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A Password-Protected Web Site for Mothers Expressing Milk for Their Preterm Infants

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ABSTRACT

Background: Research has demonstrated that breast milk significantly decreases morbidities that impact length of stay for preterm infants, but there is a need to test interventions to improve breastfeeding outcomes. Since many Americans are using technologies such as the Intranet and smartphones to find health information and manage health, a Web site was developed for mothers who provide breast milk for their preterm hospitalized infants.

Purpose: This study examined the efficacy of a Web site for mothers to educate them about breast milk expression and assist them in monitoring their breast milk supply.

Methods: Quantitative and qualitative data were collected from mothers whose preterm infants were hospitalized in a level IV neonatal intensive care unit (NICU) or transitional care unit (TCU) in an urban academic medical center in the Midwest.

Results: Eighteen mothers participated in evaluation of the Web site. Thirteen mothers consistently logged on to the password-protected Web site (mean [standard deviation] = 13.3 [11.7]) times. Most participants, (69.2%), reported they used the breast milk educational information. Most mothers indicated that using the Web site log helped in tracking their pumping. These findings can be used to direct the design and development of web-based resources for mothers of preterm infants

Implications for Practice: NICU and TCU staffs need to examine and establish approaches to actively involve mothers in monitoring the establishment and maintenance of an adequate supply of breast milk to improve neonatal health outcomes.

Implications for Research: An electronic health application that incorporates the features identified in this study should be developed and tested.

Key Words: electronic health applications, human breast milk expression, infant, intensive care units, neonatal milk, premature

It is estimated that 15 million infants are born prematurely each year (<37 completed weeks of gestation) throughout the world.[1] Preterm infants often spend weeks or months hospitalized in neonatal intensive care units (NICUs). There is a need to examine innovative practices, including electronic health applications, that decrease morbidities that increase length of stay for these infants. Research has demonstrated that breast milk has a significant role in decreasing morbidities, such as infection, that impact length of stay for this population.[2-6]

A significant body of literature confirms the numerous specific health benefits of breast milk for preterm infants,[7] and these benefits are enhanced with increased volume and duration of provision of mother's milk.[8] Many, but not all mothers decide to breastfeed and/or express breast milk for their preterm infants. The mothers of preterm infants and/or infants in the NICU encounter many challenges as they attempt to establish and maintain an adequate supply of expressed breast milk as they attempt to express their breast milk 8 to 12 times a day[9] and are often unable to maintain the recommended frequency of milk expression sessions.[10,11] As a result, mothers of premature infants frequently terminate breastfeeding or the provision of their milk before this goal is attained.[11-14]

Challenges that mothers of preterm infants encounter more frequently than mothers of full-term healthy infants include (a) insufficient milk supply, (b) stressful nature of the NICU, (c) physical separation from the child, (d) fatigue, stress of having an ill infant, (e) lack of privacy in the NICU, and (f) inconsistent knowledge among healthcare providers about the importance of breast milk for preterm infants.[9-12,15-18] Having mothers actively monitor their own milk supply, through newly created

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technologies, may be a feasible approach to increase the amount of breast milk mothers provide for their preterm infants. A mobile health application with a pumping log, diary, or tracking capability for mothers to monitor their own milk supply combined with internet platform support and education is a strategy that may help achieve this goal.[16-20]

Numerous breastfeeding, pumping, and breast milk volume tracking apps, breastfeeding Web sites, and support groups exist, but none are customized to the address situations mothers of hospitalized preterm or critically ill infants encounter. There are NICU parenting Web sites, but they are not exclusively aimed at the mother who is providing her breast milk for her hospitalized infant. Some of these Web sites include March of Dimes, Hand to Hold, and Graham's Foundation and Prematurity.[21-24]

Traditionally mothers have used a paper diary to monitor milk production[12,18,20,21]; however, this practice is not implemented routinely in clinical settings. It was believed that using a Web site to document milk production would be appropriate considering the demographic background of the mothers and their comfort with the use of online technology.

