North Carolina Department of Health and Human Services (DHHS): Catching Up with the Times – Bringing WIC to Participants via Telehealth Solutions

Final Report

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Contents

Figure

Number **Page**

Tables

Number **Page**

List of Acronyms

CFIR	Consolidated Framework for Implementation Research
CY	Calendar year
EBT	Electronic Benefit Transfer
FNS	Food and Nutrition Service
MIS	Management Information System
MyNCWIC	My North Carolina WIC
PA	Priority Area
RD	Registered Dietitian
RE-AIM	Reach, Effectiveness, Adoption, Implementation and Maintenance
SD	Standard Deviation
THIS-WIC	USDA/Tufts Telehealth Intervention Strategies for WIC
TWSC	TeleWIC Service Center
USDA	United States Department of Agriculture
WIC	Supplemental Nutrition Program for Women, Infants, and Children

Terms and Definitions

Term	Definition
Agency	WIC administrative entity that oversees clinics where WIC clients receive services.
Clinics	WIC clinics are locations where WIC clients receive services.
Comparison	Clinics that did not receive the telehealth intervention but where WIC clients had appointments via "usual care" mode.
Early phase	First quarter of implementation.
Intervention	Clinics that implemented the telehealth intervention.
Late phase	Final quarter of implementation.
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 health care, patient and professional health-related education, public health, and health administration.
Usual care	Standard mode of delivery for WIC appointment. For THIS-WIC, during the COVID-19 pandemic under Federal waivers, usual care in WIC clinics was either telephone-based or in-clinic appointments.
WIC benefit redemption	Calculated as the percentage of food benefits issued that are redeemed in whole or in part.
WIC client	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. 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 THIS-WIC Client Survey. 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 retention	Retention in WIC was defined as those WIC clients who had available data on WIC benefit redemption in the Management Information System after 180 days from survey completion date.
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 delivered nutrition education/breastfeeding support using telehealth at participating sites and agreed to take part in the interview.

WIC Staff Survey respondent	Individuals who consented to participate in the study and responded to the THIS-WIC Staff Survey. These individuals delivered nutrition education/breastfeeding support using telehealth at participating sites and agreed to take part in the survey.

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 (a) supplement the nutrition education and breastfeeding support offered to individuals in the WIC program, and (b) decrease barriers to access 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 (NC), South Carolina, Vermont, and Wisconsin. This report describes the implementation and evaluation of telehealth services in **NC.**

Project Overview

NC WIC developed a multicomponent approach to delivering nutrition education and breastfeeding support to WIC clients* via telehealth. They collaborated with GCOM Software to develop the MyNCWIC portal application to support remote appointment scheduling, document upload and sharing, and communication; and they contracted with Google to conduct videocall appointments via Google Meet. In addition, NC WIC set up a TeleWIC service center (TWSC) for WIC clients to schedule remote, virtual appointments with Registered Dietitians (RDs). NC WIC also placed fixed kiosks in high WIC client traffic areas of the community to enable WIC clients with limited or no Internet access to connect to Online Referral Forms; MyWIC, NC WIC's homepage; and WICHealth.org. The THIS-WIC evaluation in NC assessed the implementation of telehealth services using MyNCWIC and TWSC and compared staff-, agency-, and client-level outcomes for intervention (telehealth service delivery via MyNCWIC/Google Meet and TWSC) and comparison (phone-based service delivery or in-person) agencies. Between October 2022 (Q4/2022) and September 2023 (Q3/2023), six agencies (20 clinics) offered telehealth services and served as intervention agencies; six

* WIC clients refers to all individuals who receive WIC services at local agencies involved in the THIS-WIC evaluation and represent the entire agency-level caseload, not just those who consented to be part of the 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 use "WIC client," whereas others use "WIC participant." For consistency and to avoid confusion with the term "participation" in the context of the THIS-WIC evaluation, we use the term "client" in this report. We acknowledge that FNS's preferred term is "WIC participant."

agencies (eight clinics) offered usual care and served as comparison agencies. In Q1/2023, TWSC was extended to five other agencies (based on available capacity), and additional comparisons were made among the full intervention, TWSC-only, and comparison agencies. Implementation evaluation findings are based on data collected from the NC Management Information System (MIS), called Crossroads; State-level Implementation Tracking Tool; telehealth metadata; THIS-WIC Staff Surveys; cost-tracking data; and staff key informant interviews. Outcome evaluation findings are based on data collected from MIS and THIS-WIC Client Surveys.

Findings

Implementation of Telehealth in NC

NC WIC staff generally perceived that offering telehealth services was very much needed as most clients were already using this approach. In addition, telehealth addressed travel, time, cost, and other barriers faced by clients, thereby achieving WIC's overall objective to expand access. Staff received training before offering telehealth services, but they noted that the training format was not conducive to easy learning—they preferred in-person, interactive training, and handouts instead of a training video. Staff also noted that the delayed launch of the MyNCWIC portal created a gap between training and delivery, requiring them to refresh their skills in offering telehealth services. Staff considered the open lines of communication with State agency staff, support from IT staff, and discussions with colleagues as facilitators to telehealth implementation. Staff noted the user-friendliness, simplicity, and capacity of MyNCWIC to upload documents. From client to clinic, documents include proof of residency, identification, and/or income verification. From clinic to client, these include nutrition education and breastfeeding support resources. Staff considered these features to be critical to boosting client engagement.

Staff satisfaction with offering WIC services through telehealth was high. Staff expressed a preference for remote appointments so they could engage with clients from any location; some staff appreciated the flexibility to be gainfully employed while taking care of household responsibilities; some staff perceived cost savings because of moving away from contracting services to remote appointments. Overall, staff found telehealth to be a feasible approach to delivering WIC services; they appreciated its flexibility and the ability to engage with more WIC clients.

Cost of Telehealth in NC

The startup cost to offer telehealth services was $1,079,412, of which about 79 percent was spent on contracted services,18 percent was spent on labor, and 3 percent was spent on equipment. By component, the startup costs were $208,569 for TWSC; $846,701 for MyNCWIC; and $21,142 for kiosks. The ongoing mean cost per appointment increased from pre-intervention to month 8 of the intervention period by $9 at intervention agencies and by $16 at comparison agencies.

Client Experience with Telehealth in NC

WIC clients found telehealth appointments to be an acceptable approach for receiving WIC services, and they expressed a preference to continue receiving services the same way in the future (**Table ES-1**). Clients' experience with WIC appointments, intent to change dietary behaviors, and breastfeeding behaviors were largely comparable among respondents in the full intervention (MyNCWIC/Google Meet and TWSC appointments), TWSC only, and comparison agencies.

Table ES-1. Client Preference to Receive WIC Services via Telehealth for Future Appointments in NC

Statement and Agency Type	N	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
		%				
The way I received WIC services at my most recent appointment was easier than going to a WIC clinic.						
Full intervention agencies[a]	61	0.0	1.6	16.4	24.6	57.4
TWSC only agencies	107	3.7	1.9	5.6	27.1	61.7
I would like to receive services the same way at my next WIC appointment.						
Full intervention agencies	61	0.0	0.0	8.2	34.4	57.4
TWSC only agencies	107	2.8	3.7	6.5	29.0	57.9

Source: THIS-WIC Client Survey, intervention agencies only
[a] Full intervention agencies provided WIC services via MyNCWIC/Google Meet and TWSC.

Recommendations

WIC staff provided the following recommendations:

- Offer in-person, interactive training and provide handouts; offer support and additional training to increase staff comfort level; reduce the lag time between training and implementation.
- Avoid or minimize simultaneous project rollout as it reduces staff and client uptake.
- Develop infrastructure at clinics to support telehealth service delivery (e.g., equipment, Internet connectivity).
- Provide clients with the flexibility and choice to select a mode for service receipt. Although most clients may be comfortable with technology, providing support to clients in rural areas or clients who are less tech savvy may increase client comfort and use of telehealth services.
- Offer telehealth services in other languages to expand program reach.

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 increasing 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 (a) supplement the nutrition education and breastfeeding support offered to individuals in the WIC program, and (d) decrease barriers to access WIC services.[1] 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 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 Dieticians (RDs), Certified Lactation Consultants, and International Board-Certified Lactation Consultants.

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

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

In addition, THIS-WIC provided technical assistance to all agencies throughout the study to support the adoption of telehealth and the evaluation of their telehealth intervention. The COVID-19 pandemic sharply increased public and agency attention on remote access to services and elevated the relevance of telehealth solutions. The project was funded and designed before the pandemic, and some aspects of the design were modified to account for USDA COVID-19 waivers. Specifically, before COVID-19, THIS-WIC planned to evaluate the impact of delivery of WIC nutrition education and breastfeeding support services via telehealth compared to usual care (i.e., in-person appointments). In NC, during COVID-19 and through

Q3/2023, with physical presence waivers in place, most appointments in intervention agencies and all appointments in comparison agencies were remote and telephone-based. This report focuses on the implementation and outcomes of telehealth service delivery in NC using a multicomponent approach.

1.1 Need for Telehealth Solution in NC

NC ranks fifth in the United States for State WIC caseload and second in rural population—of the 100 counties in NC, 80 are considered rural by the NC Department of Natural and Cultural Resources. WIC participation in NC declined from about 84,500 clients in fiscal year (FY) 2019[2] to 80,948 clients[3] in FY2020, with driving time and cost of gas limiting clients' ability to access WIC services. In NC, the average WIC appointment—including travel time—ranged from 30 minutes to 2.5 hours, depending on the appointment type and family size.

The NC WIC program comprises 85 autonomously run local agencies that receive funding to administer the program for their designated geographical area. Most local agencies are administered through a local health department, and the average vacancy rate for Competent Professional Authorities across all agencies is about 18 percent. Each local agency operates autonomously, so they are unable to receive support from the State office or neighboring agencies when they have staffing shortages. WIC local agencies often rely on costly external contract RD services to fill Nutritionist or Competent Professional Authority vacancies until they find a qualified applicant. In addition, NC WIC's comprehensive nutrition assessments require a large amount of information to be gathered and recorded before and after appointments. The amount of time spent gathering this information from the client, parent, and guardian and recording the data in Crossroads (NC's Management Information System [MIS]) is considerable. NC hoped that telehealth would enable WIC staff to dedicate their attention to client care rather than documentation of eligibility, thereby increasing the quality of interactions, education, and goal-tailoring for clients. To address client and staff barriers, NC WIC was interested in offering telehealth to provide consistent, high-quality services to clients, especially those living in rural areas, and to develop a support system for local agencies experiencing staffing shortages.

1.2 Telehealth Implementation through THIS-WIC in NC

NC WIC developed a multicomponent telehealth solution, which included MyNCWIC, Google Meet, and a TeleWIC Service Center (TWSC):

- MyNCWIC: NC collaborated with GCOM Software (https://www.voyatek.com/voyatek-company-leadership/) to develop MyNCWIC—a mobile-friendly client portal website where clients can upload eligibility documents, answer assessment questionnaires, and request and attend video or remote appointments for their certification and education sessions.
- Google Meet: NC WIC worked with GCOM to develop a solution to provide video capabilities for telehealth appointments, leveraging a pre-existing agreement between NC WIC and Google. This feature was managed through NC MIS, allowing staff to generate appointments directly in MIS and invite participants, including WIC local

agency staff and WIC clients, to join appointments. In the early stages of development, NC WIC had planned to contract with Google to integrate video call functionality directly into the MyNCWIC portal. However, with delays to the project and technological challenges, NC WIC pursued this alternative approach using GCOM to provide this capability.

- TWSC: NC WIC established TWSC as a demonstration project to support WIC local agencies with significant staff shortages of qualified professionals (e.g., RDs). NC engaged temporary staff—one full-time RD and two part-time RDs—to provide WIC services through TWSC as part of THIS-WIC. Clients at participating agencies could schedule Google Meet or phone appointments for certifications, nutrition education, breastfeeding assessments, and follow-up appointments as needed through TWSC.

NC also placed fixed kiosks in six intervention agencies in high client traffic areas of the community to enable WIC clients with limited or no Internet access to connect to Online Referral Forms; MyWIC, NC WIC's homepage; and WICHealth.org. The kiosks provided another touchpoint for telehealth in NC, providing alternative access to WIC clients with limited or poor Internet connectivity and clients without smartphones or other means of accessing telehealth.

1.3 Telehealth Platform Development and Rollout

NC WIC had planned a 30-month timeline for its telehealth project: 12 months for design and construction, 2 months for testing and edits, 1 month for staff training, 12 months for pilot implementation and data collection, and 3 months for post-pilot evaluation and statewide rollout. However, this timeline shifted considerably due to several unforeseen factors, including the COVID-19 pandemic, the baby formula shortage crisis, and a reorganization in NC's Department of Health and Human Services that moved NC WIC under a new division. These factors extended the development and construction phase of the project by 1 year and compressed the rest of the project phases (training material testing and development, implementation, and data collection) to 9 months. To address these unexpected delays, NC used a phased rollout of the multiple components of its telehealth intervention in six intervention agencies (see Section 2.2 for more information on participating agencies): TWSC was launched in Q4/2022, and the MyNCWIC portal was launched in Q1/2023; TWSC was extended to five additional agencies (TWSC only agencies) in Q1/2023 (March).

2. Project Methods

NC WIC used a quasi-experimental study design to examine whether telehealth services decreased barriers and increased access to services in underserved communities, increased client satisfaction, and increased opportunities for delivery of nutrition education and breastfeeding support over an 11-month period, from October 2022 to September 2023. The evaluation focused on the use of (a) MyNCWIC and Google Meet to provide remote nutrition and breastfeeding education to all clients and (b) TWSC for remote RD appointments. Clients exposed to NC telehealth solutions could receive a dose of one to eight interactions over a 12-month period based on client category and/or need for breastfeeding support.

Overall, THIS-WIC used the five-stage model for comprehensive research on telehealth developed by Fatehi and colleagues[4] to guide the overall design of the telehealth research study. NC's telehealth project was in Stages 2 and 3 (service design and pre-implementation); see **Appendix NC.1** for details and the model.

2.1 Research Questions

THIS-WIC examined several research questions to understand the implementation and impact of telehealth when added to WIC standard operating procedures for nutrition education (**Table 2-1**) and whether telehealth services could overcome known barriers to WIC participation and retention by enhancing existing care practices. In the wake of COVID-19, THIS-WIC worked closely with NC WIC to understand changes to usual practices during implementation (e.g., offering telephone-based appointments as "usual care"). Implementation tracking tools were created to document and understand the delivery of services in intervention and comparison agencies throughout the evaluation period.

2.2 WIC Agencies Participating in Telehealth Solution Implementation and Evaluation

NC WIC selected 12 agencies (28 clinics) to participate in MyNCWIC. Six local agencies were selected to implement telehealth, including the MyNCWIC portal, video appointments via Google Meet, and TWSC, based on the completion of prior telehealth readiness surveys, adequate staffing, willingness to implement, and support from local-level leadership. In addition, TWSC was implemented in five additional agencies (TWSC only agencies). Six comparison agencies were matched to the six full intervention agencies by demographics, caseload, and region (urban/rural). **Appendix NC.1** lists the local agencies and the number of associated clinics involved in the THIS-WIC evaluation.

