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

## VT.1. Technical Appendix

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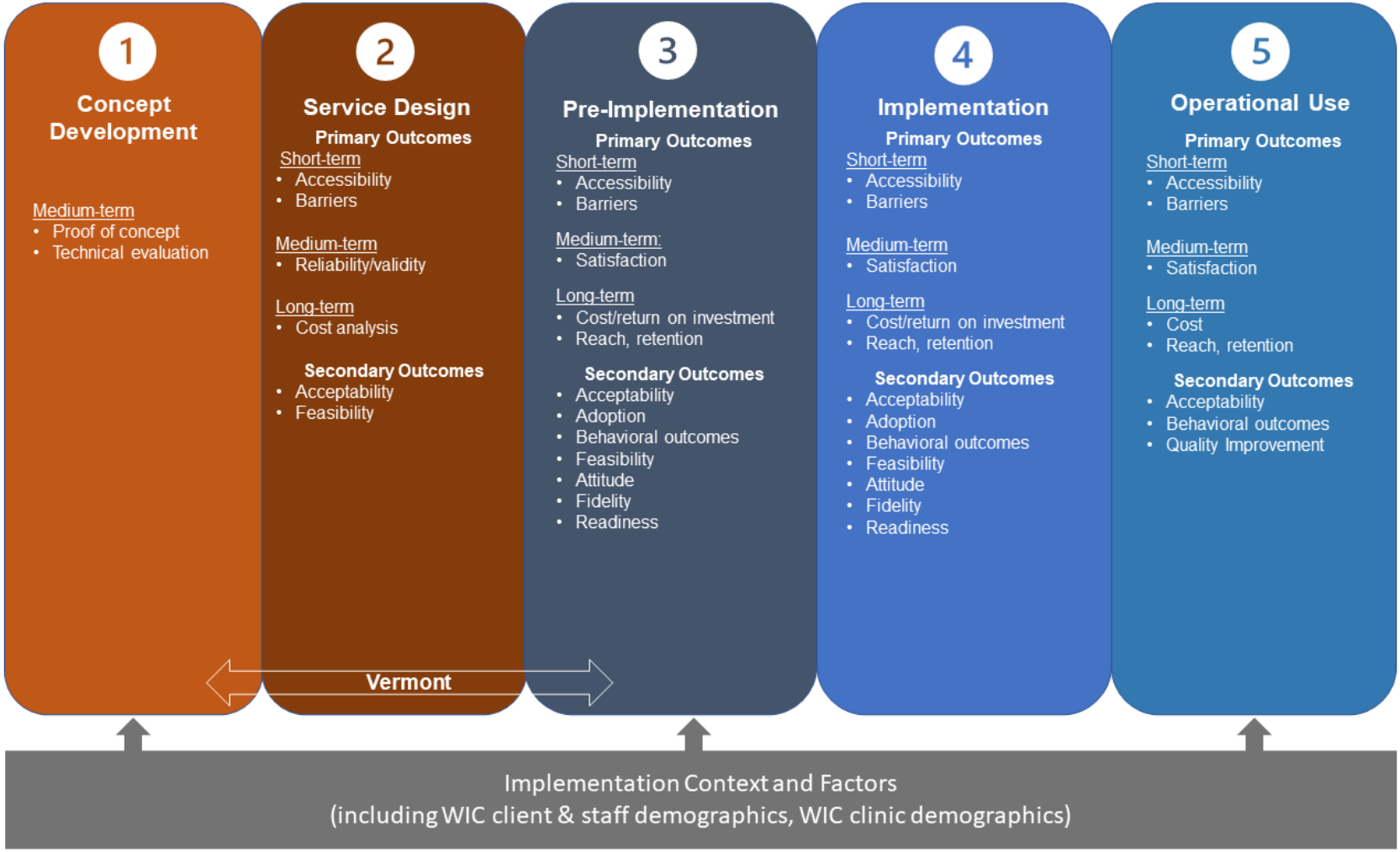
## VT.1.1 THIS-WIC Study Framework