The Institute of Medicine's "Crossing the Quality Chasm: A New Health System for the 21st Century" suggests that the innovative use of information technology can improve the delivery of healthcare, which is tailored to patient needs.[25] Numerous healthcare professionals are investigating the impact of various healthcare platforms upon healthcare delivery and outcomes.[26,27] A study exploring virtual visitation in the NICU utilized the Internet and telemedicine. The researchers found parents responded positively to the use of telemedicine and virtual access to their hospitalized child. The interventions may offer additional emotional and educational support for families, providing family comfort and emotional encouragement to families of high-risk neonates.[28,29] More recent studies evaluated NICU webcam use and impact on families and nurses.[30,31] Other researchers found that dedicated Internet applications for NICU families, which provided them with numerous educational links, often enabled parents to bring their NICU infants home sooner.[28,29]

All sectors of American society are using technologies such as the Internet and smartphones to find health information or manage their health. Many mothers have smartphones and computers, are comfortable using Web sites, and frequently use Web sites to access health information. Several demographic groups—young adults, non-whites, the less educated, and the less affluent—have indicated that they go online at consistently high rates, mostly using their cell phones.[32]

The use of a smartphone to seek health information is linked to the owner's health status.[33] Those individuals who recently experienced a medical crisis, those who encountered a recent, significant change in their physical health and caregivers, are more apt than other cell phone owners to employ their phones to search for health information. Exercise, diet, and weight apps are the most prevalent forms.[33] Almost 70% of adults track any health indicator for themselves or others. In 2015, 77% of young adult (18-29 years) smartphone owners used their phone to access information about a health condition. [34] However, it has been found that people who download apps use them only 21% of the time.[35]

What This Study Adds

- This is the first known work that developed a Web site for mothers of hospitalized neonates to track their milk supply and evaluated their input and use of the Web site.
- The findings can be used to direct the design and development of electronic health applications and resources for mothers of preterm infants.

With this knowledge of increasing prevalence of "digital connectivity," healthcare professionals, including International Board Certified Lactation Consultants (IBCLCs), are becoming more involved with electronic media channels.[36] Former US Surgeon General, Dr Regina Benjamin, in "The Surgeon General's Call to Action to Support Breastfeeding" stated that "…the increasing use of electronic communication channels opens many new possibilities for promoting breastfeeding."[37] However, little substantial research has been conducted to examine issues related to use of these tools and perceived health outcomes.[38]

Many medical professionals are now envisioning their own Web sites and apps to monitor health issues or deliver medication reminders. Suggestions for those interested in developing their own Web sites or apps include offering a "sociable, personal, engaging, interesting and fun" milieu; providing a supportive learning environment involving health behaviors; incorporating the Web site or app into the delivery system so that providers are involved in a manner that encourages Web site or app use, and being outcome driven relative to the desired change in health activities.[39] A physician survey about use of electronic communications to support breastfeeding mothers concluded that numerous breastfeeding mothers seek breastfeeding experts via the Internet. Physicians recognized as breastfeeding experts received e-mails from known and unfamiliar patients. Over half of the physicians replied personally to e-mails without reimbursement. Many breastfeeding mothers reach out to breastfeeding experts over the Internet. The findings suggest that physicians who provided care to breastfeeding mothers need further education on breastfeeding to provide adequate support to their own patients.[40]

Although a wide array of electronic resources for mothers to seek breastfeeding advice exist, most options do not meet the needs of mothers of preterm

infants who are pump dependent to establish and maintain an adequate supply of breast milk for their hospitalized infants. The purpose of this study was to explore the efficacy of the use of a password-protected Web site designed exclusively for mothers of preterm infants hospitalized in the NICU who elect to breastfeed and/or provide breast milk.

The research questions addressed in this study were:

1. What is the frequency and duration of use of the password-protected breast milk expression Web site?
2. What features of the password protected breast milk expression are used by mothers?
3. What positive attributes and problems do mothers report concerning the use of the password-protected breast milk expression Web site?

METHODS

Design

This study used a descriptive, longitudinal design to evaluate a Web site designed to facilitate mothers' provision of breast milk for their NICU infants. Mixed methods were employed to enhance the quality and comprehensiveness of evaluative data.

Sample

The convenience sample for this study included 20 mothers of infants who were hospitalized for at least 1 week in the NICU and/or the transitional care unit (TCU). The sample was composed of mothers who met the following inclusion criteria: 18 years or older; able to read and write English; and agreement to initiate milk expression. Mothers were required to have unlimited access to a means of connecting with the internet, such as a smartphone or computer. Infant inclusion criteria were 24 weeks or more of gestational age at birth; an expected duration of hospitalization of 1 week or more; and no condition incompatible with the ingestion of breast milk. The convenience sample of 21 infants contained 1 set of twins and 19 singletons.

