Vermont Department of Health (VDH) WIC: Development and Pilot Testing of the Daily Drop Interactive Breastfeeding Education Gamification App

Final Report

Authors:
Erin Hennessy, PhD, MPH
Alice Ammerman, DrPH
Lauren Au, PhD, RD
Alan Barnosky, MA
Jonathan Blitstein, PhD
Sheryl Cates, BA
Kenneth Kwan Ho Chui, PhD
Josephine Cialone, MS, RDN
Sujata Dixit-Joshi, PhD
Lisa Gualtieri, PhD
Jeniffer Iriondo-Perez, MS
Olga Khavjou, MA
Elizabeth Krupinski, PhD
Danielle Louder, BS
Jerold Mande, MPH
Parke Wilde, PhD
Susan Woods, MD, MPH
Catherine Wright, MS
Qi (Harry) Zhang, PhD

Submitted by:
Friedman School of Nutrition Science and Policy
Tufts University
150 Harrison Ave
Boston, MA 02111

Project Director:
Erin Hennessy, PhD, MPH

Submitted To:
Karen Castellanos-Brown, PhD, Project Officer
and Pascasie Adedze, PhD, SNAS Liaison
USDA, Food and Nutrition Service
Braddock Metro Center II
1320 Braddock Place, Fifth Floor
Alexandria, VA 22314

This study was conducted under Grant Number OPS-WIC Telehealth-FY19-Tufts-MA with the U.S. Department of Agriculture, Food and Nutrition Service.

Suggested Citation: Hennessy, Erin, et al., *Vermont Department of Health (VDH) WIC: Development and Pilot Testing of the Daily Drop Interactive Breastfeeding Education Gamification App. Final Report.* Prepared by Friedman School of Nutrition Science and Policy, Tufts University for the U.S. Department of Agriculture, Food and Nutrition Service, September 2024. Project Officer: Karen Castellanos-Brown.

Available online at https://thiswic.nutrition.tufts.edu/

September 2024

Tufts University | Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy

WIC Women Infants Children — Vermont Department of Health

USDA Food and Nutrition Service — U.S. Department of Agriculture

Acknowledgments

This project has been funded at least in part with Federal funds from the U.S. Department of Agriculture. The contents of this publication do not necessarily reflect the view or policies of the U.S. Department of Agriculture, and mention of trade names, commercial products, or organizations does not imply endorsement by the U.S. Government.

The Telehealth Intervention Strategies for Supplemental Nutrition Program for Women, Infants, and Children (THIS-WIC) team would like to thank the State and local agency staff who participated in this project and the WIC clients who participated in its evaluation. We would like to thank the THIS-WIC Leadership Team and Advisory Board who have provided support, guidance, and feedback throughout the project. Finally, we would like to thank all the doctoral students and graduate and undergraduate research assistants whose efforts made this work possible.

We would also like to thank our collaborators at USDA/FNS, including the project officer Karen Castellanos-Brown, PhD, MSW, and the USDA/FNS WIC liaison Pascasie Adedze, PhD.

Vermont WIC Project Team

Tricia Cassi, IBCLC
Gillian MacKinnon, MS, RD, IBCLC
Amy Malinowski, RD
Noah Praamsma, MS, RD

Contents

Figures

Number **Page**

Tables

Number **Page**

List of Acronyms

BAPT	Breastfeeding Attrition Prediction Tool
CFIR	Consolidated Framework for Implementation Research
DBE	Designated Breastfeeding Expert
ERIC	Expert Recommendations for Implementing Change
FNS	Food and Nutrition Service
IBCLC	International Board-Certified Lactation Consultant
IRB	Institutional Review Board
MIS	Management Information System
PA	Priority Area
RD	Registered Dietitian
RE-AIM	Reach, Effectiveness, Adoption, Implementation and Maintenance
RFA	Request for Application
SD	Standard Deviation
THIS-WIC	USDA/Tufts Telehealth Intervention Strategies for WIC
USDA	U.S. Department of Agriculture
VT	Vermont
WIC	Supplemental Nutrition Program for Women, Infants, and Children

Terms and Definitions

Term	Definition
Chestfeeding	Giving human milk by feeding your baby directly from your body. Chestfeeding is often used by people who don't identify their anatomy with the term "breast."
Clinics	WIC clinics are locations where WIC clients receive services.
Breastfeeding Attrition Prediction Tool (BAPT)	The Daily Drop game pathway is tailored to an individual's needs using the BAPT, a validated questionnaire that identifies knowledge, support, and confidence gaps linked to breastfeeding attrition. The BAPT score in these three different domains determines where the individual starts in the app.
Challenge Playlist	The Challenge Playlist includes eight minigames that review material Daily Drop users have had difficulty with previously.
Daily Drop app	The game-based, interactive mobile app developed by Vermont WIC to promote breastfeeding initiation and duration.
Daily Playlist	Daily Playlists are the main feature of Daily Drop and include a series of minigames to help increase users' knowledge, support, and confidence around breastfeeding or chestfeeding. There are five minigames in the Daily Playlist to complete. Minigames include content across the three domains.
Domain scores	Minigames in Daily Drop are tagged to one of three domains: knowledge, support, or confidence. Users gain points for completing minigames correctly and lose points for answering incorrectly. In each domain, users start with a score of 0 and can move between -50 and 50 points while playing minigames. The domain score shows where a user is at currently.
Early phase	First quarter of implementation during pilot study; corresponds with Q1/2023.
Intervention	Sites that implemented the telehealth intervention.
Late phase	Final quarter of implementation during pilot study; corresponds with Q3/2023.
Local agency	WIC administrative entity that oversees clinics where WIC clients receive services.
Mid phase	Midpoint of implementation during pilot study; corresponds with Q3/2023.
Minigame	Daily Drop includes six types of minigames designed to support users' knowledge, support, and confidence for breastfeeding. The minigames include matching games (e.g., matching images and text with facts about breastfeeding and nutrition), identifying differences in images related to breastfeeding and nutrition, card sorting, and games to identify myths or facts about breastfeeding.
Players	Daily Drop users during the pilot study who played at least one Daily Playlist during the first month after downloading the app.

Term	Definition
Power BI	A data visualization and reporting platform designed to be easily accessible for those without specialized data knowledge. Vermont WIC used Power BI to develop a dashboard/report to be used in-clinic to support breastfeeding and education in conjunction with the Daily Drop app.
Playlists	Playlists are groups of minigames. In Daily Drop, two kinds of playlists are presented to users: Daily Playlists and Challenge Playlists.
Nonplayer	WIC clients with access to Daily Drop who do not play at least one Daily Playlist during the first month.
Session	Time period in which a player is logged into the Daily Drop app and uses the app (e.g., completing the Daily Playlist, looking at resources in the library).
Telehealth	As defined by the U.S. Department of Health and Human Services, telehealth is the use of electronic communication and telecommunications technology to support long-distance clinical healthcare, patient and professional health-related education, public health, and health administration.
WIC client	All individuals who receive WIC services at the participating clinics involved in the THIS-WIC evaluation and represent the entire agency-level caseload, not just those in the THIS-WIC evaluation. In working with the States engaged in this work, the THIS-WIC team recognizes that States differ in how they refer to individuals who receive WIC services. Some States prefer the term “WIC client,” whereas others prefer “WIC participant.” Because of this and potential confusion with the term “participation” in the context of an evaluation, we use the term “client.” We acknowledge that FNS’s preferred term is “WIC participant.”
WIC Client Survey respondent	Individuals who consented to participate in the study and responded to the Daily Drop Client Surveys. These individuals represent a subsample of all individuals who received WIC services at participating sites (WIC clients).
WIC client telehealth user	Individuals who used the telehealth solution (as documented by telehealth metadata); these individuals may or may not be survey respondents.
WIC Staff Survey respondent	Individuals who consented to participate in the study and responded to the THIS-WIC Staff Survey. These individuals were staff who delivered nutrition education/breastfeeding support using telehealth at participating sites and agreed to take part in the survey.
WIC staff key informant interview respondent	Individuals who consented to participate in the study and took part in a WIC staff key informant interview. These individuals were staff who delivered nutrition education/breastfeeding support using telehealth at participating sites and agreed to take part in the survey or interview.

Executive Summary

Background

Telehealth has emerged as an integral approach to offering health services because it may offer enhanced access, convenience in scheduling and receiving services, and cost savings. However, factors such as comfort level with digital technology, Internet availability, privacy and security concerns, and accessibility may be barriers to telehealth integration within the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The Consolidated Appropriations Act of 2019 (Public Law 1166) authorized the allocation of $5,000,000 for competitive telehealth grants to (1) supplement the nutrition education and breastfeeding support offered to individuals in the WIC program; and (2) decrease barriers to accessing WIC services. The U.S. Department of Agriculture (USDA), Food and Nutrition Service (FNS) awarded a Cooperative Agreement to Tufts University and collaborators in Telehealth Intervention Strategies for WIC (THIS-WIC) to support the implementation and evaluation of telehealth services in WIC. THIS-WIC awarded grants and evaluated telehealth solutions across seven WIC State agencies: District of Columbia, Georgia, Michigan, North Carolina, South Carolina, **Vermont (VT)**, and Wisconsin WIC. This report describes the implementation and evaluation of telehealth services using Daily Drop in **VT**.

Project Overview

VT WIC developed Daily Drop, an interactive app to promote breastfeeding among WIC clients. Between January 2023 (Q1/2023) and September 2023 (Q3/2023), five (5) agencies offered telehealth services to pregnant and breastfeeding WIC clients.[1]

The THIS-WIC evaluation assessed the implementation and outcomes of Daily Drop in VT. Implementation evaluation findings are based on data collected from the VT Management Information System (MIS), the State-level Implementation Tracking Tool, staff and supervisor implementation tracking survey, metadata from the Daily Drop app, THIS-WIC Staff Surveys, cost-tracking data, and key informant interviews with WIC staff and clients. Outcome evaluation findings are based on data collected from MIS and the Daily Drop Client Surveys.

Findings

Implementation of Daily Drop in VT

WIC staff had favorable attitudes toward the Daily Drop app and reports; they considered the app as having the potential to reduce common barriers encountered during traditional breastfeeding support education, such as physical presence at the clinic or access to reliable

[1] WIC clients refers to all individuals who receive WIC services at the intervention and comparison agencies involved in the THIS-WIC evaluation and represent the entire agency-level caseload, not just those in the THIS-WIC evaluation. The THIS-WIC team recognizes that states engaged in this work differ in how they refer to individuals who receive WIC services. Some states prefer to use the term “WIC client,” whereas other states prefer “WIC participant.” Because of this and potential confusion with the term “participant” in the context of an evaluation, this report uses the term “client.”

Internet. Staff perceived that providing the app to clients could improve access to WIC services by providing clients the opportunity to learn in different ways; they acknowledged that the app was more interactive and engaging than traditional education methods such as handouts. Staff also thought that the Daily Drop reports are useful to provide customized education to clients. However, staff did not feel prepared to promote the app and use the reports after the training and noted that learning Daily Drop was an additional task in their already busy schedules. Older staff reported relying on younger or experienced staff to understand the process of obtaining and using the reports. Most staff considered their use of Daily Drop reports to be moderate, driven by lack of time, inability to access reports from VT MIS, and low client use. In the late phase, staff who used the reports noted that they used them to customize discussions based on client interests. However, mean scores for acceptability indicators declined over time (**Table ES-1**).

Table ES-1. Acceptability of Daily Drop Among Staff Survey Respondents in VT

Statement	Early Phase N=14	Mid Phase N=6	Late Phase N=3
	Mean (SD)[a]		
Daily Drop is an acceptable way to provide WIC breastfeeding education.	4.4 (0.6)	3.7 (0.5)	3.3 (0.6)
Daily Drop reports are useful for me as WIC staff.	4.3 (0.7)	3.0 (1.3)	2.7 (1.5)
I would like to continue using Daily Drop game play feedback in my breastfeeding support sessions.	N/A	3.0 (1.1)	2.0 (1.0)
Learning to use game play feedback for breastfeeding education and support from Daily Drop was easy for me.	3.8 (1.0)	3.0 (1.1)	2.0 (1.7)
I find the Daily Drop reports easy to understand.	3.9 (0.9)	2.8 (1.3)	3.0 (1.0)

Source: THIS-WIC Staff Survey

[a] Mean and standard deviation (SD) are from 5-point Likert scales, where 1=Strongly disagree and 5=Strongly agree.

Cost of Daily Drop in VT

VT incurred $557,084 in costs to develop and test the Daily Drop app, of which about 46 percent was spent on contracted services, 32 percent was spent on labor, and 22 percent was spent on indirect costs. The implementation costs were $2,859 per participant enrolled (over the 9.3-month pilot, VT enrolled 51 participants in the pilot study).

Client Experience with Daily Drop in VT

The median duration of Daily Drop app use among players was 29 days; during this time, players started 10 (median) sessions and completed 80 percent of these sessions. The median time spent per session was about 4 minutes. The median number of total playlists completed was 24 (out of 123), with eight each in the knowledge, support, and confidence domains. After

having access to the app for 1 month, players enjoyed learning about breastfeeding through the app and found it more engaging than other education materials used as part of WIC breastfeeding education. Respondents also indicated that they learned about breastfeeding quickly and easily because of the app. About half of the respondents indicated they would recommend it to other WIC clients, and nearly two-thirds thought other WIC clinics should offer it to clients. Most respondents noted that the app was convenient to access and simple to use. During interviews, clients reiterated the simplicity of the app; some appreciated the content and acknowledged that it reaffirmed and reinforced their intent to breastfeed and increased their confidence to breastfeed. Some respondents found the information to be repetitive and thought it did not provide any new information for mothers who had breastfed a child before. Barriers to using the app encountered by clients included lack of reminders and inability to play more than one playlist per day.

Most (85.2%) respondents had breastfed their previous baby(ies), and the average duration of breastfeeding was 5 months. A greater proportion of players than nonplayers had breastfed their child in the past. At baseline, most (86.9%) respondents planned to breastfeed their new baby in the first few weeks and continue to do so for about 15 months. Slightly more than one-third of the respondents planned to introduce formula or other foods at 5 or 6 months. Nearly half of the respondents had Breastfeeding Attrition Prediction Tool (BAPT) scores of 20 or more, considered predictive of breastfeeding behavior. At 1 month, about one-third of the respondents indicated that “playing Daily Drop makes me more likely to breastfeed my child.” Completing playlists was associated with higher domain scores; each additional playlist completed by respondents increased their knowledge score by 0.79, support score by 0.85, and confidence score by 0.76.

Baseline intent to breastfeed as well as baseline BAPT scores were significantly associated with breastfeeding behavior at 3 months. Nearly 80 percent of those who planned to breastfeed at baseline gave breastmilk to their new baby at 3 months, whereas none of the respondents who planned to formula feed or were undecided did so. Slightly more than half (57%) of the respondents with BAPT scores >20 gave their new baby breastmilk at 3 months compared to 42 percent with BAPT scores ≤20. All Daily Drop players gave breastmilk at 3 months; none of the nonplayers did so. After controlling for prior breastfeeding history, each unit increase in baseline BAPT scores increased the odds of giving breastmilk at 3 months by 27 percent. (**Table ES-2**).

Table ES-2. Factors Associated with Giving Breastmilk to Baby at 3 Months in VT among Client Survey Respondents

Variable	Adjusted Model		
	Odds Ratio	95% CI	p value
Baseline BAPT score (continuous)	1.27	1.03, 1.58	0.026*
Prior breastfeeding			
No	Ref.		
Yes	0.41	0.11, 14.3	0.623

Source: Daily Drop Baseline Survey, Daily Drop User 3 Months Postpartum Survey, Daily Drop metadata
NOTES: Outcome is postpartum breastfeeding (coded as 1: Yes; 0: No). CI: Confidence interval.
* $p<0.05$

Recommendations

WIC staff and clients provided the following recommendations:

- Providing in-depth training at a slower pace will increase staff's familiarity with the app and the reports.
- Integrating the reports into the MIS will increase staff use of the reports during appointments.
- Providing the app to WIC clients during in-clinic appointments will increase comfort with and ongoing use of the app.
- Pushing notification reminders to play games will encourage client use.
- Reducing content overlap across games will increase client use of the app.
- Making the app available in multiple languages and adding functionality to support users with auditory or visual impairments will support expansion to a wider client base.

1. Background

Telehealth technology allows healthcare providers to communicate with patients remotely, through a two-way, synchronous channel. It has emerged as an integral approach to offering healthcare services and could become a standard of care soon. For the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), telehealth may facilitate access to services in rural areas or in areas with staffing shortages, improve efficiency without higher net costs, and reduce travel and wait time, making it convenient to schedule and receive timely care services. However, factors such as comfort level with digital technology, Internet availability, privacy and security concerns, and accessibility dictate the quality of client experience and may be barriers to telehealth integration within WIC. Understanding variations in telehealth use and adoption by staff and clients is necessary to inform telehealth use policies.

