Michigan Department of Health and Human Services (MDHHS) WIC Division: Evaluation of WIC Telehealth Service Delivery for High-Risk Clients Using Zoom and ONE Platforms

Final Report

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List of Acronyms

CFIR	Consolidated Framework for Implementation Research
CLC	Certified Lactation Consultant
CI	Confidence Interval
CPA	Competent Professional Authority
ERIC	Expert Recommendations for Implementing Change
FNS	Food and Nutrition Service
HIPAA	Health Insurance Portability and Accountability Act
IBCLC	International Board-Certified Lactation Consultant
IRB	Institutional Review Board
MDHHS	Michigan Department of Health and Human Services
MIS	Management Information System
NCRD	Nutrition Counseling with Registered Dietitian
ONE	Online Nutrition Education
PA	Priority Area
RD	Registered Dietitian
RE-AIM	Reach, Effectiveness, Adoption, Implementation and Maintenance
RFA	Request for Application
SD	Standard Deviation
SE	Standard Error
TA	Technical Assistance
THIS-WIC	USDA/Tufts Telehealth Intervention Strategies for WIC
USDA	United States Department of Agriculture
MI	Michigan
WIC	Supplemental Nutrition Program for Women, Infants, and Children

Terms and Definitions

Term	Definition
Clinics	WIC clinics are locations where WIC clients receive services
Comparison	Local agencies that did not receive the telehealth intervention but where WIC clients had appointments via "usual care" mode
Early phase	First quarter of implementation
Intervention	Local agencies that implemented the telehealth intervention
Late phase	Final quarter of implementation
Local agency	WIC administrative entity that oversees clinics where WIC clients receive services
Open active accounts	ONE accounts activated and in use by the WIC client user
Open inactive accounts	ONE accounts activated but not currently in use by the WIC client user
Pending accounts	ONE accounts created but not yet activated by the WIC client user
Remote	Remote appointments, services, communications, and contacts are those in which a WIC client connects with the WIC clinic from home, work, or some other location rather than in a clinic. In this report, the term "remote" refers to interactions that take place via telehealth, including by video and telephone.
Telehealth	As defined by the U.S. Department of Health and Human Services, telehealth is the use of electronic communication and telecommunications technology to support long-distance clinical healthcare, patient and professional health-related education, public health, and health administration.
Usual care	Standard mode of delivery for WIC appointments. For THIS-WIC, during the COVID-19 pandemic under Federal waivers, usual care in WIC clinics was either telephone-based appointments or in clinic.
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 MIS after 180 days from survey completion date.
WIC Staff Survey respondent	Individuals who consented to participate in the study and responded to the THIS-WIC Staff Survey. These staff delivered nutrition education/breastfeeding support using telehealth at participating sites and agreed to take part in the survey.
WIC staff key informant interview respondent	Individuals who consented to participate in the study and took part in a WIC staff key informant interview. These staff delivered nutrition education/breastfeeding support using telehealth at participating sites and agreed to take part in the interview.
Zoom	Cloud-based peer-to-peer software platform used for video communications and voice calls

Executive Summary

Background

Telehealth has emerged as an integral approach to offering health services because it may offer enhanced access, convenience in scheduling and receiving services, and cost savings. However, factors such as comfort level with digital technology, Internet availability, privacy and security concerns, and accessibility may be barriers to telehealth integration within the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The Consolidated Appropriations Act of 2019 (Public Law 1166) authorized the allocation of $5,000,000 for competitive telehealth grants to (1) supplement the nutrition education and breastfeeding support offered to individuals in the WIC program, and (2) decrease barriers to 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, South Carolina, Vermont, and Wisconsin WIC. This report describes the implementation and evaluation of telehealth services using Zoom and the Online Nutrition Education (ONE®) platform in **Michigan (MI)**.

Project Overview

To offer telehealth services, MI implemented Zoom paired with ONE for appointments with high-risk WIC clients.* The THIS-WIC evaluation in MI assessed the implementation of telehealth services using Zoom and ONE and compared staff-, agency-, and client-level outcomes for intervention (telehealth [Zoom paired with ONE] service delivery) vs. comparison (phone-based or in-person service delivery) agencies. Between January 2022 (Q1/2022) and June 2023 (Q2/2023), eight local agencies offered telehealth services and served as intervention agencies, and nine offered usual care and served as comparison agencies.

Implementation evaluation findings are based on data collected from the MI Management Information System (MIS), state-level Implementation Tracking Tool, metadata from ONE platform, the THIS-WIC Staff Survey, cost tracking data, quarterly staff implementation survey, and key informant interviews. Outcome evaluation findings are based on data collected from MIS, metadata from ONE platform, and the THIS-WIC Client Survey.

* All individuals who receive WIC services at the intervention and comparison clinics involved in the THIS-WIC evaluation and represent the entire local 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 to use the term “WIC client,” whereas other states, including Georgia, prefer “WIC participant.” Because of this and potential confusion with the term “participant” in the context of an evaluation, this report uses the term “client.”

Findings

Client Experience with Telehealth in MI

WIC clients found telehealth appointments to be a highly acceptable approach for receiving WIC services and 96 percent agreed or strongly agreed to the statement, **"I would like to receive services the same way at my next WIC appointment"**(Table ES.1). Client experience with WIC appointments, intent to change dietary behaviors, breastfeeding behaviors, and retention in WIC were comparable among respondents in the intervention and comparison agencies.

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

Statement	N	Strongly Disagree (%)	Disagree (%)	Neither Agree nor Disagree (%)	Agree (%)	Strongly Agree (%)
I would like to receive services the same way at my next WIC appointment.	54	1.9	1.9	0.0	37.0	59.3

Source: THIS-WIC Client Survey, intervention agencies only

Implementation of Telehealth in MI

During implementation, WIC agencies experienced considerable staff turnover related to the COVID-19 pandemic. The infant formula crisis contributed to staff burnout. These major external events resulted in considerable variability in staff capacity to adopt telehealth. Despite these challenges, WIC staff had favorable attitudes toward delivering WIC services via telehealth and perceived that doing so not only aligned the WIC service delivery model with other healthcare providers but also addressed travel, time, cost, and other barriers experienced by clients, ultimately improving client participation, retention, and expanded access to WIC services. Staff highlighted the importance of creating buy-in from clients and offering them support, as most clients were not able to understand the difference between ONE and their existing MYWIC accounts; they also did not recognize that using telehealth did not require them to download an app or take any additional action and perceived it as something special. Staff also noted that client preferences for and comfort should drive the mode of appointment.

Staff noted that the engagement and support of state and local agency staff and a high level of collaboration across all participating agencies, availability of a telehealth liaison to schedule appointments, and ease of using the telehealth platform facilitated the use of the telehealth platform. Staff acceptability of providing WIC services via telehealth improved over time, as evidenced in higher mean scores for interest in using Zoom for future appointments (Table ES.2). Staff who used Zoom described positive experiences with client interaction, rapport building comparable with in-person appointments, and insights into the daily lives of their clients via Zoom. However, staff also described several barriers to successful implementation including need for community outreach and training on marketing telehealth services to clients, lag between training and implementation, ongoing training, time to become familiar with the ONE

resource library, training staff who are first line of contact with clients on promoting telehealth, and navigation challenges due to limited integration of Zoom with MIS.

Table ES.2. Staff Preference to Deliver WIC Services via Telehealth for Future Appointments in MI

Statement[a]	Early[b]	Late[b]	p-value[c]
ONE	N=5	N=2	
I would like to continue using ONE to provide WIC services.	3.40 (1.14)	4.50 (0.71)	0.273
Zoom	N=9	N=6	
I would like to continue using Zoom to provide WIC services.	3.56 (1.59)	4.83 (0.41)	0.079

Source: THIS-WIC Staff Survey

[a] Responses were assessed on a 5-point Likert scale, where 1=Strongly disagree and 5=Strongly agree.
[b] Ordinal data are summarized as mean (standard deviation).
[c] p-values are based on t-test for ordinal data.

Cost of Telehealth in MI

Overall, the startup cost to offer telehealth services was $147,659, of which almost 90 percent was spent on contracted services, to develop training materials and gain access to Zoom as well as the ONE platform for staff at implementation agencies. Mean ongoing service delivery costs per appointment and per enrollment were comparable at intervention and comparison agencies. In comparison agencies, ongoing costs of service delivery decreased from $16 per enrollment during the pre-implementation period to $14 per enrollment at the 12th month of the telehealth solution implementation. Ongoing costs of service delivery in the comparison agencies increased slightly from $14 per enrollment to $15 per enrollment during this time period. Ongoing service delivery costs per appointment decreased from $49 to $40 from pre-implementation to 12th month of the implementation in the intervention agencies but increased from $41 to $44 in the comparison agencies.

Recommendations

WIC staff provided the following recommendations:

- Clients should be provided with the option to schedule appointments in a mode (in-person or virtual) that works best for them.
- Marketing telehealth services to clients is necessary to build client confidence in use and adoption.
- High-level staff engagement and peer support increased staff comfort and use.
- Comprehensive and ongoing training should be provided to prepare staff for providing telehealth services. Depending on the experience of staff, they may need additional time to become familiar with conducting Zoom appointments and for screen sharing relevant nutrition or breastfeeding education materials available on ONE platform.

- Having a telehealth liaison ensures that appointments are completed in the scheduled time with no adverse consequences on subsequent appointments.
- Having an integrated system to schedule and conduct telehealth appointments and document outcomes can facilitate staff adoption and use.
- Expanding the topics and languages of resources available in the telehealth platform will facilitate wider access.

1. Background

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

The Consolidated Appropriations Act of 2019 (Public Law 116-6) authorized the allocation of $5,000,000 for competitive telehealth grants to (1) supplement the nutrition counseling and breastfeeding support offered to individuals in the WIC program, and (2) 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 (RFA) process, state agencies submitted proposals to implement projects focused on one of two Priority Areas (PAs):

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

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

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

In addition, THIS-WIC provided technical assistance to each of the state agencies throughout the study to support the adoption of telehealth and the conduct of the evaluation of their telehealth intervention. The evaluation details how each state implemented telehealth solutions, staff and client experience, and the overall impact on enrollment and retention of clients in WIC. 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, but some aspects of the research design were modified to account for USDA COVID-19 waivers. Specifically, prior to COVID-19, THIS-WIC evaluation

evaluated the impact of delivery of WIC nutrition sessions via telehealth compared to usual care (i.e., in-person appointments). During COVID-19, with physical presence waivers in place, most appointments in intervention agencies and all appointments in comparison agencies were virtual and telephone-based. This report focuses on the implementation and outcomes of telehealth service delivery using Zoom and the Online Nutrition Education (ONE®) platform from January 2022 to June 2023 in MI.