Setting

The setting for this study was a 38-bed, level IV NICU and/or the TCU in a large Midwestern urban academic medical center. The TCU is near the NICU and can accommodate 31 infants with single births and up to 44 infants with multiple births.

Instruments

Four instruments were used to gather data. The *Maternal Record,* which was developed for use in previous studies, recorded maternal demographic and medical history data. Infant demographic data and medical history were documented on the *Infant Record,* which was also developed for use in previous studies. The *Web-Based Diary* documented the frequency of use of Web site, the frequency of milk expression sessions as well as the volume of milk expressed and the provision of kangaroo care. The *Breast Milk Expression Website Exit Survey,* developed for this study, assessed the mother's experiences with use of the breast milk expression Web site. The survey, which was developed by 2 neonatal nurse researchers (1 of whom was an IBCLC) who had previously conducted research on this topic, consisted of 9 multiple-choice questions and 2 open-ended questions concerning the mother's perceptions of pumping and use of the web-based site.

Web Site

The principal investigator (PI) collaborated with Web site developers to create the password-protected Web site: *www.LactationLogPlus*, which would be used by mothers to monitor their milk supplies and to access breastfeeding informational resources. The Web site contained a milk diary where mothers recorded the time and volume of each milk expression. The Web site also included specialized educational materials related to establishing and maintaining an adequate milk supply, developmental and kangaroo care; and parenting in the NICU. Numerous links to helpful information were included. Among these was the breastfeeding Web site of the Office of Women's Health and *Your Guide to Breastfeeding* from the US Department of Health and Human Services, Office on Women's Health and others.

Procedure

Institutional review board approval was obtained from the hospital prior to beginning the study. Mothers who planned to express their breast milk and whose NICU infants met inclusion criteria were contacted by the PI or the nurse lactation consultant (NLC), provided a brief explanation of the research, and asked whether they would like to participate in the feasibility study. Demographic data and medical history were obtained for both the mother and infant using the *Maternal Record* and the *Infant Record*. The *Infant Record* was completed by the PI or the NLC. The 22-item *Maternal Record* was completed by the mother and she was given a $10 gift card to a national department store. Mothers were then given the link to the Web site, *www.LactationLogPlus*, where they were assigned a username, and were helped to create a unique password based upon their baby's birthdate. Mothers were taught by the PI or the NLC to enter breast milk expression times and volumes as well as the provision and duration of kangaroo care. The investigators had access to individual mother's Web site for data collection purposes only. The PI or the NLC met in person or by telephone with mothers at least once weekly to ask whether they had any questions. Within 2 to 3 days of anticipated infant discharge, or if a mother had ceased breast milk expression, mothers were asked

to complete the 11-item *Breast Milk Expression Web-Site Exit Survey*. Mothers were then given an additional $20 in gift cards to the same national department store. The Web site was taken down by the Web site developers after all infants had been discharged from the hospital and data collection was completed. Data related to maternal logins and breast milk volume entries were retrieved from the Web site in an Excel spreadsheet by the webmaster and transcribed into an SPSS version 22 file.

Data Analysis

Content analysis was used for short answer responses on the basis of themes identified by the 3 nurse researchers, 2 of whom were IBCLCs. Descriptive statistics were used including frequencies, means, distributions, ranges, and standard deviations.

RESULTS

Twenty mothers were enrolled in this study. Four additional mothers had been approached and declined to participate. Eighteen mothers actually used and evaluated the Web site. The mean maternal age of enrolled mothers was 28.6 ± 6.2 years (range 20-39). Eleven of 20 (55%) mothers reported that they had children at home, and 8 of these 11 mothers (72.7%) had previous experience with breastfeeding and breast milk expression. See Table 1 for an overview of maternal characteristics, pregnancy history, and breastfeeding intent.

Twenty-one infants comprised the sample, including 1 set of twins. There were 7 (33%) females and 14 (67%) males; 13 (62%) infants were identified as black and 8 (38%) were identified as white. The primary diagnosis for all infants was prematurity. However, 2 of these infants also had gastrointestinal tract defects that required surgical intervention and therefore a delay in the initiation of enteral feeds. Therefore, they were excluded as outliers in the analysis of time to initiation of enteral feedings. The mean time that 19 infants were started on enteral feeds was at day of life 2.4 ± 0.9 (range 1-5). See Table 2 for a description of infant characteristics.