The Consolidated Appropriations Act of 2019 (Public Law 1166) authorized the allocation of $5,000,000 for competitive telehealth grants to (1) supplement the nutrition education and breastfeeding support offered to individuals in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) program; and (2) decrease barriers to accessing WIC services. The U.S. Department of Agriculture (USDA), Food and Nutrition Service (FNS) awarded a Cooperative Agreement to Tufts University and collaborators in Telehealth Intervention Strategies for WIC (THIS-WIC) to support the implementation and evaluation of telehealth services in WIC. Through a competitive Request for Application (RFA) process, State agencies submitted proposals to implement projects focused on one of two Priority Areas (PA):

- PA I: Implement an existing telehealth solution to ensure timely access to nutritional or breastfeeding support for WIC clients by qualified professionals.
- PA II: Develop and implement an online (mobile-friendly) resource or tool to provide nutritional or breastfeeding support to WIC clients that is within the scope of the nutrition education and/or breastfeeding support offered in the WIC clinic by qualified professionals, including Registered Dietitians, Certified Lactation Consultants, and International Board-Certified Lactation Consultants (IBCLCs).

THIS-WIC awarded grants and evaluated telehealth solutions across seven WIC State agencies:

- PA I: District of Columbia, Georgia, Michigan, Wisconsin
- PA II: North Carolina, South Carolina, Vermont (VT)

In addition, THIS-WIC provided technical assistance to all agencies throughout the study to support the adoption of telehealth and the evaluation of telehealth interventions. THIS-WIC elevated the relevance of telehealth solutions due to the COVID-19 pandemic, which sharply increased public and agency attention on remote access to services. The project was funded and designed before the pandemic, and some aspects of the design were modified to account for changes to service delivery related to USDA COVID-19 waivers. This report focuses on the

development and pilot testing of an interactive breastfeeding education gamification app, Daily Drop, in VT.

1.1 Need for Telehealth Solution in VT

In fiscal year 2020, VT WIC served approximately 12,000 participants through 12 local health department offices serving 14 counties.[1] In addition, the program served approximately 800 pregnant participants per month.[2] VT is one of the two most rural states in the United States,[3] and 79 percent of VT WIC's pregnant participants live in mostly or completely rural areas. Transportation and limited broadband access are known barriers to accessing WIC services in VT. Findings from the VT WIC Annual Participant Survey indicate that respondents missed appointments due to work (10%), bad weather or roads (9%), and not having a way to travel to the WIC clinic (7%). Findings also indicate that respondents preferred to receive nutrition information on their mobile device, and the majority cited WIChealth.org, VT WIC's online nutrition education platform, as their preferred nutrition education source. However, VT WIC staff noted that breastfeeding content on WIChealth.org is limited, impacting their ability to provide comprehensive education to WIC clients.

1.2 Development of VT's Telehealth Solution

1.2.1 Overview of the Telehealth Solution

VT developed Daily Drop, a game-based breastfeeding support solution for clients to use during pregnancy and through the early weeks of the postpartum period. Daily Drop was created for WIC clients who are interested in gaining more breastfeeding knowledge, confidence, and support but may not have the flexibility or interest to be engaged in a breastfeeding class. Daily Drop provides basic breastfeeding information for clients with minimal breastfeeding knowledge, confidence, or support in an effort to mirror the information provided to WIC clients in breastfeeding classes. Daily Drop includes a series of interactive minigames, reflection activities, digital tracking tools, and a learning library with additional resources to engage participants with relevant, up-to-date materials based on content currently used at WIC clinics for in-person and online breastfeeding classes. The content for the games was adapted from several sources, including existing WIC breastfeeding curricula and resources from various State agencies, including VT, CA, and NJ, NY; federal agencies, including the U.S. Department of Agriculture (USDA), Centers for Disease Control and Prevention (CDC), and National Institutes of Health (NIH); as well as other organizations supporting breastfeeding, such as La Leche League and the Institute for the Advancement of Breastfeeding and Lactation Education.

In VT, all WIC participants complete the Breastfeeding Attrition Prediction Tool (BAPT), a validated questionnaire that identifies knowledge, support, and confidence gaps linked to breastfeeding attrition.[4] The game pathway is tailored to the BAPT domain scores for knowledge, support, and confidence and determine where the participant starts the Daily Drop minigames.

For the purposes of the THIS-WIC pilot, VT WIC did not integrate Daily Drop with MIS due to the substantial cost associated with doing so. Instead, it developed an accompanying report tool that breastfeeding support WIC staff can log into prior to clinic appointments to search for a specific client and assess where they are on their breastfeeding journey. The information in the tool includes the WIC client's BAPT score; Daily Drop domain scores for knowledge, support, and confidence; and topics of interest. Staff used this information in support of conversations with clients around continued breastfeeding successes and sticking points or barriers. Staff discussed progress during discussion at the client's mid-pregnancy and postpartum appointments and used it to develop their care plan and determine appropriate follow-up. The app has mechanisms to connect directly back to the local WIC clinic through text, email, and phone if a user experiences challenges with content delivered through the minigames or has a question. WIC clients can connect with the clinic via phone call to the local office main line, email to the local office email, or text message. WIC staff monitor each of these mechanisms during business hours and triage inquiries from participants to the Designated Breastfeeding Expert (DBE) or other appropriate staff.

1.2.2 Daily Drop Experience and Evaluation

The Daily Drop app was created through an iterative development process that included user story development, content compilation and refinement, prototyping, and alpha and beta testing and development before a pilot study in five clinics. The THIS-WIC pilot feasibility study to evaluate Daily Drop spanned 9 months between Q1/2023 to Q3/2023. Through all phases of the project, the VT State agency team engaged an advisory council comprising WIC clients, local agency WIC staff, and State agency WIC and information technology (IT) staff. Using a participatory evaluation model, VT engaged these key stakeholders in evaluation design, data collection, and reporting and dissemination of results. This engagement helped ensure that the look, feel, experience, and content of the final app resonated with and was relevant for users.

Client-Facing App

Pregnant WIC clients at participating WIC clinics were invited to download the app on their mobile device (phone or tablet). Upon opening the app for the first time, users are presented with a series of screens prompting them to enter their WIC ID (provided to them ahead of time), identify their local WIC agency, and select their preferred term: *breastfeeding* or *chestfeeding*. During the early developmental phase of the project, the VT State agency team updated the terminology in the BAPT survey to make it more inclusive[5] (e.g., *human milk* instead of *breast milk*; *chestfeeding* in addition to *breastfeeding*); the updated tool was used in Daily Drop and sent directly to users through the app. The app presents content using a WIC client's chosen terms, which the user can adjust if desired. Users are also asked whether they are pregnant (and their expected due date) or recently gave birth (and their baby's birth date). This date determines their pregnancy or postpartum stage; the content shown to users is tailored to the stage they are in. Following the initial setup questions, the app asks the user to complete the BAPT. All users need to complete the BAPT to continue to engage with key features of the app. The app includes sections for the Daily Playlist, Rewards, Learn, and Support.

Once a session has been started (i.e., the app has been opened), users are presented with a Daily Playlist that contains five minigames. Before playing a game, users will get a "knowledge summary" on the subject if they have not encountered the topic before. If they do not answer correctly, the knowledge summary and the game will be presented again until it is completed correctly. Getting more answers right results in more rewards, called Gems, which can be used to open "gifts" in the form of costumes, outfits, and accessories for the user's Daily Drop "avatar," a cartoon kangaroo that guides the user through the app.

Minigames are organized by type and include:

- Complete the Grid – Six tiles are presented, each having a description or an image. The user must drag a text tile from the bottom of the screen to the associated image or description. After all matches are successfully made, the user can move on.
- Spot the Difference – There is a prompt asking the user to find or change certain things in the image.
- Complete the Scene – An image appears on the screen and users are asked to tap a prompt and choose an option to complete the scene.
- What's Next – A question appears on the screen asking the user how they would like to proceed in the scenario and they select an option from the choices presented.
- Swipe and sort – A stack of cards appears onscreen, with only the top card's content visible. The user sorts the cards according to the options presented and can move on once all cards are sorted correctly.
- Myth Buster & Fact Locker – Four boxes with statements appear on screen—one of the boxes will be the true statement. In the Myth Buster minigame the user chooses the myth, and in the Fact Locker minigame the user chooses the fact.

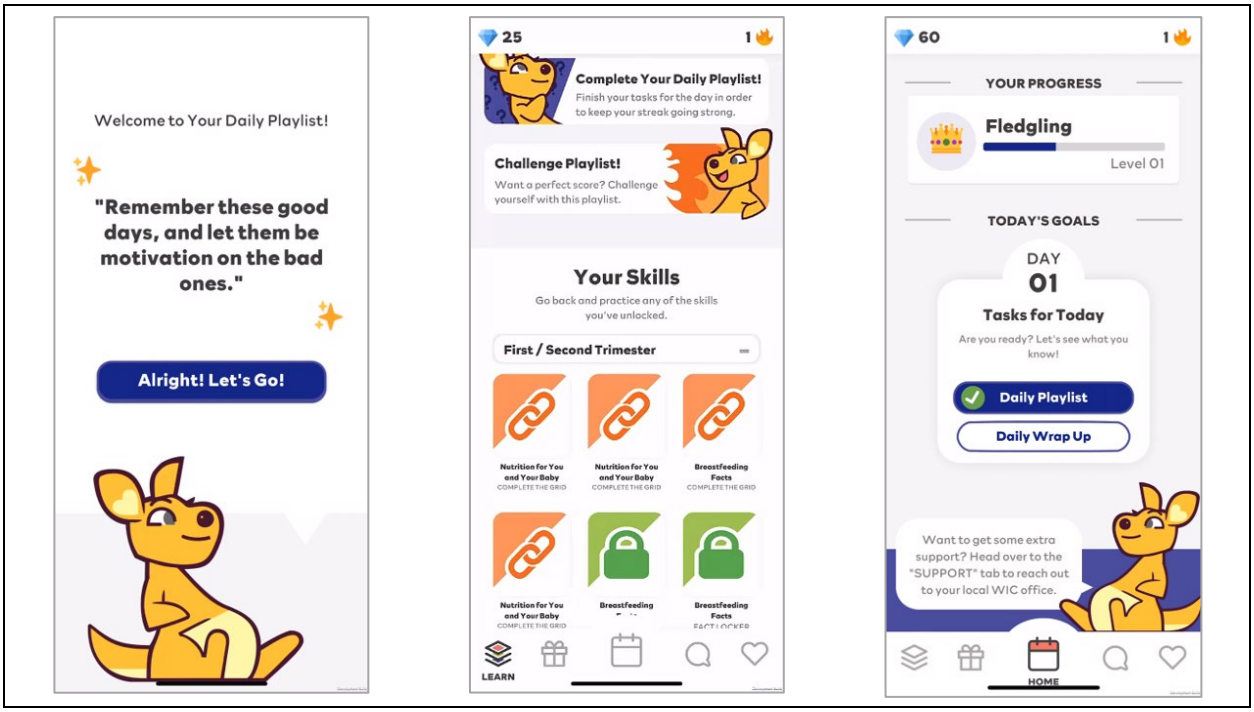
The first 10 active days of game play in the Daily Drop app are guided by the BAPT scores, so a user sees more content related to their lowest domain score. After the first 10 days of play, minigames for the Daily Playlist are randomly pulled according to a ruleset that draws from lists of the 10 least recently shown minigames in knowledge, support, and confidence; and the 10 least recently shown minigames in the domain in which the user has the lowest domain score. The Daily Playlist also pulls from a pool of minigames that the user recently answered incorrectly ("new focus" minigames). Overall, Daily Drop presents content based on the user's current learning. After every 10 days of active play, the user is presented with a Milestone question that asks them how confident they feel about breastfeeding. That response is recorded in the Daily Drop report for staff to see (see Staff-Facing Report section below).

In the Learn section of the app, users can access the library, a record of information on all the topics covered in the app, and the Challenge Playlist, which revisits material the user had difficulty with during prior game play sessions. Challenge Playlists consist of eight minigames and are built using a combination of three types of content: "new focus" (i.e., those minigames that a user recently did not complete correctly); "old focus" (i.e., those minigames that a user has completed correctly three times without fail); and "personal focus" (i.e., a confidence or

support minigame that a user has completed in such a way that it lowers their respective domain score). In addition, users can replay any minigame in the app.

At the end of each game play session, users are encouraged to complete a Daily Wrap-Up, a simple reflection on how their day is going, accompanied by a relevant Daily Affirmation. See **Figure 1-1** for example screens from Daily Drop.

Figure 1-1. Daily Drop App Screenshots



In the Support section of the app, users can contact their WIC office by phone, email, or text. Links in this section are live and allow users to contact their local WIC agency directly from the app. In addition, this section contains prompts to visit the knowledge library for common questions or concerns. Messages sent to local WIC offices are triaged to the appropriate staff member who follows up during business hours within a few minutes or no more than a couple of hours of the initial inquiry. All offices have a staff member monitoring each of these contact mechanisms regularly throughout the day. When staff within the local office are unable to respond in a timely manner, there are processes in place where regional or state IBCLCs will respond so follow-up happens quickly.

Staff-Facing Report

On the staff side, the Daily Drop Report tool, developed with Power BI and accessible via their computer, allows WIC staff (i.e., Competent Professional Authorities [CPAs], referred to as “certifiers” in Vermont, including nutritionists and designated breastfeeding experts) to view client progress through the Daily Drop app. This tool was developed to complement the breastfeeding support and education already provided by staff at the WIC clinic. Game play data

generated on users' devices are sent directly to the staff side, and the report updates automatically each morning. Staff are responsible for checking the report as part of their clinic preparation activities. Through the report, staff can view users' initial BAPT scores and any follow-up needed based on the scores. In addition, staff can follow users' progress within each domain (knowledge, support, confidence) over time.

A Milestone score shows how confident the user currently feels about breastfeeding; the Milestone question is asked every 10 active days of play. Finally, the dashboard displays users' "Top Interests" (i.e., topics they have accessed in the Knowledge Library or Common Challenges sections of the app). These topics can be used to guide conversations between WIC staff and clients during appointments.

2. Project Methods

Implementation and use of the Daily Drop app spanned 9 months from Q1/2023 to Q3/2023 (January through September 2023). The THIS-WIC evaluation sought to assess the feasibility and usability of the Daily Drop app for WIC clients who are pregnant and postpartum. Overall, THIS-WIC used the five-stage model for comprehensive research on telehealth developed by Fatehi and colleagues[6] to guide the overall design of the telehealth research study. VT's telehealth project spanned stages 1 through 3: concept development, service design, and pre-implementation (see **Appendix VT.1** for details and the model).

2.1 Research Questions

THIS-WIC examined several research questions to understand the use of the Daily Drop app (**Table 2-1**) and its potential impact on breastfeeding intentions and behaviors. Implementation Tracking Tools were created to document and understand the use of Daily Drop during the pilot trial.

Table 2-1. Staff-, Agency-, and Client-Level Research Questions in VT

Staff and agency levels	
▪ What was the staff attitude toward the Daily Drop app and reports?	▪ What was the perceived feasibility of using Daily Drop reports to provide WIC services?
▪ What was the staff level of readiness to promote the Daily Drop app and use reports during appointments?	▪ Do staff perceive the Daily Drop app to make WIC services more accessible for WIC clients?
▪ What was the staff level of satisfaction with Daily Drop reports?	▪ What was the startup cost of Daily Drop in WIC?
▪ What was the staff level of adoption for Daily Drop reports to support counseling?	
▪ What was the staff acceptability of Daily Drop reports?	
Client level	
▪ What was the level of Daily Drop app adoption among clients?	▪ What were the perceived barriers to accessing and using the Daily Drop app?
▪ What was the level of satisfaction with the Daily Drop app among clients?	▪ What was the rate of breastfeeding initiation and duration among Daily Drop app users at 3 months?
▪ What was the perceived acceptability (accessibility and feasibility) of the Daily Drop app?	

2.2 WIC Agencies Participating in Telehealth Solution Implementation and Evaluation

VT selected five WIC agencies to take part in the pilot evaluation. These agencies were selected based on demographic characteristics, agency leadership, staff capacity, and staff familiarity with the project and project goals. In addition, these agencies had at least one staff member who was part of the project advisory council. **Appendix VT.1** lists these agencies and describes their caseload characteristics.