1.1 Need for Telehealth Solution in Michigan

MI WIC provides services through 47 local agencies and 223 clinics. Annual WIC participation in Michigan declined from 213,964 in FY 2018 to 205,364 in FY 2019.[2] In 2022, 84.7 percent of MI WIC families lived below 150 percent of the poverty level. In FY2022, the Michigan WIC program served 218,814 clients: 17,001 pregnant, 13,129 breastfeeding, 13,333 postpartum, 46,105 infants and 129,347 children. Of these, 53,086 clients (23.4%) had a high-risk indication after assessment by WIC staff.[3]

The majority of MI's geographical area is rural; this is reflected in the caseload statistics, with over half of clients residing in rural areas. Telehealth appointments provide an opportunity to increase access, improve engagement, streamline processes, and ultimately improve health outcomes for MI women and children.

MI WIC requires every local agency to have one IBCLC. In some cases, IBCLCs serve multiple clinics including those in rural areas and may also be the local agency RD, thereby stretching provider time thin. The need for an IBCLC appointment is often an immediate need for families. From painful latch to poor milk transfer, these families require quick intervention by an IBCLC to optimize breastfeeding success. Providing telehealth-based appointments can increase client accessibility to IBCLC appointments for timely breastfeeding education and counseling from the comfort of their homes, while reducing travel mileage, cost, and time.

1.2 Telehealth Services and Solution Implementation Plan and Evaluation

To increase access, improve engagement, streamline processes, and ultimately improve health outcomes for MI women and children, MI WIC's telehealth solution involved pairing Zoom, a Health Insurance Portability and Accountability Act (HIPAA) compliant platform, and Nutrition Matters® ONE, an online, mobile-friendly nutrition education platform, for virtual high-risk client appointments. These included clients who had a high-risk nutrition code such as having nutritional deficiencies, gastrointestinal disorders, food allergies, being underweight, and overweight, and those experiencing breastfeeding-related issues.

The MI State agency team worked with the Michigan Public Health Institute's Center for Strategic Health Partnerships to support and train local agency staff in using telehealth services. The Center for Strategic Health Partnerships worked with the regional Telehealth Resource Center and developed training materials including live and recorded webinars and videos. The Center for Strategic Health Partnerships also attended initial telehealth sessions to troubleshoot

issues and update training materials. Training materials developed for MI's project can be viewed on the THIS-WIC website (https://thiswic.nutrition.tufts.edu/).

1.2.1 Implementation of Telehealth Appointments

After determining that the client needed Nutrition Counseling with a Registered Dietitian (NCRD) or lactation support with an IBCLC, the client was offered the opportunity to schedule a telehealth appointment. Clients who agreed to a telehealth appointment received education materials developed by the Michigan Public Health Institute regarding telehealth. A trained telehealth liaison contacted clients before their first virtual appointment to schedule a telehealth orientation, assist clients with a trial to use the Zoom platform, address technical issues, ease client concerns, and enroll them in ONE. The telehealth liaison also worked to ensure clients had the Zoom link prior to the appointment, calling or texting with reminders 3 days and 1 day before the scheduled appointment. Staff used the on-demand messaging feature in MIS to text the client an appointment reminder and used email or direct text from phone to share the link to the Zoom telehealth appointment. Between January 2022 and June 2023, clients were offered telehealth services via Zoom once or twice, with the majority interacting once with the solution over the year.

During telehealth appointments, local agency staff shared relevant nutrition or breastfeeding resources from the ONE platform with clients. If the client used the Zoom platform for their appointments, the client was able to see the materials from the ONE platform during the session. Staff were required to video-share with the client while the client determined their willingness and capability to video-share (and be seen). For IBCLC appointments, if necessary and feasible, staff observed feeding, and clients were informed of this prior to the appointment with a reminder that WIC was using the Zoom platform for the clients' security. The IBCLC also made a follow-up in-clinic appointment if a full assessment could not be completed via telehealth.

During the appointment, WIC staff encouraged clients to log into ONE to access nutrition resources. Clients could access a library of nutrition articles, recipes, and classes on demand. These online resources reinforced the counseling provided at telehealth appointments. In instances when clients did not "show" for scheduled telehealth, staff attempted to reach them by phone. If staff made telephone contact with the client and if the client was able to keep the telehealth appointment, staff completed these by phone or Zoom. If the client was not able to keep the appointment, staff rescheduled these for a later date. At the end of each appointment, staff issued WIC benefits and scheduled a follow-up appointment.

2. Project Methods

MI WIC's telehealth intervention was evaluated over 18 months (January 2022 through June 2023) using a non-randomized design. THIS-WIC sought to examine whether the use of Zoom, paired with ONE, increased access to WIC services and reduced costs while increasing or maintaining client satisfaction and other outcomes. 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. See **Appendix MI.1** for more details and the model.

2.1 Research Questions

THIS-WIC examined several research questions to understand the implementation and outcomes of telehealth services through Zoom and ONE among high-risk WIC clients (**Table 2.1**). These research questions also informed whether telehealth 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 MI State agency to understand changes to usual practices during implementation (e.g., offering telephone-based appointments as "usual care"). THIS-WIC worked with the MI State agency to develop implementation tracking tools to document and understand service delivery in intervention and comparison agencies throughout the evaluation period.

Table 2.1 Staff-, Agency-, and Client-Level Research Questions in MI

Staff and Local 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? ▪ How did rates of breastfeeding initiation and duration differ among those in the intervention and comparison agencies? ▪ What was the food benefit redemption among those in the intervention and comparison agencies? ▪ What was the client retention rate among those in the intervention and comparison agencies?

2.2 WIC Agencies Participating in THIS-WIC Evaluation

MI selected local agencies to implement the telehealth solution based on prior documented challenges of retaining qualified professionals. MI also factored in the RD/IBCLC staff-to-client ratio, barriers to WIC services, and current health outcome disparities in local agencies across the state while selecting intervention agencies. MI matched intervention agencies (n=9) with comparisons agencies (n=8) with regards to caseload and client characteristics such as race/ethnicity. During implementation, one of the nine intervention agencies withdrew from the project; the remaining eight agencies planned to deliver services via telehealth, whereas the eight comparison agencies offered usual care appointments. **Appendix MI.1** lists the local agencies involved in the evaluation.

2.3 Data Sources for THIS-WIC Evaluation

This study leveraged new and existing quantitative and qualitative data to assess processes and outcomes. The data sources included (1) Management Information System (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 MI.1** lists the lead for developing and collecting these data.

2.3.1 Management Information System Data

MI's WIC MIS included administrative data at two levels: the microlevel (individual-level MIS data from WIC clients/clients who completed the THIS-WIC survey) and macrolevel (aggregate MIS data from all clients at participating local agencies). See **Appendix MI.2** for the list of MIS data provided by MI.

2.3.2 ONE Metadata

The ONE administrative platform captured aggregate data at the clinic level for counts of client activity status (pending, open active, open inactive, closed users) lessons completed, tools shared and viewed, articles viewed, and recipes viewed and shared by staff, and viewed and favorited by WIC clients. These data were used to understand WIC staff and client engagement with ONE. See **Appendix MI.2** for the ONE metadata variables provided by MI.

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 survey was developed using existing valid/reliable tools[5-19]; MI reviewed the survey to ensure that it captured key aspects of their telehealth solutions, that it had a low respondent burden and easy-to-follow format, and that the literacy level was appropriate for the WIC clients they served. The survey was pilot 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 10 minutes. The findings from the pilot testing were used to clarify wording and improve navigability. The final Client Survey included 37 questions; clients who declined telehealth services were asked an additional question to understand reasons for declining telehealth services. The survey was translated into universal Spanish. The expected respondent burden was 10 minutes. See **Appendix MI.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). A research survey methodologist reviewed the Staff Survey to ensure comprehension and readability. The final staff English language survey included 28 questions, with branching logic to display certain questions based on response choice selection (e.g., whether staff indicated that they provided nutrition education, breastfeeding support, or both via telehealth) and the average completion time was 15 minutes. See **Appendix MI.3** for the Staff Survey.

2.3.4 Staff Key Informant Interviews

Local WIC agency staff implementing telehealth were invited to participate in THIS-WIC led key informant interviews. The interview guides were developed by THIS-WIC in collaboration with the state agencies; the questions were informed by the implementation frameworks of Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM)[27] and Consolidated Framework for Implementation Research (CFIR)[28] and assessed key implementation aspects such as relative advantage, compatibility, complexity, and trialability. Interview findings were used to understand the diffusion of telehealth solutions, activities undertaken to ensure successful implementation, and modifications to workflow to address challenges. 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. The interviews were scheduled for 60 minutes. See **Appendix MI.3** for the discussion guide for the staff and director interviews.

2.3.5 Telehealth Solution Implementation Data

Telehealth implementation data was obtained from two sources: a 46-item Implementation Tracking Tool completed by the WI WIC State agency project team in the early, mid, and late phase of implementation and a staff implementation survey fielded to local agency staff quarterly during the intervention.

2.3.5.1 Implementation Tracking Tool

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

2.3.5.2 Quarterly Staff Implementation Survey

The MI WIC State agency developed a 19-item survey to track implementation of ONE and Zoom use by staff at intervention agencies. Surveys were distributed quarterly to local agency staff via SurveyMonkey and included questions about staff perceptions of length of appointments, client engagement, and barriers to clients using Zoom. See **Appendix MI.3** for the survey.

2.3.6 Telehealth Solution Startup and Ongoing Implementation Cost Data

THIS-WIC collected startup cost data from the intervention agencies and ongoing costs from intervention and comparison agencies. Examples of startup costs included purchase of videoconference software license/app development; purchase of new equipment; and staff training. Ongoing costs are those required to deliver nutrition education and breastfeeding services. For intervention agencies that implemented ONE and Zoom, ongoing costs for the period after the intervention was implemented included annual costs related to maintaining the telehealth solution (e.g., ongoing training, licensure, administrative time). See **Appendix MI.3** for the startup and ongoing cost tracking tools.

2.4 Data Collection for Telehealth Solution Evaluation

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

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

2.4.1 Management Information System Data

At the study's onset, MI provided microlevel MIS data weekly, to orient study staff with the data fields and review data quality and integrity. After processes were established, MI provided these

microlevel data monthly for the rest of the study. MI also provided macrolevel MIS data quarterly for all intervention and comparison agencies.

2.4.2 Telehealth Solution Metadata

MI provided deidentified telehealth metadata on ONE usage for intervention agencies. These data were captured at each local intervention agency and were collected directly in ONE and shared with THIS-WIC team as Microsoft Excel format files for the intervention period.

2.4.3 Client and Staff Surveys

2.4.3.1 Client Survey

MI used SurveyMonkey Enterprise (SurveyMonkey, San Mateo, CA), a secure, web-based survey platform, to program and administer the Client Survey. Clients at both intervention and comparison agencies were invited to complete the survey. After completing an eligible appointment, WIC clients received a survey link through MI's on-demand text message platform via MIS. Due to precedent and policies, an incentive to participate in the survey was not provided at the start of the evaluation period (January 2022). However, due to low completion rates, the MI State agency team and Tufts University worked collaboratively to identify a way to provide a survey incentive. Participants were eligible to be entered into a monthly drawing to receive one of four $25 Walmart gift cards. This incentive was offered between February 2023 and the end of the evaluation period.

