to an environment in which maternal care workers feel isolated from mental health workers and are unsure of where they can refer the women in their care for additional support. As a result, the participants called for the expansion of existing in-person services to include inter-sectoral collaboration, peer support programs, services addressing multiple comorbid addictions, and facilities oriented towards whole family treatment. Moreover, it is imperative that these services emphasize early stage prevention – with a particular focus on timely mental health screening – rather than late-stage treatment (Austin, 2003). In fact, Austin (2003) argues that early intervention for perinatal depression should begin even before women begin to experience the symptoms that are used for traditional public health framework diagnoses. Primary prevention and early secondary/tertiary intervention should be completed during any of the frequent contact points – including appointments, vaccinations, and lactation consultations - that pregnant women and new mothers have with health services (Austin, 2003).

The idea of a 'menu' of services became an important concept in theorizing Northwestern Ontario's future maternal mental 'healthscape' (a term used by one of the care providers during a casual encounter to describe the collective set of physical, social, and environmental dimensions that contribute to the mental health and wellness of women living in rural, remote, and Northern areas). Care providers have continuously emphasized their opinion that PCPs and women will benefit most from having a range of different care options that they can choose from based upon their own preferences, beliefs, and value systems. They feel confident that women are most likely to seek services that cater to their self-identity and offer linguistically-, stylistically-, culturally-appropriate content and program staff. This sentiment has also been supported elsewhere, with the Mental Health Commission of Canada calling for culturally safe care that "acknowledges the influence that social disparities and imbalances of power can have on relationships" (Canadian Labour Congress, 2017, p. 1). Furthermore, the systematic review by Kolahdooz and colleagues (2016) examining Canadian Indigenous women's perspectives on maternal support services concluded that culturally safe care in maternal healthcare settings – while not sufficient in itself – is vital for empowering patients and accounting for "the socioeconomic and socio-cultural factors that impact maternal health" (Kolahdooz et al., 2016, p.343). Importantly, another review assessing the effects of culturally competent psychotherapeutic interventions found significant evidence that cultural competency has a moderate effect size on positive treatment outcomes (Griner & Smith, 2006). The notion of appropriateness was perceived as particularly important when engaging marginalized women, whom the care providers felt may otherwise feel uncomfortable accessing amenities due to racism and stigmatization. This is echoed in the report by Møller and colleagues (2018), in which some mothers described feeling stigmatized due to their age or social circumstances (Møller et al., 2018). Women may also self-stigmatize when they experience conflict between their own beliefs of what motherhood 'should be' and the reality of their experiences (Choi et al., 2003; Mauthner, 1999). When women fail to live up to their own expectations of the 'ideal' mother, they fear they will be criticized as 'bad' mothers by health care professionals (Dennis & Chung-Lee, 2006; Mauthner, 1999; Sword et al., 2008). Internalized feelings of shame, guilt, and inadequacy can be further compounded by familial, societal, or cultural stigma which has been shown to collectively influence help-seeking behaviours (Al-Hamad & O'Gorman, 2017; Dennis & Chung-Lee, 2006; Fonseca et la., 2017; Fonseca et al., 2015; Mauthner, 1990; Sword et al., 2008).

While mental health stigma is not exclusive to Northwestern Ontario, the care providers felt that women living in rural, remote, and Northern communities were particularly at risk of being defamed due to lack of anonymity. This is a well-established phenomenon that has been reported in-depth elsewhere (Brems, Johnson, Warner, & Roberts, 2006; Hoyt, Conger, Valde, & Weihs, 1997; Larson, Corrigan, & Cothran, 2012; Rost, Smith, & Taylor, 1993).

One potential product of this stigmatization is mistrust. Unfortunately, the care providers feared that marginalized and racialized women living in small communities may be skeptical that they will receive equitable care or that their patient confidentiality will be firmly upheld. Interestingly, the care providers in the mixed-methods study by Schueller and colleagues (2016) also identified mistrust as a barrier to the use of eHealth interventions. The providers in that study emphasized that patient security and privacy was important for creating a safe disclosure environment for patients sharing sensitive or personal information (Scheuller et al., 2016). The authors went on to postulate that if patients and providers "are unable to trust information coming from technologies, they are unlikely to find these technologies useful for their clinical practice" (Schueller et al., 2016, p. 150). In addition to fears over mistrust, the care providers pointed out that maternal mental health situations bring the added complexity of fears over child protective services involvement. It would seem that these fears are supported in the literature, with a recent study by Kaplan, Brusilovski, O'Shea, and Salzer (2019) finding that parents with mental illness were eight times more likely to have child protection services contacted than parents without serious mental health disorders. This study also found that parents dealing with mental health symptoms were twenty-six times more likely to have a change in living arrangements, including custody loss of their children (Kaplan, Brusilovski, O'Shea, & Salzer, 2019). Building strong therapeutic relationships was seen as essential for delivering quality maternal mental health care, therefore it is essential that these fears of CPS involvement be completely and transparently addressed before the healing process can begin. Care providers emphasized that increasing community awareness about the prevalence of maternal mood and anxiety disorders should also be prioritized as a means to address mental health stigma in Northern communities. This is particularly poignant, given that women in the *Prenatal Knowledge Xchange* study identified prenatal knowledge and education as positively contributing to their overall empowerment during the pregnancy, birthing, and motherhood processes (Møller et al., 2018). Empowerment through prenatal education is also supported elsewhere (Hajipour, Hosseini Tabaghdehi, TaghiZoghi, Behzadi, 2014; Sadat Borghei, Taghipour, Latifnejad Roudsari, Keramat, & Jabbari Noghabi, 2016).

Other perceived barriers identified by the care providers echoed findings summarized in the *Rural and Northern Community Issues in Mental Health* report released by the Canadian Mental Health Association (CMHA) and the *Rural and Remote Maternity Care in Ontario: Analysis and Recommendations* report by the Association of Ontario Midwives (Association of Ontario Midwives, 2015; Canadian Mental Health Association, 2009). The CMHA described the 'menu' of services in Northwestern Ontario as less "comprehensive, available and accessible" than supports found in other regions of the province (Canadian Mental Health Association, 2009, p. 7). In particular, limited transportation, fragmented continuity of care, deficient funding, and the lack of primary care providers were cited as unique obstacles to health care delivery. The recruitment and retention of physicians to areas of high-need with low-population density continues to prove a formidable challenge to comprehensive and continuous care in Northern

Ontario (Chan & Schultz, 2005; Making it Work, 2019; Pong & Pitblado, 2005; Wenghofer, Timony, & Pong, 2011). The 2019 *Remote Rural Workforce Stability Forum Report* released by the Northern Ontario School of Medicine and Northern Periphery and Arctic Programme calls for five-way collaboration between policy makers, health professionals, academic institutions, health administrators and communities in order to address what has "long been one of the most pressing concerns in the North" (Northern Ontario School of Medicine & Northern Periphery and Artic Programme, 2019, p.3). In addition to PCP shortages, restrictions in access to safe, reliable, and affordable transportation was identified by care providers in this study as a major barrier in both rural and urban communities in Northern Ontario. The care providers emphasized that the time commitments and high costs associated with driving, flying, busing, or taking a taxi may prevent women – particularly those from lower socioeconomic backgrounds – from seeking in-person care. This barrier is well-establish in the literature, with women in rural, remote, and Northern communities often having to travel significant distances to access care (Association of Ontario Midwives, 2015; Canadian Mental Health Association, 2009). For example, a survey by the Association of Ontario Midwives found that 28.9% of respondents had to travel between 30 minutes to one hour to reach maternal care (midwifery clinics in this case), and 9.6% had to travel over an hour (Association of Ontario Midwives, 2015). While some travel grants exist to support women who are forced to travel for maternal care, these funds typically require an official referral notice from a physician and are only available to women living in the far North (Association of Ontario Midwives, 2015). Furthermore, these reimbursements require up-front spending and may have 24-hour restrictions that fail to account for potential delays from unpredictable poor weather

(Association of Ontario Midwives, 2015). Travelling outside of one’s own community also means that women may have to leave their young children, families, and support networks behind (Association of Ontario Midwives, 2015; Canadian Mental Health Association, 2009; O’Driscoll et al., 2011). Although both Thunder Bay and Kenora have public transit systems, the limited bus routes and confusing transit schedules are still perceived to limit mothers. Furthermore, many smaller outlying communities within Northwestern Ontario do not have any public transportation at all (Ontario Ministry of Transportation, 2020). Therefore, one potential advantage of the HOPE app is that it may allow women to access therapy, counselling, and maternal mental health resources from the comfort of their own home.

Funding is another area that often limits health workers and the supports they can provide; nearly half of the care providers worked at organizations that had lost programs over the past twelve months. Unfortunately, maternal wellbeing – and the wellbeing of women in general - has received limited support from both the Canadian and Ontarian governments over the past two decades; with Canada rising 0.101 points on the UN’s Gender Inequality Index between 1995 and 2018 (United Nations Development Programme, 2019). This rise would suggest a 220% increase in the loss of potential human development due to gender inequity primarily affecting women since the mid-90s (United Nations Development Programme, 2019). One reason for Canada’s Gender Inequity Index decay has been the highly criticized funding cuts made to female-oriented services under the previous Harper government (Hamandi, 2015). For example, in 2005 the planned $5-billion-dollar National Child Care Program was eliminated in favour of a $100-monthly taxable allowance for pre-school children, a decision that has likely contributed to the childcare barrier perceived by care providers during this study (Hamandi, 2015). Provincially, the Ford government's budget cuts to the Indigenous Affairs Department, children's protection agencies, and sectors addressing women's issues has also created a number of impediments for achieving equality for all women living in Northwestern Ontario (Walsh, 2019). Furthermore, population-based funding strategies used by the province to distribute health care spending do little to support dispersed rural and remote communities (Canadian Mental Health Association, 2009; Registered Nurses' Association of Ontario, 2015). Part of the problem is that per capita funding does not consider the inflated costs associated with serving these populations, nor does it account for existing determinant-driven health inequities (Canadian Mental Health Association, 2009). As a result, the North West Local Integrated Health Network (LIHN) – with a population density of 0.5 people per square kilometer - may receive more per capita mental health funding than Southern LHINs – such as the Mid-West Toronto LHIN with a population density of 9057.8 people per square kilometer - but this amount is insufficient to meet the needs of all individuals living in rural, remote, and Northern communities (Canadian Mental Health Association, 2009; Toronto Central Local Health Integration Network, 2018; North West Local Health Integrated Network, 2017; Registered Nurses' Association of Ontario, 2015). Additionally, the application and reporting processes used for these funding initiatives may be too onerous for small communities with limited administrative staff (Registered Nurses' Association of Ontario, 2015). As a result, the Registered Nurses' Association of Ontario calls for "recognition of the capacity of rural, remote and northern health-care organizations when structuring the application and funding process" (Registered Nurses' Association of Ontario, 2015, p.26). This involves balancing the burden of application and reporting procedures with the need for accountability in health funding.

Two other perceived barriers that the app may help to circumvent are the lack of primary care providers (PCPs) and inconsistent maternal mental health screening. During interviews, care providers directly attributed fragmented continuity of care to the scarcity of general practitioners and registered nurses working in Northwestern Ontario. They felt strongly that women without PCPs do not get the benefits of early screening and often cannot connect with more intensive therapeutic services without an official referral. Unfortunately, the recruitment and retention of professionals in these regions proves an ongoing challenge for the Ontario Ministry of Health and Long-Term Care (Association of Ontario Midwives, 2015; Canadian Mental Health Association, 2009). By connecting women to online coaches via the HOPE platform, care providers are hopeful that the app will help to supplement the caseload of PCPs working in the North. Furthermore, the online Risk Assessment is viewed as an important tool for supporting local physicians with reliable and timely mental health screening. This is particularly important given that the care providers felt that mental health screening in the region was inconsistent and there were conceivable concerns that screening may be withheld due to time constraints and a lack of follow-up services. The absence of screening and data collection is particularly troubling given the strong scientific support for early identification and management of prenatal mental health disorders (Kingston et al., 2015b). No consistent approach to screening exists, despite family physicians' demonstrated interest in incorporating a brief validated screening tool into primary practice (Noonan, Doody, Jomeen, O'Regan, & Galvin, 2018). As outlined by Noonan and colleagues' (2018) report on physician's perceived roles in perinatal mental health, "the key to effectiveness of [perinatal mental health] screening programmes is a systematic process of following up all positive screening results with further clinical assessment for depression and anxiety and access to effective interventions" (Noonan et al., 2018, p.19). To this end, the Northern Ontario Postpartum Mood Disorder Project Steering Committees is currently reassessing the need for a standard, universally available, psychosocial assessment and referral system to enhance the menu of services currently offered to families in the North (Rankin & Gordon, 2015). As one care provider in this study aptly stated, the lack of screening in Northwestern Ontario is a "a missed opportunity" to intervene during the earliest stages of depression in order to prevent further decline. Digital eHealth platforms such as the HOPE app provide a medium through which routine screening can take place remotely, privately, and anonymously (Kingston et al., 2017a). Furthermore, the app may be valuable for tracking the prevalence of maternal mental health disorders in Northern communities. However, it is also important to stress that the app is not a 'one-size fits all' solution. While care providers are cautiously optimistic about the potential for the app to improve maternal care access, they are realistic in their expectations that not all women will find it a useful alternative to in-person care. For this reason, it is imperative that women are also asked to share their opinions on the suitability of the app in meeting their needs. This information is already being collected as part of the pilot study in Alberta and Southern Ontario, however, the voices of women living in Northwestern Ontario are still largely absent. In response to this, the Equity in Access team plan to involve women in the next phase of this multi-year research project. Although some of the care-provider-perceived care barriers may be avoided by using the app (such as transportation, stigma, blacklisting, time commitments, lack of insurance, shortage of specific services, sobriety, childcare, geography, weather, screening, and data collection) others will persist and must be careful considered during the revision of the HOPE platform (such as waitlists for in-person services, mistrust, fear of child protective services, linguistically-appropriate services, cultural sensitivity, funding, lack of PCPs, and internet access). Most importantly, the women living in Northwestern Ontario must not be viewed as one static, homogenous group if the app is to be successful in our region. The platform's success will require a comprehensive understanding of the multiple compounding social determinants that shape the mental health experiences of women living in this region.

Despite the many barriers that they face, care providers in Northwestern Ontario demonstrate commendable determination, resiliency, and adaptability. This resiliency and self-sufficiency has been described by the Registered Nurses' Association of Ontario as "the unique spirit that is present within all rural, remote and northern communities" (Registered Nurses' Association of Ontario, 2015, p.13). Northerners sense of community pride – bolstered by a strong connection to land and natural resources – creates a care setting that is truly unique to this area (Registered Nurses' Association of Ontario, 2015). A number of facilitators to maternal care were highlighted during the interviews, including successful small-scale screening programs, travelling to meet women within the community, providing childcare at some centres, linking metal health with addictions treatment, and working to create mutual therapeutic trust. Many of the services offered in Thunder Bay and Kenora are very well-attended, indicating that at least some women in the community access these supports at high frequency. When interest in a program is particularly high, the care providers modify their behaviours or expand their programming in order to reach as many women as possible. This might mean offering double the number of classes, increasing collaboration with other local health organizations, or working extra hours to meet the high demand. Interprofessional and intersectoral collaboration are incredibly important health approaches for increasing inter-agency referrals and decreasing patient wait times in Northern communities (Gaylord et al., 2015; Haggarty et al., 2010). Reminiscent of the shared mental health care (SMHC) model examined by Gaylord and colleagues (2015), the Situation Tables operating in both Thunder Bay and Kenora provide a medium through which organizations can cooperate to find the best care pathways for vulnerable individuals at acutely-elevated risk. The Thunder Bay Situation Table and Kenora RISK Table are community-led initiatives each comprised of more than thirty organizations representing mental health, addictions, justice, social services, employment, and education sectors (Canadian Mental Health Association, 2018; Canadian Mental Health Association, 2017). These intersectoral partnerships facilitate care access through an emphasis on flexibility, local adaption, collaboration, medical generalism, and resourcefulness (Haggarty et al., 2010). In fact, resourcefulness was a common theme brought forward by the care providers, whom often had to modify their care outside of their professional capacities in order to help the women in their communities. For example, several of the care providers had volunteered to act as the temporary primary care provider for women evaluated as high-risk in order to get them into counselling services. Others had tried to counsel women long-term themselves because other services were unavailable. The chronic shortage of care workers in Northwestern Ontario has created a comprehensive generalist role for health professionals working in this area (Northern Ontario School of Medicine & Northern Periphery and Artic Programme, 2019; Registered Nurses' Association of Ontario, 2015). Unfortunately, recently health units in the North have faced a new and evolving obstacle to health delivery in the form of the Ford government's provincial plan to consolidate Ontario's 35 public health units into ten facilities (Jeffords, 2019). By 2021-2022, provincial health care cuts are expected to reach $200 million annually, leading to further layoffs and reduced manpower in the North (Jeffords, 2019). The amalgamation will reduce Northern Ontario's nine health units to two — one in the east and one in the west – each with much larger geographical expanses and populations to serve (Jeffords, 2019). In response to these proposed changes (and contextualized within the current COVID-19 pandemic), Ontario’s Association of Local Public Health Agencies has implored the Ford government to delay these public health changes (Gibson, 2020). What became strikingly clear during the course of this project was that – despite the growing geopolitical pressures these individuals face - care providers in Northwestern Ontario often go above and beyond their call of duty in order to create resourceful solutions to the barriers they face. As a result, the compassionate, hardworking health providers of Northwestern Ontario are themselves facilitators to care access.

