

**HEALTH CARE PROVIDER'S PERCEPTIONS OF A NEWLY REVISED  
EHEALTH BREASTFEEDING RESOURCE FOR USE IN CLINICAL  
PRACTICE TO INCREASE BREASTFEEDING HEALTH LITERACY**

by

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## **PROJECT REVIEW INFORMATION**

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### **Masters of Health Science in Community, Public, and Population Health**

Project/Major Paper title: Health Care Provider's Perceptions of a Newly Revised E-health Breastfeeding Resource for Use in Clinical Practice to Increase Breastfeeding Health Literacy

The Project was approved on August 15, 2023 by the following review committee:

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The above review committee determined that the Project is acceptable in form and content and that a satisfactory knowledge of the field was covered by the work submitted. A copy of the Certificate of Approval is available from the School of Graduate and Postdoctoral Studies.

## **ABSTRACT**

Global breastfeeding rates are low, despite the World Health Organization's breastfeeding recommendations. Health care providers are encouraged to provide education and support. Ehealth resources are increasingly being used to provide breastfeeding information to patients. The purpose of this project was to determine health care providers' perceptions of a newly revised eHealth breastfeeding resource. This project followed a program evaluation approach and addressed the resources component of the logic model framework. Healthcare providers in Ontario were surveyed to determine their perceptions of the content, design and usability of a breastfeeding eHealth resource for use in clinical practice to increase breastfeeding health literacy and rates. The findings suggest that minimal revisions are needed to the resource and indicate that healthcare professionals found it acceptable for use in their clinical practice.

**Keywords:** breastfeeding; eHealth; perinatal period; childbirth education; health literacy

## **AUTHOR'S DECLARATION**

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The research work in this project that was performed in compliance with the regulations of the Research Ethics Board under **REB Certificate number: 16340**.

*Sidra Azam*

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## **LIST OF ABBREVIATIONS AND SYMBOLS**

<b>BIPOC</b>	Black, Indigenous and People of Color
<b>CDC</b>	Centers for Disease Control and Prevention
<b>HCP</b>	Healthcare professionals
<b>WHO</b>	World Health Organization

## **Chapter 1 - Introduction**

### **1.1 Background/ Statement of Problem**

Breastfeeding is the optimal method for feeding human infants. It improves the health and wellbeing of both the mother and baby (Durham Region Health Department, 2017). The World Health Organization (WHO) (2016) has recommended indicators for feeding practices of babies and young children. These include early initiation of breastfeeding within one hour of birth, exclusive breastfeeding for 6 months, and breastfeeding to two years and beyond (Victoria et al., 2016). Despite WHO's recommendations, global breastfeeding rates are low, and this is a longstanding problem (CDC, 2022; WHO, 2016). At both the local and global level, breastfeeding rates remain suboptimal (CDC, 2022; WHO, 2016). The low breastfeeding rates are due to many maternal and child-related reasons such as place of residency, mothers age, health status, number of births, economic status, domestic burden, maternal healthcare access, education level and knowledge about infant feeding practices including ways to overcome breastfeeding related problems (Jama et al., 2020). Health literacy is an important factor as it ensures parents can find and utilize credible and reliable breastfeeding information to make informed breastfeeding decisions which would help increase breastfeeding rates (Valero-Chillerón et al., 2022).

According to the CDC (2023) the definition of health literacy has been recently updated and categorized into personal and organizational health literacy. Personal health literacy is the level at which an individual can locate, understand, and utilize the health-related data and services for themselves and others (CDC, 2023). Organizational health literacy refers to the level at which organizations or groups of people with a particular

purpose can locate, comprehend, and apply the information or service to make informed health-related decisions for the association and others (CDC, 2023). Health literacy is important because it maintains trust between patients and health care providers and enables provision of the highest level of health for everyone (CDC, 2023). It is crucial that health information and services are accessible to the population in order for trust to be built and to increase the willingness of patients to use health information and services in order to promote good health and wellbeing, and enable the population to make informed decisions (CDC, 2023). This can be applied to breastfeeding health literacy, as it is crucial for parents to have breastfeeding knowledge to make informed breastfeeding decisions to promote good health and well-being for both the mother and baby (Abbass-Dick et al., 2020a).

To address the problem of low breastfeeding rates and in an attempt to increase health literacy, there are many resources that parents can access and use to overcome the issues they come across regarding breastfeeding. When parents have to deal with breastfeeding issues, they require breastfeeding information right at their finger tips for convenience. Online tools, such as websites that contain supportive and easily accessible information about breastfeeding can be very helpful in overcoming such issues (Lau et al., 2016). Many eHealth resources exist on the world wide web, that target particular populations. Examples of types of eHealth resources are available in hospital settings, including telemedicine, tele dermatology, electronic patient administration system, laboratory, and radiology information systems (Government of Canada, 2010). Likewise, Abbass-Dick and colleagues created an eHealth resource to provide breastfeeding education tailored to specific populations including young mothers, Indigenous families,

mothers, fathers and co-parents (2021; 2020b; 2018; 2017). An eHealth resource for these populations may be beneficial as it can deliver accessible information to aid in understanding how lactation works and how it can be maintained. However, there is not enough research on whether health care providers are willing to promote this eHealth resource in their clinical practice. There is no evidence on health care providers' perceptions of this particular eHealth resource, designed for use in clinical practice to provide breastfeeding education and support to patients.

### **1.2 Need for Program Evaluation**

The eHealth breastfeeding resource was recently updated based on feedback from participants obtained through several studies conducted by Abbass-Dick and colleagues (2021; 2020b; 2018; 2017; Breastfeeding Information for Parents, 2020). These studies were developed with diverse populations in order to understand and develop an eHealth resource to foster informed breastfeeding decision-making and cater to the needs of the given population. This paper will follow a program evaluation approach. It will determine if health care professionals think this eHealth breastfeeding resource contains sufficient, accessible, diverse and comprehensive information to be used in clinical practice, and identify areas for improvements or revisions required to enable them to use it with their patients. Therefore, this project evaluation will determine health care providers' perceptions of a newly revised eHealth breastfeeding resource for use in clinical practice to increase breastfeeding health literacy.

### **1.3 Creation of the eHealth Resource**

The eHealth resource was designed by Abbass-Dick and colleagues to provide breastfeeding information tailored to the learning needs of diverse populations (Abbass-

Dick et al., 2021; 2020b; 2018; 2017). The process of creating this eHealth resource required working in partnership with diverse populations including young mothers, indigenous families, mothers, fathers and co-parents (Abbass-Dick et al., 2021; 2020b; 2018; 2017). For instance, some individuals may understand information better with visual aids, while some may require larger texts and pictures. Likewise, the website was designed to be culturally inclusive, hence individuals from the Indigenous community were introduced to the eHealth resource and gave their personal input on the resource to ensure its cultural relevance (Abbass-Dick et al., 2018). Moreover, the researchers sought to determine how different target populations viewed and comprehended breastfeeding information in different stages, including pre- and post-birth, as this was crucial information to collect in order to improve the eHealth breastfeeding resource (Abbass-Dick et al., 2020b). Mothers, fathers and co-parents are the main target population for this resource (Abbass-Dick et al., 2020b), which is why their input was gathered, to ensure breastfeeding information was provided in the best way possible, and tailored to their needs (Abbass-Dick et al., 2021; 2020b; 2017). The breastfeeding eHealth resource includes comprehensive information on the following main topics – Why Breastfeed, How to Breastfeed, The Early Days, Fathers, Partners, Family & Friends, Common Concerns, Everyday Life, and Getting Help (Breastfeedinginfo, 2020). It provides information in multiple ways including text, narration videos and quizzes to aid in further user engagement (Breastfeedinginfo, 2020).

#### **1.4 Randomized Control Trial**

A randomized control trial (RCT) was conducted by Abbas-Dick et al. (2020b) comparing the effectiveness of two study conditions that differentiated in the way

mothers and co-parents accessed breastfeeding information, with study condition 1 (SC1) receiving access to the eHealth resource. The results of the RCT found that in both study conditions, breastfeeding rates were high. SC1 had 63% and study condition 2 (SC2) had 57% exclusive breastfeeding rates at 6 months and in terms of breastfeeding rates for any breastfeeding at 12 months, SC1 had 71%, while SC2 had 78%, never the less there was no statistically significant difference between groups (Abbass-Dick et al., 2020b). The secondary outcome measures such as breastfeeding knowledge, attitude, self efficacy and overcoming challenges had high scores in both study conditions (Abbass-Dick et al., 2020b). At 2 weeks post enrollment and 4 weeks postpartum, SC1 had a statistically significant increase in knowledge and attitude scores compared to the SC2 (Abbass-Dick et al., 2020b). Both study conditions used readily accessible breastfeeding tools with websites being frequently used and considered to be the most helpful (Abbass-Dick et al., 2020b). These findings suggested that: (1) breastfeeding eHealth resources should be tailored to both mothers and their co-parents; (2) both groups found web-based resources beneficial and used them to find breastfeeding information; and (3) eHealth breastfeeding resources provided in the prenatal period in clinical interactions may increase breastfeeding knowledge and attitudes (Abbass-Dick et al., 2020b). Based on the feedback from the RCT participants who had used the eHealth resource, Breastfeeding Information for Parents was revised in 2020.

According to Abbass-Dick et al. (2020b, 2023), parents reported that the eHealth resource was helpful and informative. The parents learned to overcome common breastfeeding problems and said the eHealth platform was easy to use (Abbas-Dick et al., 2020b). Electronic technologies have been tested and proven effective in increasing

breastfeeding outcomes such as initiation and duration (Almohanna et al., 2020; Lau et al., 2016).

These research findings support the introduction of the eHealth breastfeeding resource in clinical interactions, and suggest it be incorporated into breastfeeding education and support programs; however, it does not identify if health care providers are willing to accept this updated resource and will provide it to their perinatal patients. Therefore, the revised eHealth resource needs to be presented to healthcare providers that work with prenatal families, for their review, in order to determine if they find it acceptable for use in their clinical practice.

### **1.5 Purpose**

The purpose of this project was to evaluate a previously designed eHealth resource to determine if it met the needs of health care professionals (HCPs) for use in clinical practice to support breastfeeding health literacy in their patient population. This will inform any necessary revisions to the eHealth resource and ensure its acceptability by HCPs for a seamless integration into clinical practice and inclusion in breastfeeding support programs.

### **1.6 Objectives**

The project objectives are to:

1. Contact HCPs in Ontario through social media and invite them to review the revised version of *Breastfeeding Information for Parents* and provide feedback.

2. Survey these HCPs to determine their perceptions of the design, content, and usability of the eHealth online breastfeeding resource for use in clinical interaction to increase breastfeeding health literacy.
3. Determine if revisions are required or if the resource is acceptable for use in clinical practice and integration into breastfeeding support programs.



## **Chapter 2- Literature Review**

This chapter will provide an overview of the literature about the acceptability and effectiveness of breastfeeding information provided electronically, and populations, including parents and health care professionals, perceptions regarding the use of such resources in providing breastfeeding education and support. This project was conducted as a program evaluation to investigate health care providers' perceptions of a newly revised eHealth breastfeeding resource, an online tool designed for use in clinical practice to increase breastfeeding health literacy.

This literature review was conducted through the Ontario Tech Library, the PubMed database, and Google Scholar. The key search terms used to find relevant articles included: breastfeeding, eHealth, perinatal period, childbirth education, health literacy, mothers, fathers, breastfeeding support, lactation, infant feeding. The inclusion criteria were: the studies discussed the perinatal population and online breastfeeding information. The exclusion criteria were: articles that were not in English, did not discuss breastfeeding, and the parents' population that did not breastfeed or intend to breastfeed. There was no specific age of the participants required for the literature review search, as long as the parents, mothers or fathers had an infant that was planning to be breastfed. In total 14 articles were screened and were found to meet the inclusion criteria. The full text was read and they were included in this project.

In this review of the literature, three studies discussed the importance of the role of healthcare professionals in relation to their perinatal patients and the knowledge they have about breastfeeding (Brandstetter et al., 2020; Shaw & Devgan, 2018; Laantera et al., 2010). Three studies discussed exclusive breastfeeding practices and its relation to

health literacy (Ihudiebube-Splendor et al., 2019; Raheel & Tharkar, 2018; Stafford et al., 2021). Two studies discussed breastfeeding recommendations and if mothers were aware of these guidelines (Nina et al., 2012; Wen et al., 2012). Six studies discussed online electronic health resources (eHealth) and their use with parents in the perinatal period (Almohanna et al., 2020; Goetz et al., 2017; Laws et al., 2023; Mackert et al., 2018; Slomian et al., 2017a ;Yang et al., 2021). Some grey literature was used, including non-profit organizations and government reports. Additional literature was identified on a logic model which applied to healthcare setting and infant nutrition (Hayes et al. 2011).