The U.S. Department of Agriculture (USDA)/Tufts Telehealth Intervention Strategies for the Supplemental Nutrition Program for Women, Infants, and Children (THIS-WIC) used the five-stage model for comprehensive research on telehealth developed by Fatehi and colleagues[1] to guide the overall design of a telehealth research program (see **Figure VT.1.1**):

- Stage 1 (concept development): Propose a technology-based solution to a health problem; this stage may include a needs analysis, proof of concept, and a technical evaluation of the concept.
- Stage 2 (service design): Study feasibility and accessibility to determine how the service delivery model should be modified to accommodate the proposed telehealth intervention.
- Stage 3 (pre-implementation): Study the telehealth solution under a controlled environment to assess efficacy.
- Stage 4 (implementation): Study the telehealth solution in real-world settings to assess effectiveness.
- Stage 5 (operational use): After implementing a telehealth intervention, focus on operational use and sustainability of the solution.

In the context of THIS-WIC, the model mapped a multistage journey from developing a telehealth solution to the assessment of an established telehealth service. The model's internal consistency results from previous observations of the progression of telehealth projects in the telehealth field. Fatehi and colleagues[1] noted that telehealth research evaluations may not need to include all elements or stages, particularly where comparable services have been rigorously assessed. **Vermont's (VT's)** project spanned Stages 2 and 3 of the model (service design and pre-implementation), focusing on concept development and feasibility assessment of a mobile-friendly telehealth technology, the Daily Drop app.

**Figure VT.1.1.** THIS-WIC Five Stage Model for Comprehensive Telehealth Research in VT



## VT.1.2 WIC Agencies Participating in the Daily Drop Evaluation in VT

VT WIC identified five local agencies to participate in the THIS-WIC project and pilot test the Daily Drop game app (**Table VT.1.1**). These clinics were selected based on demographic characteristics, agency leadership, staff capacity, and staff familiarity with the project and project goals.

**Table VT.1.1**. Local WIC Agency and Client Characteristics of Pilot Agencies in VT

| Characteristic | Pilot agencies (number) | | | | |
|---|---|---|---|---|---|
| | Bennington | Burlington | Middlebury | Rutland St | Johnsbury |
| **Total Caseload** | 800 | 2316 | 676 | 1231 | 818 |
| Pregnant | 38 | 163 | 39 | 84 | 45 |
| Breastfeeding, full | 36 | 144 | 46 | 62 | 54 |
| Breastfeeding, partial | 29 | 94 | 19 | 41 | 23 |
| Not breastfeeding | 44 | 54 | 14 | 69 | 35 |
| | Race/ethnicity of clients served (%) | | | | |
| **AI/AN** | 0.2 | 0.3 | 0.0 | 0.8 | 0.2 |
| **Asian** | 0.2 | 14.7 | 0.6 | 0.6 | 0.7 |
| **Black/AA** | 1.3 | 15.2 | 1.4 | 1.0 | 0.9 |
| **Hispanic** | 2.8 | 2.7 | 2.3 | 3.2 | 2.8 |
| **Native Hawaiian or 2 or more races** | 0.4 | 0.9 | 0.6 | 1.0 | 0.7 |
| **White** | 95.1 | 66.2 | 94.5 | 93.4 | 94.7 |

Source: VT WIC Management Information System (MIS), participation summary report, 2021
Notes: AI/AN = American Indian or Alaska Native; Black/AA = Black or African American