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

Staff and Agency Level	
▪ What was the staff attitude toward the telehealth solution? ▪ What was the staff level of readiness to implement the telehealth solution? ▪ What was the staff level of satisfaction with the telehealth solution? ▪ What was the staff level of telehealth solution adoption? ▪ What was the staff acceptability of the telehealth solution?	▪ What was the perceived feasibility of using the telehealth solution to provide WIC services? ▪ Did staff perceive telehealth services to make WIC services more accessible for WIC clients? ▪ Did offering telehealth services affect staff travel (frequency and time) to clinics? ▪ What was the startup cost of a telehealth solution in WIC? ▪ What was the ongoing cost of offering WIC services at the intervention and comparison agencies?
Client Level	
▪ What was the level of telehealth solution adoption among clients in the intervention agencies? ▪ What was the level of satisfaction with WIC services in the intervention and comparison agencies? ▪ What was the perceived acceptability (accessibility and feasibility) of WIC services in the intervention and comparison agencies?	▪ What were the perceived barriers to attending WIC appointments in the intervention and comparison agencies? ▪ What was the intent to change dietary behaviors in the intervention and comparison agencies? ▪ What was the daily fruit and vegetable intake in the intervention and comparison agencies?

2.3 Data Sources for Telehealth Solution Evaluation

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

2.3.1 Management Information System Data

NC provided administrative data at two levels: micro (individual-level MIS data from WIC clients who completed the Client Survey) and macro (aggregate MIS data from all clients at participating agencies). See **Appendix NC.2** for the list of MIS data provided by NC.

2.3.2 Telehealth Usage Data

The NC WIC State agency team tabulated the total number of users for the MyNCWIC portal during the implementation period. NC WIC also tabulated data on TWSC usage. Data on use of Google Meet for WIC service delivery were not available from the vendor. NC WIC also documented use of the kiosks. Data collected directly by the kiosks tabulated the total number of uses by WIC clients at each local agency and which services were accessed.

2.3.3 Client and Staff Surveys

2.3.3.1 Client Survey

The Client Survey was developed by THIS-WIC to assess accessibility, barriers, satisfaction, and attitudes toward using telehealth. The Client Survey was developed using existing valid/reliable tools[5-19]; NC WIC reviewed the survey to ensure that it captured key aspects of NC's telehealth solutions, that it had a low respondent burden and an easy-to-follow format, and that the literacy level was appropriate for the WIC clients NC served. The Client Survey was tested with WIC clients (n = 11) in a local agency not participating in the THIS-WIC evaluation, and the average survey completion time was less than 5 minutes. The findings from the pilot testing were used to clarify wording and improve navigability. The final Client Survey included 37 questions, with an expected respondent burden of 10 minutes. The survey was translated into universal Spanish. See **Appendix NC.3** for the English and Spanish language versions of the Client Survey.

2.3.3.2 Staff Survey

THIS-WIC developed the Staff Survey to assess staff satisfaction with telehealth for providing nutrition education and/or breastfeeding support, accessibility and acceptability of the solution, and staff attitudes toward and readiness for telehealth use. The survey items are drawn from reliable/valid instruments[10, 17, 20-26] and focus on key outcomes listed in **Table 2-1**, along with additional demographic questions and covariates (e.g., years of experience working at WIC). As with the Client Survey, a research survey methodologist reviewed the Staff Survey to ensure comprehension and readability. The final staff English language survey included 25 questions, and the average completion time was 15 minutes. See **Appendix NC.3** for the Staff Survey.

2.3.4 Staff Key Informant Interviews

WIC staff and directors implementing MyNCWIC 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)[27] and Consolidated Framework for Implementation Research (CFIR)[28] frameworks to assess eight key 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 NC.3** for the discussion guide for the WIC staff and director interviews.

2.3.5 Telehealth Solution Implementation Data

Telehealth implementation data were obtained from a 46-item Implementation Tracking Tool completed by the NC WIC project team in the early and late phases of implementation.

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 study.[29] In collaboration with THIS-WIC, NC 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 NC.3** for the Implementation Tracking Tool.

2.3.6 Telehealth Solution Startup and Ongoing Implementation Cost Data

THIS-WIC collected both startup and ongoing cost data. Examples of startup costs included purchase of new equipment, cost of mobile applications, MIS changes, staff web application, security and infrastructure, and staff training. Ongoing costs are those required to deliver nutrition education and breastfeeding services. For intervention agencies that implemented MyNCWIC, ongoing costs for the period after the solution was implemented reflect the costs of delivering the intervention via telehealth. See **Appendix NC.3** for the ongoing cost-tracking tool.

2.4 Data Collection for THIS-WIC Evaluation

Tufts University was the Institutional Review Board of record for all data collection (Client Survey, MIS data, metadata, Staff Survey, staff key informant interviews). Before the start of data collection, the THIS-WIC principal investigator and study personnel completed human subjects protection training, in line with the requirements of the Institutional Review Board overseeing the protocol. In addition, THIS-WIC designed and provided online training via Zoom to NC WIC study 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

At the study's onset, NC provided microlevel MIS data weekly, allowing the study team to review the data and provide NC feedback to address data quality and integrity questions. After the processes were established, NC provided these microlevel data monthly for the rest of the study duration. NC also provided macrolevel MIS data for all intervention and comparison local agencies on a quarterly schedule.

2.4.2 Telehealth Usage Data

At the end of implementation, NC WIC shared information on MyNCWIC, TWSC, and kiosk usage with the THIS-WIC team.

2.4.3 Client and Staff Surveys

2.4.3.1 Client Survey

The Client Survey was programmed through the SurveyMonkey Advantage platform (SurveyMonkey, San Mateo, CA). NC WIC distributed the survey via email or through NC's two-way texting platform for both intervention and comparison agencies. At in-person appointments, NC distributed the survey by sharing QR codes and providing laptops to clients to complete the survey in-clinic after their appointments. WIC clients who completed the survey could enter a drawing for a $50 electronic prepaid Visa gift card. Three participants were randomly selected each week during the evaluation to receive the gift card.

2.4.3.2 Staff Survey

NC WIC provided a list of eligible staff (n = 62) (i.e., those who were responsible for delivering nutrition education/breastfeeding support at intervention agencies) and their email addresses to THIS-WIC. THIS-WIC sent an invitational email with a link to the Staff Survey to all eligible staff. The Staff Survey was distributed electronically via Qualtrics twice during the intervention: once in the first quarter after project implementation (early phase) and again in the last quarter of project implementation (late phase). Up to two reminders were emailed to eligible staff who did not complete the survey, and reminders were sent 1 week and 2 weeks after the initial outreach. Incentives were not provided to WIC staff for completing surveys, in compliance with Federal and/or State policies.

2.4.4 Staff Key Informant Interviews

The THIS-WIC team used a semi-structured interview guide to conduct key informant interviews via Zoom in the early and late phases of implementation (i.e., first and last quarter of the project implementation period). The interviews were scheduled for 1 hour and digitally recorded. Incentives were not provided to WIC staff for completing surveys, in compliance with Federal and/or State policies.

2.4.5 Telehealth Solution Implementation Data

Implementation data were collected using two methods: responses to the Implementation Tracking Tool for the startup (pre-implementation), midway, and endpoint or late phases of implementation (**Appendix NC.3**) and via the agency reporting tool fielded monthly during the implementation period by the NC WIC team to agencies implementing telehealth (**Appendix NC.3**).

2.4.6 Telehealth Solution Startup and Ongoing Implementation Cost Data

For startup costs, THIS-WIC extracted data from original project budgets provided by each Subgrantee at the time of award. This included information on all staff working on startup activities (both paid for from the grant and in-kind contributions), equipment used in startup activities (both paid for from the grant and in-kind contributions), and contracted services supporting startup activities. THIS-WIC conducted follow-up interviews with NC WIC staff to

obtain missing data. This information included program implementation and evaluation for staff members and other resources, in-kind staff and resources not listed in budgets, and details on the services provided in contracts.

For ongoing costs of delivering services, NC WIC completed a Microsoft Excel-based cost collection tool reporting on the resources used to provide services in a month and the number of clients served. The tool captured all staff, infrastructure and equipment, supplies, contracted services, overhead, and travel used for providing services at intervention and comparison agencies. The resource data were combined with the reported number of monthly enrollments and appointments to generate the cost per enrollment and per appointment. THIS-WIC collected costs for a typical month before telehealth implementation for FY2019 (initial) and an average of the first 4 months (midpoint) and last 4 months (endpoint) of implementation. THIS-WIC reviewed completed cost instruments submitted by the NC WIC State agency team to ensure that data entries were correct and reasonable, and they conducted follow-up to resolve data issues.

2.5 Sample Description for THIS-WIC Evaluation

Primary data were collected via surveys from WIC clients and staff. Key informant interviews were also conducted with WIC staff.

2.5.1 Client Survey Sample Size, Response Rate, Characteristics, and Representativeness

WIC clients who received nutrition education or breastfeeding support were eligible to take part in the evaluation. Respondents had to be 18 years of age or older and fall into one or more of the following categories: pregnant, non-breastfeeding postpartum, breastfeeding, or the parent/guardian of a participating infant or child in the WIC program. With a 25.2 percent response rate, 499 surveys were completed (surveys were considered complete if the respondent answered all questions in the satisfaction block).

Following their WIC appointment, 4,118 WIC clients were invited to complete the Client Survey; 1,038 clients consented to complete the survey. Of those who consented, 48.1 percent completed the survey, and 64.7 percent were successfully linked with the MIS identifier. Analysis involving MIS data to describe the characteristics of survey respondents and regression modeling controlling for demographic characteristics were limited to the data from matched respondents.

Of the 499 survey respondents, 72 (14%) were in agencies that received the full intervention, 158 (32%) were in agencies that received the partial intervention (TWSC), and 269 (54%) were in comparison agencies. Overall, 44.9 percent of respondents self-identified as Non-Hispanic White, 26.5 percent identified as Hispanic, and 21.3 percent identified as non-Hispanic Black/ African American. About 44 percent of respondents were between the ages of 26 and 35, and about 27 percent were between the ages of 18 and 25. For about 86 percent of respondents, the language used at home was English. The median annual household income was $31,782.

Overall, 62.1 percent of respondents lived in a rural area, 24.2 percent lived in an urban area, and 13.7 percent lived in a suburban area.

Overall, 34.2 percent of survey respondents had received WIC services for less than 1 year, and 24.6 percent had received WIC services for 1 to 2 years. About 20 percent of respondents each had received WIC services for 3 to 4 years and for 5 or more years. About 64 percent of respondents had a high-risk WIC client in their household. MIS data corresponding with the survey respondent's most recent appointment were used to classify clients as high risk.

The aggregate MIS data and Client Survey data were used to generate balance tables and assess the representativeness of the survey respondents. This analysis entailed comparing the survey respondents' sociodemographic characteristics, duration of WIC participation, and high-risk status with those of clients at the intervention and comparison agencies. See **Appendix NC.1** for sample size calculations, response rate, sociodemographic characteristics, and representativeness of Client Survey responses.

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

All staff involved in the delivery of nutrition education/breastfeeding support at intervention agencies were invited to participate in Staff Surveys. The number of staff invited to complete the early and late phase surveys was 62 and 60, respectively. The response rate was 35.5 percent for the early phase and 31.7 percent for the late phase.

Respondents in the early and late phases were comparable in age, race/ethnicity, role at WIC, years of WIC experience, and travel to other WIC clinics. WIC staff were primarily RDs and breastfeeding support staff, and about 50 percent (57% in the early phase and 47% in the late phase) had worked in WIC for more than 12 years. Before the COVID-19 pandemic, about 35 percent of staff surveyed in the early phase traveled to provide services, and about 64 percent of staff in the late phase did so. See **Appendix NC.1** for sample size and characteristics of Staff Survey respondents at the early and late phases.

2.5.3 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 and 26.3 percent in the late phase. See **Appendix NC.1** for the sample size and response rate for each WIC agency.

2.6 Analytic Approach

2.6.1 Aggregate Management Information System Analysis

Aggregate MIS data included WIC client characteristics, certification information, nutrition and risk assessment, nutrition education, retention in WIC, and breastfeeding practices. NC also linked the Client Survey identifier with the client-level MIS data to assess the representativeness and describe the characteristics of Client Survey respondents. Descriptive analyses were used

to analyze the data and present the findings. Cross-tabulations and chi-square statistics were used to examine the differences between intervention and comparison agencies. All analyses were conducted in SAS 9.4. See **Appendix NC.1** for details.

2.6.2 Telehealth Solution Metadata

The MyNCWIC portal automatically tracked usage metadata at the staff and agency levels. NC provided quarterly telehealth metadata for all intervention agencies spanning the intervention period.

2.6.3 Client and Staff Surveys

2.6.3.1 Client Survey

The client outcomes evaluation examined the experiences of WIC clients who received WIC services and completed a Client Survey in one of the WIC clinics associated with the 12 agencies in the study between October 2022 and September 2023. Client survey data were analyzed using descriptive statistics, cross-tabulations, and unadjusted and multivariate regression.

Descriptive statistics include respondent and household demographics, availability of and comfort with technology, attitudes toward telehealth intervention, and respondent's fruit and vegetable consumption. Cross-tabulations for categorical variables present proportions among those who provided data (i.e., missing values were excluded from the analysis) by group (full intervention, TWSC, and comparison). Descriptive statistics for continuous variables present medians and interquartile ranges (25th percentile – 75th percentile) because the data on household income were assumed to be skewed based on the distribution for other States participating in THIS-WIC.

Significance tests compare respondent demographics and household characteristics, availability and comfort with technology, and respondent behaviors between respondents in the full intervention and comparison agencies and between respondents in the TWSC only and comparison agencies. For categorical variables, chi-square tests for independence are presented. For continuous variables, the two-sample 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. Client outcomes (satisfaction index, barriers, and behavior change intentions) were assessed using unadjusted hierarchical linear regression models comparing differences in means for (a) full intervention and comparison agencies and (b) TWSC only and comparison agencies. For the client satisfaction index, demographic/household variables that significantly differed between intervention and comparison agencies were entered into multivariable hierarchical linear regression, with separate models for the full intervention and TWSC only agencies. See **Appendix NC.1** for details.

2.6.3.2 Staff Survey

Descriptive analyses were conducted to examine the Staff Survey data. Chi-square tests were performed to examine differences in responses to surveys in early and late phases. When

analyzing outcomes, attempts were made to adjust for biases in standard error estimates due to repeated measurements whenever feasible. For ordinal/continuous outcomes, the analysis adjusted for the unique participant ID numbers as random effects and corrected for repeated measurements. However, given the small sample size, the same adjustments could not be made for categorical outcomes, which impose more stringent requirements on sample size. Instead, these data were analyzed as if the two time points were not related. All analyses were conducted in Stata 18 (StataCorp LLC, College Station, TX, USA).

2.6.4 Staff Key Informant Interviews

All interviews were conducted in English, audio recorded, and transcribed by Zoom verbatim. Each transcript was reviewed for accuracy and corrected to reflect the actual discussion by listening to the audio recording. Before undertaking analysis, three THIS-WIC team members created a preliminary codebook, with codes deductively informed primarily by CFIR[28] and the Evaluation Framework for Telemedicine.[30] 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 (**Appendix NC.1**).