## **2.1 Healthcare Professionals**

The WHO (2019) has created an international classification of the health workers system. It has been created based on a vast amount of theoretical and factual knowledge in the diagnosis and treatment of disease and other health problems. It has also involved health professionals' study, recommendation, preventative, curative, rehabilitative and promotional health services (WHO, 2019). According to the literature, healthcare professionals play a crucial role as advocates for breastfeeding, and mothers say that receiving education from nurses is critical to their success (Laantera et al., 2010). However, the literature mentions that some healthcare providers, including gynaecologist and obstetricians, are not providing information on support services to their child bearing patients (Brandstetter et al., 2020). Not all healthcare providers have information on certain health conditions, for instance one study found that German physicians were reluctant and were struggling to address psychosocial problems during the child health check-up examinations. Not all service providers are equally equipped to fulfill the diverse needs (Brandstetter et al., 2020). In another study, it is seen that there is a need

for improvement in doctors' and nurses' awareness of breastfeeding recommendations in relation to global breastfeeding practices delaying weaning until after 6 months and the continuation of breastfeeding up to 2 years and beyond (Shaw & Devgan, 2018).

## **2.2 Importance of Breastfeeding**

According to the WHO (2022) breastfeeding is a way of providing infants with sufficient nourishment to promote health, growth and development and is a vital part of the female reproductive system that positively affects the mother's health (UNICEF, 2018; Victora, 2016; WHO, 2018). Breastfed babies also have a lower risk of several diseases including leukemia, obesity, diabetes, and allergies (CDC, 2022). Mothers that engage in breastfeeding practices have a lower risk of ovarian cancer and may lose their baby weight much faster than women who do not breastfeed (CDC, 2022). The recommendation of exclusive breastfeeding is from birth to six months of age (WHO, 2016); however, worldwide statistics indicate that only 38% of babies younger than six months are exclusively breastfed, which is much lower than the world-wide 2025 goal of 50% (Almohanna et al., 2020). These numbers suggest that there is a need to support breastfeeding in order to increase exclusive breastfeeding rates. The literature also validates this and suggests that to improve mothers' exclusive breastfeeding practices, midwives and other health professionals must continually educate them and reiterate the advantages of exclusive breastfeeding at every point of contact with mothers (Ihudiebube-Splendor et al., 2019). A study conducted by Raheel and Tharkar (2018) found that mothers with more experience were more likely to start breastfeeding earlier and to continue for longer. This appears to support the notion that older moms adhere to social standards more firmly in terms of culture and religion (Raheel & Tharkar, 2018).

Some young mothers did not see breastfeeding as a benefit, but rather as a risk to their convenience and physical beauty (Raheel & Tharkar, 2018). Stafford et al. (2021) found a connection between health literacy and intent to exclusively breastfeed because postpartum moms with the lowest health literacy had low exclusive breastfeeding rates at their postpartum visits.

As noted in the Baby Friendly Hospital Initiative, Ten Steps, one way to assist parents in meeting these breastfeeding goals is to provide breastfeeding education in the most effective, efficient and accessible way (Abdulahi, 2018; Breastfeeding Information for Parents, 2020; Smith, 2012). Breastfeeding education is important because obtaining breastfeeding information can be difficult, which in turn can cause discouragement for parents and lead to premature weaning (Abbass-Dick et al., 2020a; Bridges et al., 2018; Duarte et al., 2022). The literature indicates that although real milk supply is rarely assessed in the clinical environment or in research, 35% of mothers claim "insufficient milk" as the main cause of breastfeeding cessation in the early weeks (Nina et al., 2012). This suggests mothers are not aware that they can produce enough milk for their infant, impacting their ability to follow recommendations for exclusive breastfeeding (Nina et al., 2012). Likewise, another study observed that some mother's comprehension of the term "exclusive breastfeeding" was limited, many expressed doubts regarding the quantity and quality of breastfeeding as well as whether their baby would be able to survive on breastmilk alone for six months (Wen et al., 2012). The literature concluded that breastfeeding initiation and duration may be improved by raising mothers' awareness of the recommendations (Nina et al 2012; Wen et al., 2012). Breastfeeding must be viewed through the lens of health literacy to ensure that parents know enough about it,

how to use the information to assess their situation, and access resources when needed to meet their breastfeeding goals. The lens of health literacy refers to being able to access, understand and use information to produce a health outcome and this can be applied to breastfeeding (Johnston et al., 2015).

### **2.3 Online Resources**

According to Romano (2017), there is much evidence that supports the fact that online resources are a popular way of accessing information when needed. Statistics show that 16% of new mothers and 13% of mothers that have been pregnant before stated that the internet was the most used platform to find any type of information (Romano, 2017). In the perinatal period, the three most frequent reasons given by women for using the internet were to research topics independently, to look for particular infant symptom information and to learn more about subjects that were already covered by health care professionals (Slomian et al., 2017a). In fact, on average, expecting parents explored the internet 20 times a day to obtain pregnancy and birth information while the mothers were pregnant (Romano, 2017). According to the literature, the prenatal period is a crucial time for information. More than 90% of the women in Slomian et al's (2017a) study acknowledged that they still had looked for information about themselves or their babies after giving birth (Slomian et al., 2017a). Online searches that use the term "breastfeeding" is seen on millions of websites across the world wide web (Angell et al., 2015). This is clear evidence that people are interested in knowing about breastfeeding, so they turn to the internet to seek information. Choosing the right resource which is accessible, comprehensive and contains the most up to date information may be a challenge some people face. Although a lot of women utilized the internet to research

topics, they found not all material to be trustworthy, even though there were many credible sources. Most women reported the material they discover online is somewhat helpful (Slomian et al., 2017a). A systematic review conducted by Almohanna et al. (2020) found that the mode of delivery plays an important role in how effective it is for the target population to comprehend the information being delivered. Web-based platforms were used more frequently than print information, as they were the most effective method of delivering breastfeeding information to parents (Almohanna et al., 2020). In Goetz et al. (2017) study, it was evident that women required access to pregnancy-related information that had been independently scientifically verified. The expectant mothers emphasized the need for a user-friendly interface in web-based applications and mobile apps (Goetz et al., 2017). Similarly, to women, the literature states that reaching out to men during the prenatal stage through the use of online resources would be beneficial, because most new/expectant dads are interested in knowing how to support their partners' health throughout pregnancy and advance the health of their unborn children (Mackert et al., 2018). The literature further states that online resources make it possible to reach difficult-to-reach populations, such as fathers, to inform them of crucial information that may potentially help them in the care of the mother and child (Mackert et al., 2018).

Furthermore, a study conducted by Laws et al. (2023) mentioned that there were evident improvements in participant's post-partum breastfeeding attitudes as a result of using online resources such as apps during pregnancy. Likewise, the literature suggests that through observational learning and encouragement, online health information-

seeking behaviours (HISB) may contribute to improved breastfeeding outcomes (Yang et al., 2021).

## **2.4 The Logic Model**

In program evaluation, a logic model represents a graphic portrayal of how a program works and what the outcome is according to its process (Hayes et al., 2011). Moreover, quality initiatives are the improvements made in the process and practice of health care to obtain optimal patient care (Abdallah, 2014). They are organized to find solutions, maximise proficiency and reduce poor performance (Abdallah, 2014). In this project, the logic model is used as a framework to improve the quality of the breastfeeding eHealth resource to be used in clinical practice. The logic model starts from the target population, the breastfeeding parents, and then it looks at possible assumptions of the participants (Hayes et al., 2011) by asking the following questions: What information do breastfeeding parents want? How do they want to receive this information? The logic model then determines resources to meet participants' needs (Hayes et al., 2011). Will healthcare providers give breastfeeding information in clinical practice to parents by introducing and using the eHealth breastfeeding resource created by Abbass-Dick et al. (2017; 2018; 2020b; 2021). Then the activities section of the logic model is explored to see what services/interventions can be provided to meet the needs of the participants (Hayes et al., 2011). In this case, the activity would be the healthcare professionals using the eHealth breastfeeding resource (*Breastfeeding Information for Parents*, 2020) in clinical practice for their patients. The output of the logic model (Hayes et al., 2011), involves the products/interventions of each participant (Hayes et al., 2011), which in this case refers to, the types of services the patient needs, and at which stage

(pre/post birth). Lastly, the logic model ends with the outcome of the program (Hayes et al., 2011): increased breastfeeding knowledge and health literacy through provision of comprehensive, accessible information with reliable solutions to problems faced by parents during breastfeeding. This model is an effective way to plan and evaluate the program as well as engage participants making it a successful tool to understand what is working well within the program and what areas require improvements (Hayes et al., 2011). See figure 1 for the logic model diagram. The project addresses the “Resources/Challenges” sections of the logic model (Hayes et al., 2011). If the online eHealth breastfeeding resource is up to date and contains comprehensive, accessible, and reliable information for parents, the outcome is likely to be positive, meaning that parents will be able to make informed breastfeeding decisions.

**Figure 1:** The Logic Model: eHealth breastfeeding resource

Target Population	Underlying Assumptions	Resources/ Challenges	Activities	Outputs	Outcomes
Breastfeeding Parents (Hayes et al., 2011)	What breastfeeding parents want, how do they want this information  (Hayes et al., 2011)	Will healthcare providers give breastfeeding information in clinical practice to parents by introducing and using the eHealth breastfeeding resource created by Abbass-Dick et al (2021; 2020b; 2018; 2017)  (Hayes et al., 2011)	Healthcare professionals using eHealth breastfeeding resource in clinical practice for patients  (Breastfeeding information for parents, 2020) (Hayes et al., 2011)	Types of services the client needs, which stage (pre/post birth)  (Hayes et al., 2011)	Increased breastfeeding knowledge and health literacy through the provision of comprehensive, accessible information with reliable solutions to problems faced by parents during breastfeeding  (Hayes et al., 2011)



## 2.5 The Gap in the Literature

Browsing the internet for breastfeeding information is common for parents during pregnancy and after birth, but some women have reported that the information they find is frequently incorrect or missing details (Slomian et al., 2017b). Women want health care providers to suggest reliable eHealth sources for them to use (Slomian et al., 2017b). This supports the need for health care providers to refer patients to reliable eHealth resources during clinical interactions. However, the gap in the literature is that there is very little research about what health care professionals think about eHealth resources designed for use in their clinical practice. The literature gives some insight into health care professionals' use of online resources in clinical practice, as Lialiou and Mantas (2016) reported that health care providers display a low rate of using these online resources in their own practice. The reasons include lack of training in retrieving information they need and having no time (Lialiou & Mantas, 2016). However, some health care professionals expressed an interest in accessing online eHealth resources in the future (Lialiou & Mantas, 2016). This suggests that it is important for health care providers to have access to eHealth resources that health care providers will be willing to utilize in their clinical practice, such as that created by Abbass-Dick et al. (2012; 2017; 2018; 2020b). Evaluation studies with this co-parenting breastfeeding resources found participants appreciated being informed of the breastfeeding educational resource and guided through how to use it to find breastfeeding information with the research assistants delivering the interventions (Abbass-Dick et al., 2015; 2020b; 2023). This suggests having health care providers introduce this information in clinical interactions

would be well received by parents, thus, making it important to determine health care providers' perceptions of such resources.