Other perceived maternal care enablers included transportation programs, childcare options, and comorbid addictions and mental health organizations. As discussed above, transportation seems to be a major barrier to care access in rural, remote, and Northern communities. Transportation has also been recognized as an important determinant of health elsewhere, with a study by Arcury, Preisser, Gesler, and Powers (2005) finding that individuals from rural communities who had their driver’s license accessed health services for chronic care 229% more often than those without a license. Furthermore, individuals in the same study who had family or friends that could provide transportation accessed chronic care services at 1.58 times the rate of those who did not (Arcury, Preisser, Gesler, & Powers, 2005). To overcome this obstacle, many of the care providers supply travel accommodation programs through their places of work, including cab fare, bus tokens, and volunteer drivers. Some of the providers even travel to public locations in their communities – such as Tim Hortons – in order to meet with women closer to their homes. The providers hope that these programs help to give women control over the help-seeking process and support them by modifying traditional health care interactions so that they are more comfortable for women facing multiple social determinants of health. This type of non-traditional care delivery in unconventional settings is described in the therapeutic frame created by Jordan and Marshall (2010). They conclude that breaking down the wall between therapeutic space and social space can provide a valid and dynamic way to deepen the therapeutic relationship between counsellors and their clients (Jordan & Marshall, 2010). This may be particularly true for mistrustful or marginalized clients, since, many of the care providers emphasized an equity-informed approach to care as a key facilitator for serving traditionally hard-to-reach women. In these cases, a gentle and persistent approach must be used to establish trust before any formal counselling can even begin. As one of the care providers described, this could mean days or even weeks of introductions before a therapeutic relationship is established. During this time, it is important that women are not pressured to disclose personal information. It is unknown how this element of therapeutic trust building will be affected by the online format of the HOPE app; on one hand, the care providers did express that the ability to remain anonymous may be an appealing feature to some individuals seeking online treatment, however, they also worried that anonymity increased the potential for loneliness and isolation. The care providers perceived some of the questions asked during the Risk Assessment as highly personal and potentially off-putting, which could create an immediate obstacle for relationship-building between women and their coaches. At this point, we do not yet know whether women will agree with the importance of therapeutic trust building, however, the Equity in Access and HOPE teams are encouraged to keep the notion of gentle and persistent trust building in mind when designing the modifications to the HOPE platform.

Another way in which the social determinants are accounted for is through the linking of mental health and addictions services. The link between mood and anxiety disorders and comorbid mental health and addictions diseases is well supported by the literature (Brown, Campbell, Lehman, Grisham & Mancill, 2001; de Graaf, Bijl, Spilker, Beekman & Vollebergh, 2003; Devane et al., 2005; Kessler et al., 2003; Kessler et al., 2006; Lamers et al., 2011; Lenze et al., 2000; Newman, Silva, Moffitt & Caspi, 1998; O'Donnell et al., 2014; Strine et al., 2008). In fact, one study that screened 1868 racially and ethnically diverse women found that women reporting substance use problems and intimate partner violence were much more likely to also report depression perinatally (39.1% vs. 19.3%, $p<0.001$ for substance use and 10.2% vs. 1.8%, $p<0.001$ for intimate partner violence) (Connelly et al., 2013). The same study by Connelly and colleagues (2013) calls for psychosocial assessment and treatment interventions that address these multiple risk factors collectively instead of focusing on each factor exclusively. Contrary to this notion, some of the mental health programs within the communities in Northwestern Ontario currently require that women achieve sobriety before admittance to counselling. This restriction often creates insurmountable barriers for women with comorbid addictions and mental health disorders. However, there are successful programs in these communities that are perceived to increase access to maternal mental health services by offering support for both mood disorders and sobriety concurrently. Care providers pointed out that new mothers are further accommodated by these programs when on-site childcare is provided. The providers stressed that mental health disorders and addictions cannot be treated separately, and new interventions such as the HOPE app must strongly consider the compounding effects of these disorders. Furthermore, the needs of each patient must be evaluated on an individual case basis and counsellors must strive to meet these needs using a comprehensive, equity-informed, collaborative approach to care.

Addendums to the HOPE app

Overall, the care providers viewed the HOPE app as a helpful tool for improving maternal care delivery and access, with six strong stipulations: (1) the content and images must be modified to suit women in Northwestern Ontario; (2) the resource lists must be localized; (3) The content must be culturally expanded in consultation with the communities of interest; (4) the high-risk referral protocol must be re-evaluated for safety; (5) Coaches must reside in Northwestern Ontario and should be culturally relevant if possible; and (6) Coaches must be reachable by telephone, email, text message, and wifi-based chat. Most providers felt that the current app was user-friendly, intuitively laid out, and fairly easy to navigate; however, embedding external links, resetting the courses after each use, and modifying the navigation bar may help to ease movement through the platform. Additionally, creating an introductory tutorial to explain what the app is trying to accomplish and how to use each of the features may help incentivize women to use the app on a regular basis. Checklists and notification systems should be strongly considered to keep women engaged with online content.

Creating Modified Content for Northwestern Ontario

The visuals currently used by the HOPE platform were perceived as pleasant and soothing, yet they do little to represent the realities of women living in Northwestern Ontario. The care providers saw these 'bourgie' images as targeting white, upper/middle-class women over all others. The portraits used for the course modules show – what they felt were - unrealistic portrayals of happy, well-dressed, 'put together' individuals that may alienate users whose lived experiences are not reflected by these depictions. Also, while participants appreciate that an effort has clearly been made to represent various racial backgrounds, this was viewed as not enough to properly represent the diverse women of this region. The HOPE team should consider replacing these portraits with women from Northern communities or should use avatars, animals, or scenery to avoid narrow representation. If photos of women continue to be used, a more thorough attempt at cultural representation must be made – by asking women in this area their preferences - including more pronounced Indigenous imagery. Similarly, the nature photos used as backgrounds and banners were not perceived as representative of the local flora and fauna of Northwestern Ontario. These images would benefit from being replaced with more relatable pictures such as boreal forests, winter landscapes, and animals/plants found in the North. The content offered through the app will also need to be shifted to meet the unique needs of women living in rural, remote, and Northern communities. According to the care providers, this includes considering social determinants of health such as race, ethnicity, age, housing, socioeconomic status, and education when developing each online tool. For example, the literacy level is currently perceived as too high; auditory and visual substitutes could be added to ensure that women from all levels of educational attainment can benefit from the app. Breaking down the Healthy Habits using videos and external links or adding chat-box liaison feature may also help to overcome literacy barriers; however, it will be important to closely monitor how the addition of video or audio-based content increases the minimum bandwidth requirements for the app (so that it is still accessible to women living in low-connectivity areas). Particular attention should be paid to the examples used in each course, since the care providers felt that ‘Rachel and Steve’ were not representative of many women’s realities. Moreover, additional content should be developed in order to address substance involvement, domestic violence, poverty, child apprehension, addictions, racism, social isolation, and single parenthood. These findings are very consistent with obstacles encountered in the article by Griffiths and Christensen (2007), which discussed the suitability and utility of two internet-based therapy programs in rural communities in Australia. One of the programs examined – MoodGYM – was found to be unsuitable for some rural users due to its higher literacy level and structured read-only learning style (Griffiths & Chistensen, 2007). Furthermore, certain examples used by the platform (not dissimilar to the Rachel and Steve case) were not specifically tailored to rural users, which decreased uptake and suitability of the platform (Griffiths & Chistensen, 2007). Care providers reviewing the HOPE app suggested that a delicate balance needs to be struck between representing vulnerable women at the ‘extreme’ ends of the societal spectrum while also meeting the needs of women in the ‘middle’. An alternative solution would be for women to identify their cultural/racial/ethnic identity before entering the app, and then have all the visuals and content shift to personalize the experience. Of course, modifying the app to Northwestern Ontario must also include continued discussions with the women that actually live in these areas. It would be inadvisable to assume that the care providers – although experts in their fields with large amounts of personal and professional contact with women – can speak on behalf of these individuals. Instead, it is imperative that women's voices be included in the evaluation of the HOPE platform before an official launch is attempted. Another vital addition to the app will include creating a comprehensive list of the local resources available in this region. During the compilation of this list, the HOPE team should consider adding social services programs, women's shelters, addictions services, children's clothing programs, transportation services, foodbanks, as well as health organizations to the local resource page.

Cultural Expansion through Community Partnerships and Appropriate Coaches

All ten of the care providers have called for more culturally appropriate content for Indigenous women living in Northwestern Ontario. Many felt that the app should contain content available in both Anishinaabemowin (Ojibway and Oji-Cree) and French. Other suggested languages included Chinese (unspecified), Spanish, Arabic, Finnish, and Italian. In the case of Anishinaabemowin, the providers have suggested that it may not be necessary to translate the entirety of the content – given the increased number of youths that use English as their first language – but at the very least, snippets of these dialects should be used to enhance information offered in English. In support of this notion, during the 2016 census 96,575 individuals across Canada reported the ability to speak Cree, 28,130 individuals reported speaking Ojibway, and 15,585 individuals reported speaking Oji-Cree (Statistics Canada, 2017e). Ontario demonstrated the highest percentage of Ojibway speakers (56.6%) and the second-highest percentage of Oji-Cree speakers (48.2%) nationally (Statistics Canada, 2017e). However, in 2016, 15.6% of individuals identifying as Indigenous reported being able to conduct a conversation in an Aboriginal language: a 5.8% decrease from 2006 (Statistics Canada, 2017e).

Furthermore, only 12.5% of these individuals reported an Indigenous language as their primary language (Statistics Canada, 2017e). Therefore, it would seem that the care providers were accurate in their observations that full translation of the HOPE content may predominantly benefit a small percentage of individuals living in rural communities and will likely be less useful for Indigenous women living in urban centers (whom are more likely to speak English as their first language). However, this is not to say that translation is less useful just because it will benefit the 'few' over the 'many'; including these languages as a learning tool and token of respect will remain a focus for the Equity in Access group as we move forward to subsequent stages of our HOPE app research. Therefore, including at least some translated content in Ojibway and Oji-Cree is recommended for individuals who already speak these languages and for those who may be interested in learning these languages in the future. Further investigation is needed to confirm which other languages - and what formats they are delivered in - will be most useful to the diverse women of Northwestern Ontario. Providers have suggested that users should be given the opportunity to identify themselves as belonging to a particular cultural-linguistic group when first logging onto the app, and then the content should shift to deliver culturally-personalized care. This might include cultural foods, Indigenous videos, artwork, powwows, medicine wheel teachings, traditional healings, and cultural stories. Importantly, instead of simply translating the current content into Ojibway and Oji-Cree, it is imperative that new culturally-appropriate content be co-created in partnership with Indigenous communities. These stakeholders must be engaged at all levels of development, beginning with the engagement of care providers from Indigenous and multicultural organizations during the larger Equity in Access study. Tools for designing culturally relevant web platforms are described elsewhere, including Kondratova's and Goldfarb's cultural advisor tool (Kondratova and Goldfarb, 2011). This approach considers cultural markers, interface design, language cues, and engagement factors when designing culturally safe user interfaces (Kondratova and Goldfarb, 2011).

In addition to cultural content, care providers have suggested that online coaches should share the same cultural background as their clients. However, upon inspection of the existing literature, I have found limited evidence to support this notion. For example, a review of ethnic matching between psychotherapists and patients by Karlsson (2005) found the empirical evidence for efficacy to be inconclusive and of low validity. Similarly, Flaskerud's (2009) review concluded that matching client-therapist ethnicity, language, or gender did not demonstrate significant support for improved treatment outcomes. Studies by Erdur, Rude, and Baron (2003) and Cabral and Smith (2011) confirmed almost no benefit to treatment outcomes for patients with therapists from shared ethnic backgrounds. Given these results, it is important that the idea of culturally-matched coaches be discussed with women living in Northwestern Ontario in future research phases so that their opinions can be compared to what care providers have said here. Participants agreed that social workers, nurses, psychologists, nurse practitioners, social work students, Elders, kokums, religious leaders, and even peers with personal maternal mental health experience could fill the coaching role if properly trained. It is particularly important that Elders be considered, since they represent highly respected public leaders with close connections to community health organizations, schools, and local governments. However, maintaining the anonymity of women using the app must be carefully weighed against the benefits of having a high-profile community coach. Therefore, the HOPE team should consider the potential benefits and drawbacks of hiring coaches from Northwestern Ontario with the same ethnic, cultural, and linguistic backgrounds as the women we are hoping to reach. Although care providers have suggested that ethnic matching could increase positive health outcomes, it would seem that this sentiment is not supported by the existing literature (Cabral & Smith, 2011; Erdur, Rude, & Baron, 2003; Flaskerud, 2009; Karlsson, 2005). In the case that funding restricts our capacity to hire multiple coaches from small rural, remote, and Northern communities, it is imperative that at least one coach be hired regionally with an expansive local knowledge on the in-person services currently available across our region.

Reimagining the High-Risk Protocol and Telephone-Based Coaching Service

The biggest concern that care providers expressed for the app was the current protocol for emergency referral of women deemed high-risk. Currently, women who are identified as high-risk by the questionnaires are directed to contact emergency services, online crisis lines, and their primary care provider. The problem is that no follow-up is put in place to ensure that women actually seek emergency services and these individuals are denied access to the rest of the app's features in the meantime. Critically, suicidal ideation and behaviours require immediate treatment attention, including reliable assessment, management, and prevention (Weber, Michail, Thompson, & Fiedorowicz, 2017). A treatment plan -including sufficient follow-up - must be developed in consultation with the patient and any existing social supports they may have (Weber et al., 2017). Weber and colleagues (2017) have created an adapted risk level management protocol that suggests individuals classified as the highest risk for suicidal thoughts/actions should: (1) receive immediate in-person evaluation for inpatient hospitalization; (2) never be left alone; (3) be hospitalized (even involuntarily); and (4) be closely monitored for an acute period of time following hospitalization. The current risk protocol for the HOPE app fails to meet any of these requirements. Even if women do seek in-person care, there is no guarantee that this care will be sufficient or whether or not they will face discrimination when they get there. Furthermore, women living in rural and remote communities may be isolated from emergency services and it is impractical to suggest that they will drive hours to emerge even in a crisis situation. Additionally, the current protocol makes it so that women awaiting in-person treatment are denied access to the app, which may otherwise be a tool that they found useful. The current platform gives coaches a 24-hour window to contact users deemed to be high-risk; a timespan that care providers agree is insufficient for preventing self-harm in high-risk cases. The participants have highlighted the need for a clear crisis response plan outlining strong follow-up measures to ensure the safety of women using the app. This should include connecting individuals immediately to a HOPE coach, the Ontario Telehealth Nursing hotline, or pre-existing local telephone-based counselling supports while emergency services can be directed to their location. The HOPE team should consider hiring a coach that can be on-call twenty-four hours a day or partnering with local general practitioners who can be contacted in the case of a crisis. Additionally, crisis response training must be made a priority during the training of all online coaches. An in-depth exploration on patient liability and privacy measures will also need to be completed before the new crisis protocol can be implemented. Another potential barrier that the care providers identified is the reliance on cellular communication as the solitary form of therapeutic contact. While many women living in Thunder Bay and Kenora seem to have consistent access to internet-enabled devices – such as cellphones, tablets, and laptops – care providers are confident that some do not have reliable phone minutes with which to make calls. Unfortunately, this perceived barrier would seem to most strongly affect women from lower socioeconomic backgrounds, whom may go weeks or months at a time without the ability to make phone calls. As a result, modifications to the HOPE app should include expanding the coaching service to include options for telephoning, text messaging, emailing, and wifi-based chatting. Once again, patient confidentiality will need to be examined if texting, emailing, and chatting are implemented through the platform.

Investigating the Connectivity Barrier

The HOPE app's reliance on a stable internet data transfer rate of at least 1 megabit per second (Mbps) could prove one of the biggest challenges for its successful uptake in Northwestern Ontario. Rita describes her insights on this care-provider-perceived barrier below:

> One of the places where I suspect there is a huge lack of mental health resources is in the more remote reserves… they are an area where it seems something like [the app] would be well suited for and would definitely allow more access to mental health in certain areas that have less direct services. But, my understanding is, their wifi capabilities are still fairly limited, so obviously that would be [a barrier] for sure.

Before exploring the present-day extent of this barrier, it is first important to gain a brief understanding of the history of telecommunications technology in the North. Since the mid-1970s Bell Canada (now Bell Aliant Inc.) has held a monopoly over the communication service industry in much of the region (Fiser & Clement, 2012). This has been accomplished in large part due to public subsidies from the Ontario's Ministry of Transportation and Communication (Fiser & Clement, 2012). Early on, their domination over high-density, low-cost urban markets met little resistance from competitors of comparable size (Fiser & Clement, 2012). However, the telecommunications landscape in Northwestern Ontario has since changed as more national providers have established themselves alongside smaller private markets. Since its incorporation in 1902, the municipally-owned Thunder Bay Telephone Company (now Tbaytel) has become the largest independently-owned telecommunication company in Canada, with a 4G network that covers 300,000 square kilometers of landmass (Thunder Bay Community Economic Development Commission, 2019). With five major fibre optic cables from national service giants and over two hundred free public wifi hotspots provided by Tbaytel, Thunder Bay is well serviced to meet the minimal connectivity requirements necessary for the app (Tbaytel, 2020; Thunder Bay Community Economic Development Commission, 2019). Similarly, much of the Kenora District has access to rates that reach 15 Mbps since the 2017 completion of a two-million-dollar DSL-fibre infrastructure project commissioned by the Government of Canada (Government of Canada, 2015). While the urban centers of Thunder Bay and Kenora should not pose connectivity challenges – at least in theory – for the app, the low-density, high-cost markets of the surrounding rural and remote communities in Northwestern Ontario have historically attracted less investment from national corporations. This is visually depicted in the maps that have been created for the Equity in Access team by Jeff Buell of Blue Sky Net (see Appendix K – Northwestern Ontario Connectivity Maps). However, although connection speeds do tend to decrease outside of large urban centers, there have been many promising developments in the advancement of telecommunication infrastructures in smaller rural and remote communities (Budka, 2015)

The obstacles imposed by the irregular terrain of the Canadian Shield has created expensive and challenging barriers to the establishment of connectivity in these regions (Budka, 2015). As a result, funding bodies under the Canadian and Ontario governments have been reluctant to invest in the infrastructure needed to connect communities outside of urban centers (McMahon, 2011). Private industry has also shown little historical interest. So, when Industry Canada created a nation-wide funding pool for community connections projects in 1999, the Keewatinook-Okimakanak tribal council finally received the support they needed to fund K-NET; a First Nations owned and operated company working to bring broadband to dozens of remote indigenous communities across the North (Beaton, 2004; Beaton et al., 2009; Ferreira, Ramirez, & Walmark, 2004; Ramirez et al., 2003). Over the past two decades, many of Northwestern Ontario's other First Nations have followed suit in taking control over the planning and implementation of telecommunications infrastructure in their communities (Budka, 2015). As a result, a connection speed of at least 1 Mbps has been achieved in many of the rural, remote, and isolated communities outside of Thunder Bay and Kenora (See Appendix K – Northwestern Ontario Connectivity Maps). This is potentially very enthusing news for the future of the HOPE app, as it would seem that connectivity should not present as large a problem as was originally envisioned by the care providers. However, it is important to note that the ability to achieve a broadband connection is not equivalent to the assumption that everyone in these areas has access to internet. In most cases, connecting to broadband networks still requires that individuals pay a monthly internet fee. This cost restriction could mean that individuals living in 'connected zones' are still unable to access the app. Furthermore, individuals living in urban centers may not wish to travel to public wifi hotspots in fear that their interactions with the app will not be private or anonymous at these locations. Access to a stable connection is essential for the success of the HOPE platform in Northwestern Ontario; therefore, further research in partnership with Blue Sky Net is needed to continue to develop our understanding of this barrier.