2.6.5 Telehealth Solution Implementation

The analysis of Implementation Tracking Tool data involved tabulating the startup and endpoint status for each strategy to assess change over time. The startup measures were considered the implementation plan, and the change from startup to endpoint measures was considered indicative of readiness. In addition to understanding the readiness for implementation, these data were also used to provide context for the staff- and client-level outcomes. See **Appendix NC.1** for details.

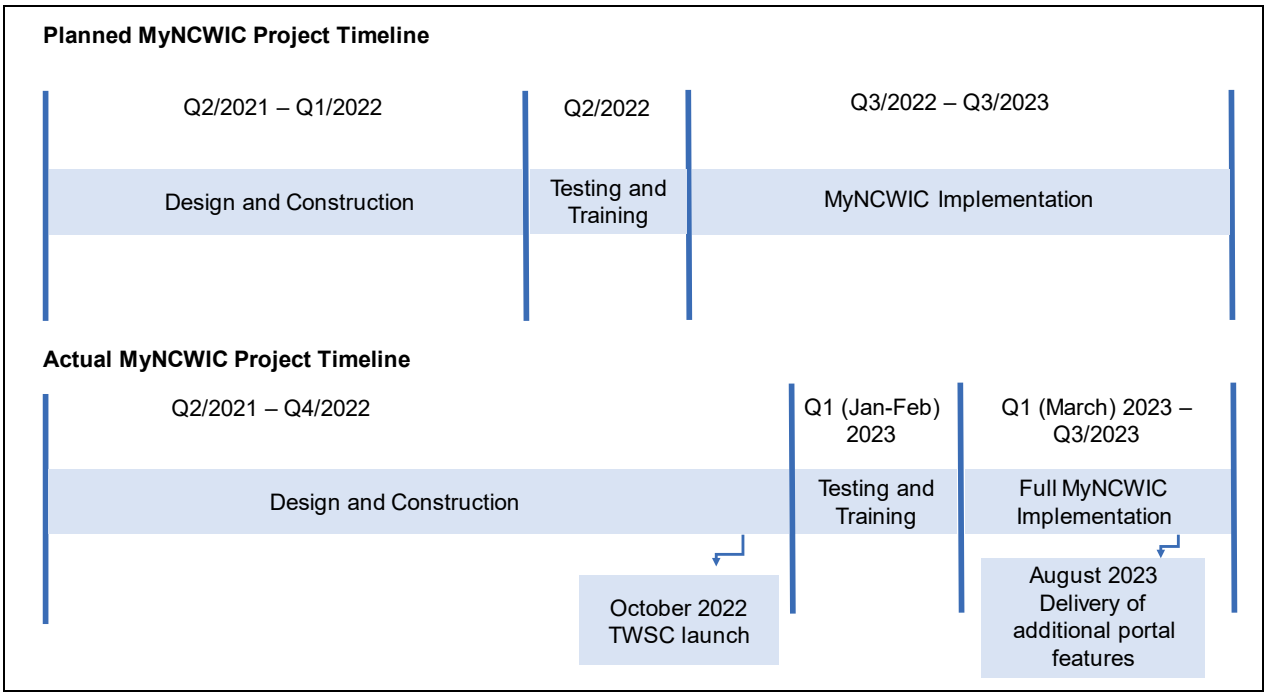
2.6.6 Telehealth Solution Startup and Ongoing Costs

Cost analysis was conducted to understand the (1) startup cost, (2) ongoing service delivery cost, and (3) ongoing cost per enrollment and per appointment. All costs were adjusted to 2023 dollars using the Consumer Price Index. All analyses were completed in Microsoft Excel and Stata 18. The COVID-19 pandemic impacted the timeline and rollout of the telehealth platform. WIC service delivery in intervention and comparison agencies was adjusted due to the pandemic, and even the comparison agencies transitioned to remote service delivery during the pandemic's height. To facilitate the comparison of costs from before to after introduction of the telehealth solution and between intervention and comparison agencies, the pre-implementation period was set to FY2019 (i.e., before the start of the pandemic) (NC provided the FY2019 data to THIS-WIC in 2023). Changes in service delivery costs from pre-intervention (FY2019) to post-intervention (February 2023 through September 2023) were examined.

3. Results: TeleWIC Implementation in North Carolina

Between Q4/2022 and Q3/2023 (October 2022 through September 2023), 12 agencies (six intervention and six comparison) participated in the 11-month telehealth evaluation. Implementation of telehealth in NC included multiple components that were rolled out in a phased manner. Implementation of TWSC launched in Q4/2022; the MyNCWIC portal launched in Q1/2023. Availability of local agency staff at TWSC resulted in six additional local agencies not originally part of the intervention offering appointments through the TWSC beginning in March 2023 (Q1/2023). **Figure 3-1** shows the planned and actual timelines for telehealth development and implementation in NC. The remainder of this chapter presents implementation outcomes (process and cost); Chapter 4 presents the client experience with telehealth and the primary and secondary outcomes.

Figure 3-1. Planned and Actual MyNCWIC Project Timeline



3.1 Telehealth Appointments Offered and Completed by Staff

Information on telehealth appointments offered and completed by WIC staff using MyNCWIC and TWSC services was assessed using data gathered from the Staff Survey. As seen in **Table 3-1**, adoption of the telehealth platform to deliver nutrition counseling and breastfeeding support was less than 30 percent.

Table 3-1. Service Type Offered to WIC Participants via Telehealth in Intervention Agencies in NC

Variables	Early Phase N = 21	Late Phase N = 17	p-value[a]
	%		
Nutrition counseling or breastfeeding support			0.176
Nutrition counseling	4.8	5.9	
Breastfeeding support	0.0	5.9	
Nutrition counseling & breastfeeding support	28.6	23.5	
Neither	66.7	64.7	

Source: THIS-WIC Staff Survey, intervention agencies only

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

3.2 Attitudes Toward Telehealth

WIC staff had positive attitudes toward offering telehealth services due to their ability to increase accessibility to WIC services and increase client participation and retention (CFIR constructs*: *innovation advantage, outer setting, inner setting, and characteristics of individuals)* through remote appointments. Comments shared by staff during key informant interviews addressed making WIC services more accessible to clients by reducing barriers, such as transportation, travel time and cost, lack of childcare, scheduling conflicts, long wait time at clinics in small wait areas, having to come to the clinic to complete the paperwork before the appointment, and ensuring privacy during appointments.

> *"I think what I appreciate most for it is that they have that opportunity to be able to continue with their benefits and not worry about whether or not they have to have that transportation to get here, or even when we have families with multiple children. It's very challenging for them to bring 4 or 5 children into the office. So, being able to help them in that way that they can remain in their home and still have that appointment and being able to address all their needs still through that video call." [Staff participant 22]*

Staff noted that offering telehealth streamlined service delivery and improved workflow and productivity. For example, staff noted that they could communicate internally with their scheduling team and join the call when the client was on, thereby avoiding the wait time. Staff also noted that, in instances when a client was a no-show, they could review the client roster and connect with other clients who may have submitted their paperwork. Some staff discussed challenges with scheduling appointments for different modes of service and which to prioritize.

* 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 note alignment with CFIR constructs when appropriate.

"Well, once we figured out the flow. it's really increased productivity. The clerk sends me a text with the ID number, I give a click of a thumbs up, I pull them up, I review their past chart history while they're checking them in. The clerk sends me a text 'she's ready' 'families ready.' Give a thumbs up. I send in the link to join the meeting and then, when Mom sends me a text… she texts, 'yes, I'm ready,' I send a message to the clerk, saying 'she's on, you may hang up.' She gives a thumbs up. I do my appointment and then when we're done I send a message 'appointment complete. Please…' and then give her instructions for follow-up and handouts to be mailed also, I would type in." [Staff participant 31]

"We'll have clients who will send in their information ahead of time. And then, when we have a client who no shows, we have, like a folder where we have all those clients. We have like a little slip for them, for all the clients who have submitted their stuff. So if we have a client who no shows, the nutritionist will just go back to that folder, grab somebody out of it, and then they're able to make good use of that time when they otherwise would, you know, be doing maybe nothing. I don't know, who knows what, but so that was what I would say is the biggest benefit to the workflow." [Staff participant 23]

"Doing a lot more referrals to disability services. A lot more referrals to food banks, charitable organizations. A lot more, I'm able to see the home, and I'm able to see if they're living in a house with no sheetrock or no, no heat. So, I'm able to, if they're seeing me inside their house wearing a winter coat, or if they're living in their car, because they're too ashamed to go inside the clinic because they haven't bathed, you know. So,...I'm able to make referrals that normally I wouldn't to get to make, or I wouldn't be aware of the need to make."[Staff participant 31]

Staff perceived that telehealth services are useful in promoting health equity among WIC clients. Staff also considered telehealth to be an integral part of WIC's health equity strategies (**Table 3-2**).

Table 3-2. Attitudes Toward Telehealth among THIS-WIC Staff Survey Respondents in NC

Statement[a]	Early	Late	p-value[b]
	N = 7	N = 6	
	Mean (SD)		
Telehealth is useful in promoting health equity among my WIC participants.	4.14 (1.57)	4.17 (1.17)	0.976
Telehealth should be a part of all WIC organization's health equity strategies.	4.14 (1.57)	4.17 (1.17)	0.976

Source: THIS-WIC Staff Survey

[a] Responses were assessed on a 5-point Likert scale, where 1 = Strongly disagree and 5 = Strongly agree.

[b] p-values were based on regression for ordinal data.

3.3 Readiness to Implement Telehealth Solution

Data on perceived readiness to implement the telehealth solution were obtained from three sources: (1) Implementation Tracking Tool completed by staff at startup and endpoint of telehealth implementation, (2) Staff Surveys in the early and late phases, and (3) key informant interviews with WIC administrators and staff in the early and late phases. Results from the Staff Survey should be interpreted with caution due to the small number of respondents in the early and late phases.

3.3.1 Telehealth Implementation Strategies

At startup, NC selected 18 strategies planned for implementation and had implemented 12 strategies at the time of startup. By endpoint, NC had implemented 19 of 46 strategies, including three of four strategies in the “adapt and tailor to context” and “change infrastructure” categories. By endpoint, NC had not implemented any strategies in the “provide interactive assistance” and “engage consumers” strategies. See **Appendix NC.4** for details.

3.3.2 Staff Training and Frequency of Telehealth Use and Mode Preference

All staff were trained before delivering services through MyNCWIC, Google Meet, or TWSC. Staff training was virtual; staff completed a self-paced online course and attended webinars with the State agency telehealth workgroup staff. During the MyNCWIC webinar training, the telehealth working group staff reviewed participant-facing portal features, the portal connection to MIS, and information about getting WIC clients enrolled in the portal and troubleshooting tips. Training for TWSC staff included onboarding to WIC, including required WIC training, MIS, and Google Meet.

Three respondents provided data on training duration for MyNCWIC and Google Meet, and four provided data on training duration for TWSC. In the early phase, staff reported 8 or more hours of training for MyNCWIC and Google Meet. In the late phase, one received 2 to 4 hours of training, and another received 8 or more hours of MyNCWIC training; one reported no training, and another reported 6 to 8 hours of Google Meet training. In the early phase, three staff reported 8 or more hours of TWSC training, and one reported less than 2 hours of training. In the late phase, all staff reported receiving 8 or more hours of training for TWSC.

In the early phase, three of four respondents provided nutrition education through MyNCWIC, Google Meet, or TWSC weekly, and one did so daily. In the late phase, one respondent provided nutrition education through MyNCWIC, Google Meet, or TWSC daily, and another did so weekly. In the early phase, three of four staff preferred to deliver breastfeeding support services through Google Meet, and one preferred to do so via MyNCWIC. In the late phase, one respondent preferred to deliver breastfeeding support via MyNCWIC, one preferred to do so in person, and one preferred to do so via Google Meet.

Table 3-3. Telehealth Training Duration and Frequency of Use in Early and Late Phases in NC

Variables	Early Phase	Late Phase	p-value[a]
	%		
Hours of training for MyNCWIC	N = 1	N = 2	0.386
0 hours	0.0	0.0	
0 to <2 hours	0.0	0.0	
2 to <4 hours	0.0	50.0	
4 to <6 hours	0.0	0.0	
6 to <8 hours	0.0	0.0	
8 or more hours	100.0	50.0	
Frequency of MyNCWIC use: Nutrition counseling	N = 1	N = 2	0.386
Daily	100.0	50.0	
Weekly	0.0	0.0	
Monthly	0.0	50.0	
Every other month	0.0	0.0	
Frequency of MyNCWIC use: Breastfeeding support	N = 1	N = 2	0.223
Daily	100.0	0.0	
Weekly	0.0	50.0	
Monthly	0.0	50.0	
Every other month	0.0	0.0	
Hours of training for Google Meet	N = 1	N = 2	0.223
0 hours	0.0	50.0	
0 to <2 hours	0.0	0.0	
2 to <4 hours	0.0	0.0	
4 to <6 hours	0.0	0.0	
6 to <8 hours	0.0	50.0	
8 or more hours	100.0	0.0	
Frequency of Google Meet use: Nutrition counseling	N = 1	N = 2	0.386
Daily	100.0	50.0	
Weekly	0.0	50.0	
Monthly	0.0	0.0	
Every other month	0.0	0.0	

(continued)

Table 3-3. Telehealth Training Duration and Frequency of Use in Early and Late Phases in NC (continued)

Variables	Early Phase	Late Phase	p-value[a]
	%		
Frequency of Google Meet use: Breastfeeding support	N = 1	N = 2	0.083
Daily			
Weekly	100.0	0.0	
Monthly	0.0	100.0	
Every other month	0.0	0.0	
Hours of training, TWSC	N = 4	N = 2	0.439
0 hours	0.0	0.0	
0 to <2 hours	25.0	0.0	
2 to <4 hours	0.0	0.0	
4 to <6 hours	0.0	0.0	
6 to <8 hours	0.0	0.0	
8 or more hours	75.0	100.0	
Frequency of TWSC use: Nutrition counseling	N = 4	N = 2	0.439
Daily	75.0	100.0	
Weekly	25.0	0.0	
Monthly	0.0	0.0	
Every other month	0.0	0.0	
Frequency of TWSC use: Breastfeeding support	N = 4	N = 2	0.540
Daily	25.0	50.0	
Weekly	75.0	50.0	
Monthly	0.0	0.0	
Every other month	0.0	0.0	
Mode preference: Nutrition counseling	N = 4	N = 3	0.388
MyNCWIC	25.0	33.0	
In-person	0.0	33.0	
Google Meet	75.0	33.0	
Mode preference: Breastfeeding support	N = 4	N = 3	0.513
MyNCWIC	0.0	33.0	
In-person	0.0	33.0	
Google Meet	100.0	33.0	

Source: THIS-WIC Staff Survey

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

Key informant interviews also provided insights into the training offered to staff. Several statements captured the strengths and limitations of the training provided to staff (CFIR constructs: *inner setting and implementation process*). Staff found the webinar training to be effective and efficient as it provided screenshots of the actual process, boosting their comfort in navigating the system. Staff appreciated the handouts and webinar recording, so they could review specific sections later; they also acknowledged the post-training support they received from their IT team and indicated that the training and post-training support made them feel comfortable and prepared to use MyNCWIC.