## **2.6 Conclusion**

Overall, in the review of literature, the main concepts explored included (1) the significance of the role of healthcare providers in connection to their patients who are expecting children and their understanding of breastfeeding (Brandstetter et al., 2020; Laantera et al., 2010; Shaw & Devgan, 2018;), (2) exclusive breastfeeding practices and its connection to health literacy (Ihudiebube-Splendor et al., 2019; Raheel & Tharkar, 2018; Stafford et al., 2021), (3) breastfeeding recommendations and if mothers were aware of them (Nina et al., 2012; Wen et al., 2012), and (4) online electronic health resources (eHealth) and their use with expectant parents in the perinatal period (Almohanna et al., 2020; Goetz et al., 2017; Laws et al., 2023; Mackert et al., 2018; Slomian et al., 2017a; Yang et al., 2021). The logic model (Hayes et al., 2011) was used as a framework to guide the project. Each of its elements were explained and connected to eHealth breastfeeding resources (Abbass-Dick et al., 2017; 2018; 2021; 2020b). The current project focused on the "Resources/Challenges" section of the logic model. After reviewing the literature, the gap in the literature is that there is scarce research about healthcare professionals' perceptions in using eHealth resources in their clinical practice. There seems to be information on parents' interest in using eHealth resources for breastfeeding information, but there is little to no findings on healthcare professionals' perceptions for the acceptability of the eHealth resources for use in their clinical practice, specifically the eHealth resource created by Abbass-Dick et al. (2017; 2018; 2020b; 2021).

## **Chapter 3- Methodology**

### **3.1 Design**

This project began as a thesis, designed as a cross-sectional exploratory descriptive study for which Research Ethics Approval was received (Appendices A-G). Due to the difficulties with recruitment during COVID, and for personal reasons, the switch was made to complete the project stream and to report this study as a component of program evaluation to align with scope and expectations of a MHS Sc Major Paper/Project compared to Thesis. This project was conducted as a program evaluation to investigate health care providers' perceptions of a newly revised eHealth breastfeeding resource, an online tool designed for use in clinical practice to increase breastfeeding health literacy. This is part of a program evaluation, as this tool will be used in breastfeeding promotion programs in health care organizations. A program evaluation is a collection of data about the events, characteristics and results of the program to make decisions and suggest improvements that can be made to make it more effective and/or advise on certain decisions for future program development (CDC, 2012). Data collection was done using a cross-sectional survey. The evaluation data collection started in May 2021 and ended July 2021 and was collected via a virtual survey using Google Forms, which is available in the Appendix E.

### **3.2 Sample**

The sample size was intended to be 50 participants, but due to the COVID pandemic the participant recruitment was challenging and the final sample size was 14 participants. Convenience sampling was used, this type of sampling is a particular non-probability sampling technique that collects data from population members who are readily available to take part in the study (Business Research Methodology, n.a). This type of sampling is a

technique used in qualitative research and it was used because it helped in facilitating data collection in a short time period. It was also easy to use and it was the most inexpensive sampling method available (Business Research Methodology, n.a). The participants were asked particular questions about the eHealth resource to help the program lead to understand the negative and positive components of the eHealth resource for use in clinical practice to educate on breastfeeding. The inclusion criteria indicated participants had to be health care providers or lay support workers that worked with families at the transition to parenthood or worked in the management of such service programs. They had to be in Ontario, Canada with access to a device and internet in order to review the eHealth resource and complete the online survey.

### **3.3 Recruitment**

Participants were recruited through online communication in the following ways:

- (1) Listservs: Best Start (<http://en.beststart.org/services/information>), Maternal newborn and child health promotion network, Best start Indigenous sharing circle network.
- (2) Social media sites of the Ontario Midwives. The Midwives posted information on the project on their social media.
- (3) Email to health care providers at Lakeridge Health.

### **3.4 Study Procedures**

The recruitment email included the program evaluation information, eligibility criteria, and contact information for the student lead. Those interested were encouraged to contact the student lead via email. Once the email was received, the project information which provided a detailed description of the project was sent via email with a link to the

online consent form. Once the consent form was completed, the participants received the link to the eHealth resource and were asked to confirm access via an online questionnaire. The participants were informed that the link to the online survey would be sent in a follow-up email that was to be completed after reviewing the resource. The survey link was sent 2 days after the eHealth resource was provided with a reminder email sent at 7 days and at 14 days. Participants email address were collected in order to send a \$10.00 egift card, (Winners/Homesense, Walmart, Indigo or The Ultimate Dining Card).

### **3.5 Types of Measurements**

The survey included questions about the design, content, breastfeeding health literacy, usability, technical difficulties, credibility, system usability scale and general perceptions of the eHealth resource. The online, self-report survey took approximately 20 minutes to complete. Measures chosen are consistent with those used with Jennifer Abbass Dick's previous evaluations. The baseline demographic variables were chosen from previously published literature (Abbass-Dick et al., 2020b). Additional measures were the Usability Scale (Usability.gov, 2021) because it is a commonly used measure to evaluate eHealth resources. The credibility measure was also used, it was created by Health on the Net code of conduct (Health On The Net, 2019) and is a commonly used measure to determine credibility of online resources for healthcare providers use.

*Baseline demographic variables:* A baseline questionnaire was used to collect data regarding the manner in which participants worked with childbearing families, their professional role, time in the perinatal period and how they preferred to provide breastfeeding education. There were 9 questions in total in this section and were similar to those used by Abbass-Dick et al. (2020b).

*Use of eHealth Resource* There were a total of 4 questions that asked about the use of the eHealth resource. It asked about how often they used the resource and the duration. To rate the eHealth resource the question's response were on a scale from 1 to 5, where 1 is the lowest and 5 is the highest. Participants were asked how thoroughly they reviewed the 7 main sections on the website which included Why breastfeed, How to breastfeed, The Early days, Father & partner, Common concerns, Getting help and Early life.

*Design* There were a total of 24 questions that asked about the design of the eHealth resource. Questions 1-11 provided response options in a 5 point-Likert agreement scale that included options strongly agree to strongly disagree and asked about the organization, innovation, layout and appearance of the eHealth resource. Questions 12-22 had questions regarding the delivery method which included text, narration, videos (parents, animations, healthcare professional), illustrations, eBooks, links & quizzes. These were assessed using a 5-point Likert scale ranging from very helpful to I did not use this feature. Question 23 was a multiple-choice selection question regarding which delivery method was the most helpful. The options were: text, narration, videos of information with narration, photos and animation, videos of parents describing their experiences, videos of professionals explaining breastfeeding, videos of cartoon animations, links to other content on the internet, illustrations, games, quizzes & other. The last question in this section was open-ended asking for additional comments about the delivery method. These questions were consistent with those used by Abbass Dick et al. (2020b) in their randomized control trial.

*Content* There were 18 questions in total in this section based on the information provided in the eHealth resource. These questions were tailored to determine the participants perceptions of the content for use in breastfeeding education. (Abbass Dick et

al., 2017; 2020b). Questions 1-6 were on a 5 point-Likert agreement scale that included options strongly agree to strongly disagree regarding how informative, interesting, up to date, and comprehensive they found the resource. Question 7 was an open-ended question for additional comments about adding certain content to the eHealth resource. Questions 8-16 asked how helpful the participant found each of the 7 main sections in the eHealth resource. Question 17 asked about which of the main sections were considered most important and question 18 asked about topics that were perceived to be most beneficial in providing patient education.

*Breastfeeding Health Literacy* There were 9 questions in this section. Health literacy questions were referred to the resource's ability to assist parents in accessing, comprehending and analyzing information as well as accessing resources when needed and were created to align with the components of health literacy presented by Osborne et al. (2013). Questions 1-8 were regarding how accessible, credible, sufficient and presentable the information in the eHealth resource was. These questions used a Likert scale with responses ranging from strongly agree to strongly disagree. Question 9 was an open-ended question which asked "Do you have additional information on how this eHealth resource could be improved to increase breastfeeding health literacy in childbearing families?".

*Usability/Navigation* There were 10 questions in this section which all asked about the navigation of the eHealth resource. Questions 1-7 were regarding how easy or not easy the navigation elements were including searching, table of content, technical instructions and buttons/arrows on screen. Question 8 was open-ended regarding any difficulties with

navigation. Question 9-10 asked about web browsers and operating systems used, with response options provided in a multiple-choice format.

*Technical Difficulties* There were 6 questions in this section regarding the technical difficulties faced while using the eHealth resource. Question 1 was multiple-choice with a second part being open-ended to express what difficulties, if any, were faced. Questions 2-4 were regarding the 7 main sections – the questions asked about the links, audio or videos. Question 5 was regarding the technical difficulties in the interactive components of the eHealth resource including Ebook, games and quizzes. Question 6 was an opened ended question regarding an additional technical difficulty faced in the sections of the eHealth resource.

*Usability Scale* There were 10 questions in this section created using the System Usability Scale (Usability.gov, 2021). The questions were formatted in a 5-point Likert scale ranging from strongly agree to strongly disagree. Some of the components the questions targeted included (1) frequency, (2) complexity, (3) easiness, (4) integration, (5) design, (6) difficulty of usage, (7) comfort of use, and (8) confidence.

*Credibility* There were 3 questions in this section created using Health on the Net code of conduct (Health On The Net, 2019). Questions 1-2 used a Likert scale ranging from strongly agree to strongly disagree. Question 1 targeted the following: (1) authenticity of information; (2) communications with HCP; (3) identity protection, (4) reference acknowledgment; (5) credible sources; (6) information consistent with best practices (7) visibilities of authorship/sponsorship; (8) included legible medical disclaimers and (9) email contact availability. Question 2 asked if information was: (1) comprehensive; (2) high quality; (3) included various populations; (4) prenatal and



postnatal information; (5) was accessible; (6) was convenient and (7) cost effectiveness. Question 3 was open-ended and asked to compare the eHealth resource to other publicly available breastfeeding resources.

*General Perceptions* There were 8 questions in this section that were open-ended. They involved questions around most and least preferences/features of the eHealth resource, what could be changed, different way of providing the information and use in clinical interactions.

### **3.6 Use and Storage of Data**

The survey was completed by participants and was anonymized, i.e., no personal identifying information was collected on the form. The participants' email address was collected on a separate email and mandatory if the participant wanted to receive an e-gift card. Gift cards were offered and sent to participants that consented and provided an email address. There was no way of linking this information to the survey as they were completed on a separate form. The participant ID and content information was kept in a password protected encrypted file. The data files were in a University Google drive on a secure server, which could be shared as needed in a secure manner with the project team.

## **Chapter 4- Results**

This chapter will present the data collected from healthcare professionals via a self-administered online survey. In program evaluations findings are communicated to the individuals that ordered the evaluation and they are given feedback in order to improve the overall program (Fraser Health, 2014). Similarly, in quality improvement reports the conclusions are presented with the summary of the most relevant findings (Wong & Sullivan, 2016). The results will be presented starting with participant characteristics, then the data will be divided into categories that include (1) use of the eHealth resource, (2) design, (3) content, (4) breastfeeding health literacy, (5) usability, (6) technical difficulties, (7) credibility, (8) system usability scale and (9) general perceptions.

### **4.1 Participant Characteristic**

A sample of 14 participants consented and completed the online eHealth survey that was sent via email. All participants were HCPs. Twelve of the participants were mothers; one was a co-parent and one was neither a mother or co-parent. Most were public health nurses, along with some lactation consultants. Ten of the health care providers were community based while three were hospital based and one did not respond to this question. There was a balanced variety of results when it came to how they provided services to clients. Half of the participants provided telephone and online based services, while the other half provided in person services. Most of the health care professionals said that both prenatal and postnatal were important stages to provide breastfeeding information to parents. The majority of the participants suggested that online, print forms and verbal information during appointments were the platforms of information delivery that should be recommended to parents. Many breastfeeding

resources were suggested by the healthcare professional, but the most common ones included La Leche League, public and community health units, International Breastfeeding Center, Best Start and Kelly Mom.

#### **4.2 Use of eHealth Resource**

It was indicated that after receiving the eHealth resource, half of the participants accessed the resource 1-6 times, while the other half viewed it 7-12 times. The duration of time that the eHealth resource was viewed ranged from 45 minutes to six hours, with 1-2 hours being the most common duration. Three health care professionals rated the eHealth resource as 5/5, while nine participants rated it as 4/5 and the remaining 3 participants rated it as 3/5. The eHealth resource *Breastfeeding Information for Parents* contained 7 main sections (Why Breastfeed, How to Breastfeed, The Early Days, Fathers, Partners, Family & Friends, Common Concerns, Everyday Life, and Getting Help). It was indicated that 46.2% of participants looked over the sections in detail, 23.1% briefly looked over these sections, 15.4% only looked at particular sections in detail, 7.7% briefly looked over some sections and reviewed some in detail, and 7.7% reviewed all sections briefly, a few in detail.