HOPE for the Future Reprised

Although the care providers were asked to discuss at length each of the features that they felt were inappropriate, many did not want to dwell solely on the negative aspects of the app. In fact, all ten care providers agreed wholeheartedly that launching the HOPE platform in Northwestern Ontario will have numerous positive outcomes for both care providers and women, including reducing mental health stigma, increasing maternal mental health screening, and creating a comprehensive care network in our region. The most obvious perceived advantage of the app is that it will increase access to specific maternal mental health supports that are currently not available in these communities (Association of Ontario Midwives, 2015; Møller et al., 2018). The ability to remotely access this support from anywhere was viewed as particularly convenient for women living in rural and remote communities, whom may otherwise need to travel to receive care (Association of Ontario Midwives, 2015; Canadian Mental Health Association, 2009; O'Driscoll et al., 2011). Accessing the app from home could help to bypass the transportation, stigma, and childcare barriers that the providers felt many women faced when receiving in-person care. The convenience of an at-home support may also be beneficial for reaching women with more advanced stages of depression, since – from the PCPs' experiences - the app requires relatively few time commitments from the user. Additionally, the perceived "calming", "mellow", and "comforting" layout was seen to contribute to a “comprehensive”, “streamlined” therapy experience that the care providers hoped women would find tailored to fit their unique needs. Furthermore, the current schedule of one module per week was observed to strike a good balance between providing enough information to support women without overwhelming them. The app could also prove incredibly useful as an anti-stigma advocacy tool for boosting community knowledge on the prevalence of maternal mood disorders (Hajipour, 2014; Møller et al., 2018). Providers hope that women silently struggling with depression may see themselves reflected in the course content and be encouraged to seek professional assistance. The online tools such as the Mood Tracker and Course Modules were championed as important visual tools for promoting self-reflective understanding and contextualizing the occurrence of depressive thoughts. To this end, adding regional statistics on maternal anxiety and depression may further help to normalize women’s experiences. Additionally, the ability to seek help anonymously may protect users from discriminatory stigmatization that they may face when seeking in-person services in small communities. This sentiment has mixed support from the literature. For example, the work by Kauer, Mangan, and Sanci (2014) reviewed studies that demonstrated no change in mental health help-seeking behaviour regardless of anonymity, yet others found a slight but significant increase in help-seeking when patients could remain unidentified. Kummervold and colleagues (2002) explored the use of Norwegian mental-health online discussion forums and found that 75% of the 492 participants found it easier to discuss personal problems online rather than face-to-face. A further 64% of participants indicated that they would not have used the service if they had been required to give their real name (Kummervold et al., 2002). While the results of these studies are significant, caution must be employed when interpreting data gathered nearly two decades ago and from a country outside of North America.

Another perceived advantage of the app is its ability to support practitioners in Northwestern Ontario by providing online maternal mental health screening. It would seem that regular screening still remains a large barrier to the early detection and treatment of mood and anxiety disorders (Kingston et al., 2015a). Unfortunately, studies have shown that care providers that rely on observational approaches alone without the supplemental integration of evidence-based screening tools are at higher risk of underdiagnosing their patients (Heneghan, Morton, & DeLeone, 2007; Heneghan, Silver, Bauman, & Stein, 2000). The HOPE app provides an acceptable and feasible alternative to in-person screening that can take place remotely and anonymously (Kingston et al., 2017a). Helping to support practitioners in the responsibility of mental health assessment is valuable for increasing positive health outcomes for women, children, and their families. This is particularly significant given past studies indicating that less than 20% of prenatal care providers regularly conduct mental health screening (Leddy, Haaga, Gray & Schulkin, 2011). Parallel to findings by Kingston and colleagues (2017a), the care providers perceived privacy, anonymity, and time efficiency as potential benefits of offering screening through the HOPE app. It is possible that early identification could also contribute to saving healthcare dollars by reducing practitioner workload and promoting preventative medicine over reactive treatment (Mental Health Commission of Canada, 2016; Roberts & Grimes, 2011). There is a growing body of evidence demonstrating positive economic returns from systems focusing on early-stage prevention approaches to mental health (Roberts & Grimes, 2011). Therefore, the Canadian Policy Network at the University of Western Ontario recommends that investing in targeted mental health promotion and prevention strategies upfront will have significant cost savings and overall positive health outcomes long-term (Roberts & Grimes, 2011). Finally, the providers felt that HOPE app represents a wonderful opportunity to create a comprehensive list of all the health and social services available to women in Northwestern Ontario. It is their opinion that the Local Resource list will not only be useful for connecting women to in-person services but will also serve as a facilitator for inter-agency collaboration between regional health organizations. Almost all of the care providers that took part in this study expressed their interest in becoming a part of this comprehensive care network and serving as coaches or contacts for second-hand in-person referral. It is their hope that these partnerships will continue to expand the maternal mental 'healthscape' in Northwestern Ontario until the needs of all woman with depression and anxiety can be met.

This hope is further bolstered by recent events, which have demonstrated the usefulness of online supports to reach isolated populations (Office of the Premier, 2020a; Office of the Premier, 2020b). The COVID-19 pandemic crisis has brought mental health to the forefront of public consciousness, with the Ontario Ford government approving an emergency fund of up to $12 million dollars to immediately expand online mental health supports across the province (Office of the Premier, 2020b). Individuals who will no longer be able to access regular in-person counselling due to government-imposed social distancing measures will be able to resume regular care through online formats (Office of the Premier, 2020b). Free, online Internet-based Cognitive Behavioural Therapy (iCBT) programs developed in partnership with MindBeacon and Morneau Shepell will be expanded as part of this new initiative (Office of the Premier, 2020a). The emergency fund will also help mental health agencies hire and train more staff, purchase new equipment, and support the transfer of existing supports to online formats (Office of the Premier, 2020a). These changes come on the heels of Health Minister Christine Elliott's announcement in March 2020 on the creation of the new Mental Health and Addictions Centre of Excellence, which will be used to co-ordinate, standardize, and assess the current mental health system (Jeffords, 2020). Additionally, pre-COVID-19, Premier Doug Ford had promised $1.9 billion dollars – a sum matched by the federal government – to mental health and addictions services over the next ten years (Jeffords, 2020). These shifts in public and political focus highlight the importance of mental health for the wellbeing of all Ontarians and lend support for the use of online platforms when in-person care is impossible. The sudden restrictions to regular, in-person care access may be a novel experience for many of the individuals living in Southern Ontario; however, for those living in rural and remote communities of Northwestern Ontario, care restriction is a daily reality. The current optimistic climate for eHealth supports also raises a number of interesting questions surrounding how the results of this project may have been altered if care providers were asked to follow-up on whether their perceptions of the app had changed in light of our current global circumstances: has the shift towards online services created a greater market for the app? Would care providers whom have been forced to use online supports during the pandemic now be more likely to embrace an online tool such as the HOPE app? Will there be more financial support from the Ministry of Health in the future to expand and modify eHealth technologies? All of these questions raise important points about the ways in which we view e-tools within the health sector. Given the impact that Covid-19 has had on the uptake of e-services thus far, it would be safe to assume that we will continue to see a boom in funding, development, and user uptake around the world in the coming years (Nittas, 2020). Although the pandemic has had many devastating consequences for our provincial, national, and global community, I am hopeful that one positive outcome will be the creation of accessible supports. Perhaps, in light of current events, the government of Ontario will be more receptive to funding a resource such as the HOPE app in the future; thereby bringing us one step closer to closing the Northern gap in maternal mental health care access.

Strengths and Limitations

Notable strengths of this study include its contributions to the limited body of work on maternal mental health, eHealth, and maternal care barriers in Northwestern Ontario. In addition to work completed by members of the Equity in Access team, only five other studies could be located that examined the current state of maternal care in this region (Association of Ontario Midwives, 2015; Dooley et al., 2009; Gaylord et al., 2015; Haggarty et al., 2010; O'Driscoll et al., 2011). Furthermore, only the three preceding reports by Equity in Access team members examined barriers and facilitators to care explicitly (Møller et al., 2015; Møller et al., 2018; Alzghoul et al., 2020). None of these studies included qualitative evaluations of maternal care providers' experiences and evaluations of the maternal/mental healthscape. As a result, large gaps still exist in our understanding of many aspects of maternal mental health in Northwestern Ontario; particularly, when it comes to the representation of provider perspectives on care delivery. Furthermore, outside of the published HOPE literature, no articles could be located that examined eHealth interventions for maternal care anywhere within Canada. Therefore, this thesis project is critical for advancing our understanding of (1) care providers' perspectives on perceived maternal care barriers and facilitators; (2) the scope of maternal mental health care in rural, remote, and Northern Ontario settings; and (3) the suitability of eHealth interventions for addressing maternal mood and anxiety disorders. This project was also important in that it employed a relatively new Interpretive Description methodology. Interpretive description was originally developed for nursing research as a way to qualitatively address practical questions about human health and illness phenomena (Teodoro et al., 2018; Thorne et al., 1997). Since the ultimate objective of this project was to inform adaptions to the HOPE app through an exploration of its suitability, this study represented a unique opportunity to apply this method outside of its envisioned setting. In this case, Interpretive Description was an appropriate methodological approach that successfully contributed to supporting the inquiry process and supplied an organized and methodological approach to understanding the perspectives of my participants.

Although the methods chosen for this study were appropriate, a number of limitations must also be formally addressed. Firstly, as a qualitative study with relatively few participants, the findings of this project cannot be generalized beyond Northwestern Ontario, and in fact, should not be generalized beyond Thunder Bay and Kenora without further engagement with rural and remote communities. Despite wide sweeping recruitment attempts in Thunder Bay, Kenora, and Sioux Lookout, only ten care providers took part in the final interview process. Further still, zero care providers were captured from Sioux Lookout and only one provider was interviewed from Kenora. Although the exact reasons for these low participation rates are unknown, a number of factors may have influenced care professionals' decisions on whether or not to participate. First of all, the lack of PCPs in rural, remote, and Northern communities means that the pool of eligible participants was limited to begin with; furthermore, the work load of these individuals is quite large, and many may have been too busy to take part in this study. The lack of participation from care providers in Sioux Lookout is primarily attributed to the scope of this thesis, which limited eligible participants to those primarily serving Euro-Canadian women. Many of the services in Sioux Lookout primarily serve women identifying as Indigenous, therefore, all care providers from Sioux Lookout are being included under the larger Equity in Access study and have been excluded from this thesis. The care providers from Kenora faced similar restrictions, since many of the organizations in this community serve primarily Indigenous-identifying audiences. The occurrence of the Covid-19 pandemic during the final eight months of this study caused significant disruptions to our team's recruitment and interview processes. Anecdotally, care providers have reported to us that they have seen increased workloads and logistical challenges since the beginning of the pandemic, delaying their ability to take part in this study. The repercussions of this limited participant pool are that Thunder Bay is largely over-represented in the sample compared to the other two communities. Better representation of care providers from both Kenora and Sioux Lookout will be achieved during the larger Equity in Access study.

Another limitation of this study is that it would be deceptive to assume that the realities described by the care providers working in urban settings are also representative of the realities of providers working in smaller surrounding rural and remote communities. The women (and care providers) living in Northwestern Ontario are incredibly diverse in their identities and experiences; therefore, generalization about the entire Northwest cannot be drawn from samples limited to urban centers. While the care providers who took part in this study often do provide support to women who travel in from more Northern locations, a further attempt to reach nurse practitioners and community health leaders that work directly in rural communities is needed if we are truly to understand the potential impacts of the app in these areas. The recruitment of physicians also proved a sizeable challenge during the implementation of this project. Physicians are incredibly busy individuals and my team found it difficult to get in touch with them at their practices. Often, information was passed along to secretarial 'gatekeepers' and no follow-up contact was received. Unfortunately, this recruitment strategy was problematic, because it was impossible to know whether the recruitment emails were ever received by the physicians in the first place. We will continue to attempt to diversify our participant pool as the larger Equity in Access study moves forward. Finally, the suitability of the HOPE app has yet to be adjudicated by the women who would potentially use this platform. Gathering the perspectives of care professionals before those of potential users was done in order to fulfill the ethical responsibility of ensuring the app content and layout was deemed medically appropriate, culturally safe, and easily comprehensible before seeking opinions on its appropriateness from women living in rural, remote, and Northern communities. However, although care providers are well positioned in their work to speak at least to some degree about the preferences of the women they serve, it would be inappropriate to assume that their suggestions capture the preferences of all women living in Northwestern Ontario. The providers are highly-qualified in their ability to share vital information on the feasibility of the HOPE app's implementation from the PCP side; however, their perceptions of women's experiences are educated guesses based upon professional interactions, and as such, should not be viewed as substitutions for authentic patient experience. If the care-provider-perceived obstacles to receiving maternal mental health care differ from the realities of the women actually seeking this care, the result could be the creation of a modified HOPE platform that still fails to meet the specific needs of mothers living in the North. Moreover, women may face a number of additional barriers in accessing the HOPE app that the care providers have not been able to capture here. For example, one such barrier could include the motivation required to download, setup, and consistently use the HOPE platform while experiencing the symptoms of major depression and anxiety. In their mixed-methods study evaluating the end-user experience of a mobile app-based intervention for depression (BlueWatch), Fuller-Tyszkiewicz and colleagues (2018) point out that "triggering performance—whether through an external or internal prompt—may not lead to the desired outcome when the individual is insufficiently motivated to engage in the task at that time" (Fuller-Tyszkiewicz et al., 2018, p. 2). This is potentially further compounded by the fact that the first interaction that women have with the HOPE platform is to complete a series of 53 questions during the Risk Assessment which touch on a number of personal topics. Although the care providers did briefly highlight the concept of incentive, promotion, and interest during their discussion on individual-level barriers, additional input from women is needed to truly understand how women perceive the accessibility of the HOPE platform as an at-home care option. Therefore, it is imperative that women living with pre-, peri-, and postnatal depression and anxiety in Northwestern Ontario be engaged during the next phase of research.

Implications, Future Directions, and Significance for Maternal Health

As an interpretive description study, the ultimate goal of this research project is to clinically apply the knowledge generated during the inquiry process (Thorne et al., 1997). Furthermore, the objective of the Equity in Access group is to lead scientific inquiry that contributes to the improved health and well-being of pregnant women and new mothers across Northwestern Ontario. It is our hope that this project will help provide equitable access to the mental health supports and services currently identified as deficient by women and care providers living in the North (Møller et al, 2018). These services are extremely important, as they contribute to better health and quality of life for both mothers and their children and they are crucial for empowering women during the pre-, peri-, and postnatal periods (Kingston et al., 2017a). To this end, the results of this project – in combination with the results from the larger Equity in Access study and the results from the quantitative IMPACT study – are anticipated to inform adaptions to the current HOPE app in order to create a version specific to the needs of care providers and women living in Northwestern Ontario. Complimentary to this work, Dr. Kingston and her team are currently completing a randomized controlled clinical trial on the HOPE app in Alberta (Kingston, 2013). This study has been ongoing since January 2014 and is expected wrap-up in December 2020. (Kingston, 2013). Based on her past research on eHealth interventions, Dr. Kingston has hypothesized that the HOPE app will offer a feasible and successful approach for providing mental health care to pregnant women and new mothers (Kingston, 2013). It is anticipated that the HOPE app will help reduce symptoms of depression, stress, and anxiety; hjelp to improve parenting competence, coping, and relationship adjustment; and help to reduce the risk of poor maternal-infant attachment (Kingston, 2013). If the HOPE app is deemed cost-effective, efficient, feasible, and acceptable through the results of the IMPACT study, the Equity in Access team will have both qualitative and quantitative evidence to support its use in Northwestern Ontario. If and when this evidence is in place, the app will then be ready for further, specific assessment by women living in rural, remote, and North communities.