TABLE 1. Maternal Demographic Characteristics, Pregnancy History, and Breastfeeding Intent

Descriptor	Characteristic, n (%)
Race (n = 20)	Black, 11 (55) White, 8 (40) Mixed, 1 (5)
Education (n = 20)	High school not completed, 2 (10) High school graduate, 8 (40) College education (1-4 y), 9 (45) Graduate school, 1 (5)
Marital status (n = 20)	Married, 8 (40) Single, 10 (50) Divorced/other, 2 (10)
Total number of pregnancies (including this pregnancy) (n = 20)	1, 8 (40) 2-4, 8 (40) 5-6, 2 (10) 9-10, 2 (10)
Total number of live births (including this birth) (n = 21)	1, 9 (42.9) 2, 4 (19) 3, 5 (23.8) 4, 3 (14.3)
When mother had decided to breastfeed this infant (n = 20)	Before pregnancy, 12 (60) First trimester, 4 (20) Second trimester, 1 (5) After delivery, 3 (15)
Maternal plan to feed baby before birth (n = 20)	Breastfeed, 3 (15) Bottle feed breast milk, 2 (10) Bottle feed formula, 2 (10) Breastfeed and bottle feed breast milk, 12 (60) Breastfeed, bottle feed breast milk and formula, 1 (5)
Maternal plan for duration to provide only breast milk for this infant (n = 17)	Up to 8 wk, 1 (5.9) Up to 4 mo, 1 (5.9) Up to 6 mo, 9 (52.9) More than 6 mo, 6 (35.3)

TABLE 2. Infant Characteristics (n = 21)

	Mean (Standard Deviation), Range
Infant gestational age, wk	31.2 (2.6), 24.7-35.7
Infant birth weight, g	1711 (635.6), 750-3470
Infant age at discharge, d	36.9 (21.4), 13-100
Infant gestational age at discharge, wk	37 (2.1), 34-44
Infant weight at discharge, g	2367.1 (501.3), 1805-3865

All mothers were able to provide breast milk for their infants during hospitalization. At hospital discharge, 9 (42.9%) infants were fed breast milk exclusively, 5 (23.8%) infants were partially fed breast milk, and 7 (33.3%) infants were not receiving any expressed breast milk. One infant was exclusively feeding at the breast at hospital discharge. Six (28.5%) infants were discharged to home partially feeding at the breast and 9 (42.9%) were not directly breastfeeding. Five (23.8%) infants had never attempted feeding directly at the breast.

Breast Milk Expression Web Site Use

Of the 20 mothers enrolled in the study, 2 mothers never logged on to the Web site and 5 mothers logged on only when guided through the process by the PI or NLC. The 13 remaining users logged on to the password-protected Web site from 2 to 45 times (mean [standard deviation] = 13.3 [11.7]). These 13 mothers entered 1 to 133 breast milk expression sessions (m [standard deviation] = 33.2 [35.4]). For the purpose of analysis, only the responses of the 13 participants who independently logged into the Web site were considered in the Web site evaluation.

Of the 13 mothers using the Web site, 9 (69.2%) reported that they felt comfortable using the Web site log in less than 1 day and 3 mothers (23.1%) indicated that they felt comfortable using the Web site in 1 to 2 days. One participant, (7.7%), indicated that she was never comfortable using the Web site.

Mothers were queried as to how long it took them to complete a Web site milk log entry. The responses of 13 mothers were considered. Almost a third (30.8%) or 4 mothers reported that it took them less than 1 minute to complete a Web site milk log entry, while 7 mothers (53.8%) indicated that they used 1 to 3 minutes. Only 1 mother took 4 to 5 minutes to complete an entry and another mother took more than 5 minutes to make a Web site entry.

Web Site Feature Use

Of the 13 mothers, 9 (69.2%) indicated that they had used the breast milk expression educational information and 2 mothers offered reasons for not using the information such as "Didn't pay much attention to it" and "I just used [the]log." Eight (61.5%) of the mothers reported that they used the *Resources for NICU Families* information. Those who did not use it volunteered reasons for not using it such as "Didn't pay much attention to it" and "no reason."

Attributes and Problems of Web Site Use

Participants were asked whether they perceived that use of the Web site log helped them to pump breast milk. Less than half or 6 of the 13 of the participants (46.1%) felt that use of the Web site log did not help at all. However, 5 mothers (38.5%) felt that use of the Web site log helped somewhat, and 2 indicated that employing the milk log Web site helped them to pump breast milk a great deal.