#### **4.3 Design**

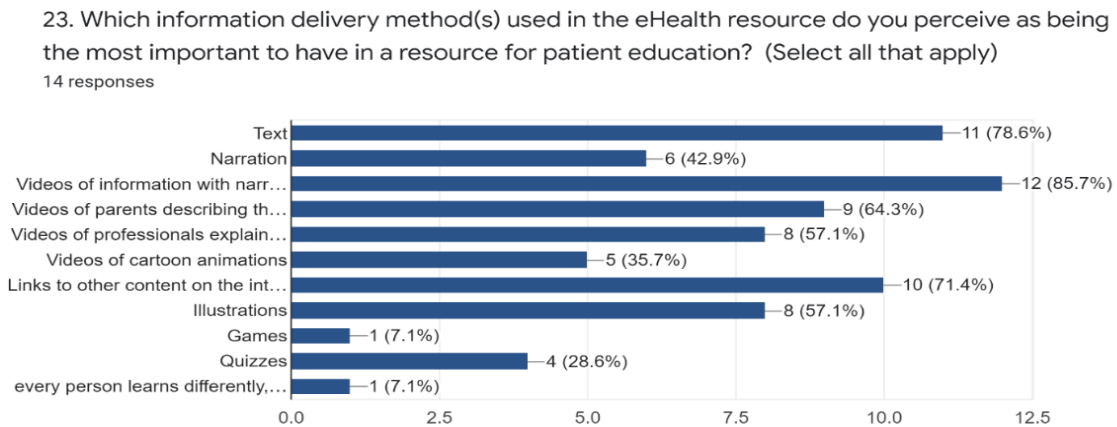
Participants provided feedback about the design of the eHealth resource. This involved how organized, innovative, interactive, understandable, easy to navigate, well laid out and representative of diverse cultures it was. Overall, participants agreed that the resource was well organized, innovative, navigable, well laid out, tailored to the population, focused on mothers and co-parents, and the images were diverse and culturally appropriate. One participant's comment referred to the appropriate use of

images, *“Love, love, love, everything else - the colours, pics, videos, narrations, etc. Awesome one-stop-shop. Will refer all my clients to this!”*. However, some had suggestions around the illustrations, for instance one participant said *“The latch illustration could be improved by showing more extension and cupping action of the tongue”*. Some participants thought the eHealth resource could be more interactive, the language could be simplified for better understanding, and the choice of colour could be improved. This is evident from one participant’s comment, *“Some sections contained very high reading level (one section I tested was gr 10). This will make the resource inaccessible to many”*. Even though some participants rated the resource as highly-diverse, there were some comments for improvements, as one participant stated: *“The resources, pictures, videos need to have more BIPOC [Black, Indigenous and people of colour] and less white faces of babies and their families”*. Likewise, another participant mentioned *“[we need] resources that are translated in other languages, increase the images of more diverse cultures throughout resource... still seems to be a bit heavy with white culture”*.

Health care professionals also provided their perception on the delivery methods. Overall, the participants perceived the information, text, narration and illustration of the delivery method to be a good way to deliver breastfeeding information. However, they suggested the video and narration could be improved. Videos of the healthcare professionals and parents were perceived to be well done. Videos of animations/cartoon needed improvements according to two participants. Health care professionals also suggested the links to other web-material, eBook and quizzes could be improved.

Most health care professionals suggested that videos of information with narration, photos and some animations were the best delivery methods used in the eHealth resources for patient education. In response to the question, “Please indicate how helpful you perceive the information delivery methods to be”, health care professionals selected ‘having easy to understand text’ and ‘links to other websites’ most often, suggesting these were highly rated elements of the eHealth resource. Some other components that ranked high included videos of parents describing their experiences, having good illustrations, and videos of professionals explaining breastfeeding. Things that were least preferred as delivery methods used in the eHealth resources included narration, videos of cartoon animations, games, and quizzes. Figure 2 indicates these

**Figure 2:** Preferred delivery method for eHealth resources



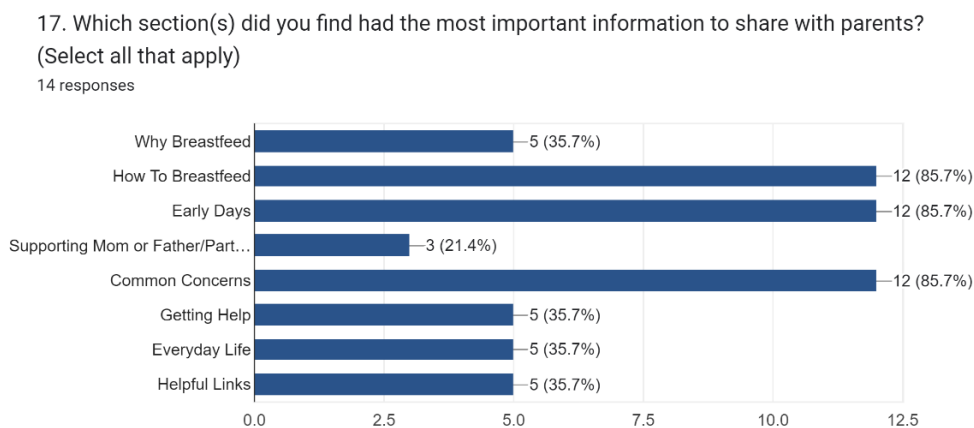
#### 4.4 Content

Health care professionals provided feedback about the content of the eHealth resource. Overall, participants agreed that the content was very informative, interesting and comprehensive. Health care providers agreed that the content was up to date, but a

few thought this area could be improved, for example one participant mentioned “*I absolutely object to prohibition of alcohol laid out in the Everyday Life section. This is not consistent with national guidelines*”. Some participants thought that some topics could be improved as to align with what they discuss in patient interactions regarding breastfeeding, for instance one participant suggested “*There was not a lot of information on reflux that I could see and lots of parents I find have questions about this*”. Likewise, another participant mentioned “*I could not find any info on pumping - it did not come up in a search and should at least be mentioned along with expressing*”. However, most health care professionals agreed that the content included in the eHealth resource would help them with patient teaching.

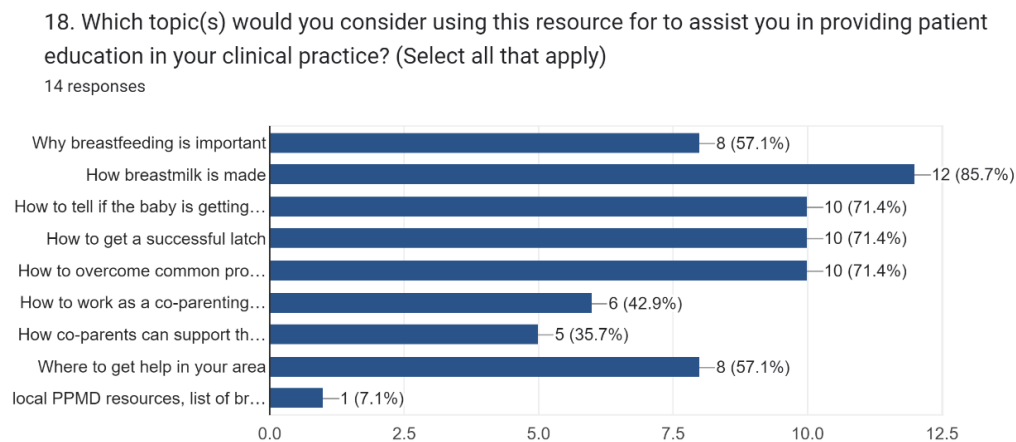
Overall, healthcare providers thought that the following sections would be the most helpful for perinatal families: Why breastfeed, How to breastfeed, Early days, Supporting mom/fathers/partners, Common concerns, Getting help, Everyday life and Helpful links. Health care professionals thought that the How to breastfeed, Early days and Common concerns sections contained the most important information to share with parents. The other sections were also seen as important but did not rank as high. This can be seen in Figure 3.

**Figure 3: Most Important Information to Share with Parents**



Healthcare professionals considered the topic “how breast milk is made” to be one of the most crucial elements to include in patient education in clinical practice. Other topics rated as important included how to tell if the baby is getting enough, how to get a successful latch, how to overcome common problems and solutions, why breastfeeding is important, and where to get help in your area. The three topics that were the least highly rated for healthcare professionals to include in patient education in their clinical practice were how to work as a co-parenting team, how co-parents can support a breastfeeding mom, and local postpartum mood disorders/depression resources. These results are presented in Figure 4.

**Figure 4:** Topics to consider to assist in providing patient education in clinical settings



Health care professionals agreed that the eHealth resource provided accessible and credible information for perinatal families and they thought that this eHealth resource was an important resource for them to introduce to parents in clinical practice to increase their breastfeeding health literacy. Half of the healthcare providers agreed the content was presented in a manner which was easy to understand, but the other half did not fully agree. Many participants expressed concern regarding the reading level of the text for a

health resource. For instance, a participant mentioned *“The information is vast and appears to be a high reading level”*. Likewise, another participant mentioned *“I think the literacy level in this resource is very high. We typically aim for Grade 6 reading level”*.

Some healthcare professionals did agree that the multiple ways of providing information will increase patient ability to comprehend the content, in particular the text narration feature. However, some participants commented on the language element, for instance a participant mentioned, *“Most of my clients are Spanish-speaking so I think maybe providing an amazing website, a translated version of it will reach more clients, aside from English-speaking ones”*. Similarly, another participant said, *“Additional information in many languages. I like that you included Cree and Ojibway. The resource has to connect with BIPOC so everyone can see themselves”*. Most healthcare professionals agreed that sufficient information to assist parents in knowing when to get help and where to get help 24/7 was included. However, one participant mentioned, *“It is hard for such a universal document to provide local resources but referring clients to their local public health unit may be helpful as well”*. Most health care providers seem to think there was sufficient information on overcoming difficulties in the eHealth resource.

#### **4.6 Usability**

Elements such as the table of contents on the first page, the page bar at the top of the website, buttons with topics at the top of each page, and having an arrow at the bottom to take you to the top of the page were all components that most healthcare professionals liked about the eHealth resource. However, the search feature’s ability to find specific content was posed as a difficulty for most healthcare providers. For instance, one participant mentioned *“I found it difficult to search for specific topics and the topics*



*were not always intuitively [located] in the section I expected*". Among participants responses, 30.8% found they had difficulty navigating the resource while 69.2% had no difficulty. A healthcare provider mentioned *"No difficulty navigating the resource, but just super busy and a lot to look at"*. Another mentioned *"the resource can seem a bit overwhelming, [with a lot] of information if not clearly explained by HCP or if client was to simply open resource on their own"*.

Most participants used Google Chrome as their web browser at (71.4%), while 21.4% used Microsoft Edge and 7.1% used their phones most of the time and finished by using Google Chrome on their laptop. Most participants used Windows 7+ as their operating system, or Windows XP, while 14.3% did not know what operating system they were using.

#### **4.7 Technical Difficulties**

Eighty six percent of healthcare providers did not experience technical difficulties while reviewing the eHealth resource, while 14.3% did. Three participants had technical difficulties with the content under "More", specifically with the *Why breastfeed* quiz, *How to breastfeed* quiz and *Early days* quiz. One participant complained about the website being frozen and having to refresh the page several times. While another participant had trouble playing videos, the participant mentioned *"since there are so many videos, when I played one video and opened another video, both videos continued on playing, so now I am listening to 2 videos"*.

#### **4.8 Usability Scale**

Most health care professionals strongly agreed or agreed that they would like to use this eHealth resource frequently. Likewise, most healthcare providers found the

resource to be easy to use. The majority of participants did not think they needed the support of a technical person to be able to use the eHealth resource. Most healthcare professionals found the various functions in the eHealth resource to be well integrated, only a few disagreed to this. There was a mix of opinion on the consistency in the design of the eHealth resource. Almost half of the participants thought the design of the eHealth resource was consistent, while the other half thought it was inconsistent. Most healthcare providers imagined that most people would learn to use the eHealth resource very quickly. The majority of the participants did not find the website awkward to use and most were confident in using it. Almost all of the participants did not need to learn a lot of components before they could get going with the system (website).

#### **4.9 Credibility**

Most healthcare professionals agreed that information is provided by qualified medical practitioners and organizations committed to the public's health. They also agreed that the eHealth resource encourages patients to discuss the health information with their care provider. The majority of healthcare providers agreed that the common breastfeeding problems presented in the eHealth resource were consistent with best practices. Some participants agreed and some were neutral about the user's identity being protected on the eHealth resource. However, this is an informational resource and no user information is collected. Most health care providers agreed that the website indicated relevant sources and references on the acknowledgements page. Likewise, most participants agreed that the sources used were credible and the authorship/sponsorship of the website as well as the medical disclaimer was obvious to users. Most users did not

find an email contact on the website, although it is located in the acknowledgements page.