It is important to note, that the suitability and applicability of the HOPE app for women in Northwestern Ontario is not solely being evaluated based upon the results of this relatively small qualitative study; rather, the outcomes of this thesis project are expected to work in combination with the multi-directional current (and future) efforts of the Equity in Access team and IMPACT team located in Northern Ontario, Southern Ontario, and Alberta. These studies – both qualitative and quantitative in nature – will work synergistically to create a comprehensive understanding of the HOPE platform and how it can be applied to different clinical contexts. Of course, our work is far from over if the HOPE app is to be successfully launched in the North; this project merely represents one more proverbial 'steppingstone' in our mission to create more comprehensive, available, and accessible supports for women and care providers living in these regions. Future research projects must focus on asking women in the North the same questions that we have posed to care providers here. Creating an opportunity for women to share their perceptions will be vital in drawing similarities and dissimilarities between the ways in which care providers and women view barriers and facilitators to maternal mental health care. Furthermore, the care providers who took part in this study emphasized that they are not always able to accurately speak to the lived experiences of their clientele; therefore, future input from women is vital in order to confirm that the care providers were accurate in their portrayal of barriers and facilitators to accessing care in the North. Another viewpoint that is missing from this study is the perceptions of care providers working in small rural and remote communities. The sample for this study was limited to care providers working in urban centers, which is unfortunate, given the important role that nurses and physicians play in small, isolated Northern communities (Association of Ontario Midwives, 2015). Given the contextual differences between providing care in large urban centers versus small, rural communities, future directions for the larger Equity in Access study should attempt to capture a larger degree of input from rural and remote care providers. As the modifications to the HOPE platform progress, co-produced participatory projects will need to be created in partnership with Indigenous communities and racialized populations in order to create culturally, ethnically, and linguistically appropriate content and visuals. Forthcoming studies should then include a quantitative pilot study examining the efficacy of the app specifically for rural, remote, and Northern populations. With the ongoing support of Dawn Kingston, the HOPE app research group, various funders, and the maternal health services of Thunder Bay, Kenora, and Sioux Lookout, my hope is that these collective projects will act as a foundation from which a new health care option can be developed to meet the specific needs of care providers and mothers living in Northwestern Ontario.

An important consideration for the success of this project is our continued partnership with the HOPE research team and the maternal health organizations of Northwestern Ontario. Dr. Kingston and her colleagues have been extremely gracious in allowing access to the HOPE app so recently after its pilot trial launch in Alberta, Canada. It was only through their continued support that I was able to complete this project. The app itself has several funders, including the Alberta Children’s Hospital Research Institute, Alberta Innovates Health

Solutions, Alberta Health Services, Canadian Institutes of Health Research, Max Bell Foundation, Norlien/Palix Foundation, Royal Alexandra Hospital Foundation, Women and Children's Health Research Institute, and the Nursing Faculty at the University of Calgary. These funders have been instrumental in allowing the HOPE team to complete their research on a provincial scale, and it is through their continued backing that the Equity in Access team is able to propose changes to the existing app in order to expand its target population to Northwestern Ontario. Furthermore, if the eventual launch of the HOPE app in Northwestern Ontario is to be successful, it will need to be done with continual input from all current maternal resources. These individuals represent experts in the field of delivering maternal care to women in the North and therefore, it is with utmost gratitude that I thank them for participating in this project. It is my hope that the relationships built during this study will contribute to lasting mutual partnerships between Lakehead University and the health services of Northwestern Ontario. These partners will continue to be involved as we move forward to the next stages of the Equity in Access project.

Chapter 6: Conclusion

This project was created in direct response to the gap in access to comprehensive maternal mental health supports experienced by women living in Northwestern Ontario (Association of Ontario Midwives, 2015; Møller et al, 2018). These supports are especially important given the elevated rates of mental illness, perceived life stress, and self-injury experienced within our region (Northwestern Health Unit, 2017; Statistics Canada, 2019c; Statistics Canada, 2019d). Through the words of ten maternal care providers located in Thunder Bay and Kenora, I have attempted to evoke an understanding of the current state of the maternal mental 'healthscape' in the North. These individuals have identified twenty distinct care-provider-perceived barriers and six key facilitators to reaching women with maternal depression and anxiety in their communities. Barriers include (1) the lack of specific maternal mental health services; (2) waitlists and capacity; (3) the shortage of primary care providers and private health insurance; (4) the lack of consistent funding; (5) deficient interprofessional and intersectoral collaboration; (6) geographical distance; (7) hazardous weather; (8) the lack of reliable and affordable transportation; (9) blacklisting; (10) mental health stigma; (11) language barriers; (12) mistrust; (13) fear of child protective services; (14) the lack of childcare at service centers; (15) minimal internet and phone access; (16) sobriety requirements; (17) poverty and marginalization; (18) cultural preferences; (19) time commitments; and (20) the lack of incentive, promotion, and interest. These complex and interrelated barriers existed at the personal, environmental, social, and structural level and are perceived to impact both care providers themselves and the women that they serve. However, in the face of these barriers, the providers in Northwestern Ontario demonstrate incredible resilience and adaptability in their aptitude to provide high quality care with very few resources. Some of the highlights they shared included (1) successful small-scale screening programs available in the North; (2) existing inter-agency collaborative efforts to meet the needs of vulnerable women with multiple complex risk factors; (3) free, subsidized, and volunteer-led transportation services; (4) existing childcare initiatives at some health centres; (5) programs linking metal health with addictions treatment, and (6) the compassionate commitment of health professionals to patiently co-construct therapeutic trust with their clients. While the herculean efforts of these care providers are most certainly commendable, more needs to be done to support women with maternal mood disorders – and the PCPs that serve them - living in rural, remote, and Northern communities. The HOPE app represents one potential solution for increasing the rates of screening, diagnosis, referral and treatment.

The purpose of this study was to understand care providers' perspectives on potential barriers and facilitators to the delivery of, access to, and use of the HOPE app in Northwestern Ontario. Overall, the care providers viewed the app as a helpful tool for improving maternal care delivery and access, with six strong stipulations: (1) the content and images must be modified to suit women in NWO; (2) the resource lists must be localized; (3) the content must be culturally expanded in consultation with the communities of interest; (4) the high-risk referral protocol must be re-evaluated for safety; (5) coaches must reside in NWO and the HOPE team may wish to consider hiring culturally relevant individuals if possible; and (6) coaches must be reachable by telephone, email, text message, and wifi-based chat. In its current form, the HOPE app was perceived to be most appealing and accessible to the women who already can and do access existing services and supports (the white, worried-well as described by several of the care providers). This is not to say that the app would not be useful for the diverse groups of women living in the North in its current form, but rather, care providers have suggested that further modifications could help to increase its appeal and accessibility; further narrowing the gap in care access experienced by these women. These modifications are suggested to be particularly important for reaching marginalized women, whom care providers feel often do not see their own preferences or identities represented by mainstream services. While the HOPE app may represent a feasible, useful, and highly lauded addition to the menu of services currently offered in Northern communities, it by no means represents a problem-free solution to all of the care barriers faced by women in these areas. Many of the social determinants of health brought forward by care providers will continue to pose challenges to care access in the North, despite the many potential benefits of an online, remotely delivered care option. Care providers' principal concern for the use of this eHealth tool in Northwestern Ontario is the potential for unstable or unavailable internet connectivity in rural and remote communities. However, the connectivity maps supplied to us by Blue Sky Net seems to suggest that broadband reaches the minimum requirement of 1 Mbps in many of the communities North of the 49th parallel. This does not mean that everyone living in these areas will have access to the prerequisite 1 Mbps connection speed, but at the very least, the infrastructure exists in these communities to allow for public organization and some individuals to access stable connections. Beyond these concerns, care providers also impressed upon us their excitement at the potential launch of this new maternal support in Northwestern Ontario. Many are HOPEful that the app will fill a much-needed service gap while also reducing mental health stigma, increasing maternal mental health screening, supporting local physicians, and creating a comprehensive care network in our region. These findings suggest that the HOPE app will represent a beneficial addition to the services currently offered in Northwestern Ontario, particularly after region-specific modifications have been made. The results of this project - in combination with the larger Equity in Access and IMPACT studies - will be used to inform adaptions to the HOPE app in order to facilitate an improved fit to the care-provider-perceived needs of women living in rural, remote, and Northern communities. These suggested adaptions will then be brought forward to women living in this region, so that they can confirm or contrast what care providers have shared here. It is the intention of the Equity team that three new extensions to the HOPE platform will be created - including Indigenous, Arabic Muslim, and Euro-Canadian versions – which will ultimately contribute to enhancing positive maternal mental health outcomes for the women, children, families, and communities of Northwestern Ontario.

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Appendices

APPENDIX A – Definition of Terms

Anxiety disorder - “A nervous disorder marked by excessive uneasiness and apprehension, typically with compulsive behaviour or panic attacks” (Oxford University Press, 2019a)

Bipolar disorder - “Bipolar disorders are brain disorders that cause changes in a person’s mood, energy and ability to function. Bipolar disorder is a category that includes three different conditions — bipolar I, bipolar II and cyclothymic disorder. People with bipolar disorders have extreme and intense emotional states that occur at distinct times, called mood episodes. These mood episodes are categorized as manic, hypomanic or depressive. People with bipolar disorders generally have periods of normal mood as well” (American Psychiatric Association, 2019a)

Borderline Personality Disorder (BPO) - “A personality disorder characterized by severe mood swings, impulsive behaviour, and difficulty forming stable personal relationships” (Oxford University Press, 2019b)

Comorbidity - “The simultaneous presence of two chronic diseases or conditions in a patient” (Oxford University Press, 2019c)

Depression - “A mental condition characterized by feelings of severe despondency and dejection, typically also with feelings of inadequacy and guilt, often accompanied by lack of energy and disturbance of appetite and sleep” (Oxford University Press, 2019d)

Disability-Adjusted Life Years (DALY) - “One DALY can be thought of as one lost year of “healthy” life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. DALYs for a disease or health condition are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality in the population and the Years Lost due to Disability (YLD) for people living with the health condition or its consequences” (World Health Organization, 2019)

eHealth - “The delivery of health care services using electronic systems, processes, and information and communication technology, to facilitate the availability and exchange of health information between patients, providers, and other authorized users” (eHealth Ontario, 2014, p. 5)

Euro-Canadian – “A Canadian who is of European descent” (Oxford University Press, 2019e)

Generalized Anxiety Disorder (GAD) – “Generalized anxiety disorder involves persistent and excessive worry that interferes with daily activities. This ongoing worry and tension may be accompanied by physical symptoms, such as restlessness, feeling on edge or easily fatigued, difficulty concentrating, muscle tension or problems sleeping” (American Psychiatric Association, 2019b)

Indigenous – “‘Indigenous peoples’ is a collective name for the original peoples of North America and their descendants. Often, ‘Aboriginal peoples’ is also used” (Government of Canada, 2019)

Infanticide – "The crime of killing a child within a year of birth" (Oxford University Press, 2019f)

Mood disorder – "A psychological disorder characterized by the elevation or lowering of a person's mood, such as depression or bipolar disorder" (Oxford University Press, 2019g)

Morbidity – "The rate of disease in a population" (Oxford University Press, 2019h)

Mortality – "The number of deaths in a given area or period, or from a particular cause" (Oxford University Press, 2019i)

Obsessive-Compulsive Disorder (OCD) – "Obsessive-compulsive disorder is an anxiety disorder in which time people have recurring, unwanted thoughts, ideas or sensations (obsessions) that make them feel driven to do something repetitively (compulsions). The repetitive behaviors, such as hand washing, checking on things or cleaning, can significantly interfere with a person's daily activities and social interactions" (American Psychiatric Association, 2019c)

Perinatal – "Relating to the time, usually a number of weeks, immediately before and after birth" (Oxford University Press, 2019j)

Post-Traumatic Stress Disorder (PTSD) – "A condition of persistent mental and emotional stress occurring as a result of injury or severe psychological shock, typically involving disturbance of sleep and constant vivid recall of the experience, with dulled responses to others and to the outside world" (Oxford University Press, 2019k). "Posttraumatic stress disorder is a psychiatric disorder that can occur in people who have experienced or witnessed a traumatic event such as a natural disaster, a serious accident, a terrorist act, war/combat, rape or other violent personal assault" (American Psychiatric Association, 2019d)

Postnatal – "Of, relating to, characteristic of, or denoting the period after childbirth" (Oxford University Press, 2019l)

Postpartum Depression (PPD) – "Peripartum depression refers to depression occurring during pregnancy or after childbirth. The use of the term peripartum recognizes that depression associated with having a baby often begins during pregnancy" (American Psychiatric Association, 2019e)

Prenatal – "Before birth; during or relating to pregnancy" (Oxford University Press, 2019m)

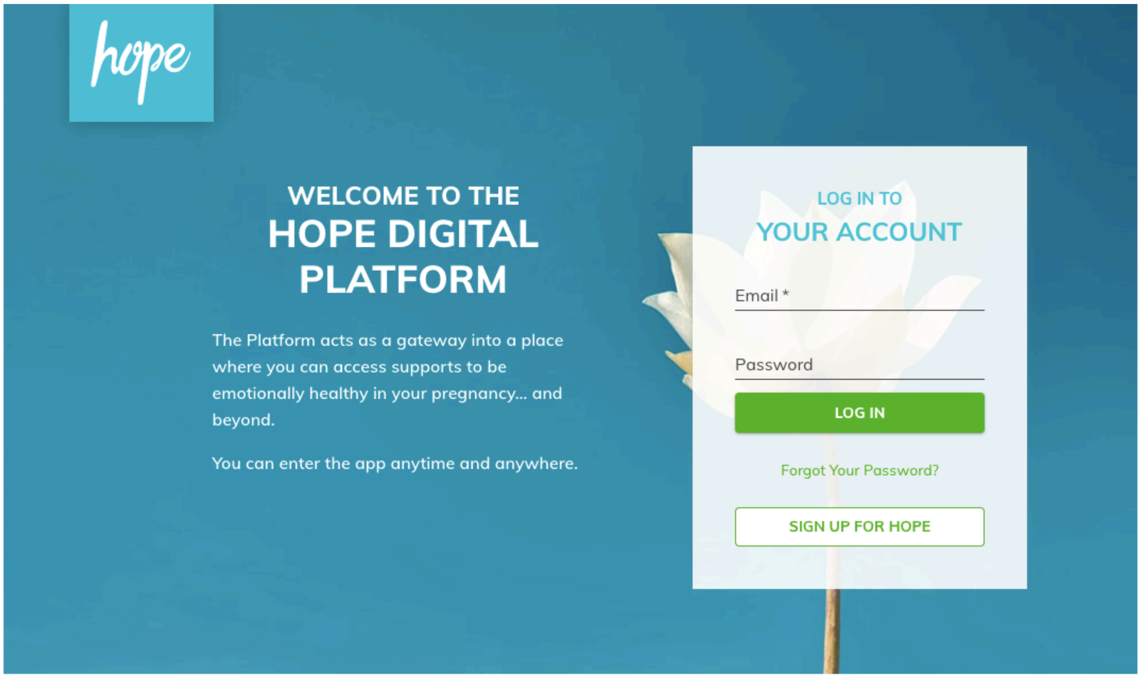
Remote Communities – "[Remote] communities are [mostly Aboriginal communities] … without year-round road access, or which rely on a third party (e.g. train, airplane, ferry) for transportation to a larger centre" (Ministry of Health and Long-term Care, 2011)

Rural Communities – "[Rural] communities in Ontario are those with a population of less than 30,000 that are greater than 30 minutes away in travel time from a community with a population of more than 30,000" (Ministry of Health and Long-term Care, 2011)

Social Anxiety Disorder (SAD) – "A person with social anxiety disorder has significant anxiety and discomfort about being embarrassed, humiliated, rejected or looked down on in social interactions. People with this disorder will try to avoid the situation or endure it with great anxiety. Common examples are extreme fear of public speaking, meeting new people or eating/drinking in public. The fear or anxiety causes problems with daily functioning and lasts at least six months" (American Psychiatric Association, 2019f)

Years Lived with Disability (YLD) – "Years lived with disability (YLDs) are a measurement of the burden of disease. YLDs are calculated by multiplying the prevalence of a disorder by the short- or long-term loss of health associated with that disability (the disability weight)" (National Institute of Mental Health, 2019)

APPENDIX B – HOPE App Platform

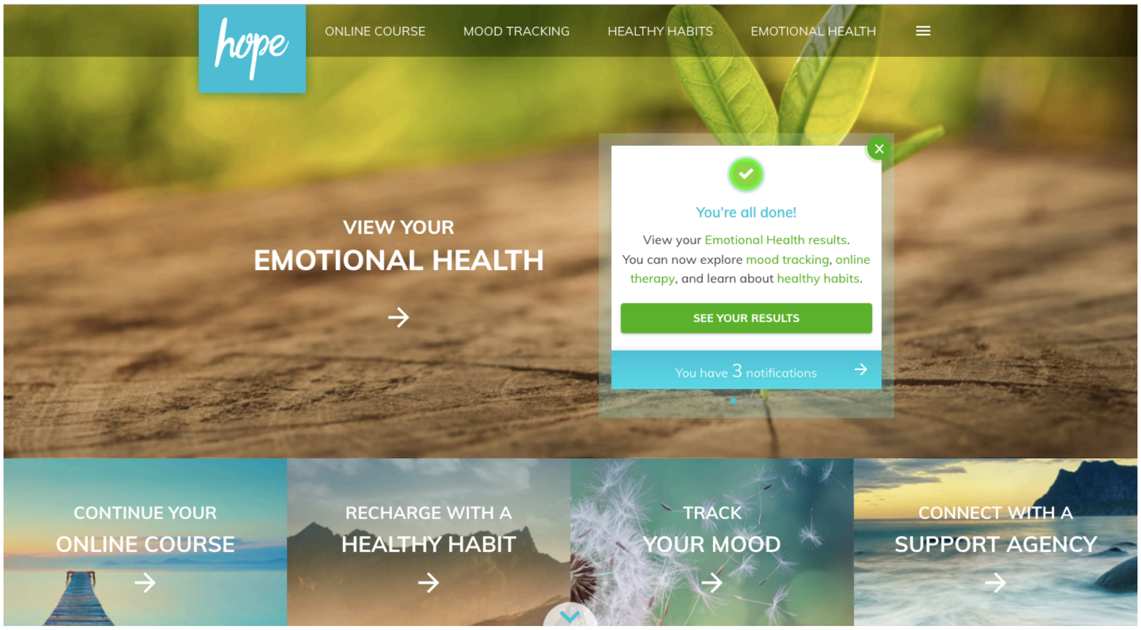


WELCOME TO THE
HOPE DIGITAL PLATFORM

The Platform acts as a gateway into a place where you can access supports to be emotionally healthy in your pregnancy... and beyond.