2.4.3.2 Staff Survey

Michigan provided a list of eligible staff (n=42) (i.e., those who were responsible for delivering high-risk nutrition counseling and/or breastfeeding support at intervention agencies), and their email address to THIS-WIC. THIS-WIC sent an invitational email with a link to the Staff Survey to all eligible staff. In MI, the Staff Survey was distributed electronically through Qualtrics (Qualtrics, Seattle, WA) three times during the intervention, once in the first quarter after implementation began (early phase), a second timepoint shortly after the first quarter for staff that did not have the opportunity to use the telehealth solution during the first quarter (e.g., low client uptake of solution), and finally in the last quarter of project implementation (late phase). Up to two reminders were sent via email to eligible staff who did not complete a survey, and reminders were sent at 1 week and 2 weeks following the initial outreach. Incentives were not provided to WIC staff for completion of 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 (first and last quarter of the project implementation period). The interviews were scheduled for 1 hour and audio recorded digitally. Incentives were not provided to WIC staff for completion of key informant interviews, 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 startup (pre-implementation), midway, and endpoint or late phase of implementation and staff implementation surveys sent quarterly during the implementation period by the MI State agency team to WIC staff implementing telehealth.

2.4.6 Telehealth Solution Startup and Ongoing Implementation Cost Data

For startup costs, THIS-WIC extracted data from original project budgets provided by the MI Stage agency 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 followed up with MI State agency staff to obtain missing data and clarify cost-related questions, and updated the cost tracking tools to ensure all costs were captured prior to analysis. This information included program implementation and evaluation for staff members and other resources, identified in-kind staff and resources not listed in budgets, and details on the services provided in contracts.

For ongoing costs of delivering services, the MI State agency completed an Excel-based cost collection tool reporting on the resources used to provide services in 1 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 appointments and enrollments to generate the cost per appointment and enrollment. THIS-WIC collected costs for a typical month prior to telehealth implementation for fiscal year 2019 (initial) and an average of the first 6 months (midpoint) and last 6 months (endpoint) of implementation. Given MI's financial system reporting, the midpoint and endpoint costs were reported over a single month rather than an average across a 6-month period. However, staff indicated that the reported monthly costs were representative of an average month in the last 6-month period. THIS-WIC reviewed completed cost instruments submitted by the MI State agency to ensure correct and reasonable data entries and conducted follow-up to resolve data issues.

2.5 Sample Description for THIS-WIC Evaluation

Primary data were collected from the Client and Staff Surveys. Key informant interviews were also conducted with WIC staff.

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

High-risk WIC clients who received nutrition counseling or breastfeeding support during a virtual appointment were eligible to take part in the evaluation. Respondents had to be 18 years of age or older, 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 5 and 10 percent response rate (typical for online surveys), the number of target surveys completed were 1,056 and 2,102, respectively.

Following their WIC appointment, 13,550 clients were invited, and 1.86 percent consented to complete the survey. Of those who consented, 100 percent completed the survey and 74.3 percent were successfully linked with the MIS identifier. Survey response rates include respondents who declined Zoom appointments (n=63).

Of the 230 survey respondents, 122 (53%) were in intervention agencies and 108 (47%) were in comparison agencies. Approximately half of the respondents (49.7%) were between 26 and 35 years of age. About 60 percent of respondents had some high school education (grades 9 to 12) and 37.2 percent had completed some college (1 to 5 years). Respondents were primarily non-Hispanic White (45.2%) and almost 36 percent identified as non-Hispanic Black/African American. Overall, 10 percent of respondents identified as Hispanic/Latino. The comparison agencies included a higher proportion of non-Hispanic White compared to the intervention agencies (56.5% vs. 34.4%) and a lower proportion of non-Hispanic Black/African American respondents (25% vs. 45.8%). Overall, 96 percent of respondents reported the use of English at home (written). Overall, about 45 percent of respondents lived in a rural area, about 40 percent lived in an urban area, and the remaining 15 percent lived in a suburban area. Respondent and household characteristics did not differ significantly for comparison and intervention agencies.

The median household size for respondents in the intervention and comparison agencies was three members and four members, respectively. The median annual household income of $10,600 for intervention agencies was slightly lower than the median annual household income of $12,000 for comparison agencies. Slightly less than half of respondents had received WIC services for less than a year and about a third of respondents had received WIC services for more than 3 years. About 82 percent of respondents had a high-risk WIC participant in their household.

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

2.5.2 Staff Survey Sample Size, Response Rate and Respondent Characteristics

All WIC staff and administrators involved in the delivery of nutrition or breastfeeding counseling services for high-risk WIC clients at intervention agencies were invited to complete the Staff Survey. Thirty unique staff members completed the survey at each round. The number of staff invited and the number of staff who completed the early phase survey was 42 and 27, respectively (64.2% response rate). The number of staff invited and the number of staff who completed the late phase survey was 40 and 19, respectively (47.5% response rate). Since WIC agencies experienced staff turnover, the same survey was administered in the early and late phases.

Respondents in the early and late phases were comparable in age, ethnicity, role at WIC, and travel to other WIC clinics. WIC staff were primarily RDs and IBCLCs. See **Appendix MI.1** for sample size and characteristics of Staff Survey respondents at early and late phases.

2.5.3 Staff Key Informant Interviews Sample Size and Response Rate

In the early phase, all staff who completed the Staff Survey and indicated they had used telehealth were invited to participate in the key informant interviews. Due to low response rate to the Staff Survey and key informant interviews in the early phase, in the late phase all staff who used the telehealth solution for high-risk nutrition appointments or breastfeeding support were invited to the key informant interview, regardless of their survey completion status. Study liaisons participated in the late phase interviews. The response rate for staff interviews was 28.6 percent in the early phase and 38.1 percent in the late phase. See **Appendix MI.1** for the sample size and response at each agency.

2.6 Analytic Approach

2.6.1 Aggregate MIS Analysis

For MI, WIC administrative data included WIC client characteristics, certification information, nutrition and risk assessment, nutrition education, and WIC food benefit redemption. MI also linked the Client Survey identified with the client-level MIS data. Aggregate MIS data were also used to examine agency-level trends in breastfeeding initiation and exclusive breastfeeding for the intervention and comparison agencies. Descriptive analyses were used to analyze the data and present the findings. All analyses were conducted in SAS 9.4. Crosstabulations and chi-square statistics were used to examine the differences between intervention and comparison agencies. See **Appendix MI.1** for details.

2.6.2 ONE Metadata

Metadata on telehealth solution usage were captured by the ONE software platform for each participating local agency. This included data on the number of pending, open active, open inactive, and closed accounts, resources shared by staff and viewed by clients, and the number of recipes accessed by clients. MI State agency staff collected and provided data to THIS-WIC. Descriptive analyses were used to examine counts of resources used during telehealth implementation. All analyses were conducted in Excel (version 2308).

2.6.3 Client and Staff Surveys

2.6.3.1 Client Survey

The client outcomes evaluation examines the experiences of WIC participants who received WIC services and completed the Client Survey in one of the WIC clinics associated with the 13 local agencies in the study between Q1/2022 and Q2/2023; one agency withdrew after implementation began and surveys from three additional agencies were excluded from the analysis because fewer than five clients completed surveys. Descriptive statistics include respondent and household demographics, availability and comfort with technology, and

behaviors and attitudes toward telehealth intervention. Crosstabulations were used to examine categorical variables and the proportion among those who provided data is presented; missing values were excluded from the analysis. Descriptive analyses were undertaken to examine continuous variables; because the data on household income and household size were skewed, median and interquartile range (25th percentile–75th percentile) are reported. Significance tests compare respondent demographics and household characteristics, availability and comfort with technology, and behaviors and attitudes toward the telehealth intervention between respondents in the intervention and comparison agencies. For categorical variables, chi-square tests for independence are presented. For continuous variables, the median test was used which examines whether the two samples come from the same population. This was done by assessing the distribution of sample scores around the median instead of comparing the actual median values. Analyses to assess client-level outcomes (satisfaction, barriers, and behavior change intentions) employed unadjusted hierarchical linear regression models comparing differences in means for intervention and comparison agencies. An adjusted model was attempted for satisfaction but was not possible because none of the demographic/household variables demonstrated statistically significant differences between intervention and comparison agencies. See **Appendix MI.1** for details.

2.6.3.2 Staff Survey

Descriptive analyses were undertaken to examine the Staff Survey data. For categorical and ordinal outcomes, chi-square tests were performed to examine differences in responses from early to late phase surveys. For ordinal/continuous outcomes, independent t-tests were performed to examine mean differences. Out of the 45 total responses, 26 were submitted in the early phase and 19 in the late phase; 14 staff completed both early and late phase surveys. Due to the low count of repeated responses, the data were analyzed cross-sectionally, and treated independently. All analyses were conducted in Stata 18 (StataCorp LLC, College Station, TX, USA).

2.6.3.3 Staff Implementation Survey

Descriptive analyses were used to examine the staff implementation survey data. Survey responses for each item are presented at the quarterly level. All analyses were conducted in Excel (version 2308).

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 actual dialogue spoken by listening to the audio recording. Before undertaking analysis, three THIS-WIC team members created a preliminary codebook, with codes deductively informed primarily by the Consolidated Framework for Implementation Science Research (CFIR)[28] and the Evaluation Framework for Telemedicine.[31] 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 of establishing interrater reliability are provided in the technical appendix (**Appendix MI.1**).

2.6.5 Telehealth Implementation

The analysis of the Implementation Tracking Tool involved tabulating the startup, midpoint, and endpoint status for each strategy to assess change. The startup measures were considered the implementation plan, and the change from startup to midpoint and endpoint measures were considered indicative of 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 MI.1** for details.

2.6.6 Telehealth Solution Startup and Ongoing Cost Analysis

Cost analysis was conducted to understand the (1) startup cost, (2) ongoing service delivery cost, and (3) ongoing cost per enrollment and appointment. Due to understaffing, one site transferred all its clients to a different provider and was therefore excluded from the ongoing service delivery cost analysis. All costs were adjusted to 2023 dollars using the Consumer Price Index. All analyses were completed in Excel (version 2308) and Stata 18. See **Appendix MI.1** for details.

3. Results: Telehealth Solution Implementation in Michigan

Between Q1/2022 and Q2/2023 (January 2022 through June 2023), 17 local agencies (eight intervention and nine comparison agencies) participated in the 18-month evaluation. This chapter presents implementation outcomes (process and cost). Data sources for findings included in this chapter include the Staff Survey, staff key informant interviews, telehealth metadata, implementation data, and startup and ongoing cost data. Chapter 4 presents impact and intermediate outcomes.

3.1 Telehealth Appointments Offered and Completed by WIC Staff

As seen in **Table 3.1**, in any given quarter, over 90 percent of staff at intervention agencies offered appointments for nutrition education; the percentage of staff offering breastfeeding support appointments ranged from 22.73 percent to 50 percent. The frequency of always offering telehealth appointments ranged from 30 percent to 65 percent, and 70 percent or more staff completed their scheduled appointments via telehealth. Reasons for these differences were not explored.