> *"I think it was effective because it was actually showing actual screenshots. You know, it was taking you through. So it wasn't anything fictitious or something similar. It was the actual module that you were looking at." [Staff participant 17]*
>
> *"It was effective in that it made me aware of how to navigate the crossroad screen. How to navigate the different programs that we utilized for WIC telehealth. and it also showed me how to problem solve." [Staff participant 31]*
>
> *"It was really helpful; I would say to have it recorded because you know a lot of times, it makes sense when you're seeing it, and you're like, yeah okay, that makes sense...It's really helpful to go back and be able to like, you know, click through recording. Be like, oh okay yeah, here's what you do next." [Staff participant 23]*

Some staff indicated that the training materials were not adequate as they only had access to the training video; print materials were not provided. A few staff also expressed frustration because of the lag between training and implementation and insufficient communication regarding the launch schedule. Staff noted that the training may have been more effective in person (rather than remote) so they could follow along and grasp the process better. One staff member noted that learning levels varied considerably across team members; some staff picked up the content during the training, whereas others required one-on-one sessions, highlighting the need for individualized training or support. Staff noted that some team members do not have sufficient WIC experience and may require more extensive training. One staff member expressed a preference for hands-on training, noting that "there wasn't really a way... to practice in the portal."

> *"As far as the portal goes, I think that there were some definite challenges with the materials that were presented for staff training. We were not given any print materials, and the staff was told that they needed to basically watch the videos.... I just I really felt like the training and the training materials were not adequate." [Staff participant 1]*

In the early and late phases, WIC staff acknowledged the potential benefits of the telehealth solution, but they also expressed concerns about its execution amid the changing realities of their workplace. For example, staff described the challenges of service delivery starting with physical presence waivers during COVID to American Rescue Plan Act (ARPA) waivers during the THIS-WIC evaluation and felt that they are still changing their service delivery. They also described additional projects, such as transitioning to Electronic Benefit Transfer (EBT), and changes to formula contracts that affected telehealth use. WIC staff highlighted the difficulty with changing the service delivery approach, particularly among staff with long WIC tenure.

> *"When it first rolled out, we were still under waivers, physical presence waivers. And then, as of August first, those physical presence waivers went away, and then we got the ARPA-wavers. So, there were some things that changed, that where WIC changed before we started the grant like in the middle when we got the grant, and then at the end when we had the grant. So, things in WIC changed about service delivery. So, I just want to preface that and say that it's not like we started in WIC was doing business one way, and it stayed that same way until now, because we've changed, and it's still changing." [Staff participant 14]*
>
> *"So, we're using everything that we learned in the grant, but we're still using different methods other than the telehealth piece. And as far as the portal goes, we're not really pushing that right now because of when things change on August 1st, we've had some pretty critical errors in the WIC system, and I could not teach them. I was like I was having to teach them how to do WIC again. Well, then it broke, you know. So, the app rolled out a new app the first part of September. ... It was a very difficult transition, and we're still dealing with difficulties there, with ... the benefit app, which is now EBT. So that was a horrible transition because everything changed at once. So back in person, waivers are gone. Your food is not automatically issued. Here's a new app. It doesn't work, and then we had to do a formula contract, formula change. That didn't work." [Staff participant 14]*
>
> *"It seems like a lot of people with WIC have been working there for years and have always done things one way and, so, being asked to do things a different way or trying to change things was kind of difficult for them so I definitely think I had a better impression of it than people who had worked for WIC before in other capacities." [Staff participant 30]*

3.4 Satisfaction with Telehealth Solution

For the small number of staff who answered the two satisfaction indicator questions in the early and late phases, satisfaction with MyNCWIC was high (**Table 3-4**). Preference for MyNCWIC appointments was high in the early phase but neutral in the late phase.

Table 3-4. Satisfaction with Telehealth in Early and Late Phases among Staff Survey Respondents in NC

Statement[a]	Early[b] N = 1 Mean (SD)	Late[b] N = 2 Mean (SD)	p-value[c]
Overall, I am satisfied with MyNCWIC.	5[d]	4.5 (0.71)	0.667
I prefer WIC appointment with MyNCWIC over WIC appointments that are in-person.	5[d]	3 (0.00)	—[e]

Source: THIS-WIC Staff Survey

[a] Responses were assessed on 5-point Likert scale, where 1 = Strongly disagree and 5 = Strongly agree.

[b] Ordinal data are summarized as predicted mean (SD).

[c] p-values were based on regression for ordinal data.

[d] No SD is derived due to n = 1 for this item.

[e] Hypothesis test could not be carried out due to lack of variability (SD is missing or is zero).

During interviews, staff shared various factors that affected their level of satisfaction with offering telehealth services. For example, staff noted that their leadership was very supportive, provided guidance when needed, and had open communication lines. Staff also acknowledged that the collaboration within their agency to become comfortable with the platform and support provided to each other through Teams increased their comfort with using MyNCWIC and ensuring smooth service delivery.

> *"I've been a registered dietitian, provisionally licensed in 88, registered in 90. And this was the best experience I've ever had as a dietitian. I've had some really great ones because you're really. Finally, this sounds terrible, but there's people called the worried well. You know they worried well, and you see that frequently decrease after a traumatic event like a world war where they don't have time to be worried if they're well. And so the people who really need the care have always been left out. And so this has been truly the best experience I've had in my career." [Staff participant 31]*
>
> *"Our supervisors, ... you know, work for the State office and have helped bring us on and stuff. So we always have a good line of communication with them through Teams as well if we need to collaborate with them, and we usually meet once a week, with the other dieticians and with our supervisors, and just touch base, and see how things are going." [Staff participant 30]*
>
> *"We started doing sort of morning check in which was helpful. Because then we can kind of talk through some of those issues prior to starting the day, so that was helpful."[Staff participant 1]*
>
> *"Luckily three of us have been there 20 plus years. So that's great. And the two new ones we have are awesome. And the fact that we're learning this new way of doing it together it just it. It makes it great that we're all doing it together." [Staff participant 14]*

> *"[I] spend time on Teams, or I'm kind of connected to Teams. And that connects me with the local office, the county WIC office, and so they let me know, like I'm able to get on their dashboard and see when clients come in and we message back and forth together to communicate to make sure that we're on the same page, and to see clients because they have to do their part, and then I have to do my part. And then they have to do more after I finish, and so we use Teams to communicate that... I interact with the people, though, the county that I'm working for that day. I'm interacting with them throughout the day. and then I have a couple of the other dietitians with the [part of telehealth solution] like we communicate on teams as well, so we can kind of help each other and support each other." [Staff participant 30]*
>
> *"The clerk will then text me through Teams, she's ready. I'll give a thumbs up emoji. I'll send the message to the mom. I'll send through Teams to the clerk, message sent. When mom texts through teletask, yes, I'll send through Teams to the clerk she's on, you may hang up now, to save time. She'll give me a thumbs up emoji, and then I'll do, I'll get Mom on the phone." [Staff participant 31]*

Staff discussed several positive aspects of the telehealth design, including its user-friendliness, simplicity, capacity to boost client engagement with the ability to upload WIC eligibility documentation, and potential to refine workflows. However, some staff described common challenges faced by clients to create an account and upload the documents prior to their appointments. Some staff indicated that sharing instructions with clients on the portal was better than providing them with paper instructions that may be lost. In NC, clients could upload a variety of documents, including prescriptions from their doctor for special infant formula, immunization records, proof of identity (such as Mother's Verification of Facts/Hospital Discharge for Infant, Photo ID), proof of residence (such as utility bill, letterhead correspondence), proof of income (such as paycheck stub, direct deposit notification, income tax form), and WIC Verification of Certification from another State.

In the late phase interviews, staff described the learning curve in transitioning to telehealth and emphasized the need for ongoing support and training to maximize the effectiveness of telehealth services. They also continued to highlight the need for reliable technological infrastructure connectivity as important factors for successful telehealth delivery.

> *"They're able to use the... to scan the code to enter their information which we would receive, that through the portal. Also, they will be able to upload information, so clients will not have to come into the office." [Staff participant 16]*
>
> *"It's not an easy program to sign up for. There's multiple steps, and to do that, you have to get an NCID. And the NCID system can be down, and it can be complicated." [Staff participant 5]*
>
> *"Whether it was the link itself being able to be sent to the participant, that was probably one of the most challenging things. But then, making sure they were able to upload the documents that they needed to, and I think a little bit to just the knowledge on where those documents would be at, and that might have just been more of the lack of experience on myself and the nutritionist. And in*

> *particular, what I'm thinking of there, is the height and weight measurements actually go to the anthropomorphic page of Crossroads...it's not just on that initial page of their demographics." [Staff participant 25]*
>
> *"Sometimes participants have a little difficulty with it... if they didn't have [video platform], or like Gmail downloaded on their phone, then they would have to download the app so sometimes that could take some time." [Staff participant 29]*
>
> *"It's been on more than one appointment. The connectivity issue was just one appointment that I myself had attempted but it was also trying to do it with the Nutritionist as well, and they also had difficulty. And even trying to get the link sometimes it's not been able to send the link to the participants so they can join." [Staff participant 25]*

3.5 Adoption of Telehealth Services

Adoption of telehealth services at intervention agencies was assessed using data gathered by the NC WIC State agency and from key informant interviews with staff. During the implementation period (Q4/2022–Q3/2023), the MyNCWIC portal had 64 users across the six intervention agencies, ranging from 1 to 39 users at the agency level (data not shown). TWSC conducted 1,001 appointments and served 1,529 WIC clients. The difference in use between MyNCWIC and TWSC is likely due, at least in part, to the fact that TWSC began offering appointments in October 2022 (Q4/2022), whereas MyNCWIC did not launch until March 2023 (Q1/2023). In addition, COVID-19 and ARPA waivers, which allowed for telephone appointments, impacted WIC client incentives to use all the functionality of MyNCWIC.

Most TWSC appointments (71.3%) were for certification, followed by nutrition education (23.7%), and breastfeeding support (2.7%). About 70 percent of TWSC appointments were completed using Google Meet with video. For the remaining 30 percent of appointments that did not use Google Meet with video, staff indicated that the video was not used because of client request (45.8%), poor connection (26.4%), issues with text message/receiving link (15.9%), and Google Meet too difficult (14.4%) (data not shown).

During interviews, staff highlighted the importance of "finding new ways... for a newer generation" and stressed the acceptance of telehealth in the medical arena and the benefits of following these standards in WIC. Staff noted that telehealth services allowed them to better connect with their clients and provide customized education, referrals, and support. They also noted that telehealth had introduced new work dynamics and provided flexibility and work options that are beneficial for staff. However, staff noted that connectivity issues for staff and clients slowed down telehealth use.

> *"It's just allowed us to be more flexible, and also just kind of more like, I don't know in today's world like telehealth isn't like a new thing. It's like everybody's really familiar with it at this point. So, I feel like it's just one more thing that kind of brings us into the technology age. But again, yeah, it just gives us a little more flexibility, which is, can make a big difference." [Staff participant 23]*

"If I am in their home. and I'm able to see that their ceiling panels have water damage or that their walls don't have any sheetrock on them, it really helps me to focus in on referrals. I think the referrals has been, and also the referrals and the nutrition education has been, more precise and exact because they're able to take their supplements or I cannot tell you how many times I've been told it's the purple can, but there's lots of purple cans, and so they're able to hold on just a minute. Walk to the kitchen and hold it up and show me same with the supplements. So it's been much more, it's increased the accuracy of my nutrition education." [Staff participant 31]

"Well, once we figured out the flow. it's really increased productivity." [Staff participant 31]

"The telehealth portion we have not used because, as I mentioned, we're having connection problems. They started around the end of July, 1st of August. It is in our whole agency, and so we can't currently support a telehealth connection and consistently." [Staff participant 13]

"I would say for the rural clients, it's touchy cause I don't know that there's consistent like Internet access in the rural areas of Union County, which is where we are. I know some clients out there probably don't have access to reliable Internet. " [Staff participant 23]

3.6 Acceptability of the MyNCWIC

Among the small number of respondents who answered the acceptability indicator questions in the early and late phases, acceptability scores were high (**Table 3-5**). Staff strongly agreed that MyNCWIC is an acceptable way to provide WIC services and that it is useful to them as WIC staff.

Table 3-5. Acceptability of MyNCWIC in Early and Late Phases among Staff Survey Respondents in NC

Statement[a]	Early[b] N = 1 Mean (SD)	Late[b] N = 2 Mean (SD)	p-value[c]
MyNCWIC is an acceptable way to provide WIC services.	5[d]	5(0)	—[e]
MyNCWIC is useful for me as WIC staff.	5[d]	5(0)	—[e]

Source: THIS-WIC Staff Survey

[a] Responses were assessed using a 5-point Likert scale, where 1 = Strongly disagree and 5 = Strongly agree.

[b] Ordinal data are summarized as mean (SD).

[c] p-values were based on regression for ordinal data.

[d] No SD is derived due to n = 1 for this item.

[e] Hypothesis test could not be carried out due to lack of variability (SD is missing or is zero).

Findings from the key informant interviews indicate that staff considered telehealth to be an important part of providing services and recognized the need to provide clients a choice (phone or telehealth) of what works best for them (CFIR constructs: *innovation advantage and characteristics of individuals*). Staff noted that offering telehealth services has "improved the safety and level of confidence" of clients in WIC services and confidentiality as they select the location without fear of someone at the WIC office overhearing their conversation. Staff also liked the fact that clients could upload the documents into the portal instead of coming into the office or asking if they can email them. Finally, staff indicated that offering telehealth services has helped with staff hiring and retention; remote work has enabled them to continue in the workforce and increased their productivity.

> *"So, I know, like, we will sometimes have clients [who] wanted [to] email us stuff. And we're like, no! Like, absolutely do not email us your personal information. Like it's not secure, and so it's nice to have a place where they can send us their secure documents. And so it's kind, it's been that nice like bridge, to get … those pieces to us so that we can do things virtually instead of them having to come into the office." [Staff participant 23]*
>
> *"Then there's also the convenience factor of we can employ more people ideally, because there's certain agencies that are in locations where they might not have anyone in the area that can, you know, provide the nutrition services. Like the agency that I worked at, I had to travel an hour to. So there wasn't anybody in that area, you know, that had like a nutrition degree, or at least was looking for employment there. So I think it really helps a lot with the fact that we can even work virtually, too." [Staff participant 29]*
>
> *"Well, this is all about me. I'm a full time caregiver, so I would not be able to work if it were not for this method. So this is pulling me out of poverty, as it were. Cause I'm a full time caregiver. And so this enables me to work, so yeah, I love it." [Staff participant 31]*
>
> *"We're gonna be able to be more efficient. See more people with our time because we're not going to, because we're not going to be coming into the clinic. We're not going to [have to] wait." [Staff participant 5]*

3.7 Feasibility of Using Telehealth Solution

The one respondent in the early phase agreed or strongly agreed with the six feasibility indicators, suggesting high feasibility of using MyNCWIC to deliver WIC services (**Table 3-6**). However, in the late phase, mean scores for four of the six indicators were indicative of moderate feasibility. Although late-phase respondents strongly agreed that they were comfortable communicating with WIC clients using MyNCWIC and agreed that learning to use MyNCWIC was easy for them, the mean scores for the other four indicators (finding MyNCWIC easy to use, flexible to interact with, making their daily work easier, and enabling them to interact with more participants) were neutral (i.e., neither agree nor disagree) and may be indicative of moderate feasibility.