Participants were asked whether, overall, the Web site helped to maintain their milk supply. All mothers (n = 13) responded and 8 (61.5%) reported that the Web site log did not help at all, whereas 3 felt that the Web site may have helped them maintain their milk supply somewhat. Two participants felt that the Web site helped them a great deal to maintain their milk supply.

Mothers shared their additional thoughts about the use of the milk log Web site. Positive and negative themes emerged from these responses. See Table 3 for maternal comments on Web site use.

DISCUSSION

The Website *LactationLogPlus* was developed as an alternative to traditional paper diaries to offer mothers of hospitalized preterm infants who had decided to breastfeed and/or provide expressed breast milk with a readily available usable form of technology as a source for breastfeeding and breast milk expression information, and a mechanism for tracking maternal milk volumes. Extant literature describes the challenges mothers of preterm infants frequently encounter in establishing and maintaining a milk supply.[10,11,13,15,16,18,19,21] It has been noted that many mothers of premature infants terminate breastfeeding or the provision of their milk earlier than recommended.[8,12,14] The idea to develop the Web site was based on the premise that it would give mothers a means of active involvement in the oversight of their efforts to provide breast milk for their preterm infants. This Web site efficacy study provides results, which informs any future electronic health platform development, regardless of the form of the electronic technology, especially those that focus on providing support for NICU families. Offering access to electronic health vehicles beyond infant hospitalization may bridge the gap in support for mothers providing breast milk as they continue to track their supplies and access relevant information to optimize the duration and volume of breast milk available for their infants.

The pattern of maternal tracking in this study reflected the national trend of infrequent health

TABLE 3. Maternal Comments on Web Site Usage

Positive	Negative
It was very easy to use and it helped me get to my pumping goals daily. If I didn't pump enough I could see where I had to make up for it.	I found it more helpful to use a paper log then the Web site. I used the Web site's log on my phone. It was little hard to use it because of its format.
I think it is helpful for mothers not knowing or understanding what to do.	I don't really get how to do the math calculations for the site that's why I haven't used it that much. It would've been more helpful if the amount of milk pumped saved so I knew where I left off. That is what I found most difficult. I think more pictures would have been helpful. It was a lot to do sometimes. It should not be so much work. I didn't use the Web site-upgrade the wifi in the unit.

tracking. Nationally, almost 70% of adults track health indicators for themselves or others but use them regularly only 21% of the time.[24] In our study, 2 mothers stated that they documented their pumping sessions 100% of the time, whereas 4 mothers (12.5%) believed that they recorded their pumping sessions less than 25% of the time. Actual maternal usage as documented on the password-protected Web site did not reflect these reported patterns. The maximum number of times any mother logged on and entered a breast milk expression entry was 45 times, with 133 pumping sessions documented. These entries are from the mother of a preterm infant born at 24 weeks of gestation who was hospitalized for 100 days. No infant was discharged before 13 days of age. The minimum times a mother should have logged in to document pumping sessions on the Web site would have been close to 80 times, if the mother pumped the recommended 8 times per day[18] and given that a mother may not have been enrolled until the infant was about 3 days of age, if the mother pumped the recommended 8 times per day.[18]

Overall, the *LactationLogPlus* Web site should be redesigned with additional features to make it attractive and easier for mothers to use. These features include a user-friendly diary format, as opposed to a data entry format that did not allow for going back to previous days' records, as well as a timer feature that would indicate to the mother that it was time to pump. Developing a Web site or mobile health application with these features requires a sufficient amount of financial support as well as a web designer who is sensitive to the needs of this population of women.

Practice and Research Implications

This study has implications for both practice and research. Additional work on an electronic health platform such as an app or Web site that is dedicated to the needs of NICU mothers of hospitalized or preterm infants who must express their breast milk at least 8 times per day to establish and maintain an adequate milk supply is needed. Future research to examine the impact of this new technology is essential. Other effective strategies to support mothers who consistently express their breast milk may emerge with future research.

Implications for clinical practice include incorporating education for neonatal healthcare professionals that will enable them to educate and support NICU families on the electronic health platform. Some strategies for a well-designed internet platform dedicated to the unique needs of NICU mothers that are providing breast milk in addition to the breast milk expression diary, might include educational resources about the benefits of breast milk and kangaroo care, breast milk expression guidelines, and other internet resources such as March of Dimes, Hand to Hold, Graham's Foundation and Prematurity.[21-24] Also, the capability for families and healthcare professionals recognized as breastfeeding experts to dialogue may be a feature that would help mothers to optimize the volume and to extend the duration that they are able to provide breast milk.[40,41] If NICU healthcare professionals could review mothers' breast milk expression tracking efforts, appropriate lactation management interventions could be offered as needed, to maximize maternal milk production.