2.3 Data Sources for Daily Drop Evaluation

This study used new and existing quantitative and qualitative data sources to assess processes and outcomes. The data sources included (1) MIS data, (2) telehealth metadata collected by the Daily Drop app, (3) Daily Drop Client Surveys, (4) THIS-WIC Staff Surveys, (5) staff and client key informant interview data, (6) implementation data, and (7) cost data. **Appendix VT.1** lists the lead for developing and collecting these data.

2.3.1 Management Information System Data

VT MIS provided administrative data at the microlevel (individual-level MIS data from WIC clients who completed Daily Drop Client Surveys). **Appendix VT.2** lists MIS data provided by VT.

2.3.2 Daily Drop Metadata

Daily Drop captured data about participant use of the app, including time played (e.g., first and last day using the app, total minutes spent playing, average session time); domain scores for knowledge, support, and confidence around breastfeeding; and number and type of playlists by domain. **Appendix VT.2** provides the list of metadata provided by VT.

2.3.3 Client and Staff Surveys

2.3.3.1 Client Surveys

WIC clients who consented to take part in the THIS-WIC evaluation completed the following surveys:

- **Daily Drop Baseline Survey**. Included questions about infant feeding intentions, demographic information, and identifiers to link survey responses with MIS data.
- **Daily Drop User 1-Month Survey**. Sent to players (Daily Drop Baseline Survey respondents who downloaded the Daily Drop app and played at least one Daily Playlist of games over the first month). The survey included questions about satisfaction with and experience using Daily Drop and current or intended infant feeding practices (e.g., breastfeeding), depending on whether the WIC client had their baby at the 1-month follow-up. Branching logic was used to determine the pathway to intended or actual feeding practice questions, depending on whether the respondent had or had not yet had their baby.

- **Daily Drop Non-User 1-Month Survey**. WIC clients who did not play at least one Daily Playlist were sent a brief survey about reasons for not using the app. This survey was sent to nonplayers instead of the Daily Drop User 1-Month Survey.
- **Daily Drop User 3 Months Postpartum Survey**. This survey was sent to players only and included questions on feeding practices (e.g., breastfeeding).

Survey questions were drawn from valid and reliable tools.[3-5; 7-19] See **Appendix VT.3** for the Daily Drop Client Surveys.

2.3.3.2 Staff Surveys

THIS-WIC developed three English-language staff surveys to assess staff experience and satisfaction with Daily Drop for providing breastfeeding support, accessibility and acceptability of the solution, and staff attitudes toward and readiness for telehealth use. Survey items were drawn from reliable/valid instruments[12; 18; 20-26] and focused on research questions listed in **Table 2-1**, along with additional demographic questions and covariates (e.g., years of experience working at WIC). A 12-question survey was fielded in the early phase to assess early implementation factors like training and acceptability. At the mid and late phases, a 22-question survey was administered that included questions about use and non-use by staff of Daily Drop reports, satisfaction with Daily Drop, and overall experience. The average completion time for each of the three surveys was 5 to 10 minutes. See **Appendix VT.3** for the Staff Surveys.

2.3.4 Staff and Client Key Informant Interviews

2.3.4.1 Staff Key Informant Interviews

Local WIC agency staff and directors at clinics offering Daily Drop to clients were invited to participate in interviews. The key informant interview guides were developed by THIS-WIC in collaboration with the State agencies; the questions were informed by the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework[27] and the Consolidated Framework for Implementation Research (CFIR)[28] implementation frameworks to assess key implementation aspects (e.g., relative advantage, compatibility, complexity, trialability). Once developed, the guide was tested and refined based on a mock interview conducted with a THIS-WIC Advisory Board member who is a former WIC State agency director. Interview findings were used to understand the diffusion of telehealth solutions, activities undertaken to ensure successful implementation, and modifications to workflow to address challenges. Interviews were scheduled for 60 minutes. See **Appendix VT.3** for the discussion guide for the staff and local agency director interviews.

2.3.4.2 Client Key Informant Interviews

WIC clients who used the Daily Drop app were invited to participate in interviews to provide additional insights about their use of and experience with Daily Drop. The interview guide was tested with members of the VT advisory council and refined based on their feedback. See **Appendix VT.3** for the client interview guide.

2.3.5 Telehealth Implementation Data

Telehealth implementation data were obtained from two sources: a 46-item Implementation Tracking Tool completed by the VT WIC team at the startup (pre-implementation), midpoint, and endpoint of implementation, and a staff and supervisor implementation tracking survey fielded to local agency staff and supervisors involved in the pilot study.

2.3.5.1 Implementation Tracking Tool

To assess implementation adoption, the THIS-WIC project management team developed an Implementation Tracking Tool with a menu of 46 implementation strategies (e.g., identify and prepare champions) from the Expert Recommendations for Implementing Change (ERIC) study.[29; 30] In collaboration with THIS-WIC, the VT WIC team developed implementation tracking plans and tools for use at intervention agencies. THIS-WIC projects were not expected to implement all 46 strategies but to select those that aligned best with their overall goals. See **Appendix VT.3** for the Implementation Tracking Tool.

2.3.5.2 Staff and Supervisor Implementation Tracking Survey

The VT WIC team developed an implementation tracking survey to collect insights on staff engagement with Daily Drop and use of the Daily Drop report in providing breastfeeding support and counseling. The 8-question tool included questions about staff use of the Daily Drop report tool during client appointments. See **Appendix VT.3** for the staff and supervisor implementation tracking surveys.

2.3.6 Telehealth Solution Cost Data

For VT, THIS-WIC collected cost data during four project phases: development (March 30 to November 16, 2021), alpha testing (November 17, 2021, to June 16, 2022), beta testing (June 17 to December 20, 2022), and the pilot study (December 21, 2022, to September 30, 2023). Cost categories collected during each phase included labor, equipment, contracts, and indirect costs. See **Appendix VT.3** for the cost-tracking tool.

2.4 Data Collection for THIS-WIC Evaluation

The VT Institutional Review Board (IRB) was the IRB of record for the protocol related to collection of WIC client data (Daily Drop Client Surveys, MIS data, telehealth metadata). The Tufts University IRB established a reliance agreement for the client protocol and separately reviewed and approved all protocols and data collection materials for the Staff Survey and key informant staff interviews led by THIS-WIC.

Before starting data collection, THIS-WIC principal investigators and study personnel completed human subjects' protection training, in line with the requirements of the IRB overseeing the protocol. In addition, THIS-WIC designed and provided online training via Zoom to state and local agency personnel relevant to their involvement in the project. The training covered implementation and evaluation aspects of the work, including details on the study and an overview of human subjects' research protection. This training was recorded to be available as a refresher and for new staff who came on board after the start of implementation.

2.4.1 Management Information System Data

VT WIC shared microlevel MIS data with the THIS-WIC team. VT WIC shared these data bimonthly.

2.4.2 Daily Drop Metadata

VT WIC shared Daily Drop metadata with THIS-WIC quarterly. All data were captured directly by the Daily Drop platform and provided in Excel format to the THIS-WIC team.

2.4.3 Client and Staff Surveys

2.4.3.1 Daily Drop Client Surveys

WIC clients at participating clinics who were 18 years of age or older, were pregnant, spoke and read English, and had access to a smartphone or tablet were eligible to participate in the study. Electronic surveys were programmed using the Alchemer survey platform (Alchemer, Louisville, CO), and links were sent by State agency staff via email or text. WIC clients completed up to three surveys during the intervention, including the Daily Drop Baseline Survey, the Daily Drop 1-Month User Survey (for players) or Daily Drop Nonuser 1-Month Survey (for nonplayers), and the Daily Drop 3 Months Postpartum User Survey. Up to two reminders were sent for the baseline and 1-month surveys. Survey respondents received a $50 prepaid electronic Visa gift card incentive for completing the baseline survey and a second $50 gift card for completing the 1-month survey. Respondents who did not play Daily Drop and completed the non-user survey received a $10 gift card. One reminder was sent for the 3-month postpartum survey following the initial text/email; incentives were not offered for the 3-month postpartum survey.

2.4.3.2 THIS-WIC Staff Surveys

VT WIC provided a list of eligible staff (n=24) (i.e., those who were responsible for delivering breastfeeding support at participating clinics) and their email addresses to THIS-WIC. THIS-WIC sent an invitational email with a link to the Staff Survey to all eligible staff. Staff surveys were distributed electronically via Qualtrics three times during the intervention: once in the first quarter after project implementation (early phase; Q1/2023), once at the mid-phase (Q3/2023), and once in the last quarter of project implementation (late phase; Q4/2023). Up to two reminders were sent via email to eligible staff who did not complete a survey, at 1 week and 2 weeks after the initial email invitation. Incentives were not provided to staff for completion of surveys, in compliance with federal and/or state policies.

2.4.4 Staff and Client Key Informant Interviews

2.4.4.1 Staff Key Informant Interviews

The THIS-WIC team used a semi-structured interview guide to conduct key informant interviews via Zoom in the early (Q1/2023), mid (Q3/2023), and late phases (Q4/2023) of the implementation period. The interviews were scheduled for 1 hour and were digitally recorded. Incentives were not provided to staff for completion of interviews, in compliance with federal and/or state policies.

2.4.4.2 Client Key Informant Interviews

VT State agency staff used a semi-structured interview guide to conduct key informant interviews via Microsoft Teams in Q3/2023 of implementation. Interviews were scheduled for 30 minutes and were digitally recorded. WIC clients who completed an interview received a $50 prepaid electronic Visa gift card incentive.

2.4.5 Telehealth Implementation Data

Implementation data were collected using two methods: responses to the Implementation Tracking Tool for startup (pre-implementation), midpoint, and endpoint or late phase of implementation; and via a staff and supervisor implementation tracking survey sent twice by VT WIC (Q2/2023 and Q4/2023) during the study (see **Appendix VT.3**).

2.4.6 Telehealth Solution Startup and Ongoing Implementation Cost Data

For each project phase (development, alpha, beta, and pilot), the VT State agency completed an Excel-based cost collection tool reporting on the resources used for developing or testing the telehealth solution during the specified project phase. The tool captured staff, infrastructure and equipment, supplies, contracted services, and overhead costs for developing and testing the telehealth solution. The THIS-WIC team reviewed completed cost instruments submitted by the VT State agency to ensure that the data entries were correct and reasonable and conducted follow-up to resolve any data issues.

2.5 Sample Description for THIS-WIC Evaluation

Primary data were collected via the Daily Drop Client Surveys and Staff Surveys. Key informant interviews were also conducted with WIC staff and WIC clients who used the Daily Drop app.

2.5.1 Daily Drop Client Survey Sample Characteristics

WIC clients who were pregnant, able to speak and read English, aged 18 or older, and who had access to a smartphone or tablet were eligible for the study (n=339). The client outcomes evaluation examined the experiences of WIC clients who received WIC services and completed the Daily Drop Baseline Survey in one of the WIC clinics associated with the five agencies in the study between January and September 2023 (Q1/2023–Q3/2023). There were 74 survey respondents for the Daily Drop baseline survey, 49 survey respondents for the 1-month survey (i.e., players), and 42 survey respondents for the 3-month postpartum survey, translating to a response rate of 18.5% for baseline, 12.3% for 1-month, and 10.5% for 3-month surveys.

For client respondents completing the Daily Drop Baseline Survey, 66 percent (N=49) were classified as Daily Drop players and 34 percent (N=25) were classified as nonplayers, based on their app engagement at the 1-month survey. The distributions of highest level of education, race/ ethnicity, primary language, place of residence, and median household income did not differ significantly among Daily Drop players and nonplayers. On average, respondents were 30 years of age. Overall, most respondents self-identified as non-Hispanic White (89.2%). About 90 percent of respondents consider English to be their primary language. Overall, slightly less than

two-thirds (61.1%) of respondents were high school graduates, and one-third (33.3%) had completed at least some college education (1 or more years). Overall, about 67 percent of respondents lived in a rural area, 22 percent lived in a suburban area, and 11 percent lived in an urban area. The median annual household income was $29,376 (see **Appendix VT.1.1** for details).

On average, respondents had two babies previously. About one-third of respondents had received WIC services for less than 1 year, and about one-quarter had received WIC services for 1 to 2 years. MIS data were used to classify clients as high risk at their most recent appointment; about 55 percent of respondents were high risk (see **Appendix VT.1.1** for details).

2.5.2 THIS-WIC Staff Survey Sample Size, Response Rate, and Representativeness

All staff involved in delivering breastfeeding support at participating agencies were invited to complete Staff Surveys. There were 24 staff invited to complete the early-, mid-, and late-phase surveys at each time point. The response rate for the early-, mid-, and late-phase surveys was 66.7 percent, 54.2 percent, and 33.3 percent, respectively.

In the early phase, more than half of respondents were aged 25 to 35, and 21 percent were aged 56 to 65. All staff responding to the survey were non-Hispanic White. About 14 percent of the respondents had participated in WIC. Staff selected several responses to indicate their role at WIC; most selected CPA* (85.9 percent) followed by nutrition education coordinator (42.9 percent) and breastfeeding coordinator (21.4 percent). The number of years staff worked at WIC varied considerably, ranging from less than 2 years to 12 or more years. See **Appendix VT.1**. for sample size and characteristics of Staff Survey respondents.

2.5.3 Client Key Informant Interview Sample Size and Response Rate

All WIC clients who used Daily Drop (n=52) were invited to participate in the interviews. The response rate for interviews was 32.7 percent. The average age of interview participants was 30. In addition, 55.8 percent were designated high risk, 65.4 percent were pregnant at the time of study enrollment, and 71.2 percent had prior breastfeeding experience. See **Appendix VT.1** for additional information about the sample size and characteristics for the client interviews.

2.5.4 Staff Key Informant Interview Sample Size and Response Rate

All staff who completed the Staff Survey were invited to participate in the key informant interviews. The response rate for staff interviews was 42.9 percent in the early phase, 25.0 percent in the mid phase, and 33.3 percent in the late phase. See **Appendix VT.1** for the sample size and response rate for each WIC agency.

* VT WIC uses the term “certifier” rather than CPA.

2.6 Analytic Approach

2.6.1 Daily Drop App Metadata

Daily Drop captured data about participant use of the app, including time played (e.g., total minutes spent playing Daily Drop, total number of sessions started, completion percentage, minutes per session) and BAPT domain scores for knowledge, support, and confidence around breastfeeding. Because these data were skewed, medians and interquartile ranges (25th to 75th percentile) are presented for respondents to the Daily Drop User 1-Month Survey.

2.6.2 Client and Staff Surveys

2.6.2.1 Daily Drop Client Surveys

The client outcomes evaluation examined the experiences of WIC clients who participated in the pilot study. Data from the Daily Drop Client Surveys (baseline and follow-up surveys of players at 1 and 3 months postpartum) were analyzed using descriptive statistics, cross-tabulations, and multivariate regression.

Descriptive statistics from the Daily Drop Baseline Survey (players and nonplayers) include respondent and household demographics, comfort with technology, and breastfeeding behavior and intentions. Crosstabulations for categorical variables present proportions for players and nonplayers among those who provided data (i.e., missing values were excluded from the analysis). Crosstabulations for continuous variables present the means and standard deviations by group (players and nonplayers). Because the data on household income were assumed to be skewed, medians and interquartile ranges (25th percentile – 75th percentile) are presented instead of means. Significance tests compare responses for players and nonplayers. For categorical variables, chi-square tests for independence are presented. For continuous variables presented as means, the *t* test was used. For continuous variables presented as medians, the median test was used. This test examines whether the two samples come from the same population by assessing the distribution of sample scores around the median instead of comparing the actual median values. Descriptive statistics from the Daily Drop User 1-Month Survey (players only) include acceptability of telehealth services, satisfaction with telehealth services, barriers to using telehealth services, and adoption of telehealth services. Proportions among those who provided data are presented; missing values were excluded from the analysis.

Regression models were used to assess the effect of players' engagement with Daily Drop—measured as the number of playlists completed by the respondent—on their competency scores (from the metadata). Separate models were run for each domain: knowledge, support, and confidence. The regression models controlled for the baseline BAPT score for the relevant domain and prior experience breastfeeding. See **Appendix VT.1** for details.

Unadjusted and adjusted logistic regression models were used to assess the factors associated with giving breastmilk at 3 months. The model included prior breastfeeding practice, planned feeding modality, and BAPT scores.

2.6.2.2 THIS-WIC Staff Surveys

VT conducted early-, mid-, and late-phase Staff Surveys. The mid- and late-phase surveys had a lot of missing data for demographic and other questions, rendering most surveys unusable. Thus, analyses presenting sample characteristics are reported only for the early phase (N=14). Additionally, because of high item nonresponse in the mid- and late-phase surveys, tables provide counts and percentages, with no statistical comparison across phases. All analyses were conducted in Stata 18 (StataCorp LLC, College Station, TX, USA).