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

Statement[a]	Early[b] N = 1 Mean (SD)	Late[b] N = 2 Mean (SD)	p-value[c]
Learning to use MyNCWIC was easy for me.	4[d]	4(0)	—[e]
I find MyNCWIC to be easy to use.	5[d]	3(2.83)	0.667
I find MyNCWIC to be flexible to interact with.	5[d]	2.5(2.12)	0.667
I feel comfortable communicating with WIC clients using MyNCWIC.	5[d]	5.0(0)	—[e]
MyNCWIC makes my daily work easier to do.	5[d]	3.0(2.83)	0.667
MyNCWIC allows me to interact with more participants.	5[d]	3.0(2.83)	0.512

Source: THIS-WIC Staff Survey

[a] Responses were assessed using a 5-point Likert scale, where 1 = Strongly disagree and 5 = Strongly agree.

[b] Ordinal data are summarized as mean (SD).

[c] p-values were based on regression for ordinal data.

[d] No SD is derived due to n = 1 for this item.

[e] Hypothesis test could not be carried out due to lack of variability (SD is missing or is zero).

Staff noted that MyNCWIC simplified the process of uploading documents for the clients, allowing them to schedule their appointments sooner. WIC staff also noted that they had limited office space for in-person appointments, and offering telehealth appointments eased concerns around privacy and comfort. Staff acknowledged the support from their IT staff and noted that having new computers would enable them to use video functionality during calls. Finally, WIC staff discussed variability in staff and client acceptance of telehealth services and the need to provide support to increase use.

> *"It's going to speed up their appointment times and again, it's just, I think, gonna give them, also let them be a little bit more invested in the appointment process." [Staff participant 14]*
>
> *"Some people are not tech savvy. So it was something different that way.... we have a great IT team. So once they kind of sat with them and walked them through, they saw that it wasn't as difficult as they were making it out to be in their head." [Staff participant 17]*
>
> *"I think the populations well, the majority of our clients I think they benefit. We do have, like some grandmothers who have custody of their children, or we have some older foster parents, and they may not be tech savvy, or may not be comfortable with the video portion and uploading documents. They are not comfortable doing that. That would be the only drawback I would say." [Staff participant 17]*

> *"We just received new computers that will make it easy for everybody. So they're starting that installation process with the video capabilities and stuff." [Staff participant 17]*
>
> *"We've had a lot of challenges with the actual link being able to be sent to the participants and for them as well as staff, to be able to access that properly. But when it has been used, I know myself, my personal experience I was able to see the participant. I was able to see the children there and get the intake information that I needed. I think it's still the same quality of care. I mean, if you're able to do the video portion of the appointment, you can still see each other face to face. You can still do that warm greeting for people and answer any questions. And they can still remain in their home and feel as though that they can get the assistance they need." [Staff participant 25]*

Some WIC staff described the importance of having telehealth as an option to sustain WIC participation and avert attrition; they also provided suggestions on ways to ensure sustainability, including aspects of telehealth with higher potential for sustainability. In the early- and late-phase interviews, staff felt that providing telehealth services is feasible and sustainable due to its convenience and accessibility for clients and staff. They indicated that clients like technology and will continue to prefer telehealth over in-person and that it was important to figure out ways to implement it across all agencies; for understaffed agencies, it was more cost-effective than contracting services.

> *"...and I think that as we get more experience and the improvements are made with the technology, that it will continue to be a good asset. It [is] now an even more important asset for people that are not able to come into the clinic." [Staff participant 25]*
>
> *"It's sustainable, but we just have to figure out, just in every local WIC agency is going to be different, based on staffing and based on just their setup. So, we just have to figure out what's gonna work for us." [Staff participant 5]*
>
> *"It's cheaper than hiring a contract service, which is 50 bucks an hour, and they're not trained. And they don't care because they're not going to be there the next day. They haven't bought into it, you know, because to be in-person. It's less expensive." [Staff participant 31]*
>
> *"I think it helps, you know, agencies who are understaffed like. I remember being somewhere where we were very understaffed, and I was seeing like 30 plus people a day, and like the burnout that comes with that, and, like, you know, mental, emotional, physical exhaustion, so that, you know, reduces sustainability. Whereas, when there is more access to having extra support, I just think that it allows it to be more sustainable in the long run." [Staff participant 29]*

3.8 Improved Accessibility of WIC Services for Clients

Staff providing services through telehealth perceived that it positively impacted accessibility to WIC services for clients (**Table 3-7**). Staff reported that the use of telehealth increased their ability to reach participants who faced challenges in accessing WIC clinics because of traffic or distance. Staff also expressed a high level of interest in continuing to use telehealth to provide WIC services.

Table 3-7. Staff Perceptions of Improved Accessibility to WIC Services for Clients Because of Telehealth in Early and Late Phases in NC

Statement[a]	Early[b] N = 1 Mean (SD)	Late[b] N = 2 Mean (SD)	p-value[c]
With telehealth, I am able to provide services for WIC participants who have difficulty accessing a clinic because of traffic or distance.	4.29 (1.5)	4.5 (0.84)	0.762
With telehealth, I am able to provide services for WIC participants who would usually miss their appointments.	4.29 (1.5)	4.5 (0.84)	0.762
I would like to continue using MyNCWIC to provide WIC services.	5.0[d]	5.0 (0.0)	—[e]

Source: THIS-WIC Staff Survey

[a] Responses were assessed using a 5-point Likert scale, where 1 = Strongly disagree and 5 = Strongly agree.

[b] Ordinal data are summarized as mean (SD).

[c] p-values were based on regression for ordinal data.

[d] No SD is derived due to n = 1 for this item.

[e] Hypothesis test could not be carried out due to lack of variability (SD is missing or is zero).

WIC staff found it helpful that the platform had a client and staff-facing functionality so clients could upload the documents, which improved workflow. Staff noted that telehealth services made it feasible for eligible nonparticipants to enroll in and receive WIC services, show up for appointments (reduce no-show rates), complete appointments in a timely manner (reduce wait times), and remain in WIC longer (increase retention).

> *"Because you're seeing clients that would not have participated in WIC. I lost count how many clients, were you on WIC with the last pregnancy? No. Why not? Oh, I couldn't get in with my schedule. I didn't have transportation. I didn't have the time. I just I just thought, you know. But this was easy. It was easier to do it this way." [Staff participant 31]*
>
> *"We were serving 2,600, and now we're up over 4,000, and we've been up over 4,000, and I mean, I really feel like it's just because we've been so accessible." [Staff participant 23]*
>
> *"I think that it's gonna help us maintain case load and increase case load." [Staff participant 17]*

> *"I think it's honestly, I think it's been a 10 out of 10. I think it's been extremely successful. The clients. They show up. If they're not there, I'm able to chase them down through text messaging, and I sure couldn't do it to the Health Department, and I did. I would just chase him down. Where are you? Where's you know? Where are you? Is everything okay?" [Staff participant 31]*

Staff noted that providing clients with step-by-step instructions to set up their account and increasing language options would make it more user-friendly. Staff also recommended enhancements to the platform, such as including interactive modules that allow clients to review nutrition education materials at their own pace.

> *"I definitely find it rewarding, especially compared to talking on the phone. I know I'm a very visual person. So when I just talk on the phone... you can't, you know, see facial expressions and everything, so I find it to be an advantage." [Staff participant 29]*
>
> *"But the biggest barrier, I would say, would be just having that portal document for the step-by-steps for them to set it up, not having that in other languages." [Staff participant 25]*
>
> *"Well, I guess some interactive modules or something to that effect. Nutrition, education that they can…It's self paced. Might be something that could be thought about." [Staff participant 17]*

Staff discussed the challenges faced by clients in attending in-person appointments and noted that clients appreciate having the option to receive services via telehealth. Staff varied in their perceptions of clients' access to technology; some noted that most clients have access to technology and the experience to do video chats, making it a viable option, whereas others discussed the lack of reliable Internet services and limited experience, making it less appealing for clients, especially in rural areas.

> *"We have really terrible transportation in this area. Just it's very rural...So that's really what motivated us. Just to, more innovative, more efficient way to serve families." [Staff participant 5]*
>
> *"...huge population of young mothers that we have really want some options and feel very comfortable using some of these telehealth options." [Staff participant 1]*
>
> *"Frequently I'm seeing them when they're on their way to another task sometimes the family has pulled over in the car. And I've interviewed them and the family, and seen the children on the side of the road… in a pasture. In a field. And it's much less… it's more informal. And I feel like it's less guarded." [Staff participant 31].*

"It depends. a good portion of the participants do have the technology and have experience with being able to have those types of video chats." [Staff participant 25]

"They are very receptive, and they would prefer to not have to come into the office, so they are very thankful. There are some that don't do as well with the technology. So, they're wanting to do the appointment by phone or not come into the office, but actually getting onto the portal, creating the account and being able to upload the documents has been challenging for them or a little bit of resistance, because they don't have the experience with doing it." [Staff participant 25]

"So,…I would say for the rural clients, it's touchy cause, I don't know that there's consistent like Internet access in the rural areas of Union County, which is where we are. I know some clients out there probably don't have access to reliable Internet." [Staff participant 23]

"There's a good chunk of them that still don't like the video portion of it, but we do let them know that we have to have that for the physical presence portion, and we do have to see the children. And then after that if they would not have to maintain their video, and they're okay with that. Again, so many of them are just thankful that they have that opportunity that they are willing to have that video call as well. To my knowledge, you can't completely decline it, because we do need to have what we call that physical presence. So, we do have to at least see them and the children initially, but then, after that, from what I have understood, they're able to not keep the video on there." [Staff participant 25]

3.9 Frequency of Travel and Travel Time

The Staff Survey asked respondents how long they worked at WIC. Staff who worked for 2 or more years were asked whether their job included traveling to one or multiple WIC clinics before the COVID-19 pandemic. Three of 7 (47%) staff in the early phase and 4 of 6 (67%) staff in the late phase traveled to one or more WIC clinics before the COVID-19 pandemic (results not shown). Among those who traveled to one or more WIC clinics before the pandemic, neither the frequency of travel nor the travel time differed significantly from the early phase to the late phase of telehealth implementation (**Table 3-8**).

Table 3-8. Frequency of Travel and Travel Time to Other WIC Sites among Staff Survey Respondents in the Early and Late Phases of Telehealth Implementation in NC

Question	Early	Late	p-value[a]
	%		
On average, how many minutes of your workday did you spend traveling to these other WIC clinic sites?	N = 3	N = 4	0.388
15 mins or less	0.0	0.0	
16–30 mins	33.3	75.0	
31–60 mins	33.3	0	
61 mins or more	33.3	25.0	
On average, how frequently did your job require you to travel to these other WIC clinic sites?	N = 3	N = 4	0.388
More than 1 per week	33.3	75.0	
1 per week	33.3	0.0	
More than 1 per month	0.0	0.0	
1 per month	33.3	25.0	

Source: THIS-WIC Staff Survey

[a] p-values are based on chi-square test for categorical data.

3.10 Startup Cost to Implement Telehealth Solution

The startup period for implementing the telehealth solution in NC was from February 2021 through September 2022. Over this 20-month period, NC WIC incurred a total cost of $1,079,412 in setting up the telehealth solution, which translated to an average monthly cost of $53,971 (**Table 3-9**). By component, the startup costs were $208,569 for TWSC; $846,701 for MyNCWIC; and $21,142 for kiosks. During the startup phase, the single largest expense was for contracted services, accounting for 79 percent of total spending and covering the cost of the MyNCWIC portal, MIS changes, staff web application, security and infrastructure, and the integration of the MIS with the telehealth solution. Other startup phase expenses included labor at 18 percent and equipment at 3 percent.

Table 3-9. NC WIC Telehealth Solution Startup Costs by Component

Telehealth component	Labor	Equipment	Contracts	Total	Average Per Month
TWSC	$196,307	$0	$12,262	$208,569	$10,428
MyNCWIC	$0	$7,591	$839,110	$846,701	$42,335
Kiosks	$0	$24,142	$0	$24,142	$1,207
Total	$196,307	$31,733	$851,372	$1,079,412	$53,971
Percentage of total	18%	3%	79%	100%	

Source: Cost Tracking Data, NC WIC State agency. Labor included the annual salary and fringe benefits for RDs. Equipment included the costs of kiosks and developing training videos for WIC clients. Contracted services included the cost of contracts with 3 Sigma and contracted RDs.

3.11 Ongoing Cost to Implement Telehealth Solution

Average ongoing costs of service delivery per enrollment are shown in **Table 3-10**, for intervention and comparison agencies and for the three timepoints of the telehealth solution implementation (pre-implementation and at 4- and 8-months post-implementation). For the intervention agencies, the ongoing service delivery costs reflect the costs of the full intervention, including the use of MyNCWIC, TWSC, and Google Meet. After implementation of the telehealth solution in the intervention agencies, the average cost per enrollment in those agencies decreased (from $17 to $15 per enrollment) at 4 months post-implementation and then decreased further at 8-months post-implementation (to $13 per enrollment). Meanwhile, per-enrollment costs in the comparison agencies roughly stayed the same during the same time ($14 pre-implementation and $15 at 4 and 8 months post-implementation). The mean and median estimates for intervention and comparison agencies were consistent at each time point. The minimum and maximum values at intervention agencies show the spread of the estimates, indicating that there was variation in the average ongoing service delivery cost across intervention agencies.

Table 3-10. Per-Enrollment Cost at Intervention and Comparison Agencies in NC

Value	Pre-implementation (FY2019)		4th month post-implementation (May 2023)		8th month post-implementation (September 2023)	
	Comparison (N = 4) [a]	Intervention (N = 6)	Comparison (N = 4) [a]	Intervention (N = 6)	Comparison (N = 4) [a]	Intervention (N = 6)
Mean	$14	$17	$15	$15	$15	$13
Median	$15	$16	$16	$12	$16	$11
Min	$13	$12	$12	$9	$12	$8
Max	$15	$22	$19	$28	$18	$21

Source: Cost Tracking Data, NC WIC State agency.
[a] Two comparison agencies had insufficient enrollment data and were therefore dropped from the analysis.

As seen in **Table 3-11**, after the introduction of the telehealth solution, per-appointment costs at 4 and 8 months post-implementation increased in the intervention agencies (from $27 pre-implementation to $44 at 4 months and to $36 at 8 months post-implementation). The ongoing per-appointment costs also increased in the comparison agencies (from $26 pre-implementation to $50 at 4 months and to $42 at 8 months post-implementation).

Table 3-11. Per-Appointment Cost at Intervention and Comparison Agencies in NC

Value	Pre-implementation (FY2019)		4th month post-implementation (May 2023)		8th month post-implementation (September 2023)	
	Comparison (N = 4)	Intervention (N = 6)	Comparison (N = 4)	Intervention (N = 6)	Comparison (N = 4)	Intervention (N = 6)
Mean	$26	$27	$50	$44	$42	$36
Median	$26	$27	$54	$43	$41	$32
Min	$20	$14	$34	$24	$33	$22
Max	$31	$42	$58	$65	$51	$60

Source: Cost tracking data, NC WIC State agency

Findings on the cost of NC's ongoing service delivery support the hypothesis that telehealth implementation can produce potential cost savings. Even though per-appointment costs increased in intervention and comparison agencies over time, the increase was larger for comparison sites. Ongoing per-appointment costs increased by $9 in intervention sites and by $16 in comparison sites. The $7 difference in cost increases between intervention and comparison sites represents potential cost savings per appointment associated with the intervention.