Table 3.1. Type and Frequency of Telehealth Appointments Provided by Staff Implementation Survey Respondents in MI

Type and Frequency of Telehealth Appointments	Q2/2022	Q3/2022	Q4/2022	Q1/2023	Q2/2023
	%				
Type of appointment	N=15	N=16	N=22	N=42	N=5
NCRD	93.33	93.75	90.91	95.24	100.00
IBCLC	33.33	31.25	22.73	30.95	50.00
Frequency of telehealth/Zoom appointments offered	N=14	N=16	N=20	N=41	N=10
Always	50.00	62.50	65.00	58.54	30.00
Most of the time	35.71	25.00	25.00	26.83	20.00
Sometimes	7.14	6.25	5.00	7.32	30.00
Rarely	0.00	6.25	0.00	2.44	0.00
Never	0.00	0.00	0.00	0.00	0.00
Other	7.14	0.00	5.00	4.88	20.00
Completed a telehealth appointment?	N=16	N=16	N=20	N=42	N=10
Yes	75.00	87.50	80.00	78.57	70.00

Source: Staff implementation survey, intervention agencies only

Survey was fielded in the following months: June 2022: Q2/2022, Sept 2022: Q3/2022; Jan 2023 Q4/2023; Apr 2023: Q1/2024; June 2023: Q2/2023

3.2 Attitudes Toward Telehealth

WIC staff perceived using telehealth services to be advantageous because it allowed for personalizing interactions, enhanced nutrition education through use of visual aids, and made it convenient for clients to receive WIC services (*CFIR constructs*: innovation advantage, outer setting, inner setting, and characteristics of individuals)*. Statements centered around making WIC services more accessible to the clients by eliminating the need for physical travel or altering their schedules significantly. Staff also noted that offering telehealth services increases program reach particularly in rural areas where resources are limited and in winter months, when travel may not be feasible. Staff felt that offering telehealth services simplified scheduling and was critical to ensuring that clients had access to reliable information at their own pace and time. Some staff did express a desire to have in-person appointments as an option to ensure that services are provided to clients (particularly grandparents) who lack access to technology, are not familiar with or have reservations about using the Internet, need additional support to complete a telehealth appointment, or simply prefer in-person appointments.

> *"It has helped our services to be more equitable because most people again have a phone, but they don't have transportation. So you know, they could get on the Zoom and do the appointment via Zoom, where like getting there is not always easy." [Staff participant 2]*
>
> *"We did have a few appointments where we specifically scheduled them for a participant's, you know, lunch break. So they didn't have to, you know take PTO (to) come to the office at a time of their appointment." [Staff participant 41]*
>
> *"People do have a lot of trouble getting to the office, so to be able to offer an appointment remotely which they might not like they might just refuse an RD appointment altogether if they had to come to the office. To be able to reach those people is wonderful." [Staff participant 3]*
>
> *"Well with our families that live in our rural community, not having to travel, not having to drive in the winter, helping with cost, whether it's date, you know, finding a babysitter, having somebody taking your child somewhere else, so that you can come here to an appointment has definitely, you know, kind of helped reduce that barrier." [Staff participant 4]*
>
> *"So that's been very helpful, like...being able to meet families where they are especially in our rural area, so that they don't have the transportation and time barriers." [Staff participant 4]*
>
> *"Some people may not want to use them and that's what we have experienced. Some of them are afraid of the Internet and don't have Internet so." [Staff participant 20]*
>
> *"Lot of them don't have transportation... We have no taxi cabs. We have no Lyft, no Uber..." [Staff participant 2]*

* 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.

> *"We have clinics, and you know, in the countryside, where there's more agriculture and the service of the internet is limited there, and if they have it it's not the greatest so, for instance, even in our clinic [telehealth solution], sometimes clients don't have reception." [Staff participant 20]*

Staff noted that offering telehealth appointments has provided clients the flexibility of scheduling appointments (i.e., not constrained by their work or daily routine, childcare responsibilities, and clinic schedule), resulting in more appointments kept and more clients retained in the program. Staff commented that their show-rates for telehealth are about 10 percent better than for in-person appointments. Staff also discussed improvements in retention rates stemming from lower cancellation rates for telehealth appointments.

> *"I have a report here that of my appointments 68 percent of my appointments were showed for my telehealth versus 57 percent, for in-person, so I thought that was interesting. that people were more likely to show for their telehealth appointments. So that's obviously improved. I think that's improving experiences. If they're more likely they're less likely to miss appointments because they can do them over Zoom that's wonderful. because yeah, it's we're always hitting about 50 percent, for in-person show right? Like, right around there. So, to see it's 68% is really nice. It'd be great if it were higher. But I think that's more than half is great. So yeah, I think that's been really cool to see." [Staff participant 3]*
>
> *"I love that we have that option because I can be more flexible. I had a client just a couple of days ago that I was on the phone with, because she had missed an appointment to come in to see me. And so, I had said, you know we can do it over, Zoom, if that's more convenient. And she really appreciated that. So, I appreciate the flexibility." [Staff participant 4]*
>
> *"Especially if it's a mother with more than one child to be able to come up with like I do, put my dogs, you know, find a babysitter somewhat something, you know nap time, whatever it is. They can actually keep an appointment." [Staff participant 30]*
>
> *"I feel like it's been very successful. I mean, I guess I haven't seen any of this client surveys, and I can't speak to numbers, but I would think that for some families, if they didn't have ONE they may not have kept an appointment to receive their education. So being able to have that as an option for families that choose it has been very important to us, being able to provide that education." [Staff participant 4]*

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 (see **Table 3.2**).

Table 3.2. Staff Attitudes Toward Usefulness of Telehealth in MI

Statement[a]	Early N=9 Mean (SD)	Late N=8 Mean (SD)	p-value[b]
Telehealth is useful in promoting health equity among my WIC participants.	3.44 (1.51)	4.63 (0.74)	0.064
Telehealth should be a part of all WIC organization's health equity strategies.	3.56 (1.42)	4.50 (1.07)	0.147

Source: THIS-WIC Staff Survey

[a] Responses were assessed on a 5-point Likert scale, where 1=Strongly disagree and 5=Strongly agree.
[b] All p-values are based on linear regression; due to small sample size, it was not possible to control for repeated measurements at individual level.

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 in the early, midpoint, and endpoint of telehealth implementation, (2) responses to the Staff Survey in the early and late phases, and (3) key informant interviews with WIC administrators and staff in the early and late phases.

3.3.1 Telehealth Implementation Strategies

At startup, MI selected 21 strategies for implementation and had implemented 5 of these strategies. MI also implemented 3 strategies that were not selected at startup (see **Table 3.3**). By the endpoint they had conducted small tests of change and purposely reexamined implementation. They centralized technical assistance, promoted adaptability, and tailored strategies to the implementation context. By endpoint, MI had conducted local census discussions, captured and shared local knowledge, and identified early adopters. MI also implemented some strategies to train and educate stakeholders, to enhance client uptake and adherence, and to change infrastructure including changing record systems and changing the physical structure and equipment. See **Appendix MI.4** for details.

Table 3.3. Planned and Implemented Strategies by Categories in MI

Category	Number of Strategies				
	In category	Planned to implement at startup[a]	Implemented at		
			Startup	Midpoint	Endpoint
1. Use evaluative and iterative strategies	9	4	2	5	5
2. Provide interactive assistance	2	1	1	2	2
3. Adapt and tailor to context	4	2	0	2	2
4. Develop stakeholder interrelationships	13	3	1	4	4
5. Train and educate stakeholders	7	6	0	6	6
6. Support clinicians	5	1	1	2	2
7. Engage consumers	2	2	0	1	1
8. Change infrastructure	4	2	0	2	2
TOTAL	46	21	5	24	24

Source: Implementation Tracking Tool

[a] Reports the count of the number of strategies that MI indicated at startup that they planned to implement.

3.3.2 Staff Training and Frequency of Telehealth Use, and Mode Preference

In the early phase, about 78 percent of WIC staff noted that they had prior experience with delivering telehealth services and in the late phase, about 67 percent did so (**Table 3.4**). MI State agency provided training to all local agency staff at the intervention agencies. Initial training on Zoom and ONE was conducted in Q3/2021 and Q4/2021 (summer/fall 2021) with check-ins and refresher trainings offered in Q4/2021 and Q1/2022. In the early phase, two-thirds of the staff reported receiving 2 to less than 5 hours of training and in the late phase, a similar proportion of staff reported receiving 6 to less than 8 hours of training. Variations in training reflect staff attendance at ongoing trainings; those reporting fewer hours may be in the process of being trained. Although the mode preference for delivery of nutrition education did not differ significantly in the early and late phases, the frequency of using ONE for nutrition counseling was significantly different in the early and late phases. In the early phase, all Staff Survey respondents used the telehealth solution every other month; in the late phase, all respondents used it weekly. There were no significant differences in Zoom use for nutrition education. Finally, only two respondents used Zoom for breastfeeding education in the early phase and none used it in the late phase.

Table 3.4. Telehealth Training Duration and Frequency of Use in Early and Late Phases in MI

Variables	Early	Late	p-value[a]
	%		
Prior telehealth experience	N=7	N=4	0.634
Yes	77.8	66.7	
Hours of training	N=8	N=6	0.118
0 to <2 hours	0.0	16.7	
2 to <5 hours	66.7	16.7	
4 to <6 hours	22.2	66.7	
6 to <8 hours	0.0	0.0	
8 or more hours	0.0	0.0	
WIC appointment mode preference (Nutrition)	N=6	N=5	0.558
In-person	50.0	80.0	
Phone	16.7	20.0	
Zoom only	16.7	0.0	
Zoom/ONE combined	16.7	0.0	
Frequency of ONE use (Nutrition)	N=5	N=2	0.008*
Daily	0.0	0.0	
Weekly	0.0	100.0	
Monthly	0.0	0.0	
Every other month	100	0.0	
Frequency of Zoom use (Nutrition)	N=9	N=8	0.312
Daily	0.0	0.0	
Weekly	66.7	87.5	
Monthly	33.3	12.5	
Every other month	0.0	0.0	
WIC appointment mode preference (Breastfeeding)	N=2	N=0	—[b]
In person	50.0	NA	
Zoom only	50.0	NA	
Frequency of ONE solution use (Breastfeeding)	N=0	N=0	—[b]
Daily	NA	NA	
Weekly	NA	NA	
Monthly	NA	NA	
Every other month	NA	NA	
Frequency of Zoom solution use (Breastfeeding)	N=2	N=0	—[b]
Daily	0.0	NA	
Weekly	0.0	NA	
Monthly	100.0	NA	
Every other month	0.0	NA	

Source: THIS-WIC Staff Survey
[a] p-values are based on chi-square tests.
[b] No inferential test results due to no variability in the responses.
*p<0.05.

Key informant interviews also provided insights into the initial and ongoing training offered to staff. In general, staff considered training to be critical to gaining an understanding of the platform, increasing their familiarity as well as comfort level with the platform. In both early and late phase interviews, staff noted several effective components of training include the interactive, hands-on opportunity; and ability to gain familiarity before going live; and routine check-in meetings to ask questions, hear about experiences of other staff members, and hear solutions to challenges. Staff appreciated having videos and the handouts/guides as references and used these to gain familiarity with the solution following the training.