When compared to other eHealth resources, the majority of participants thought this eHealth resource provided more comprehensive breastfeeding information, had somewhat of a higher quality in relation to being evidence informed, and appeared to be based on research. Most participants agreed that the eHealth resource targeted both mothers and their co-parents, and could be tailored to the needs of health care providers and families. They also agreed that it covered topics that are important both prenatally and postnatally. For example, a participant mentioned *“It is nice to have all this info available at one location for clients to access according to their needs”*. Most healthcare professionals thought it was more accessible for parents, had better information for patient teaching than other breastfeeding resources and the quality was better as well. There were mixed results on the graphics of the eHealth resources, as almost half agreed they were better, while the other disagreed. For example, a participant mentioned, *“there are 2 major content areas that I disagree with and would even say are harmful. The persistent use of the term “drinks” which [suggests] a bottle image to describe the suckling process by which babies receive milk at the human breast; and the prohibition on alcohol and breastfeeding”*. Despite this, most participants thought it would help them do a better job with educating breastfeeding parents and was more convenient, easier to use and cost effective than what was currently available. In general, healthcare providers thought this eHealth resource was more advantageous to use and a better option to provide to perinatal families than other resources. For instance, a participant mentioned

*“[It]has the interactive component that other resources don't have and [is] more focus[ed] on co-parents & families”.*

#### **4.10 General Perceptions**

Participants were asked to give their general perceptions of the eHealth resource, and indicated they thought the eHealth resource was easy to use, comprehensive, had good graphics and videos. Some liked the fact it was easy to navigate, they liked the use of different ethnic backgrounds in images and having all breastfeeding information in one place. Some disagreed and did not like the animation and suggested improvements, as well, searching for specific topics within the website was an issue for a few participants. Some participants were concerned about the volume of information in the eHealth resource and thought it could be overwhelming for parents. The participants did not mention exactly which parts of the eHealth resource they thought had a higher volume of information. Some participants brought up language barriers as well.

Some suggested changes the healthcare providers mentioned included: deleting duplicate information; adding information about reflux; condensing information to make it less overwhelming; and adding images that are more diversified. The layout was suggested to be improved for easy use on a mobile device. Some suggestions regarding additional ways to provide eHealth information included having a chat feature, having online breastfeeding courses/programs, and a low literacy version of the resource.

All the healthcare providers agreed to recommending this resource to be used in clinical interactions with healthcare providers and parents. For instance, a participant said *“It could be a very effective tool, but the HCP would have to be familiar with the content, layout to be able to do a decent job using it as a teaching tool/resource”.* The healthcare

professionals suggested several ways in which they would use the eHealth resource in their clinical interactions in the perinatal period. These included, using it with the nursing team so they could provide it to their patients that are ready to go home with their baby. It was suggested to be used as part of the hospital's video network. Similarly, a participant suggested it be used on iPads while waiting for the physician. Another participant mentioned "*[it could be used]in my hospital and private based breastfeeding class, adding into our teaching handouts etc. And post partum to refer to as a guide for helpful EB [evidenced-based] info*".

## **Chapter 5- Discussion**

The main goal of this project was to determine health care professionals' perceptions of an eHealth resource created by Abbass-Dick and colleagues and determine their perceptions of its appropriateness for use in clinical practice. It was important to determine if health care providers approved of the design, content and usability of the eHealth resource. The literature states that if an eHealth resource does not meet the expectations of the health care professional, there is a likely chance that the resource will not be used (Granja et al., 2018). The literature emphasizes how crucial healthcare professionals' role is in the facilitation of breastfeeding, because their child bearing patients need reliable information in order to make informed breastfeeding decisions (Laantera et al., 2010). From the literature search, some health care providers were not giving breastfeeding support service information to their patients (Brandstetter et al., 2020). This was supposedly due to the fact healthcare professionals did not have reliable support services to provide to their patients and may not be aware or have sufficient knowledge to provide such information (Brandstetter et al., 2020; Shaw & Devgan, 2018). This suggested the need to have the eHealth breastfeeding resource validated to ensure the resource is reliable and contains updated information so healthcare professionals can use it in clinical practice. A program evaluation approach was taken to determine if the eHealth resource was accepted by health care providers in terms of its credibility, accessibility and comprehensiveness so they could use it with their perinatal patients to provide education and potentially increase breastfeeding health literacy. The literature states that social media and other online resources may facilitate the provision of tools and knowledge to help parents feed their children either at the breast or with a

pump (Yang et al., 2021). This emphasises the need for authentic and updated online resources to be introduced in clinical practice. Overall, the results suggested that the eHealth resource was a great tool to be used in clinical practice but they did suggest some areas where it could improve on. Nine major categories were evaluated which included (1) usage, (2) design, (3) content, (4) breastfeeding health literacy, (5) usability, (6) technical difficulties, (7) credibility, (8) system usability scale and (9) general perceptions.

In terms of the usage of the eHealth resource, it was clear that the health care professionals were interested in using the eHealth resource. This can be seen with the usage rate, as 46.2% of individuals went over each of the 7 main sections of the website in detail, and rated them highly. These findings suggest that HCP are interested in using the eHealth resource which could translate to the acceptance to use in their clinical practice. The design of the resource received positive feedback from the health care providers, they liked how organized, innovative, interactive, understandable, easy to navigate, well laid out and representative of diverse cultures the resource was. However, the area some suggested to improve was the illustration of the process of latching and cupping with the tongue. According to Krasnoryadtseva et al. (2020), adding illustrations can help with understanding of health information. For instance, cupping would be illustrated through step-by-step images of an infant's tongue correctly latching on to the breast to achieve milk secretion (Krasnoryadtseva et al., 2020). Hence, this was suggested so parents can understand and mimic this action for a positive breastfeeding experience. The language was another area where suggestions for improvement were made, as some participants thought the resource was written at a high reading level. This is not

consistent with previous feedback regarding the eHealth resource received by parents as they thought the language was written in “plain English” (Abbass-Dick et al., 2017). This may be related to the study sample in Abbass-Dick et al.’s (2023) publication where 97% of the 101 intervention group participants thought the eHealth resource was written in plain English. Most of these participants had a high education level – over 80% of mothers and 64% of co-parents had a degree (Abbass-Dick et al., 2023). The literature suggests that health information should be written at a grade 6 level, however, most eHealth information in North America uses inappropriate levels of writing for public use (Daraz et al., 2018). Although the narration feature can assist with addressing this issue, elements of the breastfeeding eHealth resource should be reviewed to determine if the language needs to be written using a lower grade level to promote better understanding of the content. Moreover, most professionals agreed that the resource was culturally appropriate, but one participant thought it was more white-driven and should include additional images of Black, Indigenous and People of Color. This is also not consistent with previous feedback of the eHealth resource as most parents thought the resource displayed a diverse culture population (Abbass-Dick et al., 2018), as the resource includes images of culturally diverse families and has a section specific for Indigenous families. The literature states that BIPOC have been identified as underrepresented in many areas including healthcare (Crooks et al., 2021; Institute for Canadian Citizenship, 2022). This suggested that although the eHealth resource was identified as culturally diverse in previous evaluations, there may still be a need to evaluate areas where improvements to cultural representation of BIPOC groups can be made.



The overall delivery methods provided by the eHealth resource were liked by the healthcare providers. The literature states that health care professionals thought using technologies in the health care sector such as eHealth resources was a great way for patients to have control over their own health (Carlqvist et al., 2021). The literature suggests that eHealth interventions can be a successful strategy to address public health concerns and reach non-traditional populations, such as fathers (Mackert et al., 2018). This ensures that breastfeeding information can not only target mothers, but also fathers and coparents as well. Since most online eHealth resources can be accessed through the use of mobile devices, the literature states that this can make it a practical and acceptable source of anticipatory assistance for breastfeeding throughout the perinatal period (Almohanna et al., 2020; Laws et al., 2023). The concern around improving the videos of the eHealth resource that contained animations was not an issue that arose in previous feedback of the resource (Abbass-Dick et al., 2017; 2023). However, the results indicate that healthcare professionals thought the best delivery methods were videos of information with narration, photos, and some animations – this was consistent with previous feedback about the resource obtained from parents (Abbass-Dick et al., 2017; 2023).

The content was perceived to be well written, however, the major concern that some professionals addressed was around some areas that needed to be updated. For instance, one participant indicated that the alcohol prohibition was not in alignment with national guidelines and there was no information on pumping and infant reflux. According to the low-risk alcohol drinking guidelines of Canada, alcohol is said to be avoided during pregnancy and when breastfeeding for up to 3 months, but it is not

prohibited (Canadian Centre on Substance Use and Addiction, 2018; Government of Nova Scotia, n.d). This suggestion does align with the information in the breastfeeding resource because under the “Everyday Life” section, alcohol is recommended to be avoided when breastfeeding, however, there is no mention of prohibiting alcohol in the resource and the link to Mixing Alcohol and Breastfeeding provides information on the topic from a Provincial organization which develops educational materials for the perinatal period (Best Start, 2018; Breastfeeding Information for Parents, 2020). The literature found that most women agreed that health practitioners should recommend appropriate and trustworthy internet websites where mothers can access pertinent information regarding the postpartum period due to the unreliability of some websites (Goetz et al., 2017; Slomian et al., 2017a). This places emphasis that the content of the eHealth resource should be up to date and contain the most reliable and scientifically validated breastfeeding information.

The three sections of the eHealth resource that health care providers thought were most important included How to breastfeed, Common concerns and Everyday life. These sections seemed crucial to health care providers because they were the most common areas discussed with perinatal families, as recommended by leading health authorities (WHO, 2016). These areas of the eHealth breastfeeding resource focus on concepts that most parents face on a day-to-day basis which is why they rank as the most important sections. For instance, the basics of how to initiate breastfeeding, the difficulties associated with breastfeeding techniques and breastfeeding while tackling day-to-day life routines are all areas that most parents come across (Gustafsson et al., 2022). The element of how breastmilk is made was ranked as very important. From this piece of information,

it can be suggested that healthcare providers want patients to know and understand the biological aspect of breastfeeding. This may be because it will educate the patients of why they may be having trouble with breastfeeding. If parents are unaware of the breastfeeding guidelines, don't think compliance is possible, or don't think noncompliance will have serious health effects, they cannot be expected to follow the advised breastfeeding recommendations (Nina et al., 2012; Wen et al., 2012). Other elements were important as well, but this was the most significant according to most health care providers. Furthermore, this is not in the Canadian school curriculum and historically North America had a bottle-feeding culture and therefore many people do not know how breastfeeding works (Reyes et al., 2018). It is suggested that breastfeeding education should be introduced in the high school curriculum so students can make informed breastfeeding decisions if they experience this in their life (Abbass-Dick et al., 2022). As found in the literature breastfeeding was not seen as useful by some young moms; instead, they saw it as an inconvenience. Thus, this emphasizes the necessity of educating the younger mothers about the advantages of breastfeeding (Ihudiebube-Splendor et al., 2019; Raheel & Tharkar, 2018)

Some healthcare professionals suggested that to enhance health literacy, the reading level should be improved and made simpler. This was also prevalent in the literature, it was crucial to have oral and written patient education materials of an acceptable health literacy level (Stafford et al., 2021). The healthcare professionals also suggested for the resource to be available in different languages in order for it to be accessible for a diverse population that do not know the English language. The eHealth resource does incorporate some links to Indigenous language materials, but this is an area

that can be improved as suggested by health care providers. According to Statistics Canada (2017) there are approximately 70 different First Nations languages that are spoken across Canada (Statistics Canada, 2017), but including all these languages is not feasible. Having more languages and links to culturally diverse content within this resource is an area of improvement that can continue to be developed, to meet the needs of the multicultural patient population in Ontario. Another concern raised was that the eHealth resource did not contain a print option available on its page – this suggests that some professionals may be interested in specific components of the resource and would want a paper copy to use in clinical interactions and give to their patients.