## VT.1.3 Data Sources for Daily Drop Evaluation in VT

**Table VT.1.2** summarizes the data sources used for the Daily Drop evaluation in VT.

**Table VT.1.2**. Description of Data Sources for Daily Drop Evaluation in VT

| Data Source | Description | Developed by | Collected by |
|---|---|---|---|
| **MIS Data** | Caseload and client characteristic data. Aggregate data across sites | State agency | State agency |
| **Daily Drop Telehealth Metadata** | Telehealth usage and engagement metrics | Telehealth vendor | State agency |
| **Client Surveys** | Telehealth satisfaction, quality of telehealth interaction, and whether telehealth solution addressed known barriers to WIC participation; breastfeeding intention and breastfeeding behaviors (3 months postpartum) | State agency and THIS-WIC | State agency |
| **Staff Surveys** | Telehealth satisfaction, quality of telehealth interaction, and whether telehealth solution addressed known barriers to WIC participation | State agency and THIS-WIC | State agency |
| **Staff Key Informant Interviews** | Telehealth experience of local agency stakeholders | THIS-WIC | THIS-WIC |
| **Implementation Data** | Fidelity to the intervention protocol and implementation strategies | State agency and THIS-WIC | State agency |
| **Cost Data** | Source of information on start-up and ongoing costs related to telehealth adoption, implementation, and sustainability | THIS-WIC | State agency and THIS-WIC |

### VT.1.3.1 Telehealth Solution Implementation Data

Implementation data were collected using two methods: staff and supervisor implementation tracking surveys developed and administered by the VT State agency and responses to the Implementation Tracking Tool for the startup (pre-implementation), midway, and endpoint or late phases of implementation. See **Appendix VT.3** for data collection instruments.

**Staff and Supervisor Implementation Tracking Surveys**

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 eight-question tool included questions about staff use of the Daily Drop Report tool during appointments with clients. See **Appendix VT.3** for the staff and supervisor implementation tracking surveys.

## VT.1.4 Client Surveys

Information describing the sociodemographic characteristics and WIC participation for survey respondents was derived from the Daily Drop Baseline Survey and the Management Information System (MIS). Variables from the Daily Drop Baseline Survey included respondent's race/ethnicity, total number of years the household has received WIC services, location of residence, and respondent's average daily consumption of fruits and vegetables. The MIS record data closest to the appointment date were extracted for the following variables: presence of WIC client with high-risk status in the household, household size, annual household income, written language used at home (English, Spanish, other), and respondent's years of education.

### VT.1.4.1 Survey Sample

WIC clients at participating clinics who were 18 years of age or older, pregnant, spoke and read English, and had access to a smartphone or tablet were eligible to participate. VT WIC clients who agreed to take part in the pilot feasibility trial and completed the Daily Drop Baseline Survey and used Daily Drop were sent two additional surveys: Daily Drop User 1-Month Survey and Daily Drop User 3 Months Postpartum Survey. Respondents who did not play Daily Drop received the Daily Drop Non-User 1-Month Survey.

### VT.1.4.2 Sociodemographic Characteristics of Survey Respondents

**Table VT.1.3** presents the characteristics of Daily Drop Baseline Survey respondents in VT. As shown, 66 percent of respondents were players (N=49) and about 34 percent (N=25) were nonplayers. Participants in the two groups had similar characteristics. 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.