> *"I like the handouts and that they know, like for the ONE platform that they actually like walk through it with us, you know, besides just us doing the training on our own." [Staff participant 2]*
>
> *"As far as like the <telehealth solution> one you know the role playing was really good so that way it just kind of put it in perspective, like how to do and what was you know." [Staff participant 2]*
>
> *"It could be beneficial for a number of our staff and kind of etiquette, you know, as far as like, I'm a bad example, because I have a very busy background but you know to make sure that families can see my face, that I'm in an area where they can hear me clearly, asking them, you know, "Do you feel comfortable talking where you are," and then what to do if we do get disconnected. Which are, you know, honestly things that I probably would not have thought about, so that training was very helpful and was definitely needed." [Staff participant 4]*

In the early phase interviews, staff noted that the training occurred much before implementation. Although staff appreciated the time to become familiar with the platform, they also noted this as an ineffective component of training as they had to do a refresher prior to launch. Some staff also discussed that the training covered a lot of materials, and they would have preferred several sessions to fully understand the nuances of using the system and the content. Staff also discussed the need to be trained and become familiar with the client view of the solution, to support their clients when they experience challenges.

> *"I think, like I said, maybe just the training was a little farther out from when we were starting and so you know, maybe lost a little bit in the meantime." [Staff participant 2]*
>
> *"The trainings all were like you know before Christmas, like they were like they I want to say our last one was in November, and I did my first actual appointment like that I think it was like the middle of January so it wasn't quite as fresh as what I would have liked it to be." [Staff participant 2]*
>
> *"There was some concerns with how to create the invitation because instructions here gave steps I couldn't see on the screen in, in my ONE account I said initially I have to watch a video, because There was one step, there was that I couldn't see on my side, and neither my boss could see so we were kind of confused of creating that first appointment that we did it." [Staff participant 20]*

Staff recommendations for training were around the challenges they encountered. For example, some staff recommended incorporating demonstrations or role plays to understand both sides of the staff-client interaction. Some respondents also recommended having the opportunity to try the system following the training and asking questions in real time.

> *"So I would suggest that it's important to practice ahead of time and that maybe there's like a ghost account that clinics can use…" [Staff participant 20]*

3.4 Satisfaction with Telehealth Solution

As seen in **Table 3.5**, there was no difference in staff satisfaction with ONE or Zoom over time. However, staff were somewhat more receptive to using ONE in the late phase than in the early phase.

Table 3.5. Satisfaction with Telehealth in Early and Late Phases among Staff Survey Respondents in MI

Statement[a]	Early[b] N=26	Late[b] N=19	p-value[c]
ONE			
Overall, I am satisfied with ONE.	3.60 (0.89)	4.00 (0.00)	0.576
I prefer WIC appointment with ONE over WIC appointments that are in person.	1.20 (0.45)	2.50 (0.71)	0.029*
Zoom			
Overall, I am satisfied with Zoom.	3.44 (1.51)	4.33 (0.82)	0.213
I prefer WIC appointment with Zoom over WIC appointments that are in person.	1.78 (1.39)	2.67 (1.37)	0.245

Source: THIS-WIC Staff Survey
[a] Responses were assessed on a 5-point Likert scales, where 1=Strongly disagree and 5=Strongly agree.
[b] Ordinal data are summarized as mean (SD).
[c] p-values are based on t-test for ordinal data.
*p<0.05.

Staff shared various factors that affected their level of satisfaction with offering telehealth services. For example, in the early and late phase interviews, staff highlighted the consistent support in roll-out and implementation and appreciated the collaborative aspect of telehealth implementation. Staff also indicated that over time, they received additional support to schedule the appointments, which eased their workload. Finally, staff acknowledged that collaborating with others enabled them to identify staff strengths and weaknesses, resulting in a workstyle that is built on their abilities and an efficient implementation process.

> *"We did it pretty much as a team effort the first time that we did it. So it was not even feel like the middle of January at the beginning of January that we had our first appointment and how we did it was with a coordinated effort between my supervisor and another CPA that works here." [Staff participant 20]*
>
> *"From the agency level, [telehealth] was fully supported from the get-go, and I think it stayed that way throughout the whole thing. I feel like we had a lot of communication." [Staff participant 30]*
>
> *"I think that they were open to discussing that, you know not only in meetings with you all, but other communications amongst ourselves, to kind of try and figure out, how can this work." [Staff participant 30]*
>
> *"Well, they had a monthly meeting where we could attend and get feedback, not only from them, but also other pilot agencies. I think that was very helpful." [Staff participant 41]*

WIC staff noted various aspects of technology focused barriers, with digital literacy of their clients being the most common barrier in both early and late phases (*CFIR constructs: innovation characteristics, characteristics of individuals, implementation process*). Some respondents also discussed language barriers in communicating with the clients and described the combined effect of different accents and poor connectivity as a challenge.

> *"Some people get concerned that the responsibility is high to use the [telehealth solution] appointments. Because of the access to the Internet, sometimes around this area or the cost of the Internet... I mean if the client doesn't have access to the internet, it's hard for us to be able to work around that because you know it's costs that they usually assume and they have to see how they can do it." [Staff participant 20]*
>
> *"My first language is not English and Spanish, so I do have an accent, and I did experience a Zoom meeting, where the client kind of the communication, maybe I don't know she didn't understand what I was saying, at the beginning, but then she understood me, so I told her "well, I apologize for my accent" I told her maybe it's difficult because of the connection, but we kind of we went through the appointment, and it went well." [Staff participant 20]*

Staff also discussed specifics about their experience with using telehealth and noted that although it was reliable, user-friendly, easy to access, and easy to navigate the platform, clients needed to take an additional step of setting up their accounts or navigating through reminders. In the late phase interviews, WIC staff indicated that navigating through reminders may adversely affect client acceptance and participation. They also noted that telehealth limited their ability to conduct clinical assessments. For example, staff noted that they could not weigh and measure babies or raw blood samples.* In the late phase, staff highlighted client preferences

* During implementation of this project, MI was working under Physical Presence Waivers. These waivers were in effect from March 2020 through May 2023. In August 2023, WIC offices returned to in-person appointment and American Rescue Plan Act waivers were in place only in situations of hardship for the client. In these situations,

with the use of video and that clients appreciated having a choice of turning on their video for the appointment.

> *"So, and I think it'll be good for the clients because it's not very hard to maneuver…" [Staff participant 2]*
>
> *"But it was an added step for the clients, and you know, with them, receiving reminders from us, and then also receiving communication from the State for the link." [Staff participant 41]*
>
> *"They can decline video services and do an in-person visit instead, or if they do want to do a Zoom visit, but they can't have their camera on for one reason or another that's okay, too." [Staff participant 32]*

WIC staff described facilitators to telehealth appointments and noted that being on a video call was a more efficient way to deliver services and that more clients were requesting video chats instead of coming in for an in-person visit. Staff also emphasized the importance of sharing their screens and their office settings to give the clients the feeling of being in the office. They noted that turning on the video made the appointment more "real" for them and the client.

> *"When you have the option of video. It's like instead of just explaining it to me, you can show me. And I feel like it's just a more efficient and effective way to deliver with services that are appropriate for that client." [Staff participant 32]*
>
> *"We see more clients who are requesting to do a video chat versus an in-person visit. They kind of understand that like this is a really viable option." [Staff participant 32]*
>
> *"That's okay... being able to see them, being able to share my screen, or even physical things if I had them around me as a reference." [Staff participant 41]*
>
> *"I have a typically good show rate with the ones that do, you know, agree to the Zoom appointment, I didn't really have to encourage them to turn it on. They just did it, 'cause they knew that was part of the appointment…the face-to-face on this Zoom makes it just more, I think it more real for both of us." [Staff participant 2]*
>
> *"I enjoy using <telehealth solution> more than just doing a phone appointment. It's definitely nice for them to see me and me to see them." [Staff participant 3]*

3.5 Adoption of Telehealth Services

Adoption of telehealth services at intervention agencies was assessed using data gathered from the quarterly Staff Surveys, metadata, and key informant interviews. As seen in **Table 3.6**, in any given quarter, the number of resources viewed from the ONE platform during appointments far exceeded the number of resources shared with clients following the appointments.

anthropometric assessments could be deferred or provided through referral data. This policy was in effect for both for telehealth intervention agencies and control agencies.

Table 3.6. ONE Use by WIC Staff for Nutrition Counseling and Breastfeeding Support from Q1/2022 to Q2/2023 in MI

Number of ...	Q1/2022	Q2/2022	Q3/2022	Q4/2022	Q1/2023	Q2/2023
Tools viewed by WIC staff[a]	268	485	363	452	406	81
Tools shared by WIC staff[b]	26	30	54	6	69	47

Source: ONE metadata, MI State agency
[a] Includes tools that 25 staff pulled up during sessions for sharing with their clients.
[b] Includes tools that nine staff sent to clients via ONE or email.

In the early phase, staff reported mixed feelings about use of telehealth (*CFIR construct: inner setting, implementation process, innovation characteristics*), some perceived that implementing telehealth would be stressful because it entailed additional time and effort to learn a new system, whereas others who had gained familiarity found it to be straightforward and easier to learn and navigate than expected. In the late phase, fewer staff struggled with becoming comfortable with use of various new tools and portals and a few others found it challenging to encourage clients to adopt the telehealth platform, likely reflecting hesitation or resistance to changing their work approach. In the late phase, although staff described challenges with integrating telehealth into existing workflows (such as challenges with scheduling appointments, documentation, and managing client preferences), both staff and clients became accustomed to telehealth, and it was an acceptable way to conduct appointments.

> *"I think that initially, like every change sometimes you feel like oh something new, something else, we have to learn, and you get a little bit nervous about it. But then, once you, you know, with the help that you guys provide and the meetings that we're doing every month, I have been able to answer a lot of my questions." [Staff participant 20]*
>
> *"From the beginning, I think just because they weren't used to it. And so now it's like, oh okay, we can do it this way." [Staff participant 2]*

In the late phase interviews, staff noted that the onset of COVID-19 significantly influenced the timing and nature of telehealth implementation, impacting participant engagement and expectations. Staff also spoke to the hope of transitioning from temporary public health emergency waivers to more sustainable, long-term WIC program expectations.

> *"The timing of the study was maybe not the most conducive to, you know, high participation because when we started our participants were accustomed to receiving phone calls because of the public health and emergency waivers." [Staff participant 41]*

3.6 Acceptability of Telehealth Solution

As seen in **Table 3.7**, staff agreed with the statement that ONE was an acceptable way to provide WIC services and useful for them as WIC staff. Staff acceptability did not change from early to late phase.