Although most health care professionals seemed to have no difficulty using the eHealth resource, difficulties were reported by 30.8%. The problems they were facing were mostly related to the fact they could not easily search for content; they often ended up finding certain concepts they entered as key words in the search in sections of the resource they did not expect the information to be in. The overwhelming amount of information was also noted as a concern by some professionals. The literature states that too much information in patient education can lead to anxiety, confusion and possibly no extraction of information at all (Wang & Voss, 2022). This suggests that some information may need to be concise or presented differently to seem less overwhelming to look at (Wang & Voss, 2022), and most importantly, designed and evaluated with diverse parent groups to ensure it is meeting their learning preferences.

Technical difficulties are bound to occur sometimes when using the internet as the literature states that individuals that use health technologies face some barriers due to tech literacy and technical difficulties (Herrera et al., 2022). Some professionals

complained that certain pages froze while attempting to navigate, but the majority had no issues at all. In terms of the eHealth resource and its usage, participants displayed a low level of difficulty. The only minor concerns were around the design of the resource, which would be addressed in future reconstruction of the website. The credibility of the eHealth resource was highly rated by healthcare providers, they thought the information came from authentic sources. The only component that they thought was missing from the resource was an email contact for reference. On the acknowledgments page of the eHealth resource, there is an email address but this feedback suggests that it may need to be moved so it is more accessible and easier to locate.

In comparison with other eHealth resources, health care professionals ranked this resource higher in all aspects evaluated. They thought that along with its informative content, it was more accessible to patients than their current resources. General perceptions of the healthcare providers were mostly positive. One suggestion to enhance the resource included the addition of a chat feature in order for patients to interact with professionals. According to the literature, chat features are an indirect way of communicating and is a valued component in eHealth resources as they help in providing information to the patient that may not be present on the eHealth resource itself (Carlqvist et al., 2021). Nevertheless, this type of resource is designed to provide information for patients to self-manage common concerns and provides information on how to access additional support when needed. A few participants suggested providing this eHealth resources in different areas of the hospital such as in the hospitals video network and waiting rooms.

## **5.1 Strengths/Limitations/Future Implications of this Program Evaluation**

The strengths of this program evaluation included the use of evidence-based resources and large reach in recruitment methods enabling those health care professionals who wanted to provide feedback to participate. Moreover, the program evaluation used measures based on validated tools previously used in literature. The limitations of this program evaluation included low participation rate, with COVID-19 impacting health care professionals' ability to take time out to respond to the email and review the eHealth resource and complete the survey. In order to increase the survey rates, it is suggested to pay attention to the access problems, motivation and cognition of the target population when designing the survey questions (Selm & Jankowski, 2006). It is also suggested to have open ended questions in the survey as this may increase participation, which were included in our online survey (Selm & Jankowski, 2006). Future research should be conducted when there is less stress on the target population, such as avoiding at the time of a pandemic, this would potentially increase survey rates. A different approach in study design could potentially give more detailed results, perhaps using a mixed method, or qualitative design to explore HCPs' experiences. Additionally, a Delphi method could be used to gather information from various stakeholders as to determine best practices related to eHealth use to provide breastfeeding education and support (Nasa et al., 2021). Since eHealth resources are progressively being used to deliver breastfeeding information and support, determining the best way to implement them in practice is warranted. This study illustrated the acceptance of the eHealth breastfeeding resource by HCPs in their clinical practice. Therefore, it can be suggested the eHealth resource be incorporated into

breastfeeding interventions in the perinatal period as it could benefit not only the parents but also HCPs in the delivery of breastfeeding information.

## **Chapter 6- Conclusion**

Overall, the findings from the program evaluation suggest minimal revisions are needed based on the feedback received, some suggestions could be considered in further edits and revisions of the eHealth resource created by Abbass-Dick and colleagues. Moreover, the findings indicate that health care professionals are willing to use this eHealth resource in their clinical practice. Additionally, these findings suggest that the information presented in this eHealth resource is accessible, credible, comprehensive and uses engaging delivery methods for communicating breastfeeding information to diverse populations. Health literacy is crucial for preserving patient-provider trust and ensuring that everyone has access to the greatest level of health care. Valuable feedback was obtained to be taken into consideration in future revisions to the eHealth resource for use in clinical practice. Future evaluations can include diverse groups of parents and health care professionals and focus on the use of the eHealth in clinical practice settings to increase breastfeeding health literacy and rates.



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## APPENDICES

### Appendix A – Advertisement Email

**Subject:** Healthcare Professionals Needed for Breastfeeding Research Study

Hello,

Hope this email finds you well.

Do you work with childbearing families as a healthcare professional or care provider? Do you work with breastfeeding women? Would you like your patients to have high breastfeeding health literacy to help them meet their breastfeeding goals?

If so, we want to hear from you.

“Breastfeeding Information for parents” has recently been revised. We are looking for care provider’s who work with childbearing families to provide feedback on our evidence informed eHealth breastfeeding resource, designed to increase parents’ health literacy. Health literacy refers to accessing, understanding and using resources to meet health goals.

You are invited to participate in this research study led by Principal Investigator (PI) Dr. Jennifer Abbass Dick and student lead Sidra Azam from Ontario Tech University. The committee members include Dr. Ginny Brunton and Dr. Manon Lemonde.

The purpose of the study is to evaluate a newly revised online breastfeeding eHealth resource, which has been **designed for health care providers use in clinical practice** with diverse childbearing families. The aim is to obtain feedback about the online resource from health care providers who work with childbearing families, in particular professionals and individuals who provide support to breastfeeding women.

A poster has been attached to this email. This study was approved by the Ontario Tech Research Ethics Board REB [# 16340].

If you are interested in participating in this research study, please contact the student lead, Sidra Azam at [sidra.azam@ontariotechu.net](mailto:sidra.azam@ontariotechu.net) for complete study details.

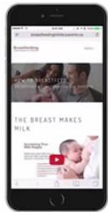
We look forward to hearing from you.

Kind regards,

Student Lead: Sidra Azam  
[Sidra.azam@ontariotechu.net](mailto:Sidra.azam@ontariotechu.net)

Principal Investigator (P.I): Dr. Jennifer Abbass Dick  
[Jennifer.AbbassDick@ontariotechu.ca](mailto:Jennifer.AbbassDick@ontariotechu.ca)

Attachment:



Are you a health care provider that works with childbearing families?

We want your feedback on our newly revised website

## “Breastfeeding information for parents”

This resource was designed to increase parents’ health literacy and to be used by health care providers in clinical practice to provide breastfeeding education and support. Health literacy refers to accessing and using resources to meet breastfeeding goals.



If you are interested in participating in our study,  
please contact Sidra Azam for the full study details.

Student Lead: Sidra Azam  
Email: [sidra.azam@ontariotechu.net](mailto:sidra.azam@ontariotechu.net)

Principal Investigator: Dr. Jennifer Abbass Dick  
Email: [Jennifer.AbbassDick@ontariotechu.ca](mailto:Jennifer.AbbassDick@ontariotechu.ca)



This study was approved by the Ontario Tech University Research Ethics Board REB (#16340) on Month, day, 2021

## **Appendix B – Email Response: Indicating Interest**

**Subject:** eHealth Breastfeeding Resource Research Study Details

Hello,

We hope this email finds you well.

Thank you for your interest in participating in this research study led by Principal Investigator (PI) Dr. Jennifer Abbass Dick and Student Lead Sidra Azam from Ontario Tech University. The committee members include Dr. Ginny Brunton and Dr. Manon Lemonde.

The purpose of the study is to evaluate a newly revised online breastfeeding eHealth resource, “Breastfeeding Information for Parents” which has been designed for health care providers to use in clinical practice with diverse childbearing families. The aim is to obtain feedback about the online resources from health care providers who work with childbearing families, professionals and individuals who provide support to breastfeeding women.

If you are a health care provider, lay supporter or working in management in programs that provide support to childbearing families around breastfeeding, you are eligible to participate. If you agree to participate, you will be asked to review the eHealth resource and email us if you are interested in providing feedback. We will send you an online consent form to complete and a survey. This survey will take approximately 20-30 minutes to complete. The questionnaire will ask your opinion regarding the eHealth resource design, content and usability as well as your perception of the ways it can be used in clinical practice. Click on the link below to access the eHealth resource. We will collect your email information to send you reminders to complete the survey at 7 and 14 days after you consent.

The survey is completely anonymous as no identifying information is collected on the survey. This means no one will know the answers came from you. You can withdraw from the study at any time before submitting the survey by closing your browser window. Any information collected before you click “submit” at the end of the survey will be discarded, should you choose to not participate and close your browser. It will not be possible to withdraw your information once you click “submit” as we will not be able to determine what information is yours since no identifying information is on the survey. Only the research team will have access to the data.

Your contact information will be collected and stored separately from the survey, in a password protected encrypted file in a secure manner and only used to send you an e-gift card and an email to confirm you received it. It will also be used to send reminder emails

regarding the survey at 7 and 14 days after you consent. Once you confirm you received the e-gift card and the reminders have been sent, your name and email will be deleted.

There is no known risk to participating in this study. Doing this survey is completely voluntary and there will be no negative consequences if you choose not to do it.

Your participation is very important to us, as the results will be used to assist us in determining the usability of the online resource in clinical practice and to obtain suggestions for improvements. The results may be presented at conferences, published in peer reviewed journals and/or shared between the participating organizations and disseminated to additional health care organizations. Only summarized results will be presented, and no names will appear in the report. If you request to receive a copy of the results, an email will be sent to you upon completion of the study informing you of the study results.

This research study has been approved by Ontario Tech University Research Ethics Board on (DATE ; file #16340). If you have any questions concerning the research study, or experience any discomfort related to the study please contact the student lead, Sidra Azam at, [sidra.azam@ontariotechu.net](mailto:sidra.azam@ontariotechu.net). Any questions regarding your rights as a participant, complaints or adverse events may be addressed to Research Ethics Board through the Compliance Office (905 721 8668 ext 3693).

Please click on the link below to access the online resource “Breastfeeding Information for Parents.” Please email Sidra Azam at, [sidra.azam@ontariotechu.net](mailto:sidra.azam@ontariotechu.net) to request a copy of the consent form and survey. A copy of the consent form will be attached to the email for your records.

Thank you very much for your interest in this study.

We look forward to hearing from you soon.

Kind regards,

Student Lead: Sidra Azam  
[Sidra.azam@ontariotechu.net](mailto:Sidra.azam@ontariotechu.net)

Principal Investigator (PI): Dr. Jennifer Abbass Dick  
[Jennifer.AbbassDick@ontariotechu.ca](mailto:Jennifer.AbbassDick@ontariotechu.ca)

[Click here to access the eHealth resource “Breastfeeding Information for Parents”](#)



## Appendix C – Consent Form

### Consent Form to Participate in a Research Study

Title of Research Study: What are healthcare providers' perceptions of an eHealth breastfeeding resource for use in clinical practice to increase breastfeeding health literacy?

Name of Principal Investigator (PI): Dr. Jennifer Abbass-Dick

PI's contact number(s)/email(s):

Email: Jennifer.AbbassDick@ontariotechu.ca / Tel #: 905-721-8668 ext. 3735

Names(s) of Co-Investigator(s), Faculty Supervisor, Student Lead(s), etc., and contact number(s)/email(s):

Student Lead: Sidra Azam (sidra.azam@ontariotechu.net / Tel #: 647-996-6785)

Committee Members:

Dr. Ginny Brunton (Ginny.brunton@ontariotechu.ca / Tel #: 905-721-8668 ext. 2434)

Dr. Manon Lemonde (Manon.Lemonde@ontariotechu.ca / Tel #: 905-721-8668 ext 2706)

Departmental and institutional affiliation(s): University of Ontario Institute of Technology (Ontario Tech University)

External Funder/Sponsor: (if applicable)

### Introduction

If you are a care provider, lay supporter or manager in programs that work with childbearing families around breastfeeding, you are invited to participate in a research study entitled "What are healthcare providers' perceptions of an eHealth breastfeeding resource for use in clinical practice to increase breastfeeding health literacy?" You are being asked to take part in this research study. Please read the information about the study presented in this form. The form includes details on the study's procedures, risks and benefits that you should know before you decide if you would like to take part. You should take as much time as you need to make your decision. You should ask the Principal Investigator (PI) or study team to explain anything that you do not understand and make sure that all of your questions have been answered before consenting to participate (clicking consent at the bottom of this form). Before you make your decision, feel free to talk about this study with anyone you wish including your friends and family. Participation in this study is voluntary.