A return on investment (ROI) can be determined using the cost savings per appointment compared with the startup cost. The total startup cost of the telehealth intervention in NC was $1,079,412. With a cost savings estimate of $6.75 per appointment, a total of 159,844 appointments would be needed for NC to recoup its startup cost investment ($1,079,412/$6.75). At endpoint (8 months post-implementation), NC intervention agencies had a total of 7,679 appointments per month. It would therefore take about 21 months (159,844/7,679) for NC to recoup its investment. **Table 3-12** shows these calculations.

Table 3-12. Return on Investment Using Cost per Appointment

Description	Estimate
Total startup cost	$1,079,412
Intervention cost per appointment	
Pre-implementation (FY2019)	$26.93
8 months post-implementation (Feb – Sep 2023)	$36.30
Difference	$9.37
Comparison cost per appointment	
Pre-implementation (FY2019)	$25.76
8 months post-implementation (Feb – Sep 2023)	$41.88
Difference	$16.12
Cost savings of intervention per appointment	$6.75
Appointments needed to recoup startup cost	159,844
Total monthly appointments at all intervention agencies	7,679
Months needed to recoup startup cost	20.8

Source: Cost Tracking Data, NC WIC State agency

3.12 Summary

In NC, 12 (six intervention and six comparison) agencies participated in the THIS-WIC evaluation. WIC staff at intervention agencies (20 clinics) used the portal app to provide nutrition education and breastfeeding support education. Key findings include the following:

- **Staff attitude**: WIC staff had a positive attitude toward the use of telehealth and perceived it to be beneficial for staff and clients. They acknowledged the role of telehealth in promoting health equity by addressing client challenges to attending in-person appointments, such as transportation, childcare, and work conflicts. Staff expressed a preference for virtual appointments, which enabled them to attend to clients from any location and increased workflow and productivity.
- **Staff readiness**: Staff received extensive training on MyNCWIC, Google Meet, and TWSC. In the early phase, staff used MyNCWIC and Google Meet daily, but this frequency decreased in the late phase. In contrast, fewer staff used TWSC weekly in the early phase than in the late phase. In the early phase, staff preferences varied, with no single approach emerging as a preferred method. Although staff considered the training to be comprehensive and the training video to be a helpful learning tool, they expressed the need for paper-based materials. Staff also expressed a preference for hands-on, in-person sessions instead of recorded videos. In the early phase, staff were excited to implement telehealth services; however, in the late phase, staff noted that other ongoing projects, such as transitioning to EBT, changes to formula contracts, and uncertainty about waivers and future plans, limited their ability to offer telehealth services.

- **Staff satisfaction**: Overall, staff satisfaction with offering services through the telehealth platform was high in the early and late phases. Staff appreciated leadership's support, guidance, and open communication lines when needed. Staff also acknowledged the support of colleagues, which boosted their comfort and confidence in using the telehealth platform. Staff indicated that the design of MyNCWIC was user-friendly, simple, and had the capacity to boost client engagement and refine workflows. In the late phase, staff alluded to the longer learning curve and the need for ongoing support to maximize the effectiveness of service delivery. Staff also emphasized the need for reliable technological infrastructure to ensure successful telehealth service delivery.
- **Staff adoption**: Staff highlighted the importance of "finding new ways … for a newer generation" and noted that telehealth had enabled them to connect better with clients and provide customized services and referrals. However, staff also noted that connectivity issues experienced by staff and clients had slowed down the use of telehealth for service delivery.
- **Staff acceptability**: Most staff noted that telehealth was an acceptable way to provide WIC services and that it was useful to them as staff. Staff emphasized that providing clients the option of appointment modality was important, and the document upload functionality enabled clients to submit documents in a timely manner, which increased workflow efficiency. Staff also noted that remote work has allowed them to stay in the workforce and has opened up the option of WIC employment for others.
- **Perceived feasibility**: Average scores for four of the six feasibility indicators were indicative of low to moderate feasibility, likely because of the small number of survey respondents. Staff noted that the document upload functionality improved client appointment scheduling rates and appreciated the support from the IT staff to increase use. Staff noted that telehealth may not work for all clients, particularly those who have limited Internet access or are not comfortable with technology. Finally, staff indicated that offering telehealth services reduced the cost of contracting services at understaffed agencies.
- I**mproved accessibility of WIC services for WIC clients:** Staff reported that they were able to provide services to clients having difficulty accessing a clinic because of traffic or distance and to those who would usually miss their appointments. Staff had a high level of understanding of the challenges faced by their clients in attending in-person appointments; they appreciated the document upload functionality and option to complete appointments via the telehealth platform, which increased client participation and retention. Staff noted that they would like to continue offering telehealth services. Staff noted that accessibility would be improved by providing clients with step-by-step instructions to set up their accounts and by providing guidance in multiple languages.
- **Travel to other WIC clinics to provide services:** Before the COVID-19 pandemic, nearly half (47% in the early phase and 67% in the late phase) of staff traveled to other clinics more than once per week, with most spending more than 15 minutes traveling.
- **The startup cost** to offer telehealth services was $1,079,412, of which about 79 percent was spent on contracted services and 18 percent was spent on labor. By component,

the startup costs were $208,569 for TWSC; $846,701 for MyNCWIC; and $21,142 for kiosks. Based on the monthly caseload data, it would take NC about 21 months (about 2 years) to recoup its investment in telehealth startup costs.

- **The mean ongoing cost** per appointment increased in the intervention and comparison agencies in the 8th month post–telehealth solution implementation. The increase was smaller in intervention agencies than in comparison agencies ($27 to $36 in intervention agencies and $26 to $42 in comparison agencies).

4. Results: Client Experiences with Telehealth Services and Solution

NC WIC implemented a telehealth solution that enabled WIC staff to offer remote appointments via MyNCWIC paired with Google Meet to clients at intervention agencies. Client survey responses and MIS data spanning the intervention period, March 2022 through June 2023 (Q1/2022 through Q2/2023) were used to assess client use of telehealth services and examine outcomes.

NC also set up kiosks at six agencies to support WIC clients with access to WIC online resources in areas with unreliable Internet and/or clients with limited mobile data. During the implementation period, kiosks were used at five of the six agencies to access WIC online referral forms, at three agencies for accessing MyWIC web page (NC's WIC homepage), and at three agencies for accessing WICHealth.org. Kiosks were used a total of 145 times to access online referral forms (n = 102), access MYWIC (n = 29), or access WICHealth.org (n = 14). See **Appendix NC.4** for additional details on kiosk use.

Additional data on kiosk use were not available. The remainder of this chapter presents findings from the Client Survey completed by clients who received the full intervention, TWSC only intervention, or no intervention.

4.1 Acceptability of Telehealth Services among Client Survey Respondents

Client Survey respondents in the full intervention (MyNCWIC with Google Meet and TWSC) and TWSC-only agencies responded to a series of questions about their experience using telehealth for their most recent appointment. Respondents in both groups found MyNCWIC acceptable. As seen in **Table 4-1**, more than 90 percent of respondents in the full intervention agencies agreed or strongly agreed that they could easily talk with and clearly hear the WIC nutrition educator, that it was easy to figure out how to use and receive WIC services, and that their most recent appointment was shorter than usual when receiving care.

About 82 percent of respondents agreed or strongly agreed that the way they received WIC services at their most recent appointment was easier than going to a WIC clinic, and about 92 percent agreed or strongly agreed they would like to receive services the same way at their next WIC appointment. More than 90 percent of respondents agreed or strongly agreed they could see the WIC nutrition educator clearly and that MyNCWIC was easy to use. About 80 percent of respondents strongly disagreed or disagreed that they had trouble accessing MyNCWIC. About 97 percent of respondents said that the content of MyNCWIC was in a language they could read (results not shown).

Table 4-1. Client Survey Respondents' Attitudes Toward Telehealth Services in NC: Full Intervention

Statement	N	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
		%				
I could easily talk to the WIC nutrition educator during my appointment.	61	1.6	1.6	3.3	21.3	72.1
I could see the WIC nutrition educator clearly.[a]	39	0.0	0.0	2.6	23.1	74.4
I could hear the WIC nutrition educator clearly.	61	3.3	0.0	1.6	19.7	75.4
It was easy to figure out how to use and receive WIC services.	72	4.2	1.4	4.2	29.2	61.1
The telehealth platform was simple to use for my WIC appointment.[a]	39	2.6	0.0	5.1	23.1	69.2
I had trouble accessing the telehealth platform.[a]	39	69.2	10.3	15.4	5.1	0.0
My most recent WIC appointment was shorter than usual when receiving care.	61	0.0	18.0	42.6	31.1	8.2
The way I received WIC services at my most recent appointment was easier than going to a WIC clinic.	61	0.0	1.6	16.4	24.6	57.4
I would like to receive services the same way as my most recent appointment for my next WIC appointment.	61	0.0	0.0	8.2	34.4	57.4

Source: THIS-WIC Client Survey, intervention agencies only

[a] Asked only if respondents completed their appointment using a video/webcam or screen share from the WIC nutrition educator.

More than 90 percent of respondents in the TWSC-only agencies agreed or strongly agreed that they could easily talk with and clearly hear the WIC nutrition educator and that it was easy to figure out how to use and receive WIC services (**Table 4-2**). About one quarter of respondents agreed or strongly agreed with the statement, "My most recent WIC appointment was shorter than usual when receiving care"; one quarter disagreed with this statement, and about half neither agreed nor disagreed. Nearly 90 percent of respondents agreed or strongly agreed that the way they received WIC services at their most recent appointment was easier than going to a WIC clinic and that they would like to receive services the same way at their next WIC appointment. Among respondents who completed their appointment using a video/webcam with the WIC nutrition educator, nearly all agreed or strongly agreed they could see the WIC nutrition educator clearly and that the platform (Google Meet) was easy to use. About 75 percent of respondents strongly disagreed or disagreed that they had trouble accessing the telehealth

platform. About 97 percent of respondents said that the content of the telehealth solution was in a language they could read (results not shown).

Table 4-2. Client Survey Respondents' Attitudes Toward Telehealth Services in NC: TWSC Only Agencies

Statement	N	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
		%				
I could easily talk to the WIC nutrition educator during my appointment.	107	2.8	0.0	1.9	24.3	71.0
I could see the WIC nutrition educator clearly.[a]	76	2.6	0.0	1.3	25.0	71.1
I could hear the WIC nutrition educator clearly.	107	2.8	0.9	0.9	23.4	72.0
It was easy to figure out how to use and receive WIC services.	158	1.3	0.0	1.9	34.8	62.0
The telehealth platform was simple to use for my WIC appointment.[a]	75	2.7	1.3	1.3	24.0	70.7
I had trouble accessing the telehealth platform.[a]	76	44.7	28.9	18.4	3.9	3.9
My most recent WIC appointment was shorter than usual when receiving care.	107	9.3	14.0	52.3	15.0	9.3
The way I received WIC services at my most recent appointment was easier than going to a WIC clinic.	107	3.7	1.9	5.6	27.1	61.7
I would like to receive services the same way as my most recent appointment for my next WIC appointment.	107	2.8	3.7	6.5	29.0	57.9

Source: THIS-WIC Client Survey

[a] Asked only if respondents completed their appointment via telehealth.

4.2 Barriers to Accessing WIC Services among Survey Respondents

4.2.1 Availability of Technology at Home

Overall, most Client Survey respondents had access to a smartphone or computer at home. As seen in **Table 4-3**, 92.2 percent had a smartphone, and many had a computer (45.6%) or tablet (29.7%) at home. Respondents connected to the Internet primarily using Home connect (71.3%) followed by cellular connect (25.8%). Among those who used Home connect, less than 6 percent often encountered problems and about 28 percent sometimes encountered problems sometimes when connecting with the internet. Among those not using Home connect, common

reasons for not connecting to the Internet at home were cost (31%), followed by a lack of availability and not wanting to do so (18% each).

Table 4-3. Availability and Use of Technology at Home among Client Survey Respondents in NC

Question	Overall	Full intervention agencies (I)	TWSC only agencies (II)	Comparison agencies (III)	p-value[a]	
	%				I vs. III	II vs. II
Which of the following do you have at home?[b]	N = 487	N = 69	N = 157	N = 261	—[c]	—[c]
A desktop or laptop computer	45.6	36.2	52.9	43.7	—[c]	—[c]
A tablet computer	28.7	26.1	28.7	29.5	—[c]	—[c]
Chromebook	8.8	10.1	9.6	8.0	—[c]	—[c]
Smartphone	92.2	91.3	93.0	92.0	—[c]	—[c]
Other	0.6	2.9	0.0	0.4	—[c]	—[c]
No devices in the home	2.5	1.4	1.9	3.1	—[c]	—[c]
How do you most often connect to the internet?	N = 488	N = 69	N = 157	N = 262	0.0995	0.0663
Home connect	71.3	73.9	77.7	66.8		
Public connect	1.2	4.3	0.0	1.1		
Cellular connect	25.8	18.8	21.7	30.2		
Do not connect	1.6	2.9	0.6	1.9		
Among Those Who Use Home Connect						
How often do you have problems with the speed, reliability, or quality of the Internet connection at home in a way that makes it hard to do things you need to do online?	N = 344	N = 51	N = 122	N = 171	0.1005	0.2119
Often	5.8	3.9	3.3	8.2		
Sometimes	27.6	15.7	26.2	32.2		
Rarely	36.0	43.1	38.5	32.2		
Never	27.6	31.4	30.3	24.6		
Don't know	2.9	5.9	1.6	2.9		

(continued)

Table 4-3. Availability and Use of Technology at Home among Client Survey Respondents in NC (continued)

Question	Overall	Full intervention agencies (I)	TWSC only agencies (II)	Comparison agencies (III)	p-value[a]	
	%				I vs. III	II vs. II
Among Those Who Do Not Use Home Connect						
What is the most important reason why you do not connect to the Internet at home?	N = 130	N = 16	N = 33	N = 81	0.1566	0.2744
Not available	17.7	18.8	27.3	13.6		
Internet cost	30.8	37.5	24.2	32.1		
Device cost	4.6	18.8	0.0	3.7		
I connect somewhere else	16.2	12.5	9.1	19.8		
I don't want to	17.7	12.5	21.2	17.3		
Privacy/security	13.1	0.0	18.2	13.6		

Source: THIS-WIC Client Survey

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

[b] Compared the difference in proportions for (1) agencies that received the full intervention vs. comparison agencies and (2) TWSC-only agencies vs. comparison agencies. The p-values are based on a chi-square test. For both comparisons (full intervention and TWSC), 25% or more of the cells have expected counts less than 5, so chi-square may not be a valid test for the following variables: have other devices at home, have no devices at home, method for connecting to Internet, and Internet cost.

[c] p-values for each response option not shown; none of the p-values were <0.05.