2.6.3 Staff and Client Key Informant Interviews

All staff interviews were conducted in English, audio recorded, and transcribed by Zoom verbatim. Each transcript was reviewed for accuracy and corrected to reflect actual dialogue spoken by listening to the audio recording. Before undertaking analysis, three THIS-WIC team members created a preliminary codebook, with codes deductively informed primarily by the CFIR[28] and the Evaluation Framework for Telemedicine.[31] Five trained qualitative researchers who conducted the interviews also coded the interviews. Graduate research assistants (n=5) with coursework and prior experience in qualitative analyses also coded interviews. A single codebook was used for both early- and late-phase coding. To start, coders independently coded the same four transcripts from the different WIC State agency projects. Coders met to compare codes, arrive at a final determination, and update the codebook if necessary. Additional details on establishing interrater reliability are provided in the technical appendix (see **Appendix VT.1**).

All client interviews were conducted by the VT team. The THIS-WIC team reviewed the transcripts and abstracted key themes that aligned with the research questions; VT used the results to guide the design of and updates to the Daily Drop app for the post-pilot, statewide rollout.

2.6.4 Telehealth Solution Implementation

Analysis of the data from the Implementation Tracking Tool involved tabulating the startup, midpoint, and endpoint status for each menu strategy in the to assess changes over time. The startup measures were considered the implementation plan, and the changes from startup to midpoint and endpoint measures were considered indicative of readiness. In addition to indicating respondents' readiness for implementation, these data also provided context for the staff- and client-level outcomes. See **Appendix VT.1** for details.

2.6.5 Telehealth Solution Costs

For each project phase, telehealth solution costs were calculated as follows:

1. Generated subtotals by summing the data for each resource category in the tool (e.g., labor, equipment, indirect, contracted services).
2. Computed total cost and cost per month as follows:
   - Total cost = Sum of cost across resource categories

- Cost per month = Total cost/number of months in the period

Labor cost was calculated by multiplying the reported percentage of full-time equivalent (FTE) spent by each staff member on the telehealth solution by that staff member's reported monthly salary (annual salary divided by 12) and the number of months in the reporting period. All costs were adjusted to 2023 dollars using the Consumer Price Index. All analyses were completed in Microsoft Excel (version #2308).

2.6.5.1 Telehealth Solution Pilot Study Cost Per Participant

For the pilot study, cost data were collected from December 21, 2022, to September 30, 2023, but Daily Drop implementation began in January 2023. Cost per participant was computed by dividing the total costs incurred during the period by the number of pilot study participants, including players and nonplayers. Costs in this period included fixed and variable costs; therefore, cost per participant represents average, rather than marginal, cost. If more clients used the telehealth solution, the average cost per participant likely would go down.

3. Results: Daily Drop Implementation in Vermont

Between Q1/2023 and Q3/2023 (January through September 2023), five WIC clinics participated in the 9-month telehealth evaluation. This chapter presents implementation outcomes (process and cost); Chapter 4 presents the client experience with telehealth and the primary and secondary outcomes.

3.1 Attitudes Toward Telehealth

WIC staff had favorable attitudes toward the Daily Drop app and highlighted that the interactive aspects of the app made breastfeeding education more engaging than traditional methods, such as handouts (CFIR constructs: *innovation advantage, outer setting, inner setting, and characteristics of individuals)*.*

Staff noted that reviewing the BAPT scores before or during the appointment increased their ability to have targeted discussions with their clients. Staff appreciated that the Daily Drop app facilitated a more individualized approach to client care, allowing clients to access resources at their own pace and alleviating information overload during in-person appointments.

> *"I was really happy that something has come about that it's not a booklet or, you know, something to read on your computer, and that it's...more interactive." (VT Participant 11, Early Phase)*
>
> *"I felt like having the (app) available kind of, it took some pressure off of what I needed to cover during an appointment. Whenever a mom wants to press speed like, there's only so much [inaudible] the appointment that you give them. Like here's the bare minimum of what you need to know or here's a specific concern that you've said, and how we can address it proactively...but you never know exactly what's gonna happen in their experience. So, if they're able to take home this kind of interactive [...] information tool to learn more about breastfeeding and allows them to be introduced to topics that I might not have thought to address. So they might not have considered and have that proactive guidance at their disposal ahead of when they might need it. (VT Participant 2, Late Phase)*

3.2 Readiness to Implement Telehealth Solution

Data on perceived readiness to implement the telehealth solution were obtained from four sources: (1) Implementation Tracking Tool completed by staff at the startup, midpoint, and endpoint phases of telehealth implementation; (2) agency reporting tool; (3) Staff Surveys in the

*As described in Chapter 2, qualitative data were analyzed deductively using the CFIR Framework, and inductively. To align project findings with the broader implementation science literature, we noted alignment with CFIR constructs when appropriate.

early and late phases; and (4) key informant interviews with WIC administrators and staff in the early and late phases.

3.2.1 Telehealth Implementation Strategies

At startup, VT selected 19 strategies for implementation and had already implemented 13. By endpoint, VT had implemented 26 of the 46 strategies, including strategies in seven of the eight categories. VT used "evaluative and iterative strategies," "adapted and tailored to context," "developed stakeholder interrelationships," "trained and educated stakeholders," "supported clinicians (i.e., WIC staff)," "engaged consumers" (i.e., end users including both WIC clients and staff), and "changed infrastructure." By endpoint, VT had not implemented any strategies in the "provide interactive assistance" category. See **Appendix VT.4** for details.

3.2.2 Telehealth Solution Use in the Early, Mid, and Late Phases

In the mid phase, two-thirds of Staff Survey respondents had used telehealth at least once in the past 30 days. By the late phase, use declined, with one-third indicating use in the past 30 days (**Table 3-1**).

Table 3-1. Use of Telehealth Solution among Staff Survey Respondents in VT

Variables	Mid phase	Late phase
	%	
Telehealth solution use in the past 30 days	N=6	N=3
Did not use	33.3	66.7
Used one time	66.7	33.3

Source: THIS-WIC Staff Survey

Key informant interviews also provided insights into the training offered to staff. Several statements captured the strengths and limitations of the training (CFIR constructs: *inner setting and implementation process*). Staff described the training as thorough and focused on all the pieces of the process, including the BAPT survey, results, and reading and using reports. Staff highlighted several effective features of the training, including the use of visuals and screenshots shared during the training, focus on the client view of the app, interactive breakout sessions, and the ability to ask questions along the way. Some staff noted that, although the training was comprehensive, they did not feel prepared and "it did not come together for me," but having PowerPoint presentations as reference was helpful.

> *"I think the piece-by-piece training on what you could see within the reporting, and pulling up the whole BAPT survey, and those details, were showcased really well." (VT Participant 8, Early Phase)*
>
> *"[T]he visuals had a lot of screenshots, so you could see what it was gonna look like. I think that's helpful for visual learners." (VT Participant 15, Early Phase)*

> *"I think the breakout sessions, because I think people don't always know they're happening, and at first everybody's like, oh, no, I'm gonna be forced to talk, but then they get into the small group, and then they realize it's not so bad to talk, and they actually give more feedback, I think, and more input than I think they would if it was still kind of in that larger group setting." (VT Participant 1, Early Phase)*
>
> *"I thought it was really nice how much feedback that [VT staff member] and the team had asked the group. I think that was great. I really enjoyed the constant email reminders of, like, hey, this is happening. This is what's going on like, here is an update. I felt as though it was very welcoming for questions and understandings, which then left quite a few questions at the end." (VT Participant 10, Early Phase)*

Some staff members who did not feel prepared also noted that the expectation to start discussing Daily Drop with clients immediately after the training was not realistic, as this was an "extra thing" they had to do. Staff also noted that the training assumed staff had experience with data and that the training did not prepare them on how to use the reports to have a conversation with clients.

> *"They're asking us to do this extra thing, but if you want that extra thing done it's gotta be pushed, or it's not gonna get done because of the competing priorities of a WIC visit." (VT Participant 9, Mid Phase)*
>
> *"I would say that I didn't feel as confident with the training that I was provided to interact with the data and fully utilize it within clinic." (VT Participant 10, Early Phase)*
>
> *"I don't work with data, hardly ever, and I felt as though when that data sheet was provided to us, like to go in and check participant ID, and here is everything about that. There was just this general understanding that everybody knows how to utilize this format, and there wasn't like a training [...] for people that are new to this, that have never used this before: here is the rundown of how to fully utilize this." (VT Participant 10, Early Phase)*
>
> *"We got training on how to use the (app) and what's in the report, but how to actually translate that into a conversation or a way to engage participants? I didn't get a lot of information ... and then I just haven't. We haven't had much of a chance to hear from other offices what they've been doing." (VT Participant 15, Late Phase)*

Staff shared several recommendations to improve the training, including a user guide or information sheet, examples of types of questions on the survey, ability to see the participant side of the app without having to download it on their personal phones, office hours to provide additional support, and a demonstration of an actual consultation.

> *"Maybe just a little more of an overview of what we are – what we, as WIC certifiers, should be doing with the data like we got a lot of information about what it looks like. So sometimes, just like this is what we want you as WIC certifiers to do with it." (VT Participant 15, Early Phase)*

> *"I think maybe if there had been, like I hate to say office hours, but like if there had been like a designated second time before it launched to be like, okay, here is like a designated time with the creators, with [VT staff member], with [VT staff member], to go through any last minute questions that you have, or any continuing questions. So that way, we can really make sure that staff feels confident in their ability to fully utilize this tool." (VT Participant 10, Early Phase)*
>
> *"I think maybe like a demo of like actual consultation with this could be interesting. I think that's just really helpful for a lot of certifiers if they can see it kind of in real time: like, how would I use this kind of statistical print out in an actual like one-on-one with a family?" (VT Participant 8, Early Phase)*

3.3 Satisfaction with Telehealth Solution

Staff were neither satisfied nor dissatisfied with Daily Drop game play feedback (**Table 3-2**). Mean scores for comfort communicating with WIC clients about their Daily Drop game play feedback during the clinic appointment were lower in the late phase than in the mid phase. Similarly, scores for staff perceptions that daily feedback made breastfeeding education and support easier or that Daily Drop allowed them to interact with more participants were lower in the late phase than in the mid phase.

Table 3-2. Satisfaction with Telehealth among Staff Survey Respondents in VT

Statement[a]	Mid phase N=6 Mean (SD)	Late phase N=3 Mean (SD)
Overall, I am satisfied with Daily Drop game play feedback in clinic appointments.	3.2 (0.8)	2.7 (1.5)
I feel comfortable communicating with WIC clients about their Daily Drop game play feedback during clinic appointments.	3.7 (1.0)	2.0 (1.7)
Daily Drop game play feedback makes breastfeeding education and support easier to do.	2.8 (1.2)	2.0 (1.7)
Daily Drop allows me to interact with more participants.	2.3 (1.2)	2.0 (1.0)

Source: THIS-WIC Staff Survey
[a] Mean and standard deviation (SD) are from 5-point Likert scales, where 1=Strongly disagree and 5=Strongly agree.

During interviews, staff described the collaboration and teaming efforts that facilitated the use of Daily Drop app reports. Staff relied on other team members who were involved in the process from the beginning to understand how to obtain and use the reports for individual clients. They also indicated that their feedback was valued by the central office and was reflected in changes to the reports, and they appreciated the direct support provided to clients who had trouble downloading the app.

"One of my co-workers was on like the other team that did other stuff, you know that was part of... I don't know what their, you know, what the name was, but so she had been pretty involved with that all along. So that was helpful because we could ask her questions like, 'hey, what are we supposed to do with this?'" (VT Participant 15, Early Phase)

"So through Power BI. [State agent] created a Excel spreadsheet with the [city] players, identified all 25 of them, and then when I opened up the Power BI report there was a dropdown sorted by ID number, so I could just take the spreadsheet that she gave me and look up the ID number and find the players that way." (VT Participant 9, Mid Phase)

"I guess I don't know if there's an official policy or procedure. I know. There was a couple like the BAPT portion of it. They had it like color coded in a way that didn't make sense to me. And so I had just reached out to like a couple of people on our central office team who, like [State agents], I think, or who I reached out to, because they've been doing the majority of the (app) to just ask like, 'Hey, what was the reasoning behind this?' And they did like they did change it based on that feedback. So, I guess if I had an ask or need, I would just reach out to our central office team." (VT Participant 15, Late Phase)

During early phase interviews, some staff indicated that reports were not as detailed as in later phases, and they were unable to understand what clients were doing with the app. In the mid and late phases, staff spoke about the advantage of accessing data for client engagement and support, the ability to customize discussions based on clients' preferences and learning process and the ease of accessing the app regardless of highspeed Internet availability.

"It's just the reports don't really seem to give me as much information as I'd like to see. I don't really get a sense from the reports what the moms are doing with the Daily Drop app." (VT Participant 9, Early Phase)

"Looking at the Power BI spread, being able to like just see quickly before they come in for that mid-pregnancy visit, what's been going on. Like what are they playing? What have they been gravitating to? I remember there was like a column of like their top picks or the top things." (VT Participant 17, Mid Phase)

"Yes... It's the (app). Seems like a much better way to get the BAPT information, because I didn't have a great rate of having people return them to me when it was, you know, like through an online form or mailed to them. So that was nice to get that info in the Daily Drop app without having to bug them one more time." (VT Participant 15, Late Phase)

"The, it's pinpoint on my web browser, where we go for all the data. That is something that I do check into, especially when I do have a participant that's labeled as using it, and it has been interesting to see what type of participation they've been doing and has helped a little bit on how I would like form and phrase different questions in my interviews with families." (VT Participant 11, Early Phase)

"You know that it doesn't require I think once you download it like it doesn't require Internet service and things like that. Which is another thing that can, you know not

> *everybody in this area has Internet or good enough Internet to, you know, join a class. So I think that that helps kind of remove some of those barriers to that. They don't have to have. You know, the fanciest high-speed Internet." (VT Participant 15, Late Phase)*

3.4 Adoption of Telehealth Services

Adoption of telehealth services at participating agencies was assessed using data gathered from Daily Drop metadata, key informant interviews, and staff and supervisor implementation surveys. Implementation surveys were fielded by the VT State agency staff in Q2/2023 and Q4/2023.

Most staff reported using the Daily Drop app report to a moderate or slight extent, with declining use from Q2/2023 to Q4/2023 (**Table 3-3**). In Q2/2023, 14 percent of staff had used the app report to a great or very great extent; however, in Q4/2023, no staff reported using it to a great or very great extent. Similar trends were noted for staff responses to the question on continuing to use Daily Drop app reports throughout changing circumstances.

In Q2/2023, slightly more than 40 percent of staff agreed or strongly agreed that they incorporated Daily Drop app reports as trained; however, by Q4/2023, only 12.5 percent indicated doing so. Similarly, in Q2/2023, about 40 percent of staff indicated modifying or tailoring their appointment procedures since the Daily Drop trainings, but only 22.2 percent indicated doing so in Q4/2023.

Table 3-3. Adoption and Use of Daily Drop Report by Staff in VT

Question	Q2/2023	Q4/2023
	%	
I use the Daily Drop app reports as much as possible when appropriate.	N=14	N=9
To a very great extent	7.1	0.0
To a great extent	7.1	0.0
To a moderate extent	28.6	33.3
To a slight extent	21.4	11.1
Not at all	35.7	55.6
I continue to use the Daily Drop app reports throughout changing circumstances.	N=14	N=9
To a very great extent	7.1	0.0
To a great extent	7.1	0.0
To a moderate extent	28.6	11.1
To a slight extent	21.4	33.3
Not at all	42.9	55.6
I use the Daily Drop to enhance WIC breastfeeding support services in terms of content and quality.	N=14	N=9
Strongly agree	14.3	0.0
Agree	7.1	22.2
Neither agree nor disagree	64.3	44.4
Disagree	0.0	33.3
Strongly disagree	7.1	0.0
I incorporate the use of the Daily Drop app report as trained.	N=14	N=8
Strongly agree	14.3	0.0
Agree	28.6	12.5
Neither agree nor disagree	42.9	62.5
Disagree	7.1	12.5
Strongly disagree	7.1	12.5
Have you modified or tailored appointment procedures since their Daily Drop trainings?	N=12	N=9
Yes	41.7	22.2
No	58.3	77.8

Source: VT State agency implementation tracking survey

Supervisor responses to the perceived adoption of telehealth services among staff were consistent with staff responses. Supervisors who responded to the implementation tracking survey perceived that staff used the Daily Drop report to a moderate or slight extent, and most

agreed that staff used the report to enhance breastfeeding support services. See **Appendix VT.4** for details.