This study has been reviewed by the Ontario Tech University Research Ethics Board #16340 on [insert date].

#### Purpose and Procedure:

You have been invited to participate in this study in order to evaluate a newly revised online breastfeeding eHealth resource, “Breastfeeding Information for Parents” which has been designed for care providers to use in clinical practice with diverse childbearing families. The aim is to obtain feedback about the online resources from health care providers, professionals and individuals who work with childbearing families and provide breastfeeding support.

Fifty healthcare professionals will be recruited in Ontario. Recruitment will be done through listservs, social media and email in selected institutions.

Healthcare professionals are of choice in this exploratory study as they provide consistent care to childbearing families over the perinatal period. Their perception is crucial regarding the newly revised eHealth resource, as it will help in understanding if the eHealth resource contains credible and useful information for use in clinical practice.

The study information, eligibility criteria, and contact information for the Student Lead (Sidra Azam) were provided on the email you previously received, which contained the link to the eHealth resource “Breastfeeding Information for Parents.” It is expected that you will have reviewed the resource and are able to provide feedback regarding its use in clinical practice.

After reading and consenting to participate at the end of this form, you will be provided with the link to the online survey. The survey will collect information on: usability, content, design, and your overall satisfaction with the eHealth resource.

Participants’ emails will be collected with the consent form and will be used to send the reminder emails, e-gift card and confirm the e-gift card was received. A reminder email will be sent at 7 days and at 14 days from the time of your consent to participate. If you have completed the survey prior to receiving these emails, please disregard the reminders.

#### Baseline demographic variables

A baseline questionnaire will collect data on the manner in which you work with childbearing families, your professional role and how you like to provide breastfeeding education.

#### Types of Measurements

The survey will include questions about the usage, design, content, and health literacy aspect of the eHealth resource. Health literacy questions will refer to the resource’s ability to assist parents in accessing, comprehending and analyzing information, as well as accessing professional support when needed. The majority of questions in the survey

provide a response set from which you can select your answer. There are also some open-ended questions to collect information on your perspective of the resource. The survey will take about 20-30 minutes to complete.

It is important to conduct this research study to determine if this eHealth resource can be used in clinical practice and what health care professionals think about it. The Covid-19 pandemic has increased the need for parents to have access to a reliable breastfeeding eHealth resources with trustworthy information, to assist them in making informed decisions and meeting their breastfeeding goals.

#### Potential Benefits:

Your participation will provide both direct and indirect benefits. The direct benefit will be your knowledge of this resource to assist you in providing breastfeeding information to childbearing families. The indirect benefits you will receive from this research study includes the fact that you will be helping the study team to create freely available, accessible resources which meet the needs of health care providers working to educate childbearing families regarding breastfeeding and to assist the study team in creating breastfeeding resources to increase health literacy and help parents meet their goals.

#### Potential Risk or Discomforts:

There are no known potential risks or discomforts.

#### Use and Storage of Data:

The surveys that will be completed by participants will be anonymized, i.e. they will have no personal identifying information present on them. The participant email information will be kept separately in a password protected encrypted file. The data files will be collected on the University Google drive on a secure server, from there the anonymous survey data will be downloaded on to the computer of the Student Lead (Sidra Azam) and stored as a password protected and encrypted file. This data will be shared with only the supervising faculty as needed in the password protected and encrypted form through sharing a secure Google file. All data will be kept in a de-identified format in a SPSS file and excel files on a password access laptop or on a USB key in a locked filing cabinet. De-identified data will be published or disseminated in aggregated form. All de-identified data may be shared with a professional with statistical expertise. The research data will be retained for up to five years to allow time for analysis and publishing and this is consistent with TCPS-2 recommendations. All information collected during this study, including your personal information, will be kept confidential and will not be shared with anyone outside the study unless required by law. You will not be named in any reports, publications, or presentations that may come from this study.

#### Confidentiality:

Personal information, your email address, will be collected so we can issue the e-gift card and send survey reminders. Your privacy shall be respected. No information about your

identity will be shared or published without your permission, unless required by law. Confidentiality will be provided to the fullest extent possible by law, professional practice, and ethical codes of conduct. Please note that confidentiality cannot be guaranteed while data is in transit over the Internet. This research study includes the collection of demographic data which will be aggregated (not individually presented) in an effort to protect your anonymity. Despite best efforts it is possible that your identity can be determined even when data is aggregated. The demographic data will be kept in a de-identified format in a SPSS file and excel files on a password access laptop. This will be the primary way to ensure the safety and privacy of all data collected. Please note that the security of e-mail messages is not guaranteed. Messages may be forged, forwarded, kept indefinitely, or seen by others using the internet. Do not use e-mail to discuss information you think is sensitive. Do not use e-mail in an emergency since e-mail may be delayed.

#### Voluntary Participation:

Your participation in this study is voluntary and you may partake in only those aspects of the study in which you feel comfortable. You may also decide not to be in this study. You may leave the study at any time before submitting the survey without affecting your employment status. You will be given information that is relevant to your decision to continue or withdraw from participation below.

#### Right to Withdraw:

You can withdraw from the research project at any time before submitting the survey by closing your browser. In this research project, the withdrawal of data is not feasible as personal information has not been collected in the survey and therefore your data cannot be identified. Additionally, it will not be possible to withdraw results once they have been published or otherwise disseminated.

#### Conflict of Interest:

The project team does not have any conflicts of interest to declare.

#### Compensation, Reimbursement, Incentives:

You will be compensated for consenting to this study with a \$10.00 e-gift card to Tim Hortons, should you prefer a different e-gift card, and please let the study team know by email. The e-gift card will be sent via email after you have consented. You will be asked via email to confirm receipt of the e-gift card.

#### Debriefing and Dissemination of Results:

The results of the study will be used to help researchers to understand if the eHealth resource meets the needs of health care providers. This resource will be disseminated widely in the future for health care providers to use with childbearing families to increase breastfeeding health literacy. These results can help determine any required revision. It will help to determine what health care provider think about the eHealth breastfeeding

resource and if it is relevant and contains the appropriate information to introduce in clinical settings. If you would like to know the results of the study or information regarding the resource developed, you can contact the principal investigator, Dr. Jennifer Abbass-Dick at Jennifer.AbbassDick@ontariotechu.ca or the student lead at sidra.azam@ontariotechu.net. If you would like a summary of the results sent to you, please email Jennifer.Abbassdick@ontariotechu.ca to request this be sent to you upon study completion. The results of this study will be shared with the health care and research community through meetings, webinars, peer reviewed journals and conference presentations.

#### Participant Rights and Concerns:

Please read this consent form carefully and feel free to ask the researcher any questions that you might have about the study. If you have any questions about your rights as a participant in this study, complaints, or adverse events, please contact the Research Ethics Office at (905) 721-8668 ext. 3693 or at researchethics@ontariotechu.ca. If you have any questions concerning the research study or experience any discomfort related to the study, please contact the student lead Sidra Azam at 647-996-6785 or sidra.azam@onatriotechu.net or the principal investigator Dr. Jennifer Abbass-Dick at 905-721-8668 ext. 3735 or Jennifer.AbbassDick@ontariotechu.ca. By checking the I agree box and clicking on the submit button at the bottom of this page, you do not give up any of your legal rights against the investigators, sponsor or involved institutions for compensation, nor does this form relieve the investigators, sponsor or involved institutions of their legal and professional responsibilities.

#### Consent to Participate:

##### Online Consent

1. I have read the consent form and understand the study being described.
2. [If applicable] I have had an opportunity to ask questions and my questions have been answered. I am free to ask questions about the study in the future.
3. I freely consent to participate in the research study, understanding that I may discontinue participation at any time without penalty. A copy of this Consent Form has been made available to me.

name \_\_\_\_\_ email address \_\_\_\_\_

I agree

## **Appendix D – eHealth Resource Link & Access Question**

**Thank you for consenting to be in this study**

**Here is the link to the newly revised breastfeeding eHealth resource is:**

**<https://breastfeedinginfo.ca/>**

You can either directly click on the link by hovering on it with your cursor and clicking OR you can copy the link and paste it into the URL section of your web browser and clicking enter.

**Question:**

**Were you able to access the breastfeeding eHealth resource link?**

Yes No

Were you able to add the URL to your search bar or home screen on your phone or tablet?

Yes No

Please review the eHealth resource over the next week or so. We will be sending the follow up survey to you via email in 2 days' time. Reminder emails will be sent 7 and 14 days from now, if we notice the survey is not yet completed. We look forward to receiving your feedback.

## Appendix E – Survey Questions

### Questionnaire for Healthcare Professionals

The following are a variety of questions regarding the capacity in which you work with childbearing families, and resources you use to educate or inform parents about breastfeeding. There are no right or wrong answers

Participant identifier \_\_\_\_\_ Date \_\_\_\_\_

1. What is your professional title called \_\_\_\_\_

2. What is the most education you have completed?

\_\_\_\_\_

3. What degrees do you hold? Please specify them

\_\_\_\_\_

4. What best describes your workplace:

- a) Hospital
- b) Clinic
- c) Community
- d) Public health
- e) Home-based

5. a) Please pick the option which best describes you, before starting the survey.

- a) Doctor
- b) Midwife
- c) Hospital Nurse
- d) Public health nurse
- e) Lactation consultant
- f) Doula
- g) Breastfeeding peer supporter
- h) Other, please specify \_\_\_\_\_

5 b). Please describe the population you work with, point in the perinatal period and in what capacity.

\_\_\_\_\_

6. What best describes you, outside of your profession. Select all that apply:

- a) Mother
- b) Father
- c) Coparent
- d) Surrogate
- e) First time Expectant Parent
- f) Expectant Parent, but not for the first time
- g) Not a Mother / Father / Coparent

7. At what point in the perinatal period do you think parents should be educated about breastfeeding?

- a) Prenatal
- b) Postnatal
- c) Pre and postnatally

8. What methods of breastfeeding education do you prefer to recommend to parents?  
Select all that apply

- a) Online
- b) Print form
- c) Verbal during appointments
- d) I do not recommend breastfeeding resources

9. Are there resources you use or suggest be used to educate parents about breastfeeding?  
Please describe the resource and what you like about these resources

---



Below are questions related to the e-Health resource you reviewed, Breastfeeding Information for Parents, <https://breastfeedinginfo.ca/>. This resource has been created to increase parents' breastfeeding health literacy and to be used in clinical practice to encourage consistency in information and increased access to the content shared once parents leave their appointments. There will be seven main elements covered by the questions, use, design, content, breastfeeding health literacy, usability, credibility and relative advantage of this resource over those currently being used. There are no right or wrong answers.

**Use:**

1. Viewing e-Health Resource Time Questions:

a) How many times did you access the URL \_\_\_\_\_

2. Approximately how long did you view the e-Health resource, each time you accessed it?

- i.** Less than 15 minutes
- ii.** 15 to less than 30 minutes
- iii.** 30 minutes to less than 1 hour
- iv.** 1 hour- less than 2 hours
- v.** 2 hours and over

3. What is your overall rating of this e-Health resource

- i.** 5 stars \* \* \* \* \*
- ii.** 4 stars \* \* \* \*
- iii.** 3 stars \* \* \*
- iv.** 2 stars \* \*
- v.** 1 star \*

4. How thoroughly did you review the online course “Breastfeeding Information for Parents”? The course contains 7 main sections (including Why breastfeed, How to breastfeed, The Early Days, Father & Partner, Common concerns, Getting help and Early life).

- i.** I briefly looked over it
- ii.** I reviewed a few sections
- iii.** I looked over each section
- iv.** I looked at all the content in detail

**Design:**

The following questions are about the design of the e-Health resource, please indicate how much you agree or disagree with the statements.