4.2.2 Comfort with Technology and Frequency of Videochat Use

Overall, about half (52.9%) of Client Survey respondents were very confident with using technology with 28.3% being somewhat confident; 6 percent indicated they were somewhat or very uncertain with using technology (**Table 4-4**). More respondents from the TWSC-only agencies than comparison agencies were very confident about using technology (64.3 vs. 46.1%). About 26 percent of respondents used videochat (e.g., FaceTime, What's App) daily (i.e., not specific to WIC appointments) to communicate with and stay connected with friends and family, and an additional 20 percent used it about two times per week. The distribution for use of videochat significantly differed between respondents from the TWSC-only and comparison agencies, with more respondents in the TWSC-only agencies reporting daily use (32.5 vs. 21.3%); reasons for this difference were not examined.

Table 4-4. Comfort with Technology and Frequency of Videochat Use among Client Survey Respondents in NC

Question	Overall	Full intervention agencies (I)	TWSC only agencies (II)	Comparison agencies (III)	p-value[a]	
		%			I vs. III	II vs. III
When it comes to the use of technology, which of the following best describes you?	N = 467	N = 68	N = 154	N = 254	0.6926	0.0047*
Very confident	52.9	51.5	64.3	46.1		
Somewhat confident	28.3	23.5	26.0	31.0		
Neither confident nor uncertain	9.6	10.3	4.5	12.7		
Somewhat uncertain	4.7	8.8	2.6	4.9		
Very uncertain	1.3	1.5	1.3	1.2		
Don't know	3.2	4.4	1.3	4.1		
How often do you use video chat to communicate and stay connected with family and friends?	N = 466	N = 68	N = 154	N = 244	0.5378	0.0162*
Daily	26.0	27.9	32.5	21.3		
2 times per week	19.7	22.1	20.1	18.9		
1 time per week	13.3	16.2	6.5	16.8		
2 times per month	12.2	10.3	12.3	12.7		
1 time per month	7.5	2.9	7.1	9.0		
Less than one time per month	10.7	7.4	14.3	9.4		
Never	6.4	10.3	4.5	6.6		
Don't know	4.1	2.9	2.6	5.3		

Source: THIS-WIC Client Survey

[a] Compared the difference in proportions for (1) comparison agencies vs. agencies that received the full intervention and (2) comparison agencies vs. TWSC-only agencies. The p-values are based a on chi-square test. For both comparisons, 25% or more of the cells have expected counts less than 5, so chi-square may not be a valid test for use of technology.

* $p<0.05$

4.2.3 Administrative, Individual, and Staff-level Barriers to Accessing WIC Services

Client Survey respondents reported barriers they experienced at their most recent WIC appointment. Barriers included administrative factors (e.g., receiving a specific appointment time, experiencing long wait times), individual-level factors (e.g., transportation, childcare, getting off work), and staff interactions (e.g., language barrier, racial/ethnic barrier, Internet

connectivity). As seen in **Tables 4-5** and **4-6**, mean scores for all measures except for WIC staff language barrier ranged from 2.4 to 2.9, indicating low frequency of experiencing barriers among respondents in the three groups. For WIC staff language barrier, the mean score was 1.9 for comparison agencies and 2.2 for full intervention agencies, indicating this barrier was experienced a little (this question was not asked for respondents in the TWSC group because none of them spoke Spanish).

For four of the five measures examined, no differences were observed in frequency of barriers among respondents from full intervention vs. comparison agencies, or from TWSC-only vs. comparison agencies. Statistically significant differences were observed for only one barrier between the TWSC only vs. comparison agencies: long wait time (mean 2.9 vs. 2.4 for TWSC-only and comparison agencies, respectively). Reasons for this difference were not examined, but WIC clients may encounter a wait time to be connected to the RD at TWSC-only agencies as these agencies used TWSC services due to existing staffing shortages.

Table 4-5. Barriers to Accessing WIC Services among Client Survey Respondents in NC: Full Intervention vs. Comparison Agencies

Barrier[a]	Full intervention	Comparison	Δ (95% CI)	p-value[b]
	N = 72	N = 269		
	Mean (SE)			
Not given a specific appointment time	2.6 (0.11)	2.6 (0.05)	-0.03 (-0.26, 0.21)	0.816
Wait too long	2.7 (0.14)	2.4 (0.09)	0.28 (-0.09, 0.66)	0.123
Transportation issues	2.6 (0.10)	2.7 (0.06)	-0.07 (-0.31, 0.18)	0.577
Childcare issues	2.6 (0.10)	2.6 (0.05)	0.03 (-0.19, 0.24)	0.802
Difficulty getting off work	2.5 (0.13)	2.6 (0.08)	-0.14 (-0.51, 0.23)	0.419
WIC staff language barrier	2.2 (0.30)	1.9 (0.16)	0.31 (-0.37, 1.00)	0.364
WIC staff racial/ethnic barrier	2.6 (0.12)	2.5 (0.08)	0.12 (-0.19, 0.43)	0.429
No or poor Internet connection	2.6 (0.10)	2.6 (0.06)	-0.03 (-0.27, 0.22)	0.828

Source: THIS-WIC Client Survey

[a] On a scale of no/never to frequently, please mark (X) if you experienced any of the following barriers to attending your WIC appointment with response options: 0 = frequently, 1 = occasionally, 2 = a little, and 3 = never.

[b] Hierarchical linear regression models (unadjusted) were used to compare differences in means for full intervention and comparison agencies.

Table 4-6. Barriers to Accessing WIC Services among Client Survey Respondents in NC: TWSC Only vs. Comparison Agencies

Barrier[a]	TWSC Only N = 158 Mean (SE)	Comparison N = 269 Mean (SE)	Δ (95% CI)	p-value[b]
Not given a specific appointment time	2.7 (0.07)	2.6 (0.05)	0.15 (-0.01, 0.31)	0.067
Wait too long	2.9 (0.11)	2.4 (0.09)	0.43 (0.08, 0.78)	0.022*
Transportation issues	2.8 (0.08)	2.7 (0.06)	0.07 (-0.16, 0.30)	0.488
Childcare issues	2.7 (0.06)	2.6 (0.05)	0.12 (-0.03, 0.27)	0.121
Difficulty getting off work	2.7 (0.09)	2.6 (0.08)	0.07 (-0.22, 0.35)	0.589
WIC staff language barrier	—[c]	—[c]	—[c]	—[c]
WIC staff racial/ethnic barrier	2.5 (0.11)	2.5 (0.09)	0.04 (-0.29, 0.38)	0.772
No or poor Internet connection	2.6 (0.08)	2.6 (0.07)	-0.04 (-0.27, 0.20)	0.743

Source: THIS-WIC Client Survey

[a] On a scale of no/never to frequently, please mark (X) if you experienced any of the following barriers to attending your WIC appointment with response options: 0 = frequently, 1 = occasionally, 2 = a little, and 3 = never.

[b] Hierarchical linear regression models (unadjusted) were used to compare differences in means for TWSC-only intervention and comparison agencies.

[c] Question not asked because none of the respondents spoke Spanish.

*p< 0.05

4.3 Satisfaction with WIC Services

Table 4-7 presents the mean client satisfaction index scores for comparison, full intervention, and TWSC-only agencies. As seen, the unadjusted mean client satisfaction level was comparable for Client Survey respondents from full intervention and comparison agencies (91.8% vs. 86.6%), reflecting similar satisfaction with WIC services delivered via telehealth compared with usual care. Similarly, the unadjusted mean client satisfaction level was comparable for Client Survey respondents from TWSC-only and comparison agencies (91.8% vs. 86.6%), again reflecting similar satisfaction with WIC services delivered via telehealth compared with usual care. **Tables 4-8** and **4-9** provide the results of the adjusted regression models, which included covariates for demographic characteristics that were statistically significant between the intervention and comparison groups for the full intervention and TWSC-only groups, respectively. The inclusion of these control variables does not change the relationship between exposure to telehealth and satisfaction with WIC services. Thus, satisfaction with WIC services delivered via telehealth was comparable to WIC services delivered with usual care.

Table 4-7. Satisfaction with WIC Appointment among Client Survey Respondents in NC

Agency	N	Mean (SE)[a]	Δ (95% CI)	p-value[b]
Comparison	269	86.6 (1.87)	—	—
Full intervention	72	91.8 (2.37)	5.16 (-1.41, 11.72)	0.112[c]
TWSC Only	158	91.7 (1.98)	5.13 (-1.07, 11.33)	0.091[d]

Source: THIS-WIC Client Survey

[a] Client satisfaction index (range: 20−100) is based on eight items (interitem correlation, alpha = 0.94).

[b] Hierarchical linear regression models (unadjusted) were used to compare differences in means for full intervention vs. comparison and TWSC-only vs. comparison agencies.

[c] Full intervention vs. comparison agencies.

[d] TWSC-only vs. comparison agencies.

Table 4-8. Adjusted Regression Model Examining Satisfaction with WIC Appointment among Client Survey Respondents in the Intervention and Comparison Agencies in NC: Full Intervention vs. Comparison Agencies

Independent Variable	Coefficient	Std error	t-value	Pr > |t|
Intercept	87.65	3.20	27.41	<.001*
Condition				
Intervention	6.45	3.52	1.83	0.094
Comparison	Ref			
Location				
Rural	-2.18	2.61	-0.83	0.406
Suburban	-0.55	2.86	-0.19	0.849
Urban	Ref			
High-risk Status				
No	1.60	1.94	0.83	0.410
Yes	Ref			

Source: THIS-WIC Client Survey

NOTE: Client satisfaction index (range: 20−100) is based on eight items (interitem correlation, alpha = 0.94), Hierarchical linear regression models (adjusted) were used to compare differences in means for full intervention and comparison agencies

*p<0.05

Table 4-9. Adjusted Regression Model Examining Satisfaction with WIC Appointment among Client Survey Respondents in the Intervention and Comparison Agencies in NC: TWSC Only vs. Comparison Agencies

Independent Variable	Coefficient	Standard Error	t-value	Pr > |t|
Intercept	87.34	2.87	30.41	<.001*
Condition				
TWSC only	6.10	2.97	2.05	0.078
Comparison	Ref			
Location				
Rural	-1.89	2.39	-0.79	0.430
Suburban	-1.51	2.68	-0.56	0.574
Urban	Ref			
High-Risk Status				
No	2.26	1.63	1.39	0.166
Yes	Ref			

Source: THIS-WIC Client Survey

NOTE: Client satisfaction index (range: 20−100) is based on eight items (interitem correlation, alpha = 0.94). Hierarchical linear regression models (adjusted) were used to compare differences in means for TWSC-only and comparison agencies.

*p<0.05

4.4 Intent to Change Dietary Behaviors

As seen in **Tables 4.10** and **4.11**, mean scores for the three intentions measures ranged from 3.5 to 4.2, indicating that Client Survey respondents neither agreed nor disagreed with these statements. For two of the three measures examined, no differences were observed in intentions among respondents from intervention vs. comparison agencies, or from TWSC-only vs. comparison agencies. Differences were observed for one intention measure between respondents from the full intervention and comparison agencies: lessons will help me choose nutritious foods (mean 4.2 vs. 3.9 for full intervention and comparison agencies, respectively).

Table 4-10. Intent to Change Dietary Behaviors Following the WIC Nutrition Education Lesson among Client Survey Respondents in NC: Full Intervention vs. Comparison Agencies

Statement[a]	Full Intervention N = 72	Comparison N = 269	Δ (95% CI)	p-value[b]
	Mean (SE)			
After my WIC nutrition education lesson, I wanted to change how I eat.	3.6 (0.12)	3.4 (0.06)	0.14, (-0.13, 0.41)	0.313
After my WIC nutrition education lesson, I wanted to change how I feed my family.	3.7 (0.12)	3.5 (0.06)	0.15, (-0.12, 0.42)	0.284
My WIC nutrition education lesson taught me things that will help me choose nutritious foods for me or my family.	4.2 (0.12)	3.9 (0.07)	0.34, (0.04, 0.64)	0.027*

Source: THIS-WIC Client Survey

[a] Response options to dietary behavior change items were 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree.

[b] Hierarchical linear regression models (unadjusted) were used to compare differences in means for full intervention and comparison agencies.

Table 4-11. Intent to Change Dietary Behaviors Following the WIC Nutrition Education Lesson among Client Survey Respondents in NC: TWSC-Only vs. Comparison Agencies

Statement[a]	TWSC Only N = 158	Comparison N = 269	Δ (95% CI)	p-value[b]
	Mean (SE)			
After my WIC nutrition education lesson, I wanted to change how I eat.	3.6 (0.08)	3.4 (0.06)	0.14, (-0.07, 0.35)	0.183
After my WIC nutrition education lesson, I wanted to change how I feed my family.	3.5 (0.08)	3.5 (0.06)	0.03, (-0.17, 0.23)	0.753
My WIC nutrition education lesson taught me things that will help me choose nutritious foods for me or my family.	4.1 (0.09)	3.9 (0.07)	0.18, (-0.10, 0.46)	0.167

Source: THIS-WIC Client Survey

[a] Response options to dietary behavior change items were1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree.

[b] Hierarchical linear regression models (unadjusted) were used to compare differences in means for TWSC-only and comparison agencies.

4.5 Daily Fruit and Vegetable Intake

Following their appointment, respondents to the Client Survey self-reported their daily fruit and vegetable intake, with response options ranging from none to 4 or more cups. As seen in **Table 4-12**, about 55% of respondents consumed 1 to 3 cups of fruits per day and 1 to 3 cups of vegetables per day. The distribution of daily fruit and vegetable intake was comparable for the full intervention, TWSC only, and comparison agencies.

Table 4-12. Daily Fruit and Vegetable Intake among Client Survey Respondents in NC

Daily intake	Overall	Full Intervention (I)	TWSC Only (II)	Comparison (III)	P-value[a]	
	%				I vs. III	II vs. III
Fruits per day	N = 465	N = 66	N = 154	N = 245	0.3668	0.8742
None	3.7	3.0	3.9	3.7		
1/2 cup or less	8.4	4.5	8.4	9.4		
1/2 to 1 cup	16.8	21.2	16.9	15.5		
1–2 cups	35.9	45.5	31.8	35.9		
2–3 cups	19.1	12.1	20.8	20.0		
3–4 cups	9.2	10.6	8.4	9.4		
4 or more cups	6.9	3.0	9.7	6.1		
Vegetables per day	N = 465	N = 67	N = 154	N = 244	0.3086	0.4234
None	4.7	6.0	4.5	4.5		
1/2 cup or less	8.8	6.0	8.4	9.8		
1/2 to 1 cup	17.0	13.4	22.1	14.8		
1–2 cups	29.9	40.3	26.6	29.1		
2–3 cups	24.7	20.9	26.6	24.6		
3–4 cups	9.2	11.9	7.8	9.4		
4 or more cups	5.6	1.5	3.9	7.8		

Source: THIS-WIC Client Survey

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

4.6 Breastfeeding Practices

Data captured in NC's MIS were used to assess the association between breastfeeding behavior and WIC service delivery. This analysis was restricted to WIC households with at least one infant. As seen in **Table 4-13**, rates of breastfeeding initiation were similar for respondents from the full intervention, TWSC only, and comparison agencies; overall, about 78 percent of respondents initiated breastfeeding. Rates of exclusive breastfeeding were also similar for respondents in the three groups, at about 25 percent overall.