Fewer staff reported facing barriers when using the Daily Drop app reports in Q2/2023 than in Q4/2023 (35.7% vs. 66.7%) (**Table 3-4**). Two commonly reported barriers faced by staff were limited time in appointments for using the report and not enough experience using it, related in part to the limited number of WIC clients using Daily Drop (data not shown). When asked whether additional materials or technical assistance would be helpful to staff to use Daily Drop, 7 percent responded affirmatively in Q2/2023, and 22 percent responded affirmatively in Q4/2023. These staff expressed interest in receiving detailed information about how to use the report and weave it into conversations during appointments with WIC clients (data not shown). Supervisors also noted that staff faced barriers in using the Daily Drop report, in particular the challenge of having another tool/resource to have to learn and use. See **Appendix VT.4** for additional details.

Table 3-4. Percentage of Staff Encountering Barriers and Needing Technical Assistance to Use Daily Drop App Report in VT

Question	Q2/2023	Q4/2023
	%	
Are there any barriers you face when using the Daily Drop app report?	N=14	N=9
Yes	35.7	66.7
No	64.3	33.3
Are there any materials or technical assistance you need to support the use of the Daily Drop app report?	N=14	N=9
Yes	7.1	22.2
No	92.9	77.8

Source: VT State agency implementation tracking survey

Key informant interviews provided additional context into staff adoption of telehealth services. Staff noted that the BAPT score and the report highlighting the topics to be discussed were extremely helpful. Some staff acknowledged that they were not tech-savvy and therefore found it difficult to navigate the reports. Some staff indicated that having to review the reports did not require additional time and that ongoing use would make them more proficient in incorporating the reports into the actual appointments; in contrast, other staff noted that they had to take the time to review the reports to figure out the priority areas for discussion.

> *"So just having, if somebody plays the Daily Drop app, we get a BAPT score, which is huge. So, having that available, and having, you know, like I said, kind of those topics and things. For the most part I really do value the use of the report." (VT Participant 1, Early Phase)*

"For me I found it difficult to navigate. I'm an older person, so my coworkers are younger, and so maybe more tech savvy. But I found it a little more difficult to navigate the reports. I remember always trying to find all these different reports." (VT Participant 13, Mid Phase)

"…it's not more difficult or more time consuming for nutritionists, and it does make that process really smooth. We don't have to worry about like having papers that then need to be graded, and it can be done kind of long term." (VT Participant 8, Mid Phase)

"And I do think that if we continue to use it, that at least I would get the hang of both reviewing it, reviewing those reports ahead of the appointments and incorporating it into the actual appointment itself pretty effectively." (VT Participant 2, Late Phase)

"I think, taking time to really look through the different individual answers to questions when you see categories are low. And not just taking one number with what that assumption might be from like the, you know, confidence, knowledge, support but actually kind of picking through and figuring out where the priority lands." (VT Participant 8, Mid Phase)

3.5 Acceptability of Daily Drop

Staff agreed with the statement that Daily Drop was an acceptable way to provide WIC services and useful for them as WIC staff (**Table 3-5**). The average score for level of agreement with the statement, "Daily Drop reports are useful for me as WIC staff" declined over time, but the difference was not significant. Finally, mean scores for interest in continuing to use Daily Drop game play feedback in breastfeeding support sessions were indicative of neutral interest in the mid phase and low interest in the late phase.

Table 3-5. Acceptability of Daily Drop among Staff Survey Respondents in VT

Statement[a]	Early phase N=14	Mid phase N=6	Late phase N=3
	Mean (SD)[a]		
Daily Drop is an acceptable way to provide WIC breastfeeding education.	4.4 (0.6)	3.7 (0.5)	3.3 (0.6)
Daily Drop reports are useful for me as WIC staff.	4.3 (0.7)	3.0 (1.3)	2.7 (1.5)
I would like to continue using Daily Drop game play feedback in my breastfeeding support sessions.	N/A	3.0 (1.1)	2.0 (1.0)

Source: THIS-WIC Staff Survey
[a] Mean and SD are from 5-point Likert scales, where 1=Strongly disagree and 5=Strongly agree.

In the early phase interviews, staff expressed excitement about the ability to present relevant and tailored breastfeeding information in a user-friendly way. Staff who used the Daily Drop

report during client discussions noted that the BAPT tool gave them more in-depth information, including topics of greatest need (i.e., lower scores). In general, VT WIC mails the BAPT survey to all WIC families, who must then mail the survey back to staff. The staff must then take time to review the results prior to appointments. Staff used the Daily Drop app reports to choose relevant topics for discussion with their clients and prepare for their appointment. However, in the mid and late phases, staff cited lack of integration with MIS and the extended learning curve due to low client use of Daily Drop as factors affecting their acceptance of Daily Drop.

> *"We're really excited about having another way to present breastfeeding information to parents...it's user-friendly, and it's tailoring to what families are, what information they're looking for." (VT Participant 11, Early Phase)*
>
> *"It was really helpful to see that it's helped staff see where families are at with using the survey that we send to all families. That's just the standard survey. This goes a little bit deeper and helps us sort of tailor what information we're providing families to what they're interested in." (VT Participant 11, Early Phase)*
>
> *"...topics that families are choosing because [that] helps you already target your conversation, and [we] can see patterns and what people are looking at in there, and what they're already talking about with you during the appointment." (VT Participant 1, Early Phase)*
>
> *"That's nice like when I will use that to see like what the different areas were you know that they, you know, scored lower in, or seemed to have concerns around or not as much knowledge around. So using that piece of it has been helpful for sort of guiding you know what topics or what things to maybe touch on, and appointments. So that part I do like." (VT Participant 15, Late Phase)*
>
> *"We use the (app) data mostly at the mid-certification visit for pregnant participants... We also use it to check our BAPT survey, which is done on the Daily Drop app also separately. And mostly it's used as a tool to then follow up about topics that are either of peak interest or topics that don't seem to be as much on a family's radar." (VT Participant 8, Mid Phase)*
>
> *"No, I don't think many of my local colleagues. I don't really think any of us have used it a ton, and we've all sort of struggled with the same in my conversations with them. I guess I don't wanna speak for them. We haven't used it a ton and haven't quite figured out how to use it for, like our appointments with people." (VT Participant 2, Mid Phase)*

3.6 Feasibility of Using Telehealth Solution

Mean scores for ease of learning to use gameplay feedback for breastfeeding education and support from Daily Drop declined steadily over time (**Table 3-6**). Mean scores in the early phase approached agreement (i.e., easy to use), whereas scores in the late phase were indicative of disagreement (i.e., not easy to use). Average scores for ease of understanding reports and having sufficient experience using Daily Drop reports to provide clients feedback in the clinic were indicative of low feasibility.

Table 3-6. Feasibility of Using Telehealth in Early and Late Phases among Staff Survey Respondents in VT

Statement[a]	Early phase N=14 Mean (SD)[a]	Mid phase N=6 Mean (SD)[a]	Late phase N=3 Mean (SD)[a]
Learning to use game play feedback for breastfeeding education and support from Daily Drop was easy for me.	3.8 (1.0)	3.0 (1.1)	2.0 (1.7)
I find the Daily Drop reports easy to understand.	3.9 (0.9)	2.8 (1.3)	3.0 (1.0)
I have a lot of experience giving Daily Drop game play feedback in my clinic.	N/A	1.5 (0.5)	1.3 (0.6)
I am good at giving Daily Drop game play feedback in my clinic appointments.	N/A	2.5 (1.4)	1.7 (1.2)

Source: THIS-WIC Staff Survey
[a] Mean and SD are from 5-point Likert scales, where 1=Strongly disagree and 5=Strongly agree.

During interviews, staff discussed several positive features of the app and considered it feasible to continue using the Daily Drop reports going forward. Staff noted that the reports facilitated meaningful discussions with their clients and that the clients "loved the games" and found them motivating. They also noted several factors that could increase client use over time. Staff noted that recruiting and signing clients in to use the app was feasible, but they were unsure of the extent to which clients would play it. Staff indicated the need for push notifications and reminders to enhance user engagement, ensuring that clients do not have to log in each time, expanding the app to "cater to more diverse needs such as those with visual or auditory impairments," offering language options, and making it available in the office through WIC-supported media (e.g., iPads in the office). Some staff noted that clients were hesitant to have another thing they needed to do before the clinic, particularly after they deliver the baby.

> *"One thing I've heard from families is, there's no push notification... they forget. They get in a good rhythm, and then it falls off." (VT Participant 11, Early Phase)*
>
> *"I don't believe we have it translated in any languages. If I'm remembering correctly. So that would probably be, if we can get that, it would be nice to have that to offer families that… don't speak English, or it's not their, you know, kind of preferred or main language to make it easier to access information. So that was, I guess, is sort of not something that's happening now, but something that I could foresee happening that would be helpful." (VT Participant 15, Late Phase)*

Staff also noted that their use of reports could be improved by integrating them into MIS, having reports that are not generic, clarifying how the reports should be used by different staff members such as certifiers versus breastfeeding peer counselors, and keeping the content updated to reflect current knowledge.

"I think if there were something to be better about the process [it] would be to have it directly linked to our system, so that it would come up and like, share that information in some way, versus having to go to a different location to get it." (VT Participant 11, Early Phase)

"I guess I thought I would get… more specifics on what knowledge they were seeking, and it was more, almost too general for me to use it to pick up a phone and talk to a mom and say, 'Hey, it looks like you were interested in learning more about something.' And they did have the 3 top topics, but they were pretty repetitive they were... like infant nutrition. Well, yeah... most new moms want to know about that. What, specifically, were you thinking, you know, that didn't come out in the reports that I could see." (VT Participant 9, Mid Phase)

"Any support you can give to the staff to make it easier to remind them that you've got this service out there. Constant reminders, not just like we're doing this thing...Like you need at least 3 or 4 constant reminders, maybe more, depending on how frequently you have to assess the situation. So the less frequently you assess, the more reminders you're going to need, because it's going to fall off your radar." (VT Participant 9, Mid Phase)

"More clarity around like how certifiers versus the breastfeeding office expert and the breastfeeding peer counselors like how each of our roles interact with that (app), like, you know, is this something that is more useful to a peer counselor like having those conversations." (VT Participant 15, Mid Phase)

3.7 Improved Accessibility of WIC Services for Clients

During key informant interviews, staff noted that the app was a significant facilitator of accessibility and flexibility in delivering breastfeeding education. Staff emphasized that the app removed common barriers associated with traditional breastfeeding support education, such as the need to be physically present at the clinic. Staff highlighted general low attendance at in-person breastfeeding education classes and the increased ability to engage and support clients through the app. Staff also noted that providing the app at no cost and being able to use it without the Internet (i.e., clients can play Daily Drop while offline and then can upload the data once an Internet connection is available) provides additional opportunities to clients to learn in different ways. Staff also noted that the app makes health care access easier for clients who are not able to come to the office, such as clients who live in remote areas, experience transportation challenges, or have busy work schedules.

"So I definitely think again, the ability to take away some of those barriers like having to be at a certain place and a certain time in person or in terms of this (app), even virtually, is helpful. You know it helps to reduce some of those barriers." (VT Participant 15, Late Phase)

"...In general, this area is so lacking in breastfeeding education. Our participants are not great about attending classes, and a mom that I've been trying to actually get to attend the class is not attending the class, but she's playing Daily Drop. So, I feel like, okay, so she didn't attend the class, but she's playing the Daily Drop. She's attended her appointments. So at least I know she's getting some form of breastfeeding education, so I really think the fact that they're not attending the classes at least if I can have some other form of education to offer, like I said, other than read this handout, I think is really important." (VT Participant 1, Early Phase)

"The fact that you know it's free. It doesn't require a whole lot of... you know Wi-fi, or whatever the right term is, to use it, I think, is helpful, because again, not everybody has that... It gives me again another kind of opportunity for people to have to get those resources." (VT Participant 15, Late Phase)

"I think that it makes... healthcare access and health education access a lot more accessible to people who might say, who work a variety of jobs or have a different schedule or a different life (that) doesn't necessarily fit into the 9 to 5 schedules that most things run on. So, by having access to, they're being able to do things remotely, allows people to live in a rural area or have less, they have less transportation to still be able to [have] some of the same benefits as those who can make it in person." (VT Participant 2, Late Phase)

"I think that also is helpful, equity wise, to, you know, to make sure it's easier for people to access to give people more opportunities and different ways to access it. If people, you know don't want to come in because of health concerns or things like that. They choose the telephone option or the virtual option. I think it's been super helpful in terms of equity to have that option." (VT Participant 15, Mid Phase)

3.8 Cost to Develop and Test the Telehealth Solution

The Daily Drop app development and testing costs by project phase are shown in **Table 3-7**. As shown, total costs during the development and testing phases were $557,084, translating to $27,017 per month. Overall, 46 percent of the expenses were for contracted services (which included consultant/vendor costs), 32 percent were for labor, and 22 percent were for indirect costs. Total cost was the highest in the beta phase (June 17 to December 20, 2022) at $219,021, with the majority ($134,112) for contracted services. Indirect costs were incurred only in the development and pilot study phases (not in the alpha and beta testing phases). Finally, labor costs were lowest in the development phase.

Table 3-7. Daily Drop App Development and Implementation Costs in VT

Phase	Labor	Indirect	Contracts	Total	Phase duration (months)	Monthly
Total Development and Testing	$176,703	$121,513	$258,868	$557,087	20.6	$27,017
Development	$34,453	$121,513	$0	$155,966	7.6	$20,522
Alpha testing	$57,341	$0	$124,756	$182,097	6.9	$26,315
Beta testing	$84,909	$0	$134,112	$219,021	6.1	$35,905
Pilot Study	$65,915	$24,912	$55,000	$145,827	9.3	$15,680

Source: VT cost-tracking tool

VT incurred $145,827 in expenses during the pilot phase, which included fixed and variable costs. This translated to $2,859 per participant (over the 9.3-month pilot, VT enrolled 51 participants in the pilot study).

3.9 Summary of Findings

In VT, five WIC agencies participated in the THIS-WIC evaluation. WIC staff at these clinics offered the Daily Drop app to pregnant clients and used the Daily Drop app reports to tailor breastfeeding education. Key findings include the following:

- **Staff attitude**: WIC staff had favorable attitudes toward the Daily Drop app and reports. Staff found the Daily Drop app to be more interactive and engaging than traditional education methods, such as handouts; they also appreciated the ability to use the Daily Drop app reports to tailor counseling sessions with clients.
- **Staff readiness**: Staff readiness was assessed at the mid and late phases. In the mid phase, 66.7 percent of staff used the Daily Drop app at least once in the past 30 days, but only 33.3 percent did so in the late phase. Staff noted that, although they were trained on the app, they did not feel prepared to start discussing it with their clients. Staff also acknowledged that, although the training covered a lot of information about the app, they did not understand the client view of the app and how to use the reports. They found that learning the app was another task they had to add to their already busy schedule.
- **Staff satisfaction**: Overall, mean satisfaction scores were indicative of neutral/low satisfaction levels and did not differ significantly between the mid and late phases. Staff indicated that collaborative and teaming efforts facilitated the use of the Daily Drop app; staff appreciated that the central office was receptive to staff suggestions, including providing direct support to clients to download the app, but they found themselves relying on other staff members to understand the process of obtaining and using the reports. In the early phase, some staff noted that the reports were not detailed enough to understand what clients were doing on the app; by the late phase, however, some found

the reports helpful and used them to customize discussions based on client preferences and interest.

- **Staff adoption**: Most staff reported using the Daily Drop app reports to a moderate or slight extent, with declining use from Q2/2023 to Q3/2023. Frequently noted barriers to use included increased appointment time to review the reports before or during the client appointment; not having enough experience using the reports, limited in part to the small number of clients who were using the app; and not being technologically savvy enough to navigate the reports. Staff acknowledged that additional training and ongoing use would make them more proficient in incorporating them into discussions with clients.
- **Staff acceptability**: Mean acceptability scores were high in the early phase and declined steadily in the mid and late phases. In the early phase, staff were excited about the ability to present relevant and tailored information to clients in a user-friendly way. The mean scores for interest in continuing to use the Daily Drop app reports in breastfeeding support sessions were indicative of neutral interest in the mid phase and low interest in the late phase. Staff did not feel prepared and did not have sufficient time to understand how to use the reports. Staff noted that low client use also played a role in their comfort with using the reports.
- **Perceived feasibility**: The mean scores for ease of learning to use game play feedback for breastfeeding education and support from Daily Drop declined steadily over time and were indicative of low feasibility. Although staff acknowledged several positive features of the app, they were unsure of the extent to which clients would use the app, particularly after they delivered their baby. Staff felt that adding features to enhance user engagement (e.g., push notifications, reminders), expanding the app to cater to more diverse needs (such as clients with visual or auditory impairments), offering the game in other languages, and offering it in the office (WIC office iPads) may increase client buy-in. Staff also noted that integrating reports into MIS may enhance their use.
- **Improved accessibility of WIC services for WIC clients**: Staff acknowledged that the app was a significant facilitator of accessibility and flexibility and that it removed common barriers encountered during traditional breastfeeding support education, such as physical presence at the clinic and access to high-speed Internet to access online information. Staff also noted that the app would serve client interests by providing them with additional opportunities to learn in different ways.
- The **development and testing phase costs** were $557,084, of which about 46 percent was spent on contracted services, 32 percent was spent on labor, and 22 percent was spent on indirect costs.
- The **implementation phase (pilot study) costs** were $2,859 per participant enrolled.