**Table VT.1.3**. Sociodemographic Characteristics of Client Survey Respondents in VT

| Variable | Overall | Players | Nonplayers | p-value[c] |
|---|---|---|---|---|
| | % | | | |
| **Age (years)** | N=74 | N=49 | N=25 | 0.6517 |
| **Mean, SD** | 30.2 (5.4) | 30.0 (5.3) | 30.6 (5.5) | |
| **Education[b]** | N=72 | N=48 | N=24 | 0.2993 |
| Some high school (9–11 grade) | 5.6 | 2.1 | 12.5 | |
| High school graduate (12th grade) | 61.1 | 62.5 | 58.3 | |
| 1–3 years of college | 20.8 | 20.8 | 20.8 | |
| 4 or more years of college | 12.5 | 14.6 | 8.3 | |
| **Race/Ethnicity[a]** | N=74 | N=49 | N=25 | 0.2207 |
| Non-Hispanic Asian | 2.7 | 2.0 | 4.0 | |
| Non-Hispanic Black | 5.4 | 2.0 | 12.0 | |
| Non-Hispanic White | 89.2 | 91.8 | 84.0 | |
| Hispanic | 2.7 | 4.1 | 0.0 | |
| **Primary Language[b]** | N=74 | N=49 | N=25 | 0.1697 |
| English | 90.5 | 93.9 | 84.0 | |
| Another language | 9.5 | 6.1 | 16.0 | |
| **Place of residence[a]** | N=73 | N=49 | N=24 | 0.3067 |
| Rural | 67.1 | 67.3 | 66.7 | |
| Suburban | 21.9 | 18.4 | 29.2 | |
| Urban | 11.0 | 14.3 | 4.2 | |
| **Household annual income ($)** | N=74 | N=49 | N=25 | 0.0875 |
| Median [IQR][b] | 29,376.0 [11,280.0, 40,000.0] | 26,400.0 [11,232.0, 36,400.0] | 31,200.0 [24,000.0, 41,600.0] | |

Sources: [a] Daily Drop Baseline Survey, [b] VT MIS

Notes: IQR = interquartile range, SD = standard deviation

[c] p-values are based on chi-square test for categorical variables, two-sample median tests for continuous variables reported as medians, and t-tests for continuous variables presented as means.

### VT.1.4.3 Length of WIC Tenure and High-Risk Status of WIC Client Survey Respondents

As seen in **Table VT.1.4**, 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. About 55

percent of respondents were high-risk. MIS data were used to classify clients as high risk at their most recent appointment.

**Table VT.1.4**. Participant Status, Length of WIC Tenure, and High-Risk Status of Client Survey Participants in VT

| Variable | Overall | Players | Nonplayers | p-value[d] |
|---|---|---|---|---|
| | % | | | |
| **In total, how many years have you received WIC services? Would you say it has been...[a]** | N=74 | N=49 | N=25 | 0.7899 |
| <1 year | 33.8 | 36.7 | 28.0 | |
| 1–2 years | 25.7 | 26.5 | 24.0 | |
| 3–4 years | 12.2 | 10.2 | 16.0 | |
| 5+ years | 28.4 | 26.5 | 32.0 | |
| **High-risk status[b, c]** | N=74 | N=49 | N=25 | 0.6738 |
| Yes | 55.4 | 57.1 | 52.0 | |
| No | 44.6 | 42.9 | 48.0 | |

Sources: [a] Daily Drop Baseline Survey, [b] VT MIS

[c] High-risk status is a dichotomous indicator coded "1" if the WIC client was assigned high-risk at their most recent WIC appointment.

[d] p-value based on chi-square tests.

## VT.1.5 Staff Survey Sample Size, Response Rate and Respondent Characteristics

### VT.1.5.1 Sample Size and Response Rate

All VT WIC staff and administrators delivering breastfeeding support at participating agencies were invited to complete staff surveys. THIS-WIC invited 24, 28, and 24 staff members to complete the early, mid, and late phase surveys, respectively. Response rates were 66.7 percent for the early phase, 54.2 percent for the mid phase, and 33.3 percent for the late phase (**Table VT.1.5**).

**Table VT.1.5**. THIS-WIC Staff Survey Sample Size and Response Rate in VT

| WIC Agency | Early Phase | | Mid Phase | | Late Phase | |
|---|---|---|---|---|---|---|
| | Invited | Responded | Invited | Responded | Invited | Responded |
| Bennington | 3 | 3 | 3 | 2 | 3 | 1 |
| Burlington | 9 | 6 | 9 | 4 | 9 | 3 |
| Middlebury | 3 | 3 | 3 | 2 | 3 | 1 |
| Rutland | 5 | 1 | 5 | 2 | 5 | 1 |
| St. Johnsbury | 4 | 3 | 4 | 3 | 4 | 2 |
| TOTAL | 24 | 16 | 24 | 13 | 24 | 8 |
| Overall response rate (%) | 66.7 | | 54.2 | | 33.3 | |

Source: THIS-WIC Staff Survey

### VT.1.5.2 Characteristics of THIS-WIC Staff Survey Respondents

The characteristics of Staff Survey respondents in the early phase are presented in **Table VT.1.6**. More than half of the respondents were between 25 and 35 years old, and 21 percent were between 56 and 65 years old. All staff responding to the survey were non-Hispanic White. About 14 percent of the respondents had participated in WIC.