You can enter the app anytime and anywhere.

Figure 1.0: The login page for the HOPE digital platform. Existing users can login using their secure email and password combination and new users can create an account.



You're all done!

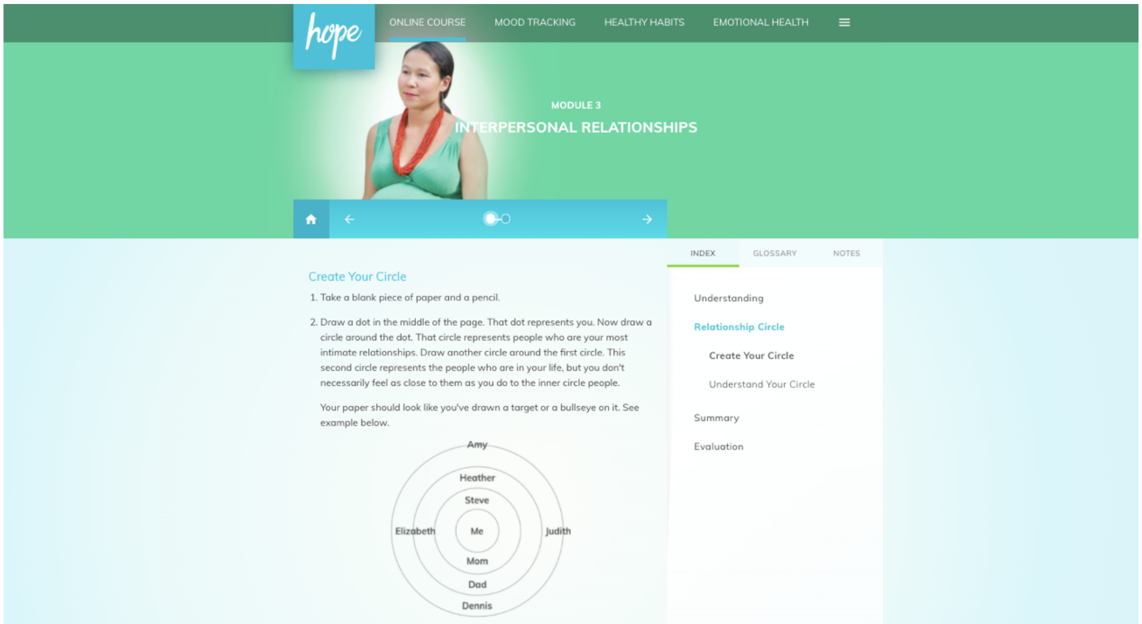
View your Emotional Health results.
You can now explore mood tracking, online therapy, and learn about healthy habits.

Figure 2.0: The homepage for the HOPE app contains four main tabs: "Online Course", "Mood Tracking", and "Emotional Health". Before entering the homepage, first-time users must fill out the Antenatal Risk Questionnaire, the Edinburgh Postnatal Depression Scale, the Depression Anxiety Stress Scales, and the Understanding Relationships scale. If women submit elevated scores in any of the four questionnaires, they are classified as high-risk by the platform and are

directed to in-person emergency services. Users can also access their assigned symptom level in order to see what answers on their questionnaires flagged them as at risk.

Figure 3.0: The online modules allow women to participate in an introduction to online therapy as well as seven modules that have been designed using a combination of CBT and IPT

strategies. Modules focus on social and behavioural aspects of the patient's life, such as attachment, communication, interpersonal relationship, disputes, role transitions, and grief and loss. The first three modules are designed to be completed in sequential order while the last four can be completed out of order and at the convenience of the patient.

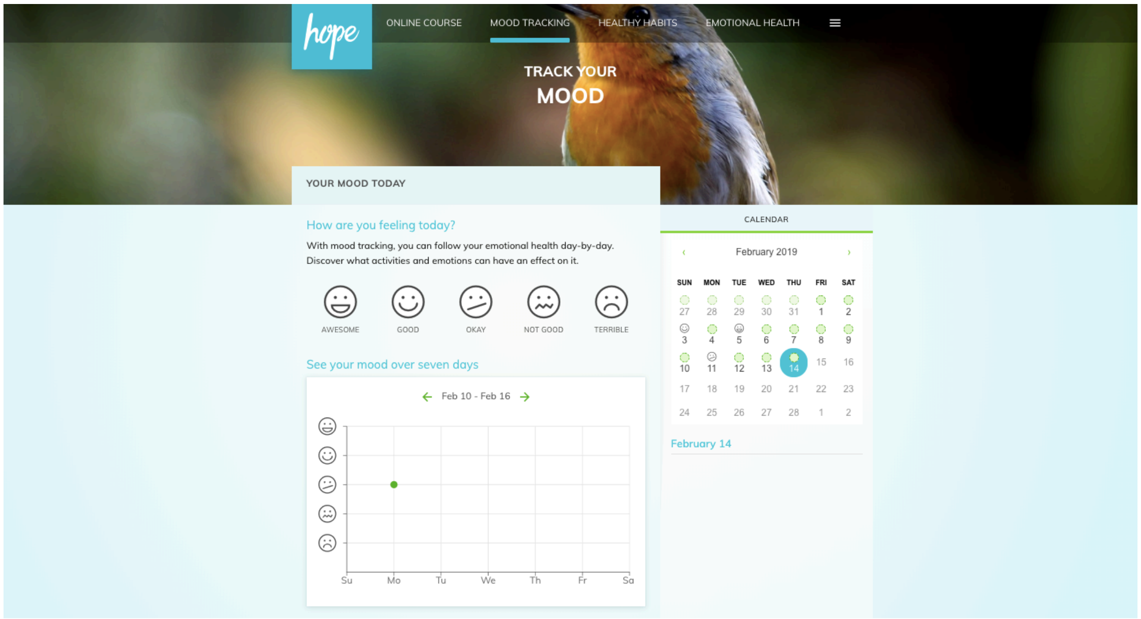


Create Your Circle

1. Take a blank piece of paper and a pencil.
2. Draw a dot in the middle of the page. That dot represents you. Now draw a circle around the dot. That circle represents people who are your most intimate relationships. Draw another circle around the first circle. This second circle represents the people who are in your life, but you don't necessarily feel as close to them as you do to the inner circle people.

Your paper should look like you've drawn a target or a bullseye on it. See example below.

Figure 4.0: Some of the online modules contain exercises - such as this interpersonal relationship circle - that can be completed by women to practice the skills they will learn during the course. The blue navigation bar under the course title contains a link back to the online therapy 'home' page and arrows to navigate backwards or forwards through the content. Circles are used to indicate the number of pages involved with each module.



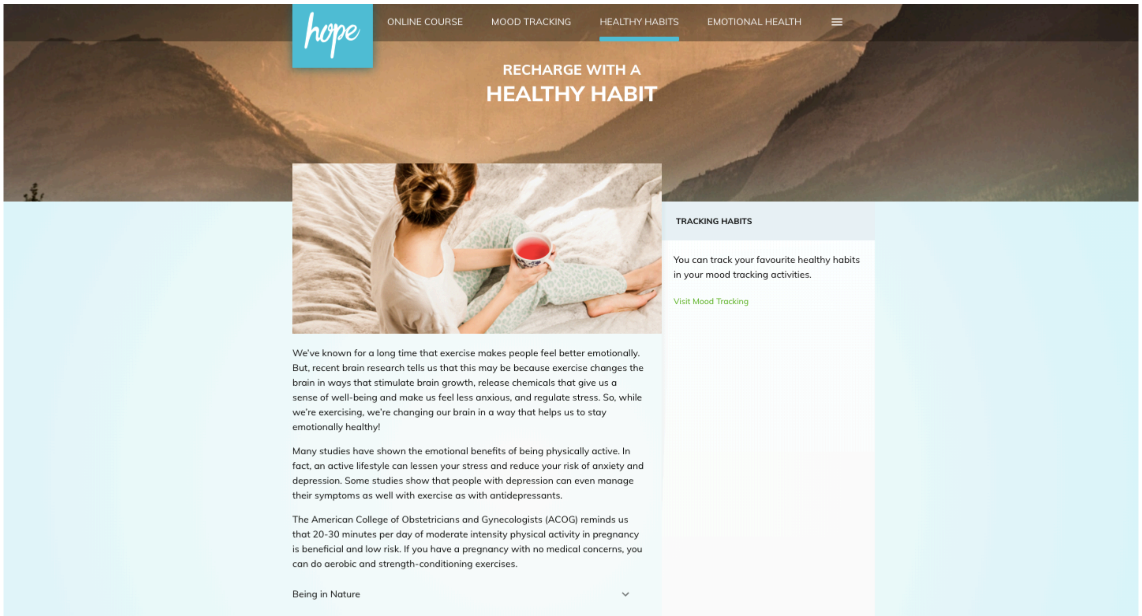
How are you feeling today?

With mood tracking, you can follow your emotional health day-by-day. Discover what activities and emotions can have an effect on it.

See your mood over seven days

February 14

Figure 5.0: The mood tracking feature of the HOPE app allows women to keep a daily log of their emotional wellbeing, their healthy behaviours, and their progress on the online modules.



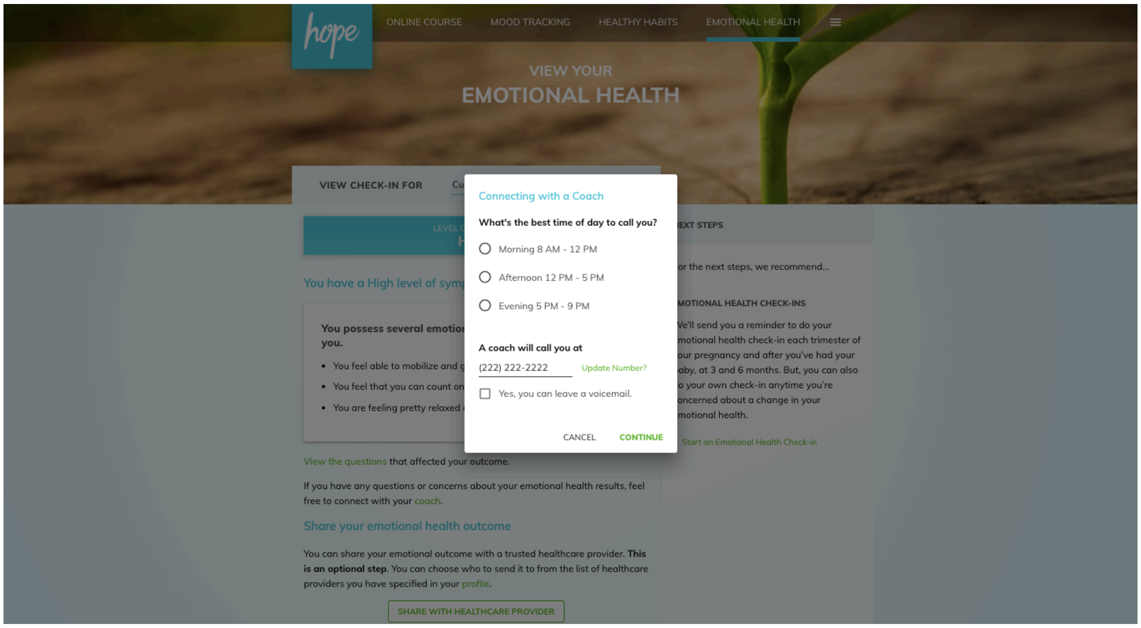
You can track your favourite healthy habits in your mood tracking activities.

We've known for a long time that exercise makes people feel better emotionally. But, recent brain research tells us that this may be because exercise changes the brain in ways that stimulate brain growth, release chemicals that give us a sense of well-being and make us feel less anxious, and regulate stress. So, while we're exercising, we're changing our brain in a way that helps us to stay emotionally healthy!

Many studies have shown the emotional benefits of being physically active. In fact, an active lifestyle can lessen your stress and reduce your risk of anxiety and depression. Some studies show that people with depression can even manage their symptoms as well with exercise as with antidepressants.

The American College of Obstetricians and Gynecologists (ACOG) reminds us that 20-30 minutes per day of moderate intensity physical activity in pregnancy is beneficial and low risk. If you have a pregnancy with no medical concerns, you can do aerobic and strength-conditioning exercises.

Figure 6.0: The Healthy Habits section recommends healthy behaviours that may contribute to better emotional health. Examples of these behaviours include being in nature, journaling, and talking to a trusted friend.



Connecting with a Coach

What's the best time of day to call you?

○ Morning 8 AM - 12 PM

○ Afternoon 12 PM - 5 PM

○ Evening 5 PM - 9 PM

A coach will call you at

(222) 222-2222 Update Number?

☐ Yes, you can leave a voicemail.

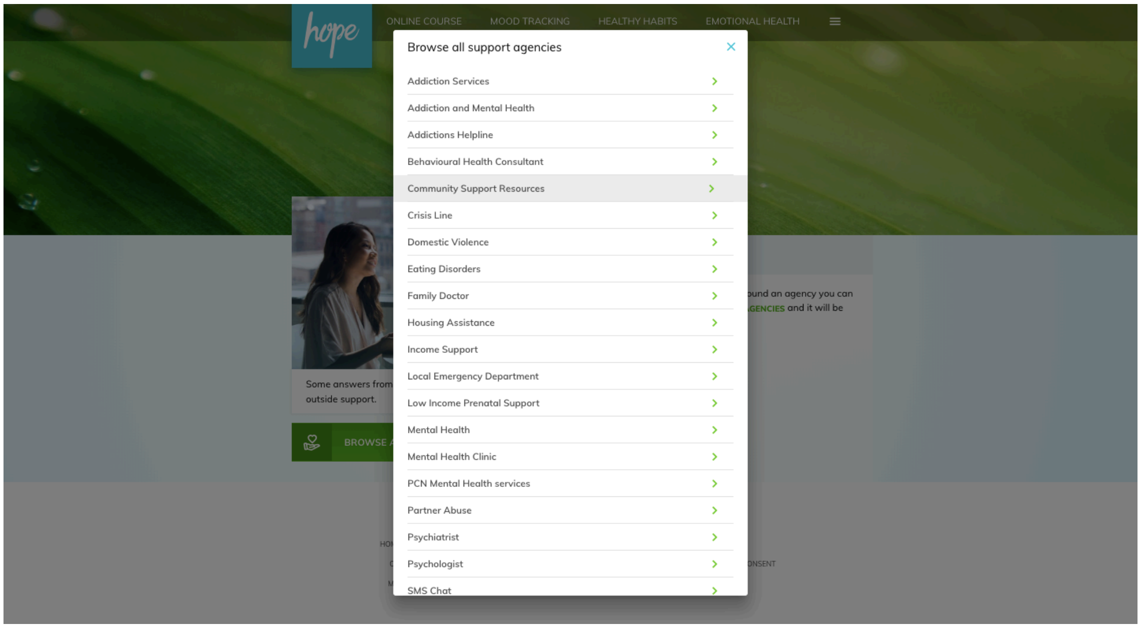
View the questions that affected your outcome.

If you have any questions or concerns about your emotional health results, feel free to connect with your coach.

Share your emotional health outcome

You can share your emotional outcome with a trusted healthcare provider. **This is an optional step**. You can choose who to send it to from the list of healthcare providers you have specified in your profile.

Figure 7.0: When women choose to connect with an online coach, they are asked to choose a date and time that best fits their schedule. The online coach will then contact the patient at the scheduled time by telephone to discuss their emotional progress.



Browse all support agencies

Figure 8.0: The HOPE app provides women with a list of local resources that they can contact to help cope with their anxiety and depression. These agencies offer a wide range of services.