4. Results: Client Experiences with Daily Drop App

VT WIC developed Daily Drop, an interactive app to promote breastfeeding among WIC clients. Responses to the Daily Drop Baseline Survey, the user and nonuser 1-month surveys, user 3-month postpartum survey, Daily Drop metadata, and VT MIS data spanning the pilot period January through September 2023 (Q1/2023–Q3/2023) were used to assess client attitudes toward and use of Daily Drop and to examine outcomes. Survey respondents were classified as Daily Drop players if they played one or more playlists between completing the baseline survey and the user 1-month survey and nonplayers if they played less than one playlist.

4.1 Breastfeeding Practices among Client Survey Respondents

Client survey respondents' prior breastfeeding behaviors were collected at baseline. Between 46 and 52 respondents provided data on prior breastfeeding behaviors at baseline; these data were compared for Daily Drop app players and nonplayers (**Table 4-1**). Respondents on average had two other babies. About 40 percent of respondents breastfed their babies for 12 months or longer.

Table 4-1. Prior Breastfeeding Behaviors of Client Survey Respondents, Overall and by Players and Nonplayers in VT

Question	Overall	Players	Nonplayers	p-value[a]
How many other babies have you had or adopted when younger than 12 months old?[b]	N=52	N=36	N=16	0.1037
Mean (SD)	1.9 (1.7)	1.7 (1.0)	2.5 (2.6)	
How old (months) was your baby when you stopped breastfeeding? (%)	N=46	N=34	N=12	0.5126
Less than 1 month	10.9	14.7	0.0	
1–2 months	8.7	8.8	8.3	
3–4 months	13.0	11.8	16.7	
5–6 months	10.9	8.8	16.7	
7–9 months	8.7	8.8	8.3	
10–12 months	6.5	2.9	16.7	
More than 12 months	41.3	44.1	33.3	

Source: Daily Drop Baseline Survey, Daily Drop Metadata
[a] For categorical variables, chi-square tests for independence are presented. For continuous variables, t-tests are presented.
[b] None of the respondents had adopted a baby younger than 12 months old.

Among respondents with a prior pregnancy who reported breastfeeding any of their baby(ies) for any length of time, about 25 percent were players and about 75 percent were nonplayers, and among respondents with a prior pregnancy who did not previously breastfeed their baby(ies) 75 percent were players. The distribution of players vs. nonplayers within the two groups (prior breastfeeding experience vs. no prior breastfeeding experience) was significantly different (**Table 4-2**). These findings suggest that respondents who did not have prior breastfeeding experience with previous pregnancies were more likely to use the Daily Drop app.

Table 4-2. Frequency of Breastfeeding among Players and Nonplayers with a Prior Pregnancy(ies) for Client Survey Respondents in VT

Player Status	Breastfeeding experience from prior pregnancies (%)	No breastfeeding experience from prior pregnancies (%)	p-value[a]
	N=46	N=8	0.0068*
Players	26.1	75.0	
Nonplayers	73.9	25.0	

Source: Daily Drop Baseline Survey
[a] Chi-square tests for independence are presented; 25 percent or more of the cells have expected counts less than 5, so chi-square may not be a valid test.
* $p<0.05$

4.2 Intent to Breastfeed their New Baby

Clients' intent to breastfeed their new baby after delivery was assessed through the Daily Drop Baseline Survey and Breastfeeding Attrition Prediction Tool (BAPT) scores. The Daily Drop game pathway is tailored to an individual's needs using the BAPT, a validated questionnaire that identifies knowledge, support, and confidence gaps linked to breastfeeding attrition. The BAPT score in these three domains determines where the individual starts in the app. The maximum BAPT score for knowledge is 18, the maximum BAPT score for support is 8, and the maximum BAPT score for confidence is 12, with higher scores indicating less gaps in that domain. The overall BAPT score is the sum of the scores for the three domains, and a score of 20 or higher indicates intent to breastfeed.

At baseline, the majority (86.9%) of respondents planned to breastfeed their infant exclusively in the first few weeks after delivery (**Table 4-3**). Among these respondents, the intended duration to breastfeed was 15.2 months (16.0 months and 13.5 months for Daily Drop app players and nonplayers, respectively). Almost 40 percent of respondents planned to introduce formula or any other food in their new baby's diet at 5 to 6 months. Trends for age of introduction of formula or other foods were comparable for Daily Drop players and nonplayers.

Table 4-3. Breastfeeding Intentions of Client Survey Respondents, Overall and by Players and Nonplayers in VT

Question	Overall	Players	Nonplayers	p-value[a]
What method do you plan to use to feed your new baby in the first few weeks?	N=61	N=45	N=16	0.6637
	%			
Breastfeed only	86.9	88.9	81.3	
Formula feed only	3.3	2.2	6.3	
Don't know yet	9.8	8.9	12.5	
How old (months) do you think your baby will be when you completely stop breastfeeding?	N=59	N=40	N=19	0.4709
Mean (SD)	15.2 (12.3)	16.0 (14.2)	13.5 (6.7)	
How old do you think your baby will be when you first feed formula or any other food besides breast milk?	N=58	N=41	N=17	0.1573
	%			
Less than 1 month	5.2	4.9	5.9	
1–2 months	6.9	2.4	17.6	
3–4 months	0.0	0.0	0.0	
5–6 months	39.7	36.6	47.1	
7–9 months	17.2	22.0	5.9	
More than 9 months	31.0	34.1	23.5	

Source: Daily Drop Baseline Survey
[a] For categorical variables, chi-square tests for independence are presented. For continuous variables, t-tests are presented. For breastfeeding method planned, and predicted age first feed formula, 25 percent or more of the cells have expected counts less than 5, so chi-square may not be a valid test.

Baseline BAPT scores were available for 52 respondents (**Table 4-4**). Overall, the BAPT score was 20 or higher for nearly half (46.2%) of respondents (results not shown). Mean BAPT overall, knowledge, and support scores were similar between players and nonplayers. Mean BAPT confidence scores were significantly higher for players than for nonplayers (8.2 vs. 4.0).

Table 4-4. BAPT Scores of Client Survey Respondents among Players and Nonplayers in VT

BAPT scores	Maximum possible score	Overall (N=52)	Players (N=49)	Nonplayers (N=3)	p-value[a]
		Mean (SD)			
BAPT overall	38	20.5 (7.3)	20.8 (7.2)	16.0 (8.9)	0.2717
BAPT knowledge	18	10.4 (3.7)	10.5 (3.7)	8.7 (3.1)	0.3963
BAPT confidence	12	7.9 (3.4)	8.2 (3.2)	4.0 (4.4)	0.0355*
BAPT support	8	2.2 (2.5)	2.1 (2.6)	3.3 (1.5)	0.4150

Source: Daily Drop Baseline Survey
[a] p-values based on t-tests.
* p<0.05

4.3 Client Survey Respondents' Engagement with Daily Drop

Players' engagement with Daily Drop was tracked in the app. **Table 4-5** presents engagement with the Daily Drop app among players who completed the Daily Drop User 1-Month Survey. The average duration of Daily Drop app use (i.e., the median number of days between the first and last day of using the app) was nearly 1 month (29 days), and players started 10 sessions (median). The median time spent playing Daily Drop was 47 minutes, with 4 minutes on each session.

The Daily Drop app had a maximum of 91 playlists for the three domains of knowledge, support, and confidence. Most players engaged with 8.5 (median) or more playlists.

Table 4-5. Client Survey Respondents' Engagement with Daily Drop among Players in VT

Engagement variable	N	Median [IQR]
Number of days between first and the last day playing the app	49	29.0 [8.0, 35.0]
Total number of sessions started	49	10.0 [4.0, 22.0]
Session completion percentage	49	80% [70%, 100%]
Total minutes spent playing minigames	49	47.0 [21.0, 90.0]
Minutes spent on each session	49	4.0 [3.0, 5.0]
Total number of playlists	49	8.0 [4.0, 15.0]

Source: Metadata for respondents who completed Daily Drop User 1-Month Survey
Note: IQR = Interquartile range

4.4 Acceptability of Daily Drop App among Client Survey Respondents

WIC clients playing the Daily Drop app at least once responded to a series of questions in the Daily Drop User 1-Month Survey about the acceptability of the Daily Drop app. About 70 percent of respondents agreed or strongly agreed that they had more fun learning about breastfeeding

because of using the app and that they learned about breastfeeding more quickly and easily because of the app (**Table 4-6**). Almost 60 percent of respondents agreed or strongly agreed that they would like to play Daily Drop more, and nearly 80 percent agreed or strongly agreed that using Daily Drop "made learning about breastfeeding a better experience than it would have been otherwise."

Almost half (46.9%) of respondents agreed or strongly agreed that playing Daily Drop made them "want to use more WIC breastfeeding support resources." In addition, about 33 percent of respondents agreed or strongly agreed that "using Daily Drop made what I was learning from my IBCLC or peer counselor feel more relevant to me," and about 25 percent agreed or strongly agreed that their WIC staff person provided them helpful feedback based on their Daily Drop scores.

Table 4-6. Acceptability of Daily Drop App among Client Survey Respondents in VT

Statement	N	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
		%				
I had more fun learning about breastfeeding because of using Daily Drop.	49	12.2	59.2	22.4	4.1	2.0
Using Daily Drop made learning about breastfeeding a better experience than it would have been otherwise.	49	16.3	63.3	16.3	2.0	2.0
I would like to play the Daily Drop more.	49	6.1	53.1	26.5	10.2	4.1
I learned about breastfeeding more quickly and easily because of using Daily Drop.	49	14.3	53.1	28.6	2.0	2.0
Playing Daily Drop made me want to use more WIC breastfeeding support resources.	49	12.2	34.7	36.7	12.2	4.1
Using Daily Drop made what I was learning from my IBCLC or peer counselor feel more relevant to me.	49	4.1	28.6	61.2	4.1	2.0
My WIC staff person provided helpful feedback based on my Daily Drop scores.	49	10.2	14.3	40.8	24.5	10.2

Source: Daily Drop User 1-Month Survey

During interviews, clients generally reported high acceptability of the Daily Drop app, noting that it was "fun," "helpful," and "trustworthy." Clients also noted that the app was more easily accessible than printed materials since it could be downloaded and accessed on a phone. Clients who reported lower acceptability of the app indicated that Daily Drop did not offer new

information for mothers who had prior experience breastfeeding or had sufficient knowledge from other sources.

> *"I think what helped me specifically was just having this be regular information coming through in an app sort of way, like a game kind of as opposed to just information that you're reading. Sometimes, articles are boring, so the way that it's set up was helpful." (VT Client, Participant 12)*
>
> *"It really just helped me eat better, a lot better. Before I didn't eat very well, and I didn't eat much. It definitely helped balance my eating habits and then making it easier to breastfeed." (VT Client, Participant 9)*
>
> *"They're definitely handy to use when you're on the go, or if you have a quick question, you can just search it right up there, and it's good to have someone readily available to give you support when you need it." (VT Client, Participant 16)*
>
> *"Like I said, if I were to use an app or if I were new to breastfeeding or a new mom, that app could be really helpful because it's not necessarily questions that maybe people feel comfortable asking other people." (VT Client, Participant 13)*
>
> *"I don't think I would share it with somebody that's had seven kids and breastfed all of them, but somebody that's new to breastfeeding or new to just motherhood. I would share it because, like I said, there's a lot of information on there that you can learn from it." (VT Client, Participant 6)*

4.5 Satisfaction with Daily Drop App among Client Survey Respondents

After having access to and using the Daily Drop app for 1 month, respondent satisfaction with Daily Drop was fair (**Table 4-7**). None of the respondents indicated they were very satisfied with the app. Almost three-quarters (72.5%) of respondents were satisfied with Daily Drop, and about 8 percent of respondents were dissatisfied or very dissatisfied.

Approximately 80 percent of respondents agreed or strongly agreed that they were glad they played Daily Drop, and 71 percent agreed or strongly agreed that using the Daily Drop app was a good use of their time. Most respondents (83.7%) agreed or strongly agreed that they would recommend Daily Drop to other WIC clients, and about 90 percent agreed or strongly agreed that other WIC offices should also offer Daily Drop to clients.

Table 4-7. Satisfaction with Daily Drop App among Client Survey Respondents in VT

Statement	N	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
		%				
Overall, how satisfied or dissatisfied are you with Daily Drop?	40	0.0	72.5	20.0	2.5	5.0
	N	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
		%				
I am glad I played Daily Drop.	49	26.5	51.0	18.4	2.0	2.0
Using the Daily Drop was a good use of my time.	49	26.5	44.9	22.4	4.1	2.0
I would recommend Daily Drop to other WIC participants.	49	30.6	53.1	12.2	2.0	2.0
I think other WIC offices should offer Daily Drop.	49	26.5	63.3	8.2	0.0	2.0

Source: Daily Drop User 1-Month Survey

During interviews, clients noted that the app provided them with new information or reinforced what they knew, encouraging them and increasing their confidence to adapt or maintain healthy behaviors, including breastfeeding their infant. Clients also viewed the app as a trusted source of information and noted that it debunked breastfeeding myths. Some clients expressed frustration and found the information repetitive. It is likely clients were frustrated because of the way the game algorithm was set up; users would continue to get a minigame in their playlist until they had successfully completed each minigame.

> *"I think it gave me more confidence in my ability because I had no idea how to breastfeed or if I was doing it right or even to know like if my baby was full. It gave a lot of knowledge that I didn't have before." (VT Client, Participant 8)*
>
> *"It was a small app. I didn't agree that some of the information was accurate... I think some of the things that were super helpful for me because I breastfed many years ago because my daughters are older just to remember certain things like hindmilk and foremilk and what those are and what the special qualities of those are and it's not just like milk. I think the more detailed information was super helpful to just remind me of those things." (VT Client, Participant 13)*
>
> *"I think one thing that was really cool is just the picture of the actual breast and what all the parts are and what the actual inside of the breast looks like with the milk because I think you just nurse sometimes and you don't think of the anatomy of the body and all the functions of what is actually happening and what's going on and*

maybe if there's something that comes up, how to problem shoot that. I think it was really cool to just have the diagrams and the pictures, and the words." (VT Client, Participant 14)

"Kind of frustrating, I ended up deleting it because it was very repetitive. I wouldn't really get any new information. There was a lot of stuff that I did learn, but it was the same stuff over and over again." (VT Client Participant 5)

4.6 Barriers to Using Daily Drop among Client Survey Respondents

Barriers to using Daily Drop were assessed using responses to questions on comfort with technology, difficulty downloading and using Daily Drop on a phone or other device, difficulty describing Daily Drop to their friends, and ease of access and support to play the game. **Sections 4.6.1** through **4.6.3** describe these barriers.

4.6.1 Comfort with Technology among Client Survey Respondents

Overall, at baseline more than two-thirds of survey respondents were very confident using technology with nearly one-third (29.7%) being somewhat confident (**Table 4-8**). Significantly more players than nonplayers were very confident about the use of technology (77.6% vs. 48%).

Table 4-8. Comfort with Technology among Client Survey Respondents in VT, Overall and by Players and Nonplayers

Comfort with Technology	Overall	Players	Nonplayers	p-value[a]
	%			
When it comes to the use of technology, which of the following best describes you?	N=74	N=49	N=25	0.0314*
Very confident	67.6	77.6	48.0	
Somewhat confident	29.7	20.4	48.0	
Neither confident nor uncertain	1.4	2.0	0.0	
Somewhat uncertain	0.0	0.0	0.0	
Very uncertain	1.4	0.0	4.0	

Source: Daily Drop Baseline Survey

[a] p-values are based on chi-square tests.

* p<0.05

4.6.2 Difficulties with Downloading and Using the Daily Drop App among Client Survey Respondents

After having access to the Daily Drop for 1 month, about 16 percent of respondents agreed or strongly agreed that they had trouble downloading the app (**Table 4-9**). Less than 5 percent of respondents had difficulty finding the information they wanted on the app and getting the app to

work on their phone or device; less than 10 percent had difficulty understanding how to get around the app and understanding the information in the app. Finally, none of the respondents indicated they would have difficulty telling friends what Daily Drop is like.