**Table VT.1.6**. Characteristics of Staff Survey Respondents in VT

| Variables | Early phase |
|---|---|
| | % |
| **Age** | N=14 |
| 18–25 | 7.1 |
| 25–35 | 57.1 |
| 36–45 | 7.1 |
| 46–65 | 7.1 |
| 56–65 | 21.4 |
| 66+ | 0.0 |
| **Race/Ethnicity** | N=14 |
| Non-Hispanic White | 100.0 |
| **Previous WIC participation** | N=14 |
| Yes | 14.3 |

Source: THIS-WIC Staff Survey

### VT.1.5.3 WIC Role and Years of Experience of Staff Survey Respondents

Data on WIC role and experience of Staff Survey respondents are presented only for the early phase, due to the high rate of missing data in the mid- and late-phase surveys (**Table VT.1.7**). Respondents selected several responses to indicate their role at WIC; most selected CPA (85.7%) followed by nutrition roles (i.e. RD, degreed nutritionist, or nutrition education coordinator) (71.4%) and breastfeeding coordinator/lactation consultant (21.4%). 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.

**Table VT.1.7**. Role and Years of WIC Experience of THIS-WIC Staff Survey Respondents in VT

| Variables | Early phase |
|---|---|
| | % |
| **WIC role**[a] | N=14 |
| CPA/CPPA | 85.7 |
| RD/degreed nutritionist/nutrition education coordinator | 71.4 |
| Breastfeeding coordinator/Lactation consultant | 21.4 |
| Director | 0.0 |
| **Years worked in WIC** | N=14 |
| <2 years | 21.4 |
| 2–4 years | 21.4 |
| 5–8 years | 21.4 |
| 9–12 years | 14.3 |
| 12+ years | 21.4 |

Source: THIS-WIC Staff Survey

[a] Percentages do not add up to 100 because respondents could select all that applied.

## VT.1.6 WIC Client Key Informant Interview Sample Size, Response Rate and Characteristics

All WIC clients who used Daily Drop (n=52) were invited to participate in a key informant interview. Seventeen WIC clients participated in interviews, corresponding to a response rate of 32.7 percent. **Table VT.1.8** presents characteristics of WIC client interview participants.

**Table VT.1.8**. Characteristics of WIC Client Interview Participants

| Variables | N=52 |
|---|---|
| **Age, mean (range)** | 30 (18–40) |
| **High Risk (%)** | |
| Yes | 55.8 |
| No | 44.2 |
| **Client Type[a] (%)** | |
| Pregnant | 65.4 |
| Breastfeeding | 28.8 |
| Non-breastfeeding postpartum | 5.8 |
| **Prior breastfeeding experience[b] (%)** | |
| Yes | 71.2 |
| No | 25.0 |

Source: VT WIC MIS
[a] Client type documented at start of pilot study.
[b] Percentages do not add to 100 due to missing data.

## VT.1.7 Staff Key Informant Interview Sample Size and Response Rate

In the early and late phases, all staff who completed the Staff Survey and indicated they had used telehealth were invited to participate in the key informant interviews (**Table VT.1.9**).