Table 3.7. Acceptability of ONE in Early and Late Phases among Staff Survey Respondents in MI

Statement[a]	Early[b]	Late[b]	p-value[c]
ONE	N=5	N=2	
ONE is an acceptable way to provide WIC services.	4.00 (0.71)	3.50 (0.71)	0.437
ONE is useful for me as WIC staff.	3.80 (0.45)	4.00 (0.00)	0.576
Zoom	N=9	N=6	
Zoom is an acceptable way to provide WIC services.	3.78 (0.97)	4.50 (0.55)	0.125
Zoom is useful for me as WIC staff.	3.67 (1.22)	4.33 (0.52)	0.234

Source: THIS-WIC Staff Survey
[a] Responses were assessed on a 5-point Likert scales, where 1=Strongly disagree and 5=Strongly agree.
[b] Ordinal data are summarized as mean (SD).
[c] p-values are based on t-test for ordinal data.

As seen in **Table 3.8**, staff implementation survey respondents reported barriers cited by WIC clients as reasons for declining telehealth appointments. The most frequent barriers were related to non-availability of private space followed by non-availability or lack of comfort with using technology. Other barriers identified included WIC clients not having a device to connect, not knowing how to connect, or not having Internet access. From the staff perspective, among those who used Zoom for telehealth appointments, the frequency of experiencing problems connecting with telehealth was low (sometimes to never) and the frequency of clients sharing video was high (always to most of the time). Most staff liked using the Zoom appointment option (always to most of the time) and hoped to continue using it after the pilot ended.

Table 3.8. Acceptability of Telehealth/Zoom Appointments among Staff Implementation Survey Respondents in MI

Barriers Faced by Clients for Telehealth Appointments	Q2/2022	Q3/2022	Q4/2022	Q1/2023	Q2/2023
	%				
	N=13	N=16	N=20	N=39	N=10
Like seeing WIC staff	23.08	31.25	20.00	25.64	20.00
Do not have Internet access	46.15	31.25	55.00	46.15	40.00
Do not have device to connect	53.85	31.25	35.00	33.33	50.00
Do not know how to connect	38.46	43.75	40.00	51.28	60.00
Do not have private space	30.77	12.50	15.00	17.95	30.00
In clinic/by phone more convenient	84.62	50.00	75.00	69.23	70.00
Privacy concerns	7.69	6.25	10.00	12.82	30.00
Other	23.08	43.75	25.00	35.90	0.00
Frequency of experiencing problems connecting to telehealth/Zoom appointments	N=10	N=13	N=15	N=31	N=7
Always	0.00	0.00	0.00	0.00	0.00
Most of the time	10.00	7.69	0.00	3.23	0.00
Sometimes	10.00	15.38	26.67	25.81	42.86
Rarely	20.00	38.46	53.33	41.94	14.29
Never	60.00	38.46	20.00	29.03	42.86
Other	0.00	0.00	0.00	0.00	0.00
Frequency of clients sharing video during telehealth/Zoom appointments	N=10	N=13	N=15	N=31	N=7
Always	80.00	76.92	20.00	41.94	14.29
Most of the time	0.00	15.38	66.67	45.16	42.86
Sometimes	10.00	7.69	13.33	12.90	42.86
Rarely	0.00	0.00	0.00	0.00	0.00
Never	10.00	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00	0.00
Do you like using the telehealth/Zoom appointment option?	N=9	N=13	N=15	N=31	N=7
Always	55.56	38.46	33.33	32.26	28.57
Most of the time	33.33	53.85	33.33	45.16	28.57
Sometimes	0.00	7.69	20.00	12.90	28.57
Rarely	11.11	0.00	13.33	9.68	14.29
Never	0.00	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00	0.00
Do you hope to continue the telehealth/Zoom appt option after the pilot is over?	N=10	N=13	N=15	N=31	N=7
Yes	70.00	76.92	73.33	74.19	57.14
Maybe	10.00	15.38	13.33	12.90	28.57
No	10.00	0.00	13.33	6.45	14.29
Other	10.00	7.69	0.00	6.45	0.00

Source: Staff implementation survey, intervention agencies only
Survey was fielded in the following months: June 2022: Q2/2022, Sept 2022: Q3/2022; Jan 2023 Q4/2023; Apr 2023: Q1/2024; June 2023: Q2/2023

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 (of phone or telehealth) and letting them decide what works best for them (C*FIR innovation advantage and characteristics of individuals*). WIC staff noted that despite the complexity of integrating telehealth in various settings and for different appointment types, the use of telehealth had addressed several challenges for them as well as their clients. Some challenges noted by staff included insufficient time for documentation following a telehealth appointment due to increased caseload, figuring out the process to send clients the telehealth link, and not having client email addresses on file, to send them the link.

> *"The sending the Zoom links was, I think I feel like that was my biggest like trying to remember to do that. And I just figured out not that long ago that I could schedule send stuff from Outlook, which would have been really helpful to know a year ago." [Staff participant 4]*
>
> *"But usually like I'm at least 30 to 45 minutes alone just doing the Zoom meeting. So it gives me a very small amount of time to do my documentation after I get done because then I typically will have somebody else scheduled." [Staff participant 2]*
>
> *"We had to collect email addresses and so, a lot of people don't have an email address on file with us." [Staff participant 30]*

Staff appreciated the opportunity to see their clients, which allowed for meaningful interactions and rapport building.

> *"I enjoy Zoom too because it's not the same talking on the phone that putting a face to a person when they were talking and being able to see their facial expressions where you can read how they're feeling." [Staff participant 20]*

3.7 Feasibility of Using Telehealth Solution

As seen in **Table 3.9**, staff found the ONE platform easy to use. They also found it easy to use and flexible to interact with. Compared with the early phase, there was a lower score for agreement with the statement, "learning to use ONE was easy for me" during the late phase of implementation. Although not significant, there was a trend in staff indicating that ONE was easier and more flexible to use over time. Significantly more respondents in the late phase than in the early phase noted that Zoom allowed them to interact with more participants.

Table 3.9. Feasibility of Using Telehealth in Early and Late Phases among Staff Survey Respondents in MI

Statement[a]	Early[b] N=26	Late[b] N=19	p-value[c]
ONE			
I feel comfortable communicating with WIC clients using ONE.	3.00 (1.58)	2.50 (2.12)	0.740
ONE makes my daily work easier to do.	3.20 (0.84)	4.00 (0.00)	0.257
ONE allows me to interact with more participants.	2.80 (1.30)	2.50 (2.12)	0.821
I find ONE to be easy to use.	3.60 (1.14)	2.50 (2.12)	0.389
I find ONE to be flexible to interact with.	3.40 (1.34)	4.00 (0.00)	0.576
Learning to use ONE was easy for me.	3.40 (1.34)	3.00 (1.41)	0.739
Zoom			
I feel comfortable communicating with WIC clients using Zoom.	3.11 (1.36)	4.50 (0.55)	0.035*
Zoom makes my daily work easier to do.	3.22 (1.56)	4.17 (0.41)	0.176
Zoom allows me to interact with more participants.	3.22 (1.39)	4.50 (0.55)	0.054
Learning to use Zoom was easy for me.	3.78 (0.97)	4.17 (1.17)	0.495
I find Zoom to be easy to use.	3.78 (0.97)	4.00 (1.10)	0.686
I find Zoom to be flexible to interact with.	3.67 (1.12)	4.00 (1.10)	0.578

Source: THIS-WIC Staff Survey
[a] Responses were assessed on a 5-point Likert scales, where 1=Strongly disagree and 5=Strongly agree.
[b] Ordinal data are summarized as mean (SD).
[c] p-values are based on t-test for ordinal data.
*p<0.05.

Table 3.10 presents the duration of appointments and the approach to sharing resources for clients during in-person virtual appointments and telehealth appointments. As seen, there was considerable variability in the time needed to complete IBCLC appointments, regardless of mode conducted. However, IBCLC appointments conducted via telehealth were longer in the initial two quarters (Q2/2022 and Q3/2022) than in subsequent quarters. Most nutrition education appointments conducted in-person or virtually generally took about 16 to 30 minutes, whereas most appointments conducted via telehealth took 31 to 45 minutes or more. Reasons for this difference were not explored. Finally, staff conducting in-person or virtual appointments shared education materials with their clients via printed handouts followed by website link with some sending video links; those conducting telehealth/Zoom appointments shared materials via the ONE platform and website links, with some using Nutrition Counseling with an RD (NCRD) video links and printed handouts.

Table 3.10. Appointment Time and Education Materials Provided by Staff During In-Person/Virtual vs. Telehealth/Zoom Appointments by Quarter in MI

Variable	Q2/ 2022	Q3/ 2022	Q4/ 2022	Q1/ 2023	Q2/ 2023	Q2/ 2022	Q3/ 2022	Q4/ 2022	Q1/ 2023	Q2/ 2023
	In-office/virtual (not by telehealth/Zoom)					Telehealth/Zoom				
Time needed for IBCLC appointments	N=6	N=7	N=9	N=19	N=5	N=5	N=4	N=6	N=12	N=4
	%									
0–15 min	0.00	14.29	11.11	10.53	20.00	0.00	25.00	16.67	16.67	0.00
16–30 min	33.33	14.29	22.22	15.79	0.00	20.00	0.00	0.00	0.00	25.00
31–45 min	33.33	0.00	0.00	0.00	40.00	0.00	0.00	50.00	33.33	50.00
46–60 min	33.33	42.86	55.56	52.63	40.00	80.00	75.00	0.00	33.33	25.00
60+ min	0.00	28.57	11.11	21.05	0.00	0.00	0.00	33.33	16.67	0.00
Time needed for RD appointments	N=13	N=15	N=19	N=40	N=9	N=9	N=13	N=15	N=31	N=7
	%									
0–15 min	0.00	6.67	0.00	2.50	0.00	11.11	0.00	6.67	3.23	0.00
16–30 min	61.54	20.00	36.84	25.00	22.22	0.00	7.69	6.67	6.45	14.29
31–45 min	15.38	53.33	47.37	52.50	55.56	55.56	30.77	26.67	32.26	28.57
46–60 min	0.00	20.00	15.79	17.50	22.22	22.22	46.15	46.67	45.16	57.14
60+ min	0.00	0.00	0.00	2.50	0.00	11.11	15.38	13.33	12.90	0.00
Education materials provided	N=14	N=16	N=18	N=40	N=9	N=9	N=13	N=14	N=28	N=7
	%									
Printed Handout	78.57	81.25	77.78	80.00	100.0	44.44	30.77	35.71	39.29	28.57
Website link	71.43	81.25	0.00	32.50	0.00	77.78	38.46	50.00	53.57	100.0
Video link	31.58	31.58	36.84	78.95	21.05	44.44	23.08	42.86	35.71	57.14
ONE platform	---------- NOT APPLICABLE ----------					55.56	76.92	71.43	78.57	57.14
Do not provide education materials	5.26	0.00	0.00	0.00	0.00	11.11	7.69	7.14	7.14	0.00
Other	5.26	0.00	36.84	47.37	0.00	0.00	7.69	14.29	10.71	0.00

Source: Staff implementation survey
Surveys were administered on the following dates: 22 June: Q2/2022, 22 Sept: Q3/2022; 23 Jan: Q4/2023; 23 Apr: Q1/2024; 23 June: Q2/2023

Emergent themes from key informant interviews further provide evidence of the facilitators and barriers to using ONE (*CFIR construct: innovation characteristics, inner setting, and implementation process*). In the early phase, staff noted that their clinic had relatively new equipment and expressed a need to identify ways to get resources to buy new equipment for other agencies for consistent implementation across their agencies. Even in the late phase interviews, staff noted the need for additional equipment such as dual screen monitors, ring light, headset, and iPad to fully optimize the telehealth solution use for virtual and in-person appointments.