Table 4-9. Difficulties Downloading and Using Daily Drop App among Client Survey Respondents in VT

Statement	N	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
		%				
I had trouble downloading Daily Drop onto my phone/device.	49	4.1	12.2	10.2	34.7	38.8
I had no difficulty finding the information that I wanted in Daily Drop.	49	16.3	61.2	18.4	4.1	0.0
I had no difficulty getting Daily Drop to work on my phone/device.	49	28.6	59.2	6.1	4.1	2.0
I had no difficulty understanding how to get around in Daily Drop.	49	22.4	63.3	6.1	8.2	0.0
I had no difficulty understanding the information in Daily Drop.	49	24.5	63.3	4.1	8.2	0.0
I would have no difficulty in telling friends what Daily Drop is like.	49	24.5	59.2	16.3	0.0	0.0

Source: Daily Drop User 1-Month Survey

4.6.3 Ease of Accessing and Using Daily Drop among Client Survey Respondents

More than 90 percent of respondents agreed or strongly agreed that the Daily Drop app was convenient to access and simple to use (**Table 4-10**). About half of respondents agreed or strongly agreed and 2 percent disagreed with the statement, “It was easy to access support from my WIC office when needed through the app.” Finally, nearly 60 percent of respondents expressed interest in playing Daily Drop more.

Table 4-10. Ease of Access and Use of Daily Drop App among Client Survey Respondents in VT

Statement	N	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
		%				
It was convenient to access Daily Drop.	49	34.7	55.1	8.2	2.0	0.0
Daily Drop was simple for me to use.	49	38.8	55.1	4.1	2.0	0.0
It was easy to access support from my WIC office when needed through the app.	49	14.3	34.7	49.0	2.0	0.0
I would like to play the Daily Drop more.	49	6.1	53.1	26.5	10.2	4.1

Source: Daily Drop User 1-Month Survey

In interviews, most clients found Daily Drop easy to use. Some clients noted initial challenges with downloading and getting used to the app, but their comfort increased once they spent some time using it. Some clients noted that they did not remember to play the game because there were no reminders. Others felt that playing one game per day was a limiting factor, and they often forgot to return to it the next day.

> *"It is just hard to get the app." (VT Client, Participant 17)*
>
> *"It was pretty neutral. It was not pretty easy, but it was more easygoing rather than more difficult. There was just one thing that I struggled with because you would have to do the dailies, and then you were learning it. I didn't know if I was supposed to read all the intel that they had to do the Daily Drops to refresh my memory on it. I was just confused about that." (VT Client Participant 9)*
>
> *"It could have more things on it. It could be a bigger app. It seemed pretty small." (VT Client, Participant 13)*
>
> *"My only issue was remembering to do it because it didn't have any reminders, or if it did, I didn't have them on." (VT Client, Participant 11)*

4.7 Impact of Using the Daily Drop App on Intent to Breastfeed

After having access to the Daily Drop app for 1 month, 36 percent of respondents agreed or strongly agreed that playing Daily Drop made them more likely to breastfeed their child (**Table 4-11**). About half of respondents neither agreed nor disagreed, and about 11 percent disagreed or strongly disagreed that playing Daily Drop made them more likely to breastfeed their child. Minimal changes in self-reported intent to breastfeed were noted from baseline to the 1-month survey (data not shown).

Table 4-11. Impact of Playing Daily Drop on Intent to Breastfeed Their Child among Client Survey Respondents in VT

Statement	N	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
		%				
Playing Daily Drop makes me more likely to breastfeed my child.	36	5.6	30.6	52.8	5.6	5.6

Source: Daily Drop User 1-Month Survey

In interviews, clients reported that Daily Drop helped them learn new information or reinforced things they already knew, increased their confidence to breastfeed, and ultimately convinced them to breastfeed.

> *"I thought it was very helpful. This was my second kid. My first child, I did not breastfeed for, so this time around, I was going in with a blind eye, and it really helped me. I thought I had known some things just from hearsay, my own research, but it helped me learn new things, but then it also, the repetition of some of the activities and the things that you do on the (app) helped get it into my head more, which I thought was really nice and just learning different facts about nutrition and breastfeeding as well was really cool." (VT Client, Participant 2)*
>
> *"I think it gave me more peace of mind that what I was attempting to do. My daughter didn't really like my anatomy. I had a little bit of trouble having her latch in the hospital. It just gave me more reassurance about that situation and that it didn't have to be an anxiety-producing venture to breastfeed." (VT Client, Participant 8)*
>
> *"It made me want to breastfeed more. I already had wanted to breastfeed beforehand, but just finding out the information that's not even talked about was just mind-blowing. I was like, 'I definitely want that for my kid.'" (VT Client, Participant 5)*

4.8 Impact of Engagement with Daily App on Domain Scores

Regression models assessed the effect of a player's engagement with the app (measured as the total number of playlists completed) on their domain scores for knowledge, support, and confidence, controlling for whether respondents had breastfed in the past. The results suggest that completing more playlists leads to a higher knowledge domain score. Each additional playlist completed by respondents increased their knowledge domain score by 0.79 (**Table 4-12**).

Table 4-12. Impact of Engagement with Playlists on Knowledge Score in VT

Independent Variable	Coefficient[a]	Std error	t-value	Pr > |t|
Intercept	3.24	11.58	0.28	0.78
Total number of playlists completed	0.79	0.14	5.81	<.0001*
BAPT knowledge score	–0.23	0.67	–0.35	0.73
Breastfed other babies in the past				
Yes	8.96	10.96	0.82	0.42
No	Ref.			

Source: Daily Drop Baseline Survey and Daily Drop metadata
[a] Coefficients represent the change in score calculated using multivariate regression.
* p<0.05

Completing more playlists led to a higher support domain score. Each additional playlist completed by respondents increased their support domain score by 0.85 (**Table 4-13**).

Table 4-13. Impact of Engagement with Playlists on Support Score in VT

Independent Variable	Coefficient[a]	Std error	t-value	Pr > |t|
Intercept	–0.91	13.91	–0.07	0.95
Total number of playlists completed	0.85	0.18	4.70	<.001*
BAPT support score	–1.11	1.27	–0.88	0.39
Breastfed other babies				
Yes	17.03	14.12	1.21	0.24
No	Ref.			

Source: Daily Drop Baseline Survey and Daily Drop metadata
[a] Coefficients represent the change in score calculated using multivariate regression.
* p<0.05

Finally, completing more playlists led to a higher **confidence** domain score. Each additional playlist completed by respondents increased their confidence domain score by 0.76 (**Table 4-14**).

Table 4-14. Impact of Engagement with Playlists on Confidence Scores in VT

Independent Variable	Coefficient[a]	Std error	t-value	Pr > |t|
Intercept	2.41	7.59	0.32	0.75
Total number of playlists completed	0.76	0.10	7.94	<.001*
BAPT confidence score	–0.59	0.67	–0.88	0.39
Breastfed other babies				
Yes	5.65	9.52	0.59	0.56
No	Ref.			

Source: Daily Drop Baseline Survey and Daily Drop metadata
[a] Coefficients represent the change in score calculated using multivariate regression.
* p<0.05

4.9 Postpartum Breastfeeding Practices

The Daily Drop user 3-month postpartum survey asked participants, "Over the past 24 hours, did you give your baby breastmilk?" For respondents who planned to breastfeed only at baseline, 79 percent breastfed their baby at 3 months, which was significantly higher compared to those who planned to formula feed or didn't know. For respondents with a BAPT score greater than 20, 96 percent breastfed their baby at 3 months which was significantly higher compared to respondents with a BAPT score ≤ 20. For respondents who played Daily Drop at least once, 73 percent breastfed their baby at 3 months which was significantly higher compared with respondents who did not play Daily Drop at least once (see **Table 4-15**).

Table 4-15. Summary Statistics on BAPT Performance, Experience, and Plan to Breastfeed by 3-Month Postpartum Breastfeeding Status

Variable	Breastmilk given to baby at 3-month		
	No	Yes	p-value[a]
	N=13	N=29	
	Row Percentages		
Planned feeding method at baseline			
Breastfeed only	20.6	79.4	0.042*
Formula feed only	100.0	0.0	
Don't know yet	100.0	0.0	
Overall BAPT score			<0.001*
Overall BAPT ≤20	66.7	33.3	
Overall BAPT >20	4.2	95.8	
Played at least one Daily Drop game			
No (nonplayer)	100.0	0.0	0.030*
Yes (player)	27.5	72.5	

Sources: Daily Drop Baseline Survey, Daily Drop User 1-Month Survey, Daily Drop User 3 Months Postpartum Survey, and Daily Drop metadata

[a] p-values are based on chi-square tests; 25% or more of the cells have expected counts less than 5, so chi-square may not be a valid test.

* p<0.05

The odds of giving breastmilk at 3 months is nearly 6 times higher for those who played the game at 1 month than those who did not (**Table 4-16**). A single unit increase in BAPT score was associated with a 17 percent increase in odds of giving breastmilk at 3 months. Using the categorical versions of the BAPT scores as the predictor yielded similar results. Only one respondent scored above 20 and did not breastfeed postpartum, so the odds ratios were large (46.0 for the two-level BAPT scores; results not shown). Prior breastfeeding experience was not significantly associated with giving breastmilk at 3 months.

The adjusted regression model included continuous BAPT score as the main independent variable as its odds ratio was more interpretable. Prior breastfeeding experience was included as a covariate because this independent variable has a more ideal distribution across the two

outcome options. BAPT score remained a significant predictor of giving breastmilk at 3 months, after adjusting for previous breastfeeding experience (see **Table 4-16**). For a 1-unit increase in the BAPT score, the odds of giving breastmilk at 3 months increased by 27 percent. Given the multiplicative nature of odds ratio, for a 5-unit increase in the BAPT score, the odds would go up to 1.27 (i.e., about three times).

Table 4-16. Factors Associated with Giving Breastmilk to Baby at 3 Months in VT

Variable	Unadjusted models			Adjusted model		
	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI	p-value
Played at least one Daily Drop game [a]			0.181	NA	NA	NA
No (nonplayer)	Ref.	--		NA	NA	NA
Yes (player)	5.7[a]	0.43, Inf.		NA	NA	NA
Baseline BAPT score (continuous)	1.17	1.04, 1.31	0.008*	1.27	1.03, 1.58	0.026*
Prior breastfeeding			0.087			0.623
No	Ref.	--		Ref.	--	--
Yes	9.6	0.7, 127.5		0.41	0.11, 14.3	
Planned feeding method at baseline			0.057	NA	NA	NA
Breastfeed only	Ref.	--		NA	NA	NA
Formula feed only	0.30 [a]	0, 11.6		NA	NA	NA
Don't know yet	0.30 [a]	0, 11.6		NA	NA	NA

Sources: Daily Drop Baseline Survey, Daily Drop User 1-Month Survey, Daily Drop User 3 Months Postpartum Survey, Daily Drop metadata

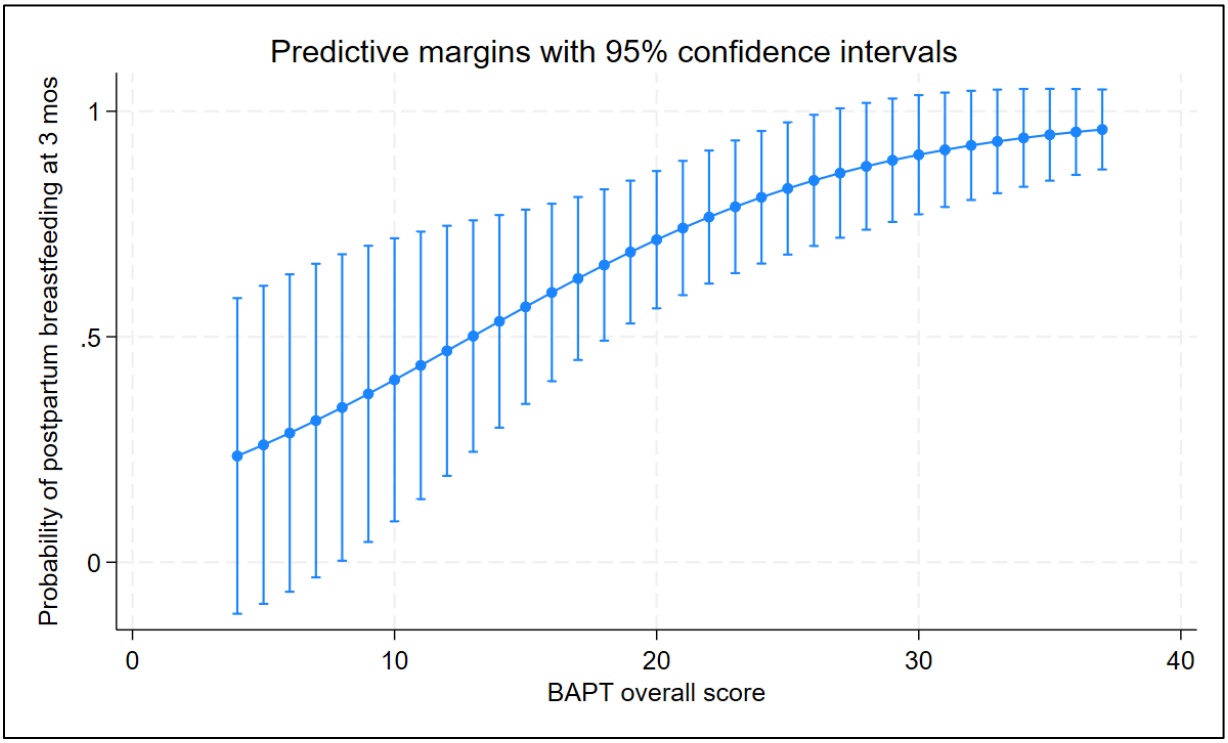
Notes: Outcome is giving breastmilk (coded as 1: Yes; 0: No) at 3 months. Inf. = infinity, Ref. = reference. NA = variable not included in model.

[a] Estimated with exact logistic regression due to perfect prediction.

* p<0.05

Figure 4-1 displays the adjusted predicted probability—based on the results of the final adjusted model—by single point of score, ranging from 4 (minimum observed score) to 37 (maximum observed score). A BAPT score of 14 corresponds to a 50 percent chance of giving breastmilk at 3 months, a score of 18 corresponds to a 75 percent chance, and a score of 23 or greater corresponds to a 90 percent or higher chance of giving breastmilk at 3 months.

Figure 4-1. Predicted Probability of Postpartum Breastfeeding Against BAPT Overall Score, Adjusted for Previous Breastfeeding Experience



4.10 Summary of Findings: WIC Clients

Pregnant WIC clients receiving services at one of the five participating WIC agencies were invited to download the Daily Drop app on their phone or other device for breastfeeding education. Clients who downloaded the Daily Drop app and played at least one game before the Daily Drop User 1-Month Survey were defined as players, and those who did not play any games were defined as nonplayers. This chapter described client experiences with telehealth services and resources and compared outcomes for Daily Drop players and nonplayers. Key findings include the following:

- **Breastfeeding practices and intentions:** At baseline, respondents had an average of 1.9 children prior to the current pregnancy. Most respondents had breastfed their previous babies (94.4% players vs. 66.7% nonplayers), and the mean duration of breastfeeding was about 5 months (4.7 months for players vs. 5.1 months for nonplayers).
- **Intent to breastfeed their new baby:** At baseline, most respondents planned to breastfeed their new baby in the first few weeks (88.9% players vs. 81.3% nonplayers), and the mean planned breastfeeding duration was 16 months for players and 13.5 months for nonplayers. Trends for players and nonplayers were comparable for the age at which formula or other food was introduced; however, fewer players than nonplayers (7.3% vs. 23.5%) planned to introduce formula or other food before 4 months of age. In

the Daily Drop User 1-Month Survey, slightly more than one-third of the respondents agreed or strongly agreed that playing Daily Drop made them more likely to breastfeed their child.