**Table VT.1.9**. Number of Staff Who Were Invited and Participated in Key Informant Interviews in VT

| WIC Agency | Early phase | | Mid phase | | Late phase | |
|---|---|---|---|---|---|---|
| | Invited | Participated | Invited | Participated | Invited | Participated |
| | Number of staff | | | | | |
| Bennington | 2 | 1 | 3 | 1 | 1 | 1 |
| Burlington | 6 | 3 | 9 | 2 | 3 | 0 |
| Middlebury | 3 | 1 | 3 | 0 | 1 | 0 |
| Rutland | 1 | 1 | 5 | 2 | 1 | 0 |
| St. Johnsbury | 2 | 0 | 4 | 1 | 2 | 1 |
| **TOTAL** | 14 | 6 | 24 | 6 | 8 | 2 |
| **Overall response rate (%)** | 42.9 | | 25.0 | | 25.0 | |

Source: THIS-WIC Staff Survey and key informant interviews

## VT.1.8 Data Analysis

### VT.1.8.1 Daily Drop Implementation

**Implementation Tracking Tool**

Responses to the Implementation Tracking Tool were collected at the startup, midpoint, and endpoint of telehealth implementation. The 46 distinct strategies in the menu were grouped into eight conceptually relevant implementation categories, using the groupings developed by Waltz and colleagues.[2, 3] While Waltz and colleagues had developed nine categories through concept mapping, “utilize financial strategies” category was not included in the THIS-WIC menu. **Table VT.1.10** lists the eight implementation categories and corresponding menu strategies. The analysis of the Implementation Tracking Tool data involved tabulating the startup, midpoint, and endpoint status for each menu strategy to assess change. The startup measures were considered the implementation plan, and the change from startup to midpoint and endpoint measures were considered indicative of fidelity. In addition to understanding the fidelity of implementation, these data were also used to provide context for the staff- and client-level outcomes.

**Table VT.1.10.** THIS-WIC Implementation Tracking Tool Menu Categories

| Implementation category | Implementation menu strategy |
|---|---|
| **Use evaluative and iterative strategies** | Assess for readiness and identify barriers and facilitators. |
| | Conduct local needs assessment. |
| | Audit and provide feedback. |
| | Conduct small tests of change. |
| | Develop a formal implementation blueprint. |
| | Develop and organize quality monitoring systems. |
| | Obtain and use WIC clients and family feedback. |
| | Purposely reexamine the implementation. |
| | Stage implementation scale-up. |
| **Provide interactive assistance** | Centralize technical assistance. |
| | Provide local technical assistance. |
| **Adapt and tailor to context** | Promote adaptability. |
| | Tailor strategies. |
| | Use data experts. |
| | Use data warehousing techniques. |
| **Develop stakeholder interrelationships** | Conduct local consensus discussions. |
| | Develop academic partnerships. |
| | Build a coalition. |
| | Capture and share local knowledge. |
| | Identify and prepare champions. |
| | Identify early adopters. |
| | Inform local opinion leaders. |
| | Organize WIC staff implementation team meetings. |
| | Promote network weaving. |
| | Recruit, designate, and train for leadership. |
| | Use advisory boards and workgroups. |
| | Use an implementation advisor. |
| | Visit other sites. |
| **Train and educate stakeholders** | Conduct educational meetings. |
| | Conduct ongoing training. |
| | Develop and distribute educational materials. |
| | Make training dynamic. |
| | Provide ongoing consultation. |
| | Shadow other experts. |
| | Use train-the-trainer strategies. |

(continued)

**Table VT.1.10.** THIS-WIC Implementation Tracking Tool Menu Categories (continued)

| Implementation category | Implementation menu strategy |
|---|---|
| **Support clinicians** | Create new telehealth teams. |
| | Develop resource sharing agreements. |
| | Revise professional roles. |
| | Facilitate relay of telehealth breastfeeding/nutrition data to staff. |
| | Remind WIC staff and clients. |
| **Engage consumers** | Intervene with WIC clients to enhance uptake and adherence. |
| | Involve WIC clients and family members. |
| **Change infrastructure** | Change record systems. |
| | Change physical structure and equipment. |
| | Change service sites. |
| | Start a dissemination organization/committee. |

### VT.1.8.2 Client Surveys

The client outcomes evaluation examines the experiences of WIC clients who received WIC services and completed a Daily Drop Baseline Survey in one of the WIC clinics associated with the five clinics for race, ethnicity, and total participation/caseload. There were 74 survey respondents: 49 who played the Daily Drop app one or more times (players) and 25 who did not play it at all (nonplayers). All surveys were completed by the pregnant client, to reflect WIC services they received for themselves. Item nonresponse ranged from 0 to 28, with more complete information for demographics than for breastfeeding practices and intent, as reflected in the data tables in the report.