APPENDIX C – List of Organizations

Name	Location	Address
Canada Prenatal Nutrition Pogram	Kenora	1181 Minto Ave, P9N3K1
Crisis Response Services - Kenora Rainy River District	Kenora	58 Goodall St, P8N2Z6
Kenora Midwives	Kenora	2-35 Wolsley St, P9N0H8
Lake of the Woods District Hospital	Kenora	21 Sylvan Steet West, P9N3W7
Northwestern Health Unit - Healthy Babies Healthy Children	Kenora	210 First St North, P9N2K4
Sunset Country Family Health Team	Kenora	1-35 Wolsley St, P9N0H8
The Kenora Family Connection	Kenora	
Canada Prenatal Nutrition Pogram	Sioux Lookout	68 Princess Street, P8T1H4
Northwestern Health Unit - Healthy Babies Healthy Children	Sioux Lookout	47B Front St, P8T1A3
CMHA - Thunder Bay Crisis Response Services	Thunder Bay	200 Van Norman St, P7A4B8
Communities Together for Children	Thunder Bay	452 Edward St North, Suite #11, P7C4P7
Community Midwives of Thunder Bay	Thunder Bay	1119 Victoria Ave East, P7C1B7
District of Thunder Bay Social Services Administration Board	Thunder Bay	231 May St South, P7E1B5
Faye Peterson House	Thunder Bay	C. N. Station, P7B6T7
Fort William Family Health Team/ Family medicine obstetrics	Thunder Bay	1260 Golf Links Rd, P7B0A1
La Leche League Canada	Thunder Bay	160 Algonquin Ave South, P7B4T1
Lakehead Alternative Schools - SAMMIS	Thunder Bay	2135 Sills St, P7E5T2
Maternity Care Midwives	Thunder Bay	212 Villa St, P7A3X9
Norwest Community Health Centre	Thunder Bay	525 Simpson St, P7C3J6
Ontario Addiction Treatment Centres	Thunder Bay	125 Vickers St South, P7E1J2
Our Kids Count	Thunder Bay	704 McKenzie St, P7C3L4
St. Joseph's Care Group - Mental Health Outpatient Services	Thunder Bay	710 Victoria Ave East, P7C5P7
TBRHSC- Labour & Delivery & Maternal Newborn Unit	Thunder Bay	980 Oliver Rd, P7B6V4
The Children's Aid Society of the District of Thunder Bay	Thunder Bay	1110 Jade Court, P7B6M7
The Maternity Centre	Thunder Bay	984 Oliver Rd Suite #402, P7B64V
Thunder Bay Breastfeeding Coalition	Thunder Bay	
Thunder Bay Counselling Centre (Hope Place)	Thunder Bay	544 Winnipeg Ave, P7B3S7
Thunder Bay District Health Unit	Thunder Bay	999 Balmoral St, P7B6E7
Métis Nation of Ontario Pre/Postnatal Nutrition	Kenora	4-621 Lakeview Dr, P9N3P6
Ne-Chee Friendship Centre	Kenora	326 2nd St South, P9N3X3
Waasegiizhig Nanaandawe'iyewigamig Health Access Centre	Kenora	212 4th Ave South, P9N1Y9
Keewaytinook Okimakanak	Sioux Lookout	115 King St, P8T1B9
Sioux Lookout Meno Ya Win Health Centre	Sioux Lookout	1 Meno Ya Win Way, P8T1B4
Sunset Women's Aboriginal Circle	Sioux Lookout	26 Second Ave North, P8T1H2
Sioux Lookout First Nations Health Authority	Sioux Lookout	61 Queen Street, P8T1B8
Anishnawbe Mushkiki Thunder Bay Community Health Centre	Thunder Bay	101 North Syndicate Ave Suite 2B, P7C3V4
Beendigen	Thunder Bay	541 Luci Crt, P7E1H2
Dilico Anishinabek Family Care	Thunder Bay	200 Anemki Place, P7J1L6
Fort William First Nations Health Centre	Thunder Bay	90 Anemki Dr, Suite 200, P7J 1L3
Keewaytinook Okimakanak	Thunder Bay	215 South Algoma St, P7B3C2
Keewaytinook Okimakanak	Thunder Bay	1046 Memorial Ave, P7B4A3
Keewaytinook Okimakanak	Thunder Bay	383 Mooney St, P7B5L5
Keewaytinook Okimakanak	Thunder Bay	Anemki Dr, Suite 105-100, P7J1A5
Métis Nation of Ontario Pre/Postnatal Nutrition	Thunder Bay	226 May St South, P7E1B4
Ontario Native Women's Association - Aboriginal Healthy Babies Healthy Children	Thunder Bay	150 City Rd, P7J1J7
Thunder Bay Indigenous Friendship Centre - Family Support Program	Thunder Bay	401 North Cumberland St, P7A4P7

*** Organizations that will only be approached as part of the larger Equity study have been highlighted in yellow.

APPENDIX D – Recruitment Email Template

Good afternoon,

I hope this email finds you well.

The equity in access team has worked further with the information that came out of the prenatal knowledge x-change project and the workshops that we held where project findings were shared.

One major finding was that mothers, social service providers, and health care providers advocated for more accessible and comprehensive mental health services for pregnant and postpartum mothers. As a result, we are conducting a follow up study that explores care providers' perspectives on potential barriers and facilitators to using a digital maternal mental health application - the HOPE app - in Northwestern Ontario. The HOPE app is an e-screening, e-referral, and e-therapy tool with a single, virtual point of access.

It has already been successfully trialed in Calgary, Alberta https://camrosepcn.com/news/hope-pregnancy-app. We are working with the developers with the aim of offering the HOPE app to women in NOW (if care and service providers find it appropriate), perhaps in an adapted form.

We would like to hear the perspectives providers from a range of disciplines (physicians, nurses, midwives, obstetricians/gynecologists, social service providers, and lactation consultants) located at organizations in Thunder Bay, Sioux Lookout, and Kenora.

The interview can be conducted face-to-face over the phone, or via SKYPE, and will be digitally recorded in order to ensure accuracy of representation. Participation in the study would of course be completely voluntary, and you may choose to withdraw at any time without penalty. I have attached an information letter to this email that contains additional details about this project. If you would like to participate (whether face to face or via telephone/Zoom) or have any questions/concerns about the study, please email or contact our principle investigator Helle Moller at hmoeller@lakeheadu.ca or 807 343 8965.

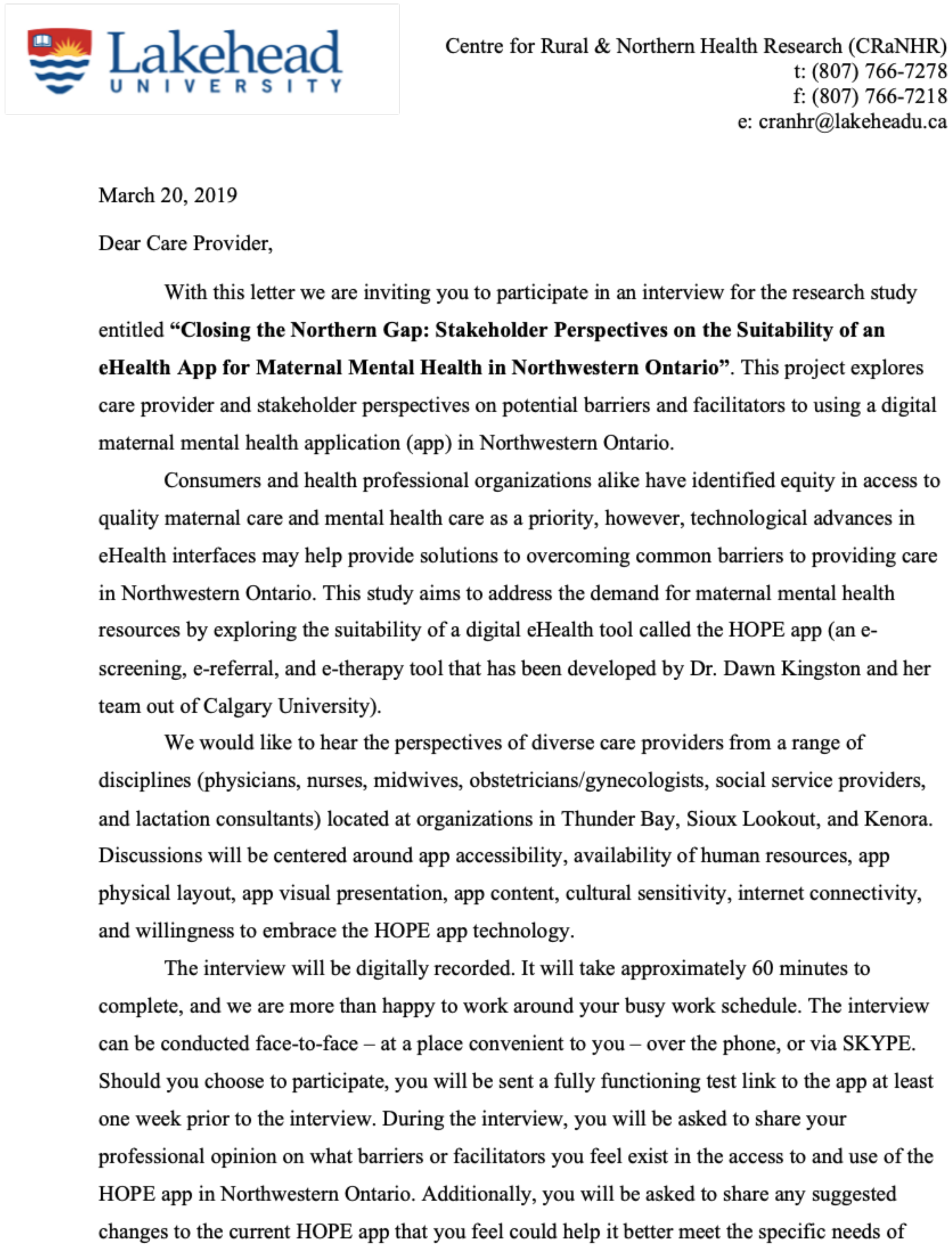
If you are interested in participating in an interview, please respond with a day that works best for you out of the following date ranges:

July 22nd – July 23rd
July 29th – August 2nd
August 5th – August 9th
August 12th – August 16th
Sept 9th – Sept 13th

Please feel free to share this email and attachment with other individuals providing service to pregnant women or new mothers.

Warm regards,
Abigale Kent

APPENDIX E – Information Letter



Lakehead UNIVERSITY

Centre for Rural & Northern Health Research (CRaNHR)
t: (807) 766-7278
f: (807) 766-7218
e: cranhr@lakeheadu.ca

March 20, 2019

Dear Care Provider,

With this letter we are inviting you to participate in an interview for the research study entitled **"Closing the Northern Gap: Stakeholder Perspectives on the Suitability of an eHealth App for Maternal Mental Health in Northwestern Ontario"**. This project explores care provider and stakeholder perspectives on potential barriers and facilitators to using a digital maternal mental health application (app) in Northwestern Ontario.

Consumers and health professional organizations alike have identified equity in access to quality maternal care and mental health care as a priority, however, technological advances in eHealth interfaces may help provide solutions to overcoming common barriers to providing care in Northwestern Ontario. This study aims to address the demand for maternal mental health resources by exploring the suitability of a digital eHealth tool called the HOPE app (an e-screening, e-referral, and e-therapy tool that has been developed by Dr. Dawn Kingston and her team out of Calgary University).

We would like to hear the perspectives of diverse care providers from a range of disciplines (physicians, nurses, midwives, obstetricians/gynecologists, social service providers, and lactation consultants) located at organizations in Thunder Bay, Sioux Lookout, and Kenora. Discussions will be centered around app accessibility, availability of human resources, app physical layout, app visual presentation, app content, cultural sensitivity, internet connectivity, and willingness to embrace the HOPE app technology.

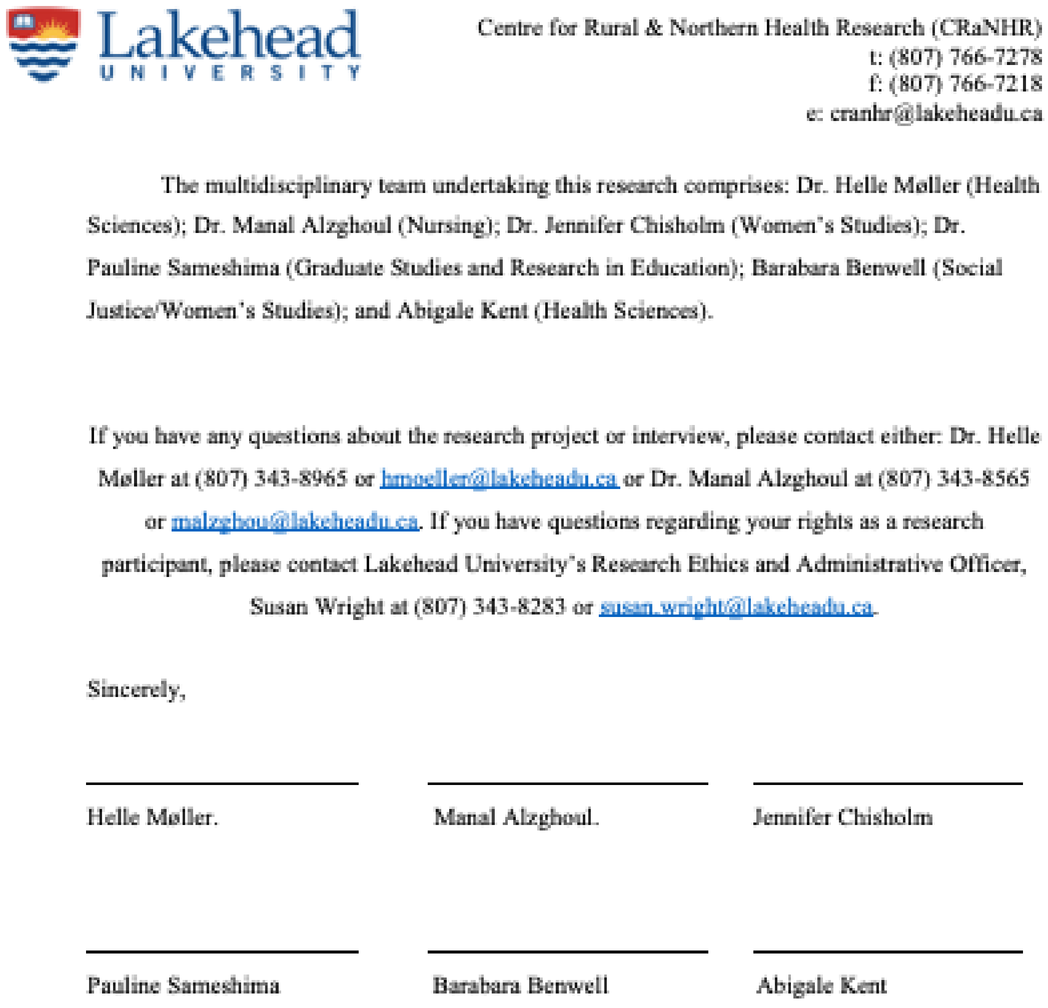
The interview will be digitally recorded. It will take approximately 60 minutes to complete, and we are more than happy to work around your busy work schedule. The interview can be conducted face-to-face – at a place convenient to you – over the phone, or via SKYPE. Should you choose to participate, you will be sent a fully functioning test link to the app at least one week prior to the interview. During the interview, you will be asked to share your professional opinion on what barriers or facilitators you feel exist in the access to and use of the HOPE app in Northwestern Ontario. Additionally, you will be asked to share any suggested changes to the current HOPE app that you feel could help it better meet the specific needs of women living in Northwestern Ontario. Your participation in the interview is completely voluntary. Even if you initially decide to participate, you may withdraw from the interview at any time without penalty. It is within your rights to refuse to answer any or all questions with which you are presented or to ask that portions of our discussion not be recorded.

Should multiple individuals from the same organization express interest in participating in this study, you will be asked if you feel comfortable completing the interviews collectively as a focus group. All other components of the interview process will remain the same, except that discussions will take place in a group and a time period of 90 minutes will be allotted in order to give sufficient time for everyone to participate. If you would rather complete a one-on-one interview, you can simply refuse the focus group offer without penalty

Your confidentiality will be treated with the utmost respect and no information that identifies you or your workplace will be made public or published. The digital recordings and interview transcripts will be de-identified and kept on a password-protected computer in the office of project supervisor, Dr. Helle Møller, for five years. A draft of your interview transcript can be provided to you upon request for review and confirmation of factual representation.

The risks associated with participation in this interview are minimal. While there are no direct benefits to you associated with participating in this interview, your willingness to share your knowledge and experiences will contribute to ongoing efforts to increase equitable access to comprehensive, available, and quality maternal mental health resources for consumers and care providers in Northwestern Ontario.

Dissemination of the outputs of this study will include a MHSc thesis dissertation that will be presented at Lakehead University in the summer of 2020. This study will be nested within a larger concurrent study entitled **“Acting on what mothers told us: evaluating the HOPE app to support the mental health of pregnant and postpartum women in Northwestern Ontario”**, which will include an exploration of the cultural appropriateness of the app with regard to Indigenous, Euro-Canadian, racialized, and other women. Outputs of the larger study include a number of in-person and online workshops (hosted in Thunder Bay, Kenora, and Sioux Lookout), a 3-minute research highlights video, and a published final report. A copy of the final research findings can be provided to you upon request.



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t: (807) 766-7278
f: (807) 766-7218
e: cranhr@lakeheadu.ca

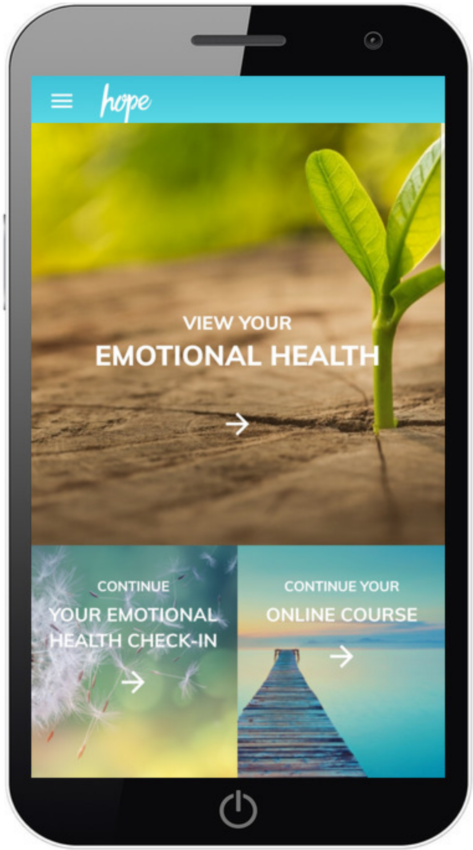
The multidisciplinary team undertaking this research comprises: Dr. Helle Møller (Health Sciences); Dr. Manal Alzghoul (Nursing); Dr. Jennifer Chisholm (Women's Studies); Dr. Pauline Sameshima (Graduate Studies and Research in Education); Barabara Benwell (Social Justice/Women's Studies); and Abigale Kent (Health Sciences).

If you have any questions about the research project or interview, please contact either: Dr. Helle Møller at (807) 343-8965 or hmoeller@lakeheadu.ca or Dr. Manal Alzghoul at (807) 343-8565 or malzghou@lakeheadu.ca. If you have questions regarding your rights as a research participant, please contact Lakehead University's Research Ethics and Administrative Officer, Susan Wright at (807) 343-8283 or susan.wright@lakeheadu.ca.