> *"We are fortunate where we're at like we have pretty modern up-to-date...and you know our equipment is really in the newer end. And some of the other agencies that don't have as much money, don't have equipment like that, so you know definitely want to make sure that you have the right equipment..." [Staff participant 2]*
>
> *"We were sent a ring light, a webcam, and a headset from our state WIC office. but I actually haven't used those items for any of my Zoom visits. I have them, but they don't travel with me. So I just use my laptop with my webcam and microphone, and it works perfectly fine." [Staff participant 32]*
>
> *"With the using of a laptop and having multiple programs opened. If there was a way to integrate the programming so that it's right there, you know. Touch of a mouse or a finger to access that rather than having to have a split screen, multiple split screens," [Staff participant 30]*

Most staff noted significant operational changes in offering telehealth services stemming from staffing, increased caseload, and churn on both staff and client front. In the late phase, staff also noted that they were shifting back to in-person appointments. Thus, the agency was focused on identifying ways to continue implementing telehealth, given the return to in-person appointments, staff and client turnover, and increasing caseload. The biggest hurdle to continuing telehealth implementation was the need to train new staff and discuss it with new clients. Staff also noted that even before the formula recall, they were experiencing challenges with the formula supplier, which further limited the use of ONE.

> *"We kind of go through cycles, or we've had lots of staff kind of turn over or having babies and leaving." [Staff participant 3]*
>
> *"We did have some delays at the beginning of the year, because it was just busy here at work with different things. People moving people around... we've had some people that quit their jobs..." [Staff participant 20]*

In early phase interviews, staff also noted concerns around client privacy in situations where they may accidentally share their screen which might have information for another client. In late phase interviews, staff had some reservations about client privacy in instances where the client may not be in safe and private settings for virtual appointments.

> *"With the Zoom appointment, I was concerned, by accident, I could open a screen or something of a different client. And let's say that you're sharing the screen and you go back to the schedule, then the client can see different last names and stuff so that was kind of like I said I wanted to be sure that the screen was down." [Staff participant 20]*
>
> *"I have like my meeting room set up where they have to, you know, I have to let them in so I've not had any concerns about someone getting in that shouldn't be." [Staff participant 4]*
>
> *"If you're in person, then you get like prime picks for a room like a clinic room that you can sit in with the client. Close the door. But when you're working remotely, there's no promise that that's not a shared space." [Staff participant 32]*

Staff discussed the need to spread awareness of telehealth services across all staff so that there is consistent messaging to clients from everyone they interact with at the WIC clinic. WIC staff were keenly aware of the need to include interpreters so services could be offered in multiple languages. Staff also highlighted the importance of creating buy-in from clients and offering them support; staff indicated that most clients did not recognize that using telehealth did not require them to download an app or take any additional action and perceived it as something special. For example, staff recommended, "Using the EMR to send a nutrition education" as most of them use it to invite the clients and it would have been "nice to have a quick option here (in EMS)."

"The nurses or other staff that are offering those telehealth business really need to know how to offer it because I'm just... that's not what I'm doing. So, I think maybe more training or information for those staff that are doing the referring would be great. Yes, there's the brochure, whatever. But, you know, I think that they, if they don't know much about it, they don't know how to talk it up." [Staff participant 3]

I would tell people share this, share with those you know who are in the program and that we do this, that because this is new. It takes a while for word to get out as much as it can spread like wildfire. So that was something I did do. I guess that was sort of a workaround just trying to promote it by, you know, person-to-person outside of our agency." [Staff participant 30]

"But I think, having a clear structure for how interpreter services should be offered would have been very helpful. and also, if we are opening of the participation in this study, and being a more inclusive to other languages, then it would make sense to have the evaluation or form in languages other than English and Spanish." [Staff participant 41]

"I think, having more individuals who are bilingual, I think definitely helps not just like with WIC, all services like you want to make sure people are being serviced correctly, and they're getting the best that they can, because they're here to get that support for a reason. So, I think it would have been would have been good." [Staff participant 44]

"I don't think it was communicating correctly or whatever. I just think that people thought they had to add an app or download some software. Just because it was presented the way it was, I think that would made it seem like it was something special when it really wasn't." [Staff participant 30]

3.8 Improved Accessibility of WIC Services for Clients

As seen in **Table 3.11**, staff providing WIC services through ONE perceived it positively impacted accessibility to WIC services for clients. Staff reported an increase in their ability to reach participants who face challenges accessing clinics due to traffic or distance, and those who typically miss their appointments. Staff also expressed interest in continuing to use ONE and Zoom to provide WIC services.

Table 3.3. Staff Perceptions of Improved Accessibility to WIC Services for Clients Because of Telehealth in Early and Late Phases in MI

Statement[a]	Early[b] N=9	Late[b] N=8	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.	3.78 (1.39)	4.62 (0.74)	0.146
With telehealth, I am able to provide services for WIC participants who would usually miss their appointments.	3.67 (1.22)	4.50 (0.76)	0.118
ONE	N=5	N=2	
I would like to continue using ONE to provide WIC services.	3.40 (1.14)	4.50 (0.71)	0.273
Zoom	N=9	N=6	
I would like to continue using Zoom to provide WIC services.	3.56 (1.59)	4.83 (0.41)	0.079

Source: THIS-WIC Staff Survey
[a] Responses were assessed on a 5-point Likert scales, where 1=Strongly disagree and 5=Strongly agree.
[b] Ordinal data are summarized as mean (SD).
[c] p-values are based on t-test for ordinal data.

During key informant interviews, staff noted that continuing to offer telehealth services is in alignment with the delivery of other health care services and the overall objectives of WIC (C*FIR construct: innovation characteristics, outer setting, inner setting, characteristics of individuals, and implementation process*). Staff were acutely aware of their client's lifestyle and routine and acknowledged the role of telehealth services in increased client participation and retention. Staff noted that their clients were now able to step out of their office or talk with them from the comfort of their home, or while taking care of chores, which helped with client participation and retention. WIC staff also emphasized the convenience of accessing and sharing nutrition education materials without concerns that they may have run out of paper copies or spend time trying to locate them. In the early phase, one respondent indicated that although clients are interested in scheduling telehealth appointments, they may experience challenges with access to the telehealth platform (i.e., connectivity issues), resulting in converting the telehealth appointment to a phone appointment. Data on frequency of conversion from telehealth to phone appointments were not collected.

"Right so because yeah for the last few years we've been working remotely, we haven't done anybody in person. So, it has been nice like I was saying, to actually be able to see the face that goes with the person, you know, because it does help to build a relationship and that rapport with them. So, yeah, definitely, I feel like it's been better." [Staff participant 2]

"But, for instance with the materials that we have in the office, sometimes we don't have materials like, I need something with iron, I mean I usually do (have it), iron is just an example, I do have plenty of information, but just to give you an example, I might run out of material, and we don't have any more. And that we need to order more, but in that moment the client needs it, so with that (telehealth solution) platform, everything is there." [Staff participant 20]

"And I've had a few like that I've scheduled also like that we're okay with doing it, but then, when they came the day came like their phone was broken. So, they could hear, but they couldn't do the actual appointment because their screen was broken. So, so I had to change them from a Telehealth to like a just a regular virtual appointment at that point so I've had a couple of that (type)." [Staff participant 2]

3.9 Frequency of Travel and Travel Time

The Staff Survey asked respondents about the length of work at WIC. Staff who worked at WIC for 2 years or more (24 out of 26 in the early phase and 16 out of 19 in the late phase survey) were asked if their job included traveling to one or multiple WIC clinics prior to the COVID-19 pandemic. In the early phase, 14 out of 24 (58%) of them traveled to one or more WIC clinics prior to the pandemic and in the late phase about 9 out of 16 (56%) traveled for work prior to the pandemic. As seen in **Table 3.12**, neither the frequency of travel nor travel time to other clinics differed significantly from the early phase to the late phase of telehealth implementation.

Table 3.12. Frequency of Travel and Travel Time to Other WIC Sites among Staff Survey Respondents in the Early and Late Phases of Telehealth Implementation in MI

Question	Early[a]	Late[a]	p-value[b]
	%		
On average, how frequently did your job require you to travel to those other WIC clinic sites?	N=14	N=8	0.502
More than 1 per week	50.0	50.0	
1 per week	21.4	37.5	
More than 1 per month	21.4	0.0	
1 per month	7.1	12.5	
On average, how many minutes of your workday did you spend traveling to these other WIC sites?	N=18	N=10	0.231
15 mins or less	13.0	11.1	
16–30 mins	20.0	55.6	
31–60 mins	20.0	22.2	
61 mins or more	46.7	11.1	

Source: THIS-WIC Staff Survey
[a] These two questions were only asked to staff who indicated they had to travel.
[b] p-values are based on chi-square tests.

3.10 Startup Cost to Implement Telehealth Solution

The startup period for implementing the telehealth solution in MI was from February 24, 2021, to January 1, 2022. As seen in **Table 3.13**, over this 10-month period, MI incurred $147,659 in setting up the telehealth solution. This translated to an average monthly cost of $14,766. During the startup phase, the single largest expense was on contracted services, accounting for 87 percent of total spending. The largest contracted cost was for a contract with MI Health Institute/Center for Strategic Health Partnerships to develop training materials, followed by costs for contracts with Zoom, ONE Nutrition Matters, and Client Telehealth Liaison.

Table 3.4. Telehealth Solution Startup Costs (February 2021–January 2022) in MI

Resource Category	Cost	Percentage of Total Cost
Labor	$17,674	12
Equipment	$1,852	1
Indirect	$0	0
Contracted services	$128,133	87
Total (10 months)	$147,659	100
Average per month (10 months)	$14,766	N/A

Source: Cost-tracking Data, MI State agency

3.11 Ongoing Cost to Implement Telehealth Solution

Average ongoing costs of service delivery per enrollment are shown in **Table 3.14**, for intervention and comparison groups and for the three timepoints of the telehealth solution implementation. During the pre-implementation period, the average cost per enrollment was slightly higher in the intervention agencies than the comparison agencies ($16 vs. $14 per enrollment). After implementation of the telehealth solution in the intervention agencies, the average cost per enrollment in those agencies decreased slightly at 6- and 12-months post-implementation. Meanwhile, per-enrollment costs in the comparison agencies roughly stayed the same, at $14 and $15 per enrollment at 6- and 12-months post-implementation, respectively. The mean and median estimates for intervention and comparison agencies at each timepoint were similar, indicating minimal skewness of the data. The minimum and maximum values show the spread of the estimates, indicating that there was variation in the average ongoing service delivery cost across agencies.