#### Breast Feeding Practices and Intent to Breastfeed

Data from the Daily Drop Baseline Survey were used to describe survey respondents' prior breastfeeding behaviors and their intentions to breastfeed for their current pregnancy. Data from the Daily Drop User 3 Months Postpartum Survey were used to describe clients' breastfeeding practices after their baby's delivery and to assess whether playing Daily Drop made them more likely to breastfeed.

#### Acceptability of Daily Drop App

Acceptability of the Daily Drop app was assessed using responses to the following statements in the Daily Drop User 1-Month Survey, with response options ranging from "strongly disagree" to "strongly agree":

- I had more fun learning about breastfeeding because of using the Daily Drop app.
- I learned about breastfeeding more quickly and easily because of using the Daily Drop app.

- Using the Daily Drop app made learning about breastfeeding a better experience than it would have been otherwise.
- Playing Daily Drop made me want to use more WIC breastfeeding support resources.
- Using the Daily Drop app made what I was learning from my IBCLC or peer counselor feel more relevant to me.
- My WIC staff person provided helpful feedback based on my Daily Drop app scores.

**Satisfaction with Daily Drop App**

The following survey questions from the Daily Drop User 1-Month Survey were used to assess client satisfaction with the Daily Drop app, with responses ranging from “strongly disagree” to “strongly agree”:

- Overall, how satisfied or dissatisfied are you with the Daily Drop app?
- I am glad I played Daily Drop.
- Using the Daily Drop app was a good use of my time.
- I would recommend the Daily Drop app to other WIC participants.
- I think other WIC offices should offer the Daily Drop app.

**Barriers**

Barriers were assessed using responses to the Daily Drop User 1-Month Survey questions, ranging from availability and use of technology (when it comes to the use of technology, which of the following best describes you, with response options ranging from very confident to very uncertain), to trouble downloading the app on their phone or device, and difficulty with getting and using the Daily Drop app, with responses ranging from “strongly disagree” to “strongly disagree”:

- I had trouble downloading the Daily Drop app on my phone/device.
- I had no difficulty finding the information that I wanted in the Daily Drop app.
- I had no difficulty understanding how to get around in the Daily Drop app.
- I had no difficulty getting the Daily Drop app on my phone/device.
- I had no difficulty understanding the information in the Daily Drop app.
- I would have no difficulty in telling friends what the Daily Drop app is like.

Additionally, questions on ease of accessing the app and using Daily Drop were also analyzed to assess the extent to which respondents perceived these as barriers. Responses to the following questions ranged from “strongly disagree” to “strongly agree”:

- It was convenient to access Daily Drop.
- Daily Drop was simple for me to use.
- It was easy to access support from my WIC office when needed through the app.
- I would like to play Daily Drop more.

### 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, confidence, and social support gaps linked to breastfeeding attrition. The BAPT score in these three domains determines where the individual starts in the app. The maximum possible BAPT scores are 18 for knowledge, 12 for confidence, and 8 for support, with higher scores indicating less gaps in that domain. The overall BAPT score is the sum of the scores for the three domains, with a score of 20 or higher indicating intent to breastfeed. The mean BAPT scores (and standard deviation) were calculated using Daily Drop metadata for respondents who completed the Daily Drop Baseline Survey, overall and for players and nonplayers.