Sincerely,

Helle Møller.	Manal Alzghoul.	Jennifer Chisholm
Pauline Sameshima	Barabara Benwell	Abigale Kent

APPENDIX F – Information Card



EVALUATING THE HOPE APP to support maternal mental health in Northwestern Ontario

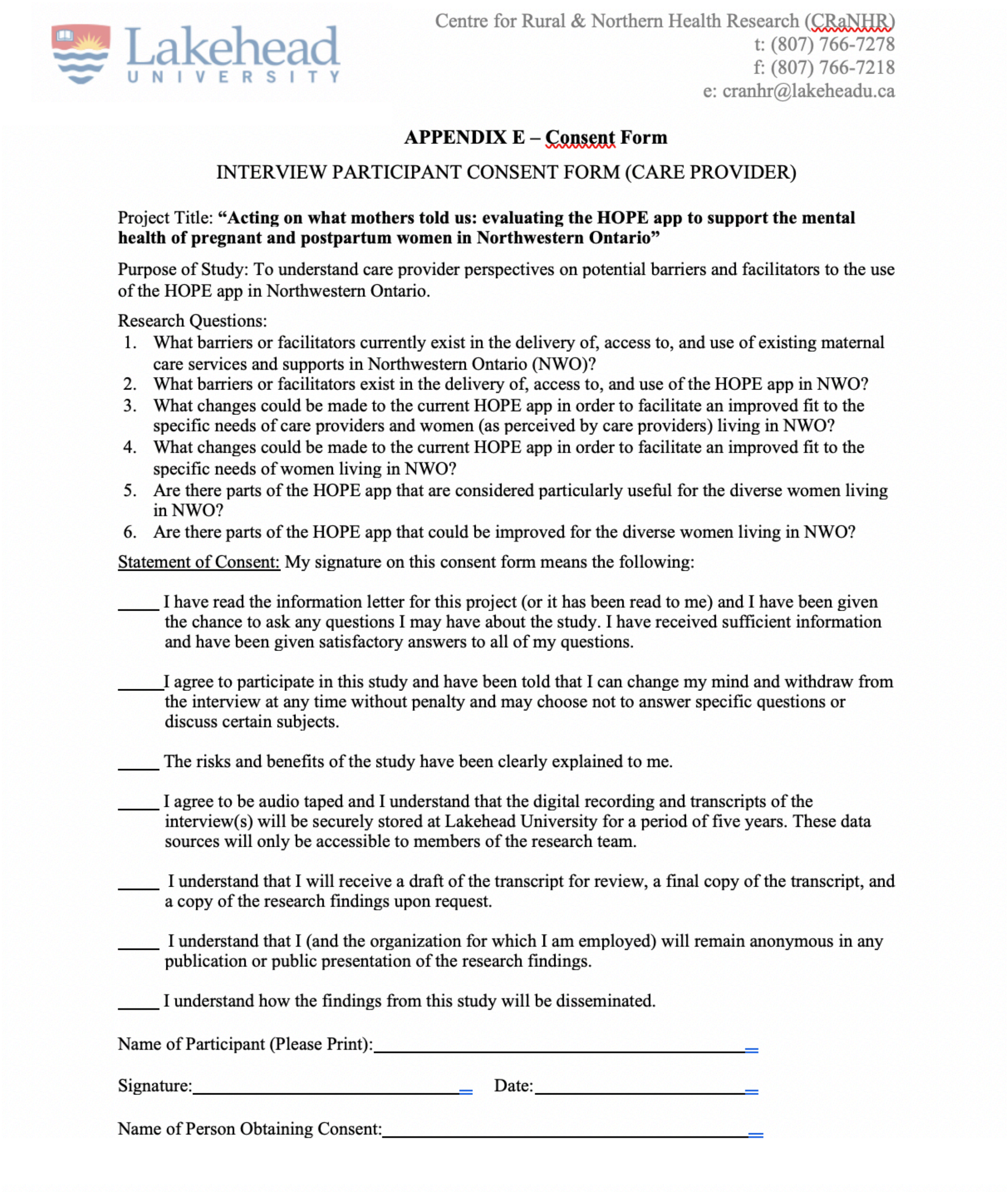
We are seeking the opinions of health & social service professionals working in a maternal care capacity at organizations located within Thunder Bay, Kenora, and Sioux Lookout.

For more information please contact:

Dr. Helle Møller
hmoeller@lakeheadu.ca
http://www.solspire.com/prenatal-knowledge-xchange.html

RaNHR
Lakehead University

APPENDIX G – Consent Form



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f: (807) 766-7218
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APPENDIX E – Consent Form

INTERVIEW PARTICIPANT CONSENT FORM (CARE PROVIDER)

Project Title: **"Acting on what mothers told us: evaluating the HOPE app to support the mental health of pregnant and postpartum women in Northwestern Ontario"**

Purpose of Study: To understand care provider perspectives on potential barriers and facilitators to the use of the HOPE app in Northwestern Ontario.

Research Questions:

1. What barriers or facilitators currently exist in the delivery of, access to, and use of existing maternal care services and supports in Northwestern Ontario (NWO)?
2. What barriers or facilitators exist in the delivery of, access to, and use of the HOPE app in NWO?
3. What changes could be made to the current HOPE app in order to facilitate an improved fit to the specific needs of care providers and women (as perceived by care providers) living in NWO?
4. What changes could be made to the current HOPE app in order to facilitate an improved fit to the specific needs of women living in NWO?
5. Are there parts of the HOPE app that are considered particularly useful for the diverse women living in NWO?
6. Are there parts of the HOPE app that could be improved for the diverse women living in NWO?

Statement of Consent: My signature on this consent form means the following:

_____ I have read the information letter for this project (or it has been read to me) and I have been given the chance to ask any questions I may have about the study. I have received sufficient information and have been given satisfactory answers to all of my questions.

_____ I agree to participate in this study and have been told that I can change my mind and withdraw from the interview at any time without penalty and may choose not to answer specific questions or discuss certain subjects.

_____ The risks and benefits of the study have been clearly explained to me.

_____ I agree to be audio taped and I understand that the digital recording and transcripts of the interview(s) will be securely stored at Lakehead University for a period of five years. These data sources will only be accessible to members of the research team.

_____ I understand that I will receive a draft of the transcript for review, a final copy of the transcript, and a copy of the research findings upon request.

_____ I understand that I (and the organization for which I am employed) will remain anonymous in any publication or public presentation of the research findings.

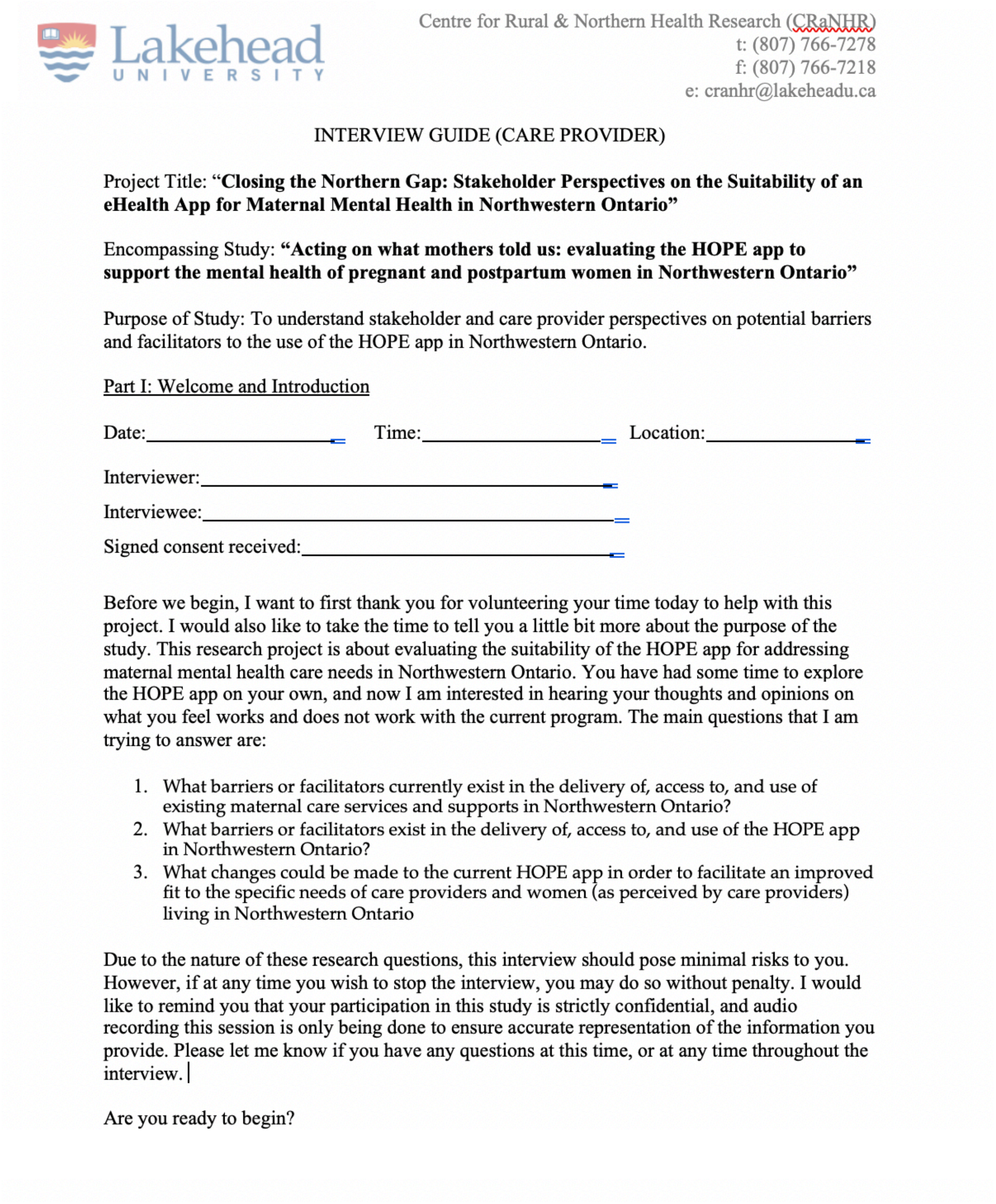
_____ I understand how the findings from this study will be disseminated.

Name of Participant (Please Print):_______________________________________

Signature:______________________________ Date:________________________

Name of Person Obtaining Consent:_______________________________________

APPENDIX H – Interview Guide



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t: (807) 766-7278
f: (807) 766-7218
e: cranhr@lakeheadu.ca

INTERVIEW GUIDE (CARE PROVIDER)

Project Title: “**Closing the Northern Gap: Stakeholder Perspectives on the Suitability of an eHealth App for Maternal Mental Health in Northwestern Ontario”**

Encompassing Study: **“Acting on what mothers told us: evaluating the HOPE app to support the mental health of pregnant and postpartum women in Northwestern Ontario”**

Purpose of Study: To understand stakeholder and care provider perspectives on potential barriers and facilitators to the use of the HOPE app in Northwestern Ontario.

Part I: Welcome and Introduction

Date:____________________ Time:____________________ Location:________________

Interviewer:____

Interviewee:____

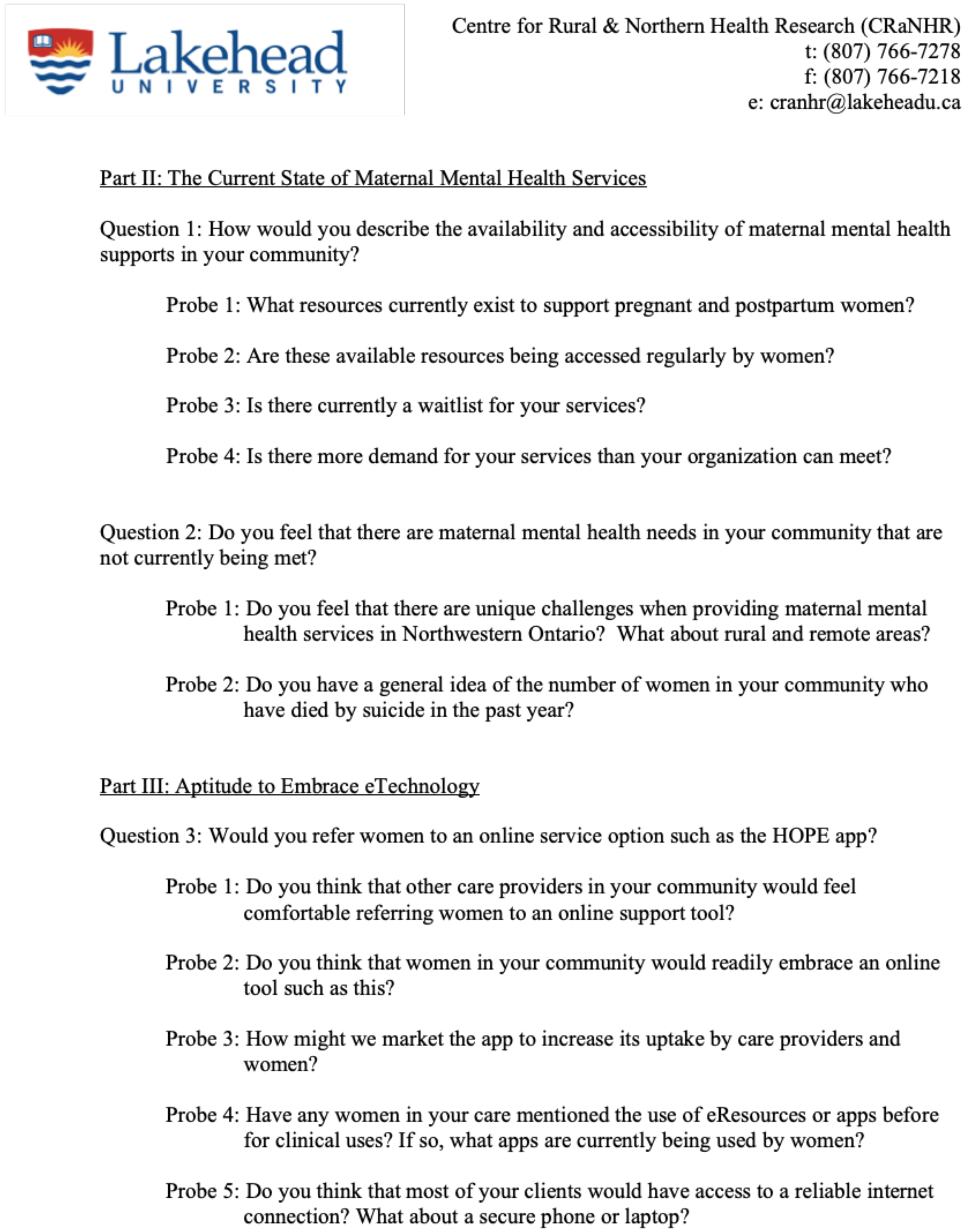
Signed consent received:________________________________

Before we begin, I want to first thank you for volunteering your time today to help with this project. I would also like to take the time to tell you a little bit more about the purpose of the study. This research project is about evaluating the suitability of the HOPE app for addressing maternal mental health care needs in Northwestern Ontario. You have had some time to explore the HOPE app on your own, and now I am interested in hearing your thoughts and opinions on what you feel works and does not work with the current program. The main questions that I am trying to answer are:

1. What barriers or facilitators currently exist in the delivery of, access to, and use of existing maternal care services and supports in Northwestern Ontario?
2. What barriers or facilitators exist in the delivery of, access to, and use of the HOPE app in Northwestern Ontario?
3. What changes could be made to the current HOPE app in order to facilitate an improved fit to the specific needs of care providers and women (as perceived by care providers) living in Northwestern Ontario

Due to the nature of these research questions, this interview should pose minimal risks to you. However, if at any time you wish to stop the interview, you may do so without penalty. I would like to remind you that your participation in this study is strictly confidential, and audio recording this session is only being done to ensure accurate representation of the information you provide. Please let me know if you have any questions at this time, or at any time throughout the interview.

Are you ready to begin?



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Part II: The Current State of Maternal Mental Health Services

Question 1: How would you describe the availability and accessibility of maternal mental health supports in your community?

Probe 1: What resources currently exist to support pregnant and postpartum women?

Probe 2: Are these available resources being accessed regularly by women?

Probe 3: Is there currently a waitlist for your services?

Probe 4: Is there more demand for your services than your organization can meet?

Question 2: Do you feel that there are maternal mental health needs in your community that are not currently being met?

Probe 1: Do you feel that there are unique challenges when providing maternal mental health services in Northwestern Ontario? What about rural and remote areas?

Probe 2: Do you have a general idea of the number of women in your community who have died by suicide in the past year?

Part III: Aptitude to Embrace eTechnology

Question 3: Would you refer women to an online service option such as the HOPE app?