Table 4-13. Breastfeeding Practices of Client Survey Respondents in NC

Breastfeeding practice[a]	Overall	Full Intervention (I)	TWSC Only (II)	Comparison (III)	p-value[b]	
	%				I vs. III	II vs. III
Ever breastfed	N = 102	N = 15	N = 38	N = 49	0.2911	0.3726
Yes	78.4	86.7	81.6	73.5		
No	21.6	13.3	18.4	26.5		
Exclusively breastfed	N = 112	N = 20	N = 41	N = 51	—[c]	—[c]
Yes	25.0	25.0	34.1	17.6		
No	75.0	75.0	65.9	82.4		

Source: NC MIS

[a] Ever breastfed includes all infants in the sample; exclusively breastfed includes currently breastfed infants, indicated as "fully breastfed" in the infant formula field.

[b] p-values are based on chi-square test.

[c] Unable to estimate p-value.

4.7 Retention in WIC

Six months after completing the survey, two-thirds (63.7%) of the Client Survey respondents continued to receive WIC services. Retention rates were about 10 percent higher for respondents from the full intervention and TWSC-only agencies than for those from comparison agencies (**Table 4-14**); reasons for this difference were not examined.

Table 4-14. Client Survey Respondents' Retention in NC WIC[a]

Respondent Retention	Overall	Full Intervention	TWSC Only	Comparison	p-value[c]
	N = 535	N = 109	N = 220	N = 206	
	%				
Retained for 180 days or more[b]	63.74	67.89	68.18	56.80	0.0304*

Source: NC MIS linked to Client Survey data.

[a] Analysis restricted to respondents who completed the Client Survey in the first 6 months of the intervention.

[b] Reflects interval between first and last certification date.

[c] p-values are based on chi-square test.

* $p<0.05$.

4.8 Summary of Findings: WIC Clients

WIC clients in the intervention agencies received services via telehealth through MyNCWIC, which was paired with Google Meet for video-based appointments, and/or TWSC. WIC clients in the comparison agencies received phone and in-person services. This chapter described client experiences with telehealth services and resources and compared outcomes for clients in the intervention and comparison agencies. Key findings include the following:

- **Acceptability of telehealth services and MyNCWIC:** Most Client Survey respondents who received WIC services through MyNCWIC/Google Meet or TWSC found it acceptable (agree or strongly agree) to do so. Slightly more than 80 percent of respondents indicated that the way they received WIC services was easier than going to a WIC clinic, and 91.8 percent expressed a preference to continue receiving services the same way at their next appointment. Respondents found it easy to access MyNCWIC and/or Google Meet, simple to use, and easy to figure out how to use and receive WIC services. Respondents who used MyNCWIC with Google Meet or TWSC with video capabilities found it easy to talk with and see their WIC nutrition educator.
- **Barriers to accessing WIC services:** In general, most respondents had a computer and smartphone and Internet connection at home. Additionally, most were very confident (52.9%) or somewhat confident (28.3%) about using technology; about 6 percent had never used videoconferencing to communicate with family and friends. Respondents had favorable experiences with their appointments. Mean barrier scores did not differ significantly for those in the full intervention and comparison agencies for all eight barrier questions, likely because clients at comparison agencies received services via phone. Similarly, mean scores for seven of the eight barrier questions did not differ for those in the TWSC-only and comparison agencies; mean scores for "wait too long" were higher for respondents in the TWSC only than those in for comparison agencies (2.9 vs. 2.4).
- **Satisfaction with WIC appointment**: Consistent with low frequency of barriers, across groups, respondents expressed a high level of satisfaction with their WIC appointment in the full intervention (91.8%), TWSC only (91.7%), and comparison agencies (86.6%).
- **Intent to change dietary behaviors:** Respondents in the intervention and comparison agencies had comparable scores (3.4 to 3.7 on a 5-point agreement scale) for intent to change their dietary behaviors (i.e., how they ate, how they feed their family). However, mean scores were higher for respondents from full intervention than from comparison agencies in their perception that "lessons will help me make healthy choices" (4.2 vs. 3.9). Mean scores were comparable for TWSC-only and comparison agency respondents for all three intent-to-change dietary behavior questions.
- **Daily fruit and vegetable intake:** About 55 percent of respondents consumed 1 to 3 cups of fruits per day and 1 to 3 cups of vegetables per day. Following respondents' WIC appointment, distributions of fruit and vegetable intake were comparable for respondents from the full intervention, TWSC-only, and comparison agencies.
- **Breastfeeding practices**: Unadjusted analysis of breastfeeding practices indicates similar rates of breastfeeding initiation among respondents in the full intervention, TWSC-only, and comparison agencies. Rates of exclusive breastfeeding were also similar for respondents in the three groups, at about 25 percent overall.
- **WIC retention rates:** Retention rates were about 10 percent higher for respondents from the full intervention (67.9%) and TWSC-only (68.2%) agencies than from comparison agencies (56.8%).

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 level with digital technology, Internet availability, privacy and security concerns, and accessibility may be barriers to telehealth integration within WIC. The goal of the THIS-WIC project was to develop a robust evidence base regarding telehealth solutions in WIC and to understand whether and how telehealth influences impact, intermediate, process, and cost outcomes.

NC WIC planned to deliver WIC nutrition education and breastfeeding support to clients at intervention agencies through telehealth and at comparison agencies through in-person appointments. The project launch was delayed due to several unforeseen factors, including the COVID-19 pandemic. However, COVID-19 and ARPA waivers for physical presence were in place during implementation, so phone-based appointments were available and conducted in all WIC agencies, including both intervention and comparison groups. Development of the MyNCWIC portal took longer than initially planned, reducing the planned time available for testing, training, implementation, and data collection from more than 12 months to 9 months.

5.1 Implementation of Telehealth Services in NC

Between October 2022 (Q4/2022) and September 2023 (Q4/2023), six agencies (20 clinics) offered telehealth services via MyNCWIC, Google Meet, and TWSC and served as full intervention agencies; five additional agencies served as TWSC-only intervention agencies; six agencies (8 clinics) offered usual care and served as comparison agencies. WIC staff generally perceived a high need to offer remote services to their clients and believed that it was important to “finding new ways (of service delivery) for a newer generation.” Staff also considered that offering telehealth services was important to promote health equity, as it addressed challenges to attending in-person appointments faced by most clients.

All WIC staff received ongoing training in various modes, including virtual, self-paced training, and webinars. Some staff did not feel prepared to provide telehealth services in the early phase because of multiple ongoing projects including transition to a new EBT provider, changing vendors for infant formula, and short lag between training and implementation with limited ability to engage fully in self-paced learning. Others felt prepared and noted that interactive, hands-on opportunities allowed them to gain familiarity with MyNCWIC. Staff appreciated the open lines of communication with NC WIC, support from IT staff, and discussions with colleagues; these experiences and interactions allowed them to feel comfortable using MyNCWIC. Staff acknowledged the user-friendliness, simplicity, and capacity of MyNCWIC to upload documents and considered it critical to boost client engagement.

Overall staff satisfaction with offering services through MyNCWIC and TWSC was high; staff also noted that offering telehealth services reduced the cost of contracting services at understaffed agencies. Mean scores for four of the six feasibility indicators were indicative of

low to moderate feasibility; staff emphasized the need for reliable technological infrastructure and client comfort with, and access to, reliable Internet services as factors that drove uptake by staff and clients.

Before the COVID-19 pandemic, nearly half the staff traveled to other WIC clinics and spent more than 15 minutes traveling. The startup cost to offer telehealth services was $1,079,412, of which about 79 percent was spent on contracted services and about 18 percent was spent on labor. Based on monthly caseload data, it would take NC about 21 months to recoup the investment in the telehealth solution. In month 8 of the telehealth intervention, mean cost per enrollment had increased in intervention and comparison agencies, and the increase was smaller in the intervention agencies (from $27 to $36) than in comparison agencies (from $26 to $42).

5.2 Client Experience and Outcomes

In general, most Client Survey respondents had a computer and smartphone at home and were confident or somewhat confident about using technology. Survey findings indicate a high level of acceptability to receiving telehealth services among respondents from intervention agencies. Respondents also expressed a preference to continue receiving WIC services the same way for their next appointment. Client survey respondents found MyNCWIC easy to access and simple to use; those who used the video capability through Google Meet also found it easy to talk with and see the WIC nutrition educator.

Satisfaction scores were comparable for respondents in the full intervention, TWSC only, and comparison agencies. Following their WIC appointment, intent-to-change dietary behaviors was comparable for survey respondents in the full intervention, TWSC only, and comparison agencies. However, mean scores for “lessons will help me choose nutritious foods for me or my family” were higher for respondents from the full intervention (MyNCWIC, Google Meet, TWSC) than for those from the comparison agencies. Overall, rates of breastfeeding initiation and exclusive breastfeeding were comparable across full intervention, TWSC-only, and comparison agencies.

5.3 Lessons Learned

Development of a new telehealth solution is an iterative process and may take longer than initially planned. NC WIC encountered several delays due to unforeseen external forces (COVID-19, infant formula shortage, reorganization in the NC Department of Health and Human Services). These factors impacted the capacity and timelines at NC WIC and its telehealth vendor, GCOM, and increased the development timeline.

Despite challenges experienced in getting solutions up and running, telehealth is a viable approach to deliver WIC services to clients. Telehealth services can involve a phone-based appointment. Comprehensive training is essential to preparing staff for providing telehealth services, understanding the logistics of setting up appointments, assisting clients to set up accounts and navigate the resources, and marketing/promoting the use of resources to clients. Staff noted that clients should have flexibility in how they would like to receive WIC services.

High-level staff engagement and support are critical for staff take-up. Staff highlighted the importance of clear communication, IT support, and the ability to discuss issues with colleagues as vital to offering telehealth services. However, staff experienced challenges during implementation, stemming from simultaneous ongoing projects, including transition to a new EBT provider, change in infant formula vendor, and technological disruptions experienced by staff and clients. Despite the technological challenges, staff prefer telehealth appointments and note that telehealth services can help increase client participation as it saves clients time for document submission and reduces or eliminates the barriers to attending in-person appointments. Staff who use the video functionality appreciate the rapport building and connections with the clients, which ultimately lead to better engagement. Similarly, clients who completed an appointment via telehealth prefer to receive services the same way for future appointments.

5.4 Implications

Telehealth is a relatively new approach to providing services to WIC clients, and findings from this evaluation demonstrate the potential of increasing reach, promoting participation, and reducing attrition. The higher level of satisfaction with WIC services among respondents in the intervention agencies demonstrates the feasibility of delivering remote services successfully. Additional studies and evaluations are needed to demonstrate its efficacy, particularly as WIC resumes offering in-person services (i.e., usual care). Understanding and deploying strategies to increase awareness, comfort, and use of telehealth may increase the percentage of appointments kept. The findings from this evaluation suggest that flexibility in providing telehealth services is essential, and ongoing training of staff on the process and promotion of telehealth platform resources may lead to increased use of telehealth.

The findings on the cost of ongoing service delivery should be interpreted with caution. First, to assess changes in service delivery costs associated with telehealth implementation, the pre-implementation period was set to FY2019 (i.e., before the start of the COVID-19 pandemic), because services in intervention and comparison agencies were remote during the height of the pandemic. This resulted in a 3.5-year gap between the study pre-implementation and post-implementation periods. Changes in staffing and reporting systems during this period may have affected the quality of the data reported for the pre-implementation period in intervention and comparison agencies. Other factors and changes in service delivery (beyond implementation of the telehealth solution) may have also affected the costs incurred during the post-implementation period. Most importantly, because of ARPA waivers, comparison agencies continued to offer remote services to their clients during the post-implementation period.

Agency-level costs can also vary for reasons beyond telehealth or traditional delivery models, such as socioeconomic composition of the clients, geographical differences, or provider turnover. For example, agencies that experience higher provider turnover may have higher costs because additional resources are spent on recruiting, hiring, training, and onboarding new staff. Studies with a larger sample size can statistically control for these confounding factors, but this could not be done in this study, which had a limited sample size. Therefore, in addition to

the limitations noted above, the changes in costs among telehealth and comparison agencies may be caused by other factors unrelated to the mode of delivery, such as changes in staffing, the level of services or administrative tasks that agencies are required to provide, and WIC participation.

5.5 Strengths and Limitations

This evaluation has several strengths and limitations. Some of the strengths of the evaluation include the mixed methods design, emphasis on effectiveness and implementation outcomes, large number of participating agencies, and WIC staff and client participation in the evaluation. The evaluation employed a quasi-experimental study design and included staff and clients from 17 agencies, including comparison agencies. Intervention agencies were selected based on the completion of prior telehealth readiness surveys, adequate local agency staffing, willingness to implement telehealth, and support from local-level leadership. Comparison agencies were matched to intervention agencies based on caseload and client characteristics such as race/ethnicity as well as region in the State (urban/rural). In addition, due to available capacity, five local agencies provided TWSC only services; and the evaluation compared outcomes for full intervention (MyNCWIC portal, videoconferencing via Google Meet, and TWSC), TWSC only, and comparison agencies. In the context of understanding client satisfaction and experiences, the client response rate was above the target response rate of 5 to 10 percent. Finally, WIC agencies encountered several challenges during the development and implementation of the telehealth solution; and findings reflect real-world barriers, facilitators, and potential outcomes from using telehealth solution in WIC settings.

This evaluation has several limitations. First, during the COVID-19 pandemic, USDA physical presence waivers followed by ARPA waivers reshaped usual care service delivery and workflow for WIC staff; across all local agencies, phone appointments were available instead of in-person appointments. Thus, the mode of service delivery was MyNCWIC, paired with Google Meet for video-based appointments, or TWSC for the intervention agencies and phone/in-person for the comparison agencies. Second, simultaneous projects, including transition to a new EBT provider, changes to the vendor for infant formula, and technological challenges, also resulted in limited capacity to promote telehealth use to clients in the intervention agencies and likely impacted uptake of telehealth. Finally, the sample sizes for the Staff Survey and interviews were small, and results should be interpreted with caution.

Comparable client-/respondent-level outcomes in the intervention and comparison agencies should not be interpreted as evidence of the absence of improvements. In addition to the similarity in mode of service delivery, it is possible that implementing the intervention in the absence of the COVID-19 pandemic may have produced different results. Additional studies are needed to evaluate the effectiveness of telehealth services compared to in-person appointments, assess factors that affect synchronous use of resources during appointments, and obtain client perspectives on facilitators and barriers to using resources via a telehealth platform.

5.6 Sustainability

NC WIC considers telehealth to be a viable option for providing WIC services to clients. Following the THIS-WIC project, NC rolled out the MyNCWIC portal statewide to 83 additional local agencies. Based on lessons learned from the MyNCWIC pilot, training has been updated to include printed materials and access to hands-on experience in a "practice portal." The rollout phase was from April 1 through June 14, 2024. As of September 2024, 73 out of 85 local agencies (including pilot agencies) have enrolled at least one portal user, with more than 4,500 users statewide. Feedback from WIC staff has been largely positive. The NC WIC Telehealth Workgroup has submitted requests for several portal improvements to the MIS computer vendor for inclusion in future upgrades.

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