## Questions 1-11

	Strongly agree	agree	neutral	disagree	Strongly disagree
The resource is well organized					
The resource is innovative					
The resources uses a variety of ways to provide information					
The resource is interactive					
The resource is easy to navigate					
The resource is written in plain English which is easy to understand					
The resource appears to be targeting both mothers and co-parents					
I like the layout of the resource					
I liked the photos in the resource					
The photos in the resource identify different cultures					
I like the colours used in the resource					

## Questions 12-22

How helpful do perceive the information delivery methods to be?	Very helpful	helpful	neutral	Not very helpful	Not at all helpful	n/a as I did not this feature
Text						
Narration						
Video with narration						
Video of health professionals						

Video of parents						
Video of animations/cartoons						
Link to other material on the internet						
illustrations						
ebook						
Quizzes						

23. Which information delivery method used in the e-Health resource do you perceive as being the most important to have in an eHealth resource for patient education? Choose all that apply:

- a) Text
- b) Narration
- c) Videos of information with narration, photos and some animation
- d) Videos of parents describing their experiences
- e) Videos of professionals explaining breastfeeding
- f) Videos of cartoon animations
- g) Links to other content on the internet
- h) Illustrations
- i) Games
- j) Quizzes
- k) Other \_\_\_\_\_

24. Do you have any additional comments about the design of the resource and how it can be improved?

---

**Content:**

The next questions are related to the content provided in the resource.

Question 1-6

	Strongly agree	agree	neutral	disagree	Strongly disagree
The content is informative					
The content is interesting					
The content is up to date					
The content is comprehensive					
The content includes topics you commonly use in patient interaction regarding breastfeeding					
The content will help me with my patient teaching					

7. Is there any content you usually cover regarding breastfeeding which is not included in this resource, if so please explain

---

For the sections of the resource you used, how helpful do you perceive the information provided as being to childbearing families?

Question 8-16

	Very helpful	helpful	neutral	Not very helpful	Not at all helpful	I did not review this section
How to use this resource						
Why Breastfeed						
How to breastfeed						
Early days						
Supporting mom/or fathers/partners						

Common concerns						
Getting help						
Everyday life						
Helpful links						

17. Which section did you find had the most important information to share with parents?  
(select all that apply)

- a) Why Breastfeed
- b) How to breastfeed
- c) Early days
- d) Supporting mom or Father/partners
- e) Common concerns
- f) Getting help
- g) Everyday life
- h) Helpful links

18. Which topics below would you use this resource in clinical practice to provide information to parents on?

Check all that apply

- a) Why breastfeeding is important
- b) How breastmilk is made
- c) How to tell if the baby is getting enough
- d) How to get a successful latch
- e) How to overcome common problems and solutions
- f) How to work as a co-parenting team
- g) How co-parents can support the breastfeeding mom
- h) Where to get help in your area
- i) Other \_\_\_\_\_

**Breastfeeding Health literacy:**

We are interested in increasing parents breastfeeding health literacy which we define as their ability to access, understand, assess their situation, access resources, work with care providers and use health information and resources to meet their breastfeeding goals.

To what extent do you agree this resource is adequately designed to address elements of breastfeeding health literacy

Question 1-8

This eHealth resource:	Strongly agree	agree	Neutral	disagree	Strongly disagree
Provides accessibility to credible information for childbearing families					
The content is presented in a manner which is easy to understand					
The reading level of the text is appropriate for a health resource					
The multiple ways of providing information will increase patient ability to comprehend the content					
Sufficient information to assist parent in knowing when to get help is included					
Sufficient information on where to get help 24/7 is included					
Sufficient information on overcoming difficulties is included.					
Overall, I think this is an important resource for health care providers to introduce to parents in clinical practice to increase their breastfeeding health literacy					

9. Do you have additional information on how this resource could be improved to increase breastfeeding health literacy in childbearing families?

---

**Usability:**

The following questions are about navigation:

Question 1-7

How easy to use do perceive the navigation elements?	Very easy	Easy	neutral	Not very easy	Not at all easy	n/a as I did not this feature
Search feature						
Table of contents on the first page						
Instructions on use at the bottom of the home page						
Page bar at top of website						
Buttons with topics at top of each page						
Arrow at bottom to take you to the top of the page						
It is easy to find specific content or information						

8 a.) Did you have any difficulty navigating the resource? 1. Yes 2. No

8 b) If no, please explain \_\_\_\_\_

9. Which Web Browser did you use to review the course?

- a) Firefox
- b) Google E
- c) Google Chrome
- d) Safri
- e) Internet Explorer (IE) 6
- f) IE 7
- g) IE 8 and above
- h) Don't know
- i) Other, please specify

10. What Operating System are you viewing this on?

- a) Android
- b) iOS
- c) Windows XP
- d) Windows Vista
- e) Windows 7 + above
- f) Mac OS
- g) Linux
- h) Don't know
- i) Other, please specify

### **Technical Difficulties Questions:**

1. Did you experience technical difficulties (glitches in the online course) while reviewing this course?

- a) No
- b) Yes, If Yes, please answer the following questions

2. I cannot open some links. Please check which sections:

- a) Why breastfeed
- b) How to breastfeed
- c) The Early Days
- d) Father & Partner
- e) Common concerns
- f) Getting help
- g) Early life

3. I can't hear narrative for the slides. Please check which sections:

- a) Why breastfeed
- b) How to breastfeed
- c) The Early Days
- d) Father & Partner
- e) Common concerns
- f) Getting help
- g) Early life

4. I can't open some videos. Please check which sections:

- a) Why breastfeed
- b) How to breastfeed
- c) The Early Days
- d) Father & Partner
- e) Common concerns
- f) Getting help
- g) Early life

5. I have issues with content under "More". Please check which sections: E-book

- a) Games
- b) Why breastfeed quiz
- c) How to breastfeed quiz
- d) Early days quiz



- e) Common concerns quiz
- f) Family and friends quiz
- g) Everyday life quiz

6. If there were other technical difficulties, please specify what technical difficulties and indicate which sections.

## The SUS Scale

Question 1-10

The System Usability Scale Standard Version		Strongly disagree					Strongly agree				
		1	2	3	4	5	1	2	3	4	5
1	I think that I would like to use this system frequently.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	I found the system unnecessarily complex.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	I thought the system was easy to use.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	I think that I would need the support of a technical person to be able to use this system.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	I found the various functions in the system were well integrated.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	I thought there was too much inconsistency in this system.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	I would imagine that most people would learn to use this system very quickly.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	I found the system very awkward to use.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	I felt very confident using the system.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	I needed to learn a lot of things before I could get going with this system.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 1. The standard SUS.

Lewis, J., (2019) Measuring Perceived Usability: SUS, UMUX, and CSUQ Ratings for Four Everyday Products, *International Journal of Human-Computer Interaction*, 35:15, 1404-1419, DOI: 10.1080/10447318.2018.1533152

## Credibility

In relation the Health on the Net (HON) Code of Conduct how does this website rate in your opinion in relation to:

Question 1

This eHealth resource:	Strongly agree	agree	Neutral	disagree	Strongly disagree
Information is provided by qualified medical practitioners and organizations committed to the public's health					
It encourages you to discuss the health information with your care provider					
The users identity is protected					
The website indicates sources or references for information provided under acknowledgements					
The sources used are credible					
Are common problems to breastfeeding problems presented in the resource consistent with best practices					
Is the authorship/sponsorship of the website obvious to you					
Is the medical disclaimer obvious to you					
Is there an email contact on the website					

Health On the Net Foundation (HON). (2001). International Journal of Health Care Quality Assurance, 14(6). <https://doi.org/10.1108/ijhcqa.2001.06214fag.001>

**Compared to other breastfeeding resources**

Question 2

This eHealth resource:	Strongly agree	agree	Neutral	disagree	Strongly disagree
Provides more comprehensive breastfeeding information					
Is targeted towards both mothers and their co-parents					
Covers topics that are important both prenatally and postnatally					
Is more accessible for parents					
Has better information for teaching					
Has better graphics					
Is a better quality resource					
Would better help me do my job with breastfeeding parents					
Is more convenient to use					

3. Compared to resources you currently use to education parents about breastfeeding, do you think this resource offers any advantages, please explain.

---

**General perceptions:**

1. What did you like most about this eHealth resource?
  
2. What did you like least about this eHealth resource?
  
3. What would you suggest be changed about the eHealth resource?
  
4. Would you recommend a different way of providing this information? If so, in what way?

5. Would you recommend this resource be used in clinical interactions with health care providers and parents? Why or why not?

6. In which ways do you see this resource being used in clinical interactions by health care providers over the perinatal period?

## Appendix F – Reminder Email: 7 Days & 14 Days

### Reminder Email for Day 7

**Subject:** Research Study Reminder for Completing eHealth Breastfeeding Resource Survey

Hello,

Hope this email finds you well.

Thank you for your interest in participating in this research study led by Principal Investigator (P.I) Dr. Jennifer Abbass Dick and Student Lead Sidra Azam from Ontario Tech University.

This is a friendly reminder that if you have not completed the survey yet, you have 1 more week from today to complete it. [Click here](#) at assess the survey.

Thank you again for participating in this study and assisting us in creating eHealth resources for health care practitioners to use in clinical practice to increase breastfeeding health literacy among childbearing families. After you complete the survey, a \$10.00 egift card to Tim Hortons will be sent to you at this email as a token of our appreciation for your involvement. Should you prefer a different egift card please email us to arrange this. We ask that you confirm receipt of the egift card via email.

If you have any questions or concerns please do not hesitate to contact the student lead, Sidra Azam at [sidra.azam@ontariotechu.net](mailto:sidra.azam@ontariotechu.net).

An additional friendly reminder will be emailed in one weeks time, if we notice the survey has not been completed.

We look forward to hearing from you soon.

Kind regards,

Student Lead: Sidra Azam  
[Sidra.azam@onatriotechu.net](mailto:Sidra.azam@onatriotechu.net)

Principal Investigator (P.I): Dr. Jennifer Abbass Dick  
[Jennifer.AbbassDick@ontariotechu.ca](mailto:Jennifer.AbbassDick@ontariotechu.ca)

## **Reminder Email for Day 14**

**Subject:** Research Study Reminder for Completing eHealth Breastfeeding Resource Survey

Hello,

Hope this email finds you well.

Thank you for your interest in participating in this research study led by Principal Investigator (P.I) Dr. Jennifer Abbass Dick and Student Lead Sidra Azam from Ontario Tech University.

This is a friendly reminder that if you have not completed the survey yet, you have 1 more week from today to complete it. Click here at [assess the survey](#).

Thank you again for participating in this study and assisting us in creating eHealth resources for health care practitioners to use in clinical practice to increase breastfeeding health literacy among childbearing families.

If you have any questions or concerns please do not hesitate to contact the student lead, Sidra Azam at [sidra.azam@ontariotechu.net](mailto:sidra.azam@ontariotechu.net).

This is the final reminder. The survey will be available to you for one more week. After that point the survey will be closed.

After you complete the survey, a \$10.00 egift card to Tim Hortons will be sent to you at this email as a token of our appreciation for your involvement. Should you prefer a different egift card please email us to arrange this. We ask that you confirm receipt of the egift card via email.

If you have any questions or concerns please do not hesitate to contact the student lead, Sidra Azam at [sidra.azam@ontariotechu.net](mailto:sidra.azam@ontariotechu.net).

Thank you very much for your participation in this study.

We look forward to hearing from you soon.

Kind regards,

Student Lead: Sidra Azam  
[Sidra.azam@ontariotechu.net](mailto:Sidra.azam@ontariotechu.net)

Principal Investigator (P.I): Dr. Jennifer Abbass Dick  
[Jennifer.AbbassDick@ontariotechu.ca](mailto:Jennifer.AbbassDick@ontariotechu.ca)

## Appendix G – Thank You Gift Card Incentive

When the participants (health care professionals) have completed the survey, the e-gift card will be sent to them as a form of appreciation for participating in the research study.

The gift card will be issued using the website: [www.egiftcard.ca](http://www.egiftcard.ca) and the gift card of choice (Winners/Homesense, Walmart, Indigo or The Ultimate Dining Card) with the amount of \$10 CAD will be given.

In the message area of the gift card, a Thank you message will be written as follows: “Thank you for participating in our study. It will assist us in designing eHealth resources to provide breastfeeding information to parents.”

Below is a screen shot of how the information will be inserted:

The screenshot shows the Tim Hortons eGift Card purchase interface. On the left, there is a product image of a Tim Hortons coffee cup and a description of the eGift Card. The main form on the right allows the user to select an amount (with \$10 selected), set the quantity to 1, and confirm it is a gift. Delivery details include recipient and confirmation emails, and a pre-filled 'From' field: "eHealth Resource|Breastfeeding Study Team". The gift card message is pre-filled with the thank you message. The delivery method is set to "Now".

Follow up email: Please confirm the egift card has been received. If you do not see it in your inbox please check your junk mail. Thank you again for your participation in this study.