- **Baseline BAPT scores:** At baseline, the BAPT score was 20 or higher for nearly half of respondents. The mean BAPT score for confidence was significantly higher for Daily Drop players than nonplayers (8.2 vs. 4.0), whereas mean BAPT scores for knowledge and support were comparable for players and nonplayers.
- **Engagement with Daily Drop app:** Daily Drop players started about 10 sessions (median) and spent 4 minutes per session. During the pilot study, the Daily Drop app recorded the number of completed playlists across all users in the domains of knowledge, support, and confidence; the highest number of playlists recorded was 91, but most players engaged with about 8 (median).
- **Acceptability of Daily Drop app**: At 1 month, most respondents liked the Daily Drop app, had fun learning about breastfeeding because of the app, and found the app more engaging than other education materials used as part of WIC breastfeeding education. Respondents expressed a preference for Daily Drop over in-person classes and indicated that they learned about breastfeeding more quickly and easily because of the app. Over half (59.2%) of players indicated that want to play the Daily Drop more and almost half (46.9%) indicated that it made them want to use more WIC breastfeeding support resources.
- **Satisfaction with Daily Drop app**: At 1 month, respondent satisfaction with the app was fair, and most respondents were glad they played Daily Drop games. Most respondents (83.7%) indicated they would recommend the app to other WIC clients, and about 90 percent thought other WIC offices should also offer Daily Drop app to clients.
- **Barriers to using Daily Drop:** At baseline, more players than nonplayers indicated that they were very confident with technology (78% vs. 48%). At 1 month, most players did not experience any barriers to using Daily Drop. At 1 month, about 16 percent of respondents noted they had trouble downloading the app on their phone or device, 8 percent had difficulty understanding how to get around the app and the information in the app, and 4 percent had difficulty finding the information they wanted and getting the app to work on their phone or device. Additionally, most respondents noted that the app was convenient to access and simple to use.
- **Impact of Daily Drop app use on knowledge, support, and confidence domain scores**: Completing playlists was associated with significantly higher domain scores; each additional playlist completed by respondents increased their knowledge domain score by 0.79, support domain score by 0.85, and confidence domain score by 0.76.
- **Predictors of giving breastmilk at 3 months:** After controlling for planned feeding behavior and prior breastfeeding practices, BAPT scores at 1 month were significant predictors of giving breastmilk at 3 months.

5. Conclusions and Lessons Learned

Telehealth has emerged as an integral approach to offering healthcare services because it may offer enhanced access to services, convenience in scheduling and receiving services, and cost savings by eliminating the need for transportation. However, factors such as comfort with technology, Internet availability, privacy and security concerns, and accessibility may be barriers to integrating telehealth within WIC. The goal of the THIS-WIC project was to develop a robust evidence base of telehealth solutions in WIC and to assess whether and how telehealth affects intermediate, process, and cost outcomes.

The project aimed to test the feasibility of augmenting breastfeeding education and support provided during in-person appointments with an interactive game-based Daily Drop app. The app underwent user story development, alpha and beta development and testing before launch; since the app was in the feasibility testing stage, it was not integrated with VT MIS.

5.1 Implementation of Telehealth Services in VT

Between January 2023 (Q1/2023) and September 2023 (Q3/2023), five clinics participated in the THIS-WIC evaluation and offered the Daily Drop app to pregnant clients. Staff have a favorable attitude toward the Daily Drop app; they perceived that the app was more interactive and engaging than traditional breastfeeding education methods, such as handouts. Staff indicated that offering the app removed accessibility barriers faced by participants related to attending in-person appointments or accessing online resources. Staff also felt that the app reports can facilitate meaningful discussions with clients. However, staff acceptability, satisfaction, and perceived feasibility of using the Daily Drop app declined over time. Staff did not feel prepared to promote the app or use the reports during appointments with clients. Staff indicated they needed more time to understand the process of obtaining and interpreting the reports, and they noted that having to review these reports either before or during appointments increased appointment time. Staff also indicated that not having an integrated system (metadata and MIS) and low client use played a role in their comfort with using the reports. Staff felt that clients may sign up for the Daily Drop app but may not use the app after their appointment. They recommended providing access to the games when clients are in the office (using office iPads) and using push notifications or other reminders to increase engagement. Staff expressed interest in expanding the app to cater to a wider client base, including those with auditory or visual impairments, and making the Daily Drop app available in other languages.

The development and testing phase costs were $557,084. The implementation phase cost for the pilot was $2,859 per participant enrolled.

5.2 Client Experience and Outcomes

To promote breastfeeding initiation and support exclusive breastfeeding for the first 6 months, the Daily Drop app includes playlists in the knowledge, support, and confidence domains. Daily Drop players logged about 10 sessions in the Daily Drop app and engaged with about 8 playlists

in each of the three domains. Most players liked the app and had fun learning about breastfeeding because of the app. They found the app to be more engaging than other educational materials used as part of WIC breastfeeding education. Most players were satisfied with the app, were glad they played the games, indicated they would recommend the app to their friends, and thought other WIC clinics should offer it. Most respondents did not encounter any barriers to using the app, and most found it convenient to access and simple to use. Completing playlists in the knowledge, support, and confidence domains was associated with significantly higher domain scores; each additional playlist completed by the respondents increased their knowledge domain score by 0.79, support domain score by 0.85, and confidence domain score by 0.76.

At baseline, about 85 percent of survey respondents had breastfed their child, and a similar percentage planned to breastfeed their new baby in the first few weeks. Although most respondents had breastfed their prior child for about 5 months, they planned to breastfeed their new baby for more than 1 year, and about half planned to introduce formula or other foods after 4 months of age. At 1 month, about one-third of the respondents indicated that playing the Daily Drop app made them more likely to breastfeed their child. Baseline BAPT score was a significant predictor of giving breastmilk at 3 months.

5.3 Lessons Learned

Innovative approaches to providing WIC clients the opportunity to receive supplementary breastfeeding education on their own time have the potential to align breastfeeding practices with recommendations, and boost rates of breastfeeding initiation and exclusive breastfeeding duration. Clients are receptive to such an approach and prefer it over traditional nutrition education formats such as handouts. Comprehensive training is essential to preparing staff in terms of discussing the app with the client, accessing and reviewing the reports, and using them during in-person appointments. Integrating the Daily Drop app reports with the MIS, providing support to interpret the reports, and ensuring that these efforts do not negatively impact appointment times are critical for staff buy-in.

5.4 Implications

Telehealth is a relatively new approach to providing services to WIC clients, and findings from this evaluation demonstrate the potential of using Daily Drop to promote breastfeeding behaviors among soon-to-be mothers. The higher level of satisfaction with WIC services among respondents demonstrates the feasibility of providing supplementary breastfeeding education to clients. Additional studies and evaluations are needed to demonstrate feasibility and efficacy. Integrating app reports within the MIS, training staff on the process of using the reports during appointments without increasing appointment duration, and pushing notifications or reminders may lead to increased use of Daily Drop among staff and clients.

5.5 Strengths and Limitations

The evaluation of the Daily Drop pilot in VT had several strengths, including using a mixed methods approach to understand staff and client satisfaction and their experience using the Daily Drop app, staff and client data collection at three time points, follow-up with players and nonplayers, and availability of metadata on app use.

VT WIC developed the Daily Drop app with input from staff and clients; the app went through extensive alpha and beta testing prior to its use. The Daily Drop app was evaluated using a mixed methods approach; qualitative data provided context and aided in the interpretation of quantitative data. Since Daily Drop was a new app, the THIS-WIC evaluation was able to collect baseline client data on intent to give their baby breastmilk and examine the association of the Daily Drop on postpartum breastfeeding practices. Additionally, respondents who did not play Daily Drop completed the nonplayer survey, which provided insights into the barriers to playing the games.

This evaluation has several limitations. First, the pilot study tested an innovative game to support breastfeeding education over a 9-month period, and the number of clients participating in the evaluation was small, with 49 playing the game. A longer pilot period with more users may provide better insights into the feasibility and identify additional design concerns from staff and client perspective. The small client sample size meant staff had limited opportunity to engage with Daily Drop on the staff side. Second, this pilot study did not include a comparison group who received usual care. More studies are needed to evaluate the effectiveness of providing supplemental breastfeeding education through a game compared to usual care methods like handouts or electronic resources. Third, although the decision to breastfeed at baseline was associated with giving breastmilk at 3 months, some women who planned to breastfeed did not do so, and their reasons were not examined.

Finally, the rate of breastfeeding initiation is high in Vermont. In 2023, 81 percent of WIC mothers had ever breastfed, 72% breastfed their infant up to three months and 70 percent did so until 6 months. In 2023, the rate of exclusive breastfeeding at 3 and 6 months was 45 percent and 35 percent, respectively.[32] Additional studies are needed to examine the effectiveness of the app in promoting breastfeeding in other subgroups, such as those with lower breastfeeding rates, primiparous vs. multiparous women, and those with other language needs.

5.6 Sustainability

Following the THIS-WIC evaluation and pilot study, VT WIC designed and developed additional enhancements to the Daily Drop app. For example, changes were made to address client frustration about the inability to move to new games (when they had a score of less than 100/100). In the updated version, clients can access all of the content in the app; the minigames are cycled into playlists throughout the user experience. Additionally, the algorithm has been refreshed in the updated version so that it does not force a correct answer before allowing a user to move on. After two incorrect attempts, it will allow the user to move on.

VT WIC convened a working group to help plan for statewide rollout of Daily Drop. The working group also reviewed current state policies and protocols related to WIC breastfeeding services and provided feedback on how Daily Drop can complement existing support. Training was provided to all staff on Daily Drop and the reports, and state IT staff were trained by the contractor on maintaining the app. The Daily Drop clinical report tool has been enhanced to include monitoring of statewide engagement as well as total active and cumulative users over time. The tool is incorporated into an internal SharePoint site where all other local agency breastfeeding protocols and resources are housed. Statewide rollout began in early 2024.

References

1. United States Department of Agriculture. WIC Data Tables, Annual State Level Data, Total Participation.

2. United States Department of Agriculture. WIC Data Tables, Monthly Data, State Level Participation by Category and Program Costs.

3. United States Census Bureau. (2013). *American Community Survey.* https://www.census.gov/acs/www/about/why-we-ask-each-question/computer/

4. Gill, S. L., Reifsnider, E., Lucke, J. F., & Mann, A. R. (2007, Jul-Sep). Predicting breast-feeding attrition: adapting the breast-feeding attrition prediction tool. *Journal of Telemedicine and Telecare, 21*(3), 216-224. https://doi.org/10.1097/01.Jpn.0000285811.21151.37 . PMID: 17700098.

5. Kinney, R., Praamsma, N., Malinowski, A., Cassi, P., & Hennessy, E. (2023). Testing inclusive language revisions of the breastfeeding attrition prediction tool using cognitive interviewing: a pilot study. *Journal of Human Lactation, 39*(3), 529-539.

6. Fatehi, F., Smith, A. C., Maeder, A., Wade, V., & Gray, L. C. (2017). How to formulate research questions and design studies for telehealth assessment and evaluation. *Journal of Telemedicine and Telecare, 23*(9), 759-763.

7. Au, L. E., Whaley, S., Rosen, N. J., Meza, M., & Ritchie, L. D. (2016). Online and in-person nutrition education improves breakfast knowledge, attitudes, and behaviors: a randomized trial of participants in the special supplemental nutrition program for women, infants, and children. *Journal of the Academy of Nutrition and Dietetics, 116*(3), 490-500.

8. Nestor, B., McKenzie, J., Hasan, N., AbuSabha, R., & Achterberg, C. (2001). Client satisfaction with the nutrition education component of the California WIC program. *Journal of Nutrition Education, 33*(2), 83-94.

9. Weber, S., Uesugi, K., Greene, H., Bess, S., Reese, L., & Odoms-Young, A. (2018). Preferences and perceived value of WIC foods among WIC caregivers. *Journal of Nutrition Education and Behavior, 50*(7), 695-704.

10. Agha, Z., Schapira, R. M., Laud, P. W., McNutt, G., & Roter, D. L. (2009). Patient satisfaction with physician–patient communication during telemedicine. *Telemedicine and e-Health, 15*(9), 830-839.

11. Chai, L. K., Collins, C. E., May, C., Brown, L. J., Ashman, A., & Burrows, T. L. (2021). Fidelity and acceptability of a family-focused technology-based telehealth nutrition intervention for child weight management. *Journal of Telemedicine and Telecare, 27*(2), 98-109.

12. Parmanto, B., Lewis Jr, A. N., Graham, K. M., & Bertolet, M. H. (2016). Development of the telehealth usability questionnaire (TUQ). *International Journal of Telerehabilitation, 8*(1), 3.

13. Woelfel, M. L., Abusabha, R., Pruzek, R., Stratton, H., Chen, S. G., & Edmunds, L. S. (2004). Barriers to the use of WIC services. *Journal of the American Dietetic Association, 104*(5), 736-743.

14. Woods, S. S., Schwartz, E., Tuepker, A., Press, N. A., Nazi, K. M., Turvey, C. L., & Nichol, W. P. (2013). Patient experiences with full electronic access to health records and clinical notes through the My HealtheVet Personal Health Record Pilot: qualitative study. *Journal of Medical Internet Research, 15*(3), e2356.

15. Pew Research Center. (2021). *The Internet and the Pandemic.* https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2021/09/PI_2021.09.01_COVID-19-and-Tech_TOPLINE.pdf

16. Pew Research Center. (2021). *Mobile Technology and Home Broadband 2021.* https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2021/06/PI_2021.06.03_Mobile-Broadband_TOPLINE.pdf

17. Kakulla, B. (2021). *AARP 2021 Tech Trends.* https://www.aarp.org/content/dam/aarp/research/surveys_statistics/technology/2021/2021-tech-trends-older-adults.doi.10.26419-2Fres.00420.001.pdf

18. Office of Management and Budget. *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity.* https://www.govinfo.gov/content/pkg/FR-1997-10-30/pdf/97-28653.pdf

19. WIC Infant and Toddler Feeding Practices Study 2: Fourth Year Report. Appendix A Study Research Questions 2020.

20. Shiferaw, K. B., Mengiste, S. A., Gullslett, M. K., Zeleke, A. A., Tilahun, B., Tebeje, T., Wondimu, R., Desalegn, S., & Mehari, E. A. (2021). Healthcare providers' acceptance of telemedicine and preference of modalities during COVID-19 pandemics in a low-resource setting: An extended UTAUT model. *PLoS One, 16*(4), e0250220.

21. Zhu, D., Paige, S. R., Slone, H., Gutierrez, A., Lutzky, C., Hedriana, H., Barrera, J. F., Ong, T., & Bunnell, B. E. (2024). Exploring telemental health practice before, during, and after the COVID-19 pandemic. *Journal of Telemedicine and Telecare, 30*(1), 72-78.

22. Rho, M. J., young Choi, I., & Lee, J. (2014). Predictive factors of telemedicine service acceptance and behavioral intention of physicians. *International Journal of Medical Informatics, 83*(8), 559-571.

23. Gao, S., Krogstie, J., & Siau, K. (2011). Developing an instrument to measure the adoption of mobile services. *Mobile Information Systems, 7*(1), 45-67.

24. Becevic, M., Boren, S., Mutrux, R., Shah, Z., & Banerjee, S. (2015). User satisfaction with telehealth: study of patients, providers, and coordinators. *The Health Care Manager, 34*(4), 337-349.

25. Cates, S., Capogrossi, K., & Sallack, L. (2016). WIC Nutrition Education Study: Phase I Report. Alexandria, VA: United States Department of Agriculture. *Food and Nutrition Service, Office of Policy Support*.

26. Anderson, A. E., Henry, K. A., Samadder, N. J., Merrill, R. M., & Kinney, A. Y. (2013). Rural vs urban residence affects risk-appropriate colorectal cancer screening. *Clinical Gastroenterology and Hepatology, 11*(5), 526-533.

27. Glasgow, R. E., Harden, S. M., Gaglio, B., Rabin, B., Smith, M. L., Porter, G. C., Ory, M. G., & Estabrooks, P. A. (2019). RE-AIM planning and evaluation framework: adapting to new science and practice with a 20-year review. *Frontiers in Public Health, 7*, 64.

28. Keith, R. E., Crosson, J. C., O'Malley, A. S., Cromp, D., & Taylor, E. F. (2017). Using the Consolidated Framework for Implementation Research (CFIR) to produce actionable findings: a rapid-cycle evaluation approach to improving implementation. *Implementation Science, 12*, 1-12.

29. Powell, B. J., Waltz, T. J., Chinman, M. J., Damschroder, L. J., Smith, J. L., Matthieu, M. M., Proctor, E. K., & Kirchner, J. E. (2015). A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. *Implementation Science, 10*, 1-14.

30. Waltz, T. J., Powell, B. J., Matthieu, M. M., Damschroder, L. J., Chinman, M. J., Smith, J. L., Proctor, E. K., & Kirchner, J. E. (2015). Use of concept mapping to characterize relationships among implementation strategies and assess their feasibility and importance: results from the Expert Recommendations for Implementing Change (ERIC) study. *Implementation Science, 10*, 1-8.

31. Chang, H. (2015). Evaluation framework for telemedicine using the logical framework approach and a fishbone diagram. *Healthcare Informatics Research, 21*(4), 230.

32. Vermont Department of Health. (2024). *VT WIC Data Dashboard*. https://www.healthvermont.gov/family/wic/wic-plans-reports