Future research is needed to examine and systematically evaluate barriers to breast milk expression to develop proactive strategies that may enhance the initiation, exclusivity, and duration of breast milk feedings received by hospitalized neonates. Ideally, these strategies would empower mothers to have an active role in monitoring their milk supply.[42-44] Additional research is essential to develop and evaluate electronic health vehicles such as Web sites, apps, telemedicine, or social media that could incorporate suggestions from mothers in this study including an interactive diary and personalization capacity. As healthcare providers we need to utilize any of these methods to build bridges with NICU families who choose to provide breast milk to optimize maternal milk supplies. In addition, adequate funding is necessary to ensure the success of the collaborative,

Summary of Recommendations for Research and Practice	
What we know:	• Mothers of NICU and TCU infants encounter challenges as they maintain a rigorous breast milk expression schedule. Systematic approach for mothers to monitor their supply of breast milk may be helpful.
What needs to be studied:	• The development of a mobile health platform or an app that mothers of preterm or hospitalized neonates can use with ease to track their breast milk volumes and schedules. • The impact on the volume and duration of expressed breast milk that mothers who use the new tool.
What we can do today:	• It is essential that neonatal nurses promote breastfeeding and the provision of breast milk in this vulnerable population. • Collaborate with other members of the healthcare team to provide education and consistent positive reinforcement to mothers working to provide breast milk. • Facilitate kangaroo care opportunities for mothers. • Encourage mothers to maintain a breast milk expression log to track their milk supply.

effective, and innovative ventures. Options to provide portable computers with internet access for disadvantaged families so they can access educational mobile electronic health applications may be a strategy to ensure access for all NICU families.

Study Limitations

There are several limitations to this investigation. The small sample included mothers of preterm infants hospitalized in the NICU who decided to breastfeed and/or provide breast milk from only one hospital in the Midwest; therefore, the results are not generalizable. Mothers often shared verbal anecdotal feedback with the PI but did not document this content on the study questionnaires. The actual Web site that was developed did not have all the content and options that the clinical investigator initially envisioned as most helpful to mothers of preterm or hospitalized infants. Another limitation of this study was that the only electronic platform investigated was a Web site in the ever-growing field of electronic health applications. However, the study findings can be used to direct the future design and development of user-friendly electronic health resources for this generation of mothers of preterm infants who are increasingly tech-savvy.

Lessons Learned

When undertaking to collaborate with electronic health platform designers, it is essential to select designers who have a documented record of collaborating with healthcare professionals to develop a product that can function as the clinician envisions and can meet the needs of this vulnerable population. Also, it is critical that there are adequate financial resources to support these endeavors. The architects of mobile electronic health vehicles should have sufficient time to be responsive to changes indicated by use and comments from early electronic health application users and be able to move quickly to bring new technology to the electronic health landscape.

To encourage future participants to provide significant, thorough, and thoughtful input, the study format may need revision. Perhaps a documented or recorded verbal discussion with participants after using electronic health applications with content analysis for emerging themes may have garnered more usable feedback.

CONCLUSION

This is the first known work that developed a Web site for mothers of hospitalized neonates who had opted to breastfeed and/or provide breast milk to track their milk supply and evaluate their input and use of the Web site. The Web site was developed as a usable form of technology readily available to mothers of hospitalized infants to provide breastfeeding and breast pumping information and have the capability to track maternal milk volume and expression frequency. In its current format, the Web site did not consistently meet the tracking needs of NICU breast pumping mothers. Mothers of hospitalized preterm infants need additional support and resources to maintain a rigorous breast milk expression schedule to establish and maintain an adequate milk supply to ensure that their children receive the abundant health benefits of breast milk. An easy-to-use and accessible electronic health platform that meets the unique needs of this generation of mothers of hospitalized or preterm infants who are expressing breast milk would be a valuable addition to the ever-increasing cache of lactation technologies that help mothers to improve their breast milk supplies, thereby improving neonatal health incomes. Healthcare professionals need to keep pace with the growing use of mobile health application vehicles used by all sectors of society.

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