### Analysis Procedures

**Descriptive Statistics**. Descriptive statistics include respondent and household demographics, attitudes toward telehealth intervention, and respondent's intent to breastfeed and breastfeeding behaviors. Crosstabulations for categorical variables present proportions among those who provided data (i.e., missing values were excluded from the analysis) by group (players and nonplayers). Descriptive statistics for continuous variables present medians and interquartile ranges (25th percentile – 75th percentile) because the data on household income and household size were assumed to be skewed.

**Statistical Models**. Regression models assessed the effect of a player's engagement with the app on their competency scores for three domains the game was designed to influence: (1) knowledge, (2) confidence, and (3) support. Each domain was assessed separately in the game application. Similarly, engagement was measured as the number of domain-specific playlists completed by the player. Using playlist count, engagement could be modeled as a dosage variable. Three separate models were run: one for each domain (knowledge, confidence, social support). The regression models controlled for the baseline BAPT score for the relevant domain and prior experience breastfeeding. The linear regression models were estimated with the SAS PROC MIXED procedure using restricted maximum likelihood and Type-3 F test to assess study hypotheses with statistical significance set at $p<0.05$.

To better quantify the association between BAPT score and postpartum breastfeeding outcome, binary logistic regression analyses were used. Postpartum breastfeeding outcome (1: Yes; 0: No) was used as the dependent variable. For the first models the main independent variables were player status at 1 month, baseline BAPT score (continuous), BAPT score (two-level categorical), previous breastfeeding experience (binary), and planned feeding method at baseline. In the case of perfect prediction where binary logistic regression failed to estimate, exact binary logistic regression was used. For the second model, a multivariable logistic regression was attempted and included the continuous BAPT score as the main independent variable adjusting for previous breastfeeding experience.

### VT.1.8.3 Staff Survey

The VT team conducted early-, mid-, and late-phase staff surveys. Fourteen staff completed the early phase survey. The mid- and late phase surveys had missing demographic and other data, rendering most surveys unusable. Thus, analysis presenting sample characteristics are reported only for early phase. Additionally, because of high item nonresponse in the mid- and late-phase surveys, tables in the reports provide counts and percentages, with no statistical comparison across phases. All analyses were conducted in Stata 18 (StataCorp LLC, College Station, TX, USA).

### VT.1.8.4 Staff Key Informant Interviews

All interviews were audio recorded and transcribed by Zoom verbatim in English only. 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 Consolidated Framework for Implementation Science Research (CFIR)[4] and the Evaluation Framework for Telemedicine.[5] Five trained qualitative researchers who conducted the interviews also coded the interviews.

A single codebook was used to code early- and late-phase interviews. The codebook included a description, inclusion and exclusion guidance, and an example quote for each code when relevant. To start, five researchers independently coded the same four transcripts from four WIC State agencies. Coders met over video to compare codes, arrived at an agreement on differing codes through discussion, and updated the codebook to address inconsistencies or to add clarity.

Next, researchers established inter-rater reliability across four different transcripts. These four transcripts involved the WIC roles of two front-line nutrition staff (e.g., RD), one breastfeeding-focused staff (e.g., IBCLC), and one local agency director. Researchers coded each transcript individually, ran coding comparisons against the primary coder, and discussed results. Coders discussed results until all codes reached 90 percent agreement and a Kappa coefficient of at least 0.40 (fair to good judgment). Researchers conducted the same process for all four transcripts. As new researchers joined the project, the main coder facilitated the same reliability process with the previously established agreement NVivo files until coders reached 90 percent agreement and a Kappa coefficient of at least 0.40.

Two reviewers coded the remaining transcripts. The main coder randomly assigned transcripts to coders in batches of five. After coders completed their five assignments, the group reconvened and discussed coding uncertainties as a full coding team. Researchers then updated the codebook after reaching a consensus if needed. NVivo version 13 (QSR International) was used to organize and analyze coded interviews.

# References

1. 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.

2. 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.

3. 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.

4. 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.

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