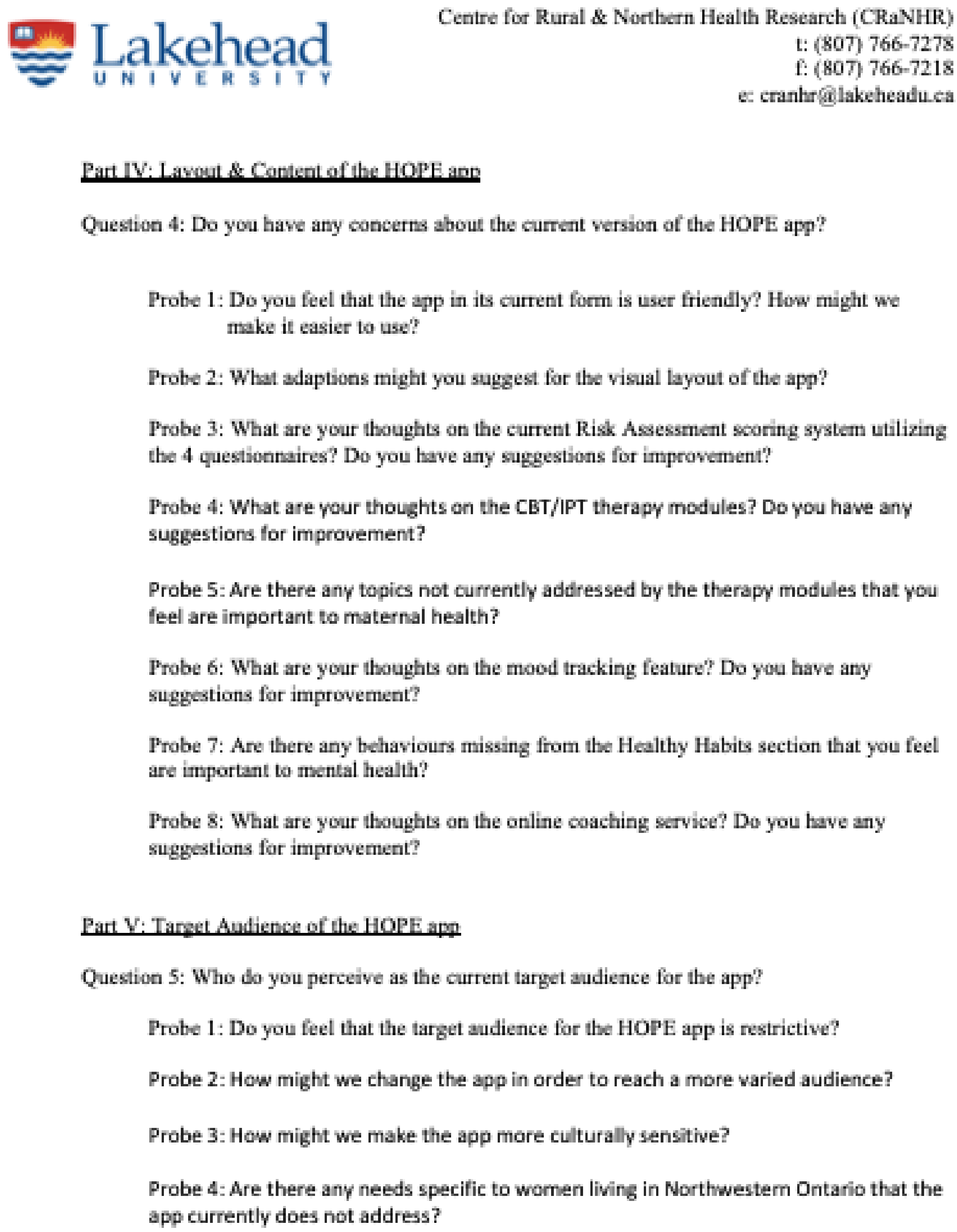
Probe 1: Do you think that other care providers in your community would feel comfortable referring women to an online support tool?

Probe 2: Do you think that women in your community would readily embrace an online tool such as this?

Probe 3: How might we market the app to increase its uptake by care providers and women?

Probe 4: Have any women in your care mentioned the use of eResources or apps before for clinical uses? If so, what apps are currently being used by women?

Probe 5: Do you think that most of your clients would have access to a reliable internet connection? What about a secure phone or laptop?



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t: (807) 766-7278
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Part IV: Layout & Content of the HOPE app

Question 4: Do you have any concerns about the current version of the HOPE app?

Probe 1: Do you feel that the app in its current form is user friendly? How might we make it easier to use?

Probe 2: What adaptions might you suggest for the visual layout of the app?

Probe 3: What are your thoughts on the current Risk Assessment scoring system utilizing the 4 questionnaires? Do you have any suggestions for improvement?

Probe 4: What are your thoughts on the CBT/IPT therapy modules? Do you have any suggestions for improvement?

Probe 5: Are there any topics not currently addressed by the therapy modules that you feel are important to maternal health?

Probe 6: What are your thoughts on the mood tracking feature? Do you have any suggestions for improvement?

Probe 7: Are there any behaviours missing from the Healthy Habits section that you feel are important to mental health?

Probe 8: What are your thoughts on the online coaching service? Do you have any suggestions for improvement?

Part V: Target Audience of the HOPE app

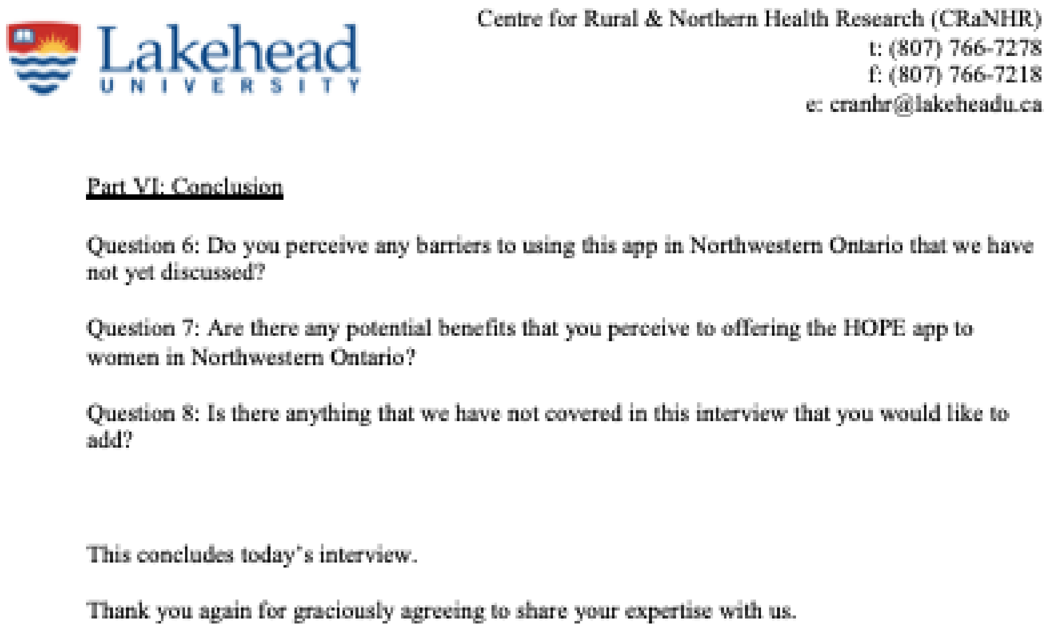
Question 5: Who do you perceive as the current target audience for the app?

Probe 1: Do you feel that the target audience for the HOPE app is restrictive?

Probe 2: How might we change the app in order to reach a more varied audience?

Probe 3: How might we make the app more culturally sensitive?

Probe 4: Are there any needs specific to women living in Northwestern Ontario that the app currently does not address?



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t: (807) 766-7278
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Part VI: Conclusion

Question 6: Do you perceive any barriers to using this app in Northwestern Ontario that we have not yet discussed?

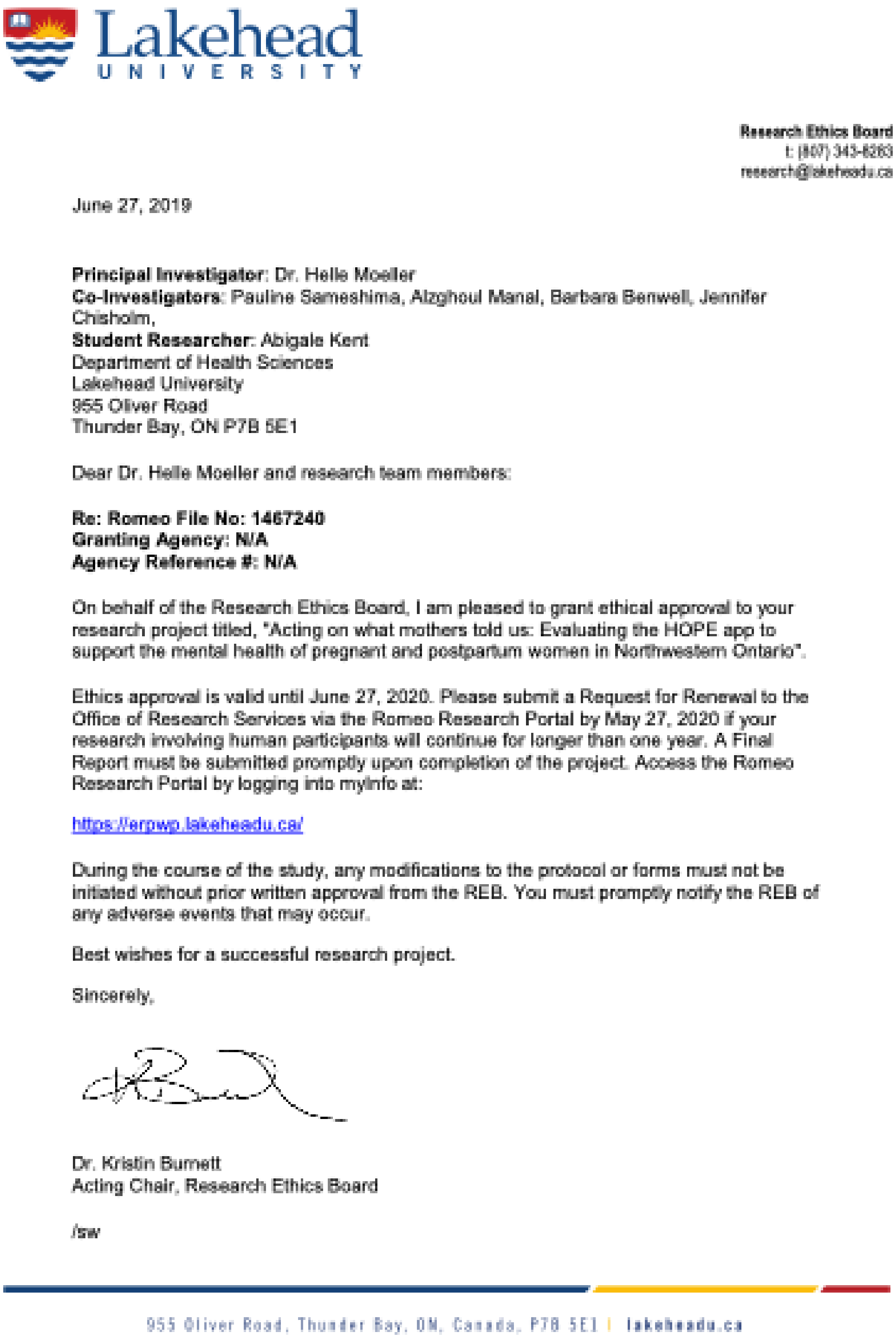
Question 7: Are there any potential benefits that you perceive to offering the HOPE app to women in Northwestern Ontario?

Question 8: Is there anything that we have not covered in this interview that you would like to add?

This concludes today's interview.

Thank you again for graciously agreeing to share your expertise with us.

APPENDIX I – Lakehead University REB approval



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Research Ethics Board
t: (807) 343-8283
research@lakeheadu.ca

June 27, 2019

Principal Investigator: Dr. Helle Moeller
Co-Investigators: Pauline Sameshima, Alzghoul Manal, Barbara Benwell, Jennifer Chisholm,
Student Researcher: Abigale Kent
Department of Health Sciences
Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1

Dear Dr. Helle Moeller and research team members:

Re: Romeo File No: 1467240
Granting Agency: N/A
Agency Reference #: N/A

On behalf of the Research Ethics Board, I am pleased to grant ethical approval to your research project titled, "Acting on what mothers told us: Evaluating the HOPE app to support the mental health of pregnant and postpartum women in Northwestern Ontario".

Ethics approval is valid until June 27, 2020. Please submit a Request for Renewal to the Office of Research Services via the Romeo Research Portal by May 27, 2020 if your research involving human participants will continue for longer than one year. A Final Report must be submitted promptly upon completion of the project. Access the Romeo Research Portal by logging into myInfo at:

https://erpwp.lakeheadu.ca/

During the course of the study, any modifications to the protocol or forms must not be initiated without prior written approval from the REB. You must promptly notify the REB of any adverse events that may occur.

Best wishes for a successful research project.

Sincerely,

Dr. Kristin Burnett
Acting Chair, Research Ethics Board

/sw

955 Oliver Road, Thunder Bay, ON, Canada, P7B 5E1 | lakeheadu.ca

APPENDIX J – Care Provider Profiles

Table 1

Care Provider Specialization Profiles

Care Provider Pseudonyms*	Official Role	Primary Area of Care	Sex	Active or Retired
Hannah	Public Health Nurse	Maternal Health	F	Active
Nicole	Public Health Nurse	Maternal Health	F	Active
Emily	Public Health Nurse	Maternal Health	F	Active
Kelly	Nurse Practitioner	Maternal/Mental Health	F	Active
Jennifer	Addictions Counsellor	Addictions/Mental Health	F	Active
Linda	Addictions Counsellor	Addictions/Mental Health	F	Active
Maria	Social Service Worker	Social/Mental Health	F	Active
Susan	Social Service Worker	Social/Mental Health	F	Active
Alice	Public Health Nurse	Maternal Health	F	Active
Rita	Primary Care Physician	Maternal/Mental Health	F	Active

***Pseudonyms are being used to protect the identity of all participants involved in this research project. For this reason, information on each participant's place of work and their location within Northwestern Ontario has been withheld. Some official role titles have been slightly altered to ensure anonymity. The age range of participants was approximately 25-55 years old.**

APPENDIX K – Northwestern Ontario Connectivity Maps

Figure 8.0: A connectivity map of Northwestern Ontario prepared by project manager Jeff Buell of Blue Sky Net. The map shows all communities currently serviced by telecommunications providers with colour-coded areas matching the maximum available download speed in that region: 50 Mbps (green), 25 Mbps (blue), 10 Mbps (pink), 5 Mbps (brown), less than 5 Mbps (red), and unknown (gray). Most populated regions show a current capacity somewhere between 1-5 Mbps, indicating the HOPE app would be usable in some of the rural, remote, and Northern communities outside of Thunder Bay, Kenora, and Sioux Lookout. However, connectivity is still greatly reduced within some Northern First Nations, potentially indicating that the HOPE app will be less useful for these isolated communities.

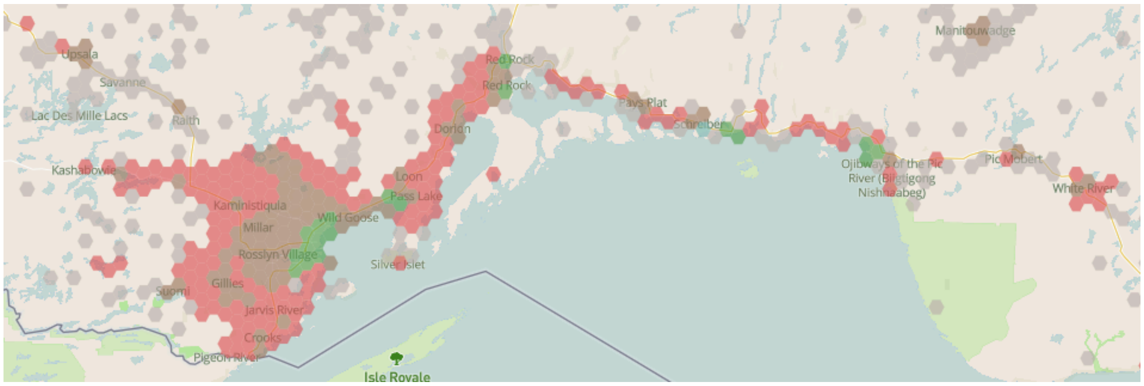

Figure 9.0: A connectivity map of Thunder Bay (unorganized) demonstrating the wide availability of broadband connectivity within this urban center. Colour-coded areas match the maximum available download speed: 50 Mbps (green), 25 Mbps (blue), 10 Mbps (pink), 5 Mbps (brown), less than 5 Mbps (red), and unknown (gray). Connectivity peaks within the downtown core and then declines towards Red Rock in the East and Shebandowan in the West.

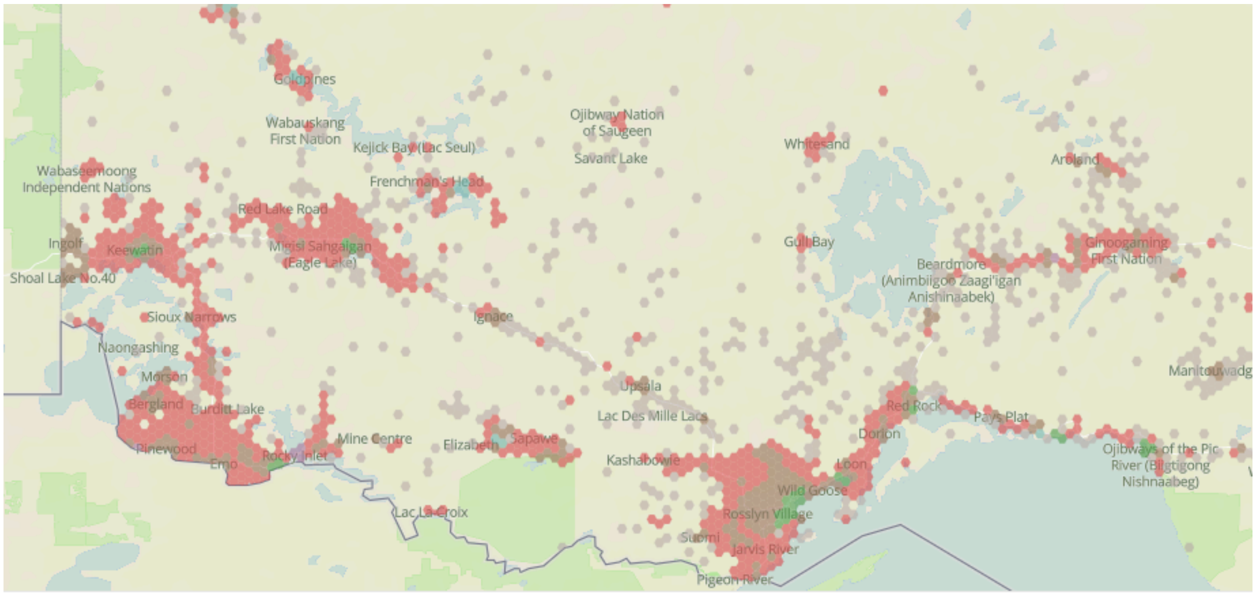

Figure 10.0: A connectivity map of Thunder Bay (unorganized) and Kenora (unorganized). Colour-coded areas match the maximum available download speed: 50 Mbps (green), 25 Mbps (blue), 10 Mbps (pink), 5 Mbps (brown), less than 5 Mbps (red), and unknown (gray).