Table 3.5. Per-Enrollment Cost at Intervention and Comparison Agencies in MI

Value	Pre-implementation (FY2019)		6-month Post-Implementation (July 2022)		12-month Post-Implementation (January 2023)	
	Comparison (N=7)	Intervention (N=7)	Comparison (N=7)	Intervention (N=7)	Comparison (N=7)	Intervention (N=7)
Mean	$14	$16	$14	$14	$15	$14
Median	$15	$16	$14	$12	$14	$12
Min	$10	$9	$9	$9	$10	$9
Max	$16	$20	$22	$20	$19	$21

Source: Cost-tracking data, MI State agency

As seen in **Table 3.15**, average per-appointment costs in the pre-implementation period were higher in the intervention agencies ($49) than in the comparison agencies ($41). After the introduction of the telehealth solution, per-appointment costs at 6 and 12 months post-implementation decreased slightly in the intervention agencies (to $49 and $41, respectively) but increased in the comparison agencies (to $46 and $44, respectively). For per-appointment costs, the difference in the mean and medians was larger than for per-enrollment costs, but the estimates were still relatively consistent.

Table 3.6. Per-Appointment Cost at Intervention and Comparison Agencies in MI

Value	Pre-implementation (FY2019)		6-month Post-Implementation (July 2022)		12-month Post-Implementation (January 2023)	
	Comparison (N=7)	Intervention (N=7)	Comparison (N=7)	Intervention (N=7)	Intervention (N=7)	Intervention (N=7)
Mean	$41	$49	$46	$49	$44	$40
Median	$36	$42	$40	$40	$40	$38
Min	$27	$30	$23	$22	$23	$22
Max	$59	$77	$76	$90	$60	$57

Source: Cost-tracking Data, MI State agency

The return on investment analysis assessed the cost savings per appointment compared to the investment of startup (**Table 3.16**). The total startup cost of the telehealth solution in MI was $147,659. At a cost savings of $11.29 per appointment, 13,073 appointments would be needed for MI to recoup their startup cost investment ($147,659/$11.29). In the 12th month post-implementation (January 2023), MI intervention agencies conducted 16,036 appointments. It would, therefore, take a little less than 1 month (13,073/16,036) for MI to recoup its investment of the telehealth startup costs.

Table 3.16. Return on Investment Using Cost per Appointment in MI

Description	Estimate
Total startup cost	$147,659
Intervention cost per appointment	
Pre-implementation (FY2019)	$48.77
12 months post-implementation (Oct-Mar 2023)	$40.29
Difference	-$8.48
Comparison cost per appointment	
Pre-implementation (FY2019)	$40.83
12 months post-implementation (Oct-Mar 2023)	$43.64
Difference	$2.81
Cost savings of intervention per appointment	$11.29
Appointments needed to recoup startup cost	13,073
Total monthly appointments at all intervention sites	16,036
Months needed to recoup startup cost	0.82

Source: Cost-tracking Data, MI State agency

3.12 Summary of Findings

The MI state WIC agency selected 17 (8 intervention and 9 comparison) local WIC agencies to participate in THIS-WIC evaluation. Fifty-three (53) clinics implemented the telehealth solution across the intervention local agencies. Key findings include the following:

- **Staff attitude**: WIC staff had favorable attitudes toward the use of telehealth with a high level of awareness about the ability to reach clients in rural areas and clients with transportation, childcare, or other constraints. Offering telehealth services aligned with modern health care, provided clients a choice of appointment type, and allowed for personalized interactions among those who chose telehealth appointments.
- **Staff readiness**: More than two-thirds of the WIC staff had prior experience with delivering telehealth services. MI State agency conducted trainings, centralized technical assistance, promoted adaptability, identified and prepared champions, organized WIC staff implementation team meetings, offered dynamic and ongoing training, and offered scheduling support to ease staff burden. Although the State agency provided support, most staff noted that the lag between training and implementation required them to review and understand the system again. Staff also expressed a need to practice using a ghost account and understand client side of things.
- **Staff satisfaction**: Overall, staff satisfaction with delivering services through the telehealth platform was high. Staff noted that the PDF and video materials on the platform were comprehensive and of high quality. Staff highlighted the high level of collaboration across all intervention agencies and clinics, which allowed them to discuss

and address problems in real time. Staff shared the high level of support provided by the state and agency staff and appreciated the liaison's support to schedule telehealth appointments. Staff found telehealth services to be rewarding as they could interact with the clients and build rapport.

- **Staff adoption**: Metadata on trends in telehealth platform use over time reported by local agency directors reveal that staff shared more resources from ONE platform during appointments than after the appointment. State agency staff also noted that staff churn and fatigue contributed to the varying levels of staff adoption overall and within agencies.
- **Staff acceptability**: Most staff cited lack of private space in the clinic and convenience to conduct appointments by phone followed by lack of technology/knowledge to use technology as barriers to conduct telehealth/Zoom appointments. Staff noted that despite the complexity of integrating telehealth services in MIS, telehealth was an acceptable way to provide WIC services, and most hoped to continue using telehealth appointments after the end of the project. Although staff favored telehealth services, they acknowledged that their usage was driven by clients and that clients should be provided flexibility in choosing how they would like to schedule appointments and receive WIC services.
- **Perceived feasibility**: In general, staff noted that it was easy to learn how to use the telehealth platform and that it was easy to use and interact with the platform. Some staff reported navigation challenges and felt that clients did not open the link to join the appointments and wanted a seamless and straightforward approach to encourage client take-up. Staff also noted the lack of email addresses as a barrier to setting up client accounts on the ONE platform. Finally, staff noted that clients found it confusing to have both MYWIC and ONE accounts to access resources.
- **Improved 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 barriers faced by clients and reported that telehealth services make it feasible for clients to keep their appointments. Staff noted that they would like to continue using ONE to provide services.
- **Travel to other WIC clinics to provide services**. There were no changes to the frequency of travel or travel time to other WIC clinics.
- **The startup cost** to offer telehealth services was $147,659, of which about 87 percent was spent on contracted services with MI Health Institute/Center for Strategic Health Partnerships (to develop training materials), Zoom, and ONE. Based on the monthly caseload data, it would take MI less than one month to recoup its investment in telehealth startup costs.
- **The mean ongoing cost per enrollment** was generally similar at intervention and comparison agencies. Prior to THIS-WIC project, the cost of delivering services was $14 per enrollment at comparison and $16 per enrollment at intervention agencies.

Intervention agencies spent an average of $14 per enrollment at 6 and 12 months, whereas comparison agencies spent $14 and $15 per enrollment, respectively.

- **The mean ongoing cost per appointment** prior to THIS-WIC project, the cost of delivering services was $49 per appointment for intervention and $41 per appointment at comparison agencies. At 12 months, the cost per appointment declined to $40 for intervention agencies but increased to $44 per appointment for comparison agencies.

4. Results: Client Experiences with Telehealth Services, Zoom, and ONE

MI implemented virtual appointments via Zoom or phone paired with ONE to provide nutrition education and counseling and breastfeeding support. Telehealth allowed WIC staff at intervention agencies to share information and content with WIC clients during virtual appointments and allowed clients to review the materials synchronously during the appointment and asynchronously following their appointments. Client Survey responses and MIS data from 15 local agencies (eight intervention and nine comparison agencies) spanning the intervention period, February 2022 through July 2023 (Q1/2022 through Q3/2023), were used to assess client use of telehealth services and resources and examine outcomes for respondents in intervention and comparison agencies.

4.1 Acceptability of Telehealth Services

As seen in **Table 4.1**, almost all Client Survey respondents strongly agreed or agreed that they could hear the WIC nutrition educator clearly and that it was easy to figure out how to use and receive WIC services through telehealth. Over 90 percent of respondents also agreed or strongly agreed that the way they received WIC services was easier than going to a WIC clinic and they would like to receive services the same way at their next WIC appointment. Most strongly agreed or agreed that they could talk to the WIC nutrition educator easily. Finally, almost 75 percent of respondents agreed or strongly agreed that their WIC appointment was shorter than usual when receiving care, and about 15 percent disagreed or strongly disagreed that their appointment was shorter than usual when receiving care.

Among respondents who used Zoom for their appointment, about 9 percent disagreed or strongly disagreed that they had trouble accessing the telehealth platform and a similar percentage agreed or strongly agreed that the telehealth platform was simple to use for their WIC appointment. Most strongly agreed or agreed that they could see the WIC nutrition educator. All survey respondents found the content of the telehealth solution to be in a language they could read (data not shown).

Clients in intervention agencies found telehealth services to be an acceptable approach to receiving nutrition education; one client noted “my nutrition counselor was very attentive to my concerns and helped me to fix them and get information easily available to help me. I feel confident I can go to her whenever I have a health or nutrition question.” Responses from clients in the comparison agencies with regards to phone appointments were mixed with some indicating that ... “I love the phone appointments ... It’s wonderful to finally let the babies nap and complete an appointment over the phone” to “I’d much rather be in person and go to the office than do it by phone or over Zoom.”

Table 4.1. Client Survey Respondents' Attitudes Toward Telehealth Services in MI

Statement	N	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
		%				
All Respondents						
I could hear the WIC nutrition educator clearly.	77	3.9	2.6	2.6	28.6	62.3
It was easy to figure out how to use and receive WIC services.	71	1.4	1.4	0.0	33.8	63.4
My WIC appointment was shorter than usual when receiving care.	73	6.8	8.2	12.3	27.4	45.2
The way I received WIC services was easier than going to a WIC clinic.	73	1.4	1.4	5.5	28.8	63.0
I would like to receive services the same way at my next WIC appointment.	54	1.9	1.9	0.0	37.0	59.3
I could easily talk to the WIC nutrition educator.	77	2.6	2.6	0.0	31.2	63.6
Respondents Who Used Zoom During Appointment						
The telehealth platform was simple to use for my WIC appointment.	20	0.0	0.0	0.0	20.0	80.0
I had trouble accessing the telehealth platform.	20	70.0	15.0	5.0	5.0	5.0
I could see the WIC nutrition educator clearly.	20	0.0	0.0	10.0	15.0	75.0

Source: THIS-WIC Client Survey, intervention agencies only
NOTE: Includes 73 respondents who indicated their last WIC appointment was onsite at the WIC clinic.

4.2 Adoption and Utilization of ONE Resources

The ONE platform directly captured metadata on WIC client activity, including data on the number of pending, open active, open inactive, and closed accounts. MI State agency captured these data each quarter.

4.2.1 Trends in ONE Account Activation

Throughout implementation of telehealth in MI, ONE account usage by clients remained low. The number of pending accounts increased from 27 in Q1/Q2 to 309 by the end of implementation, reflecting an increase in the number of new accounts set up by MI WIC staff but pending activation by WIC clients. Open active accounts increased slightly from 35 in Q1/Q2 to 37 by the end of implementation, whereas open inactive accounts increased from two in Q1/Q2 to 57 by the end of implementation. The small increase in the number of open active accounts over time and the larger increase in the number of open inactive accounts is indicative of limited use of ONE over time (data not shown).

4.2.2 Trends in ONE Resources Viewed

ONE resources included articles that could be shared by WIC staff with clients to be reviewed at their convenience and nutrition lessons that could be completed independently by clients on their own time. In addition, ONE included recipes that WIC clients could access after activating their accounts. **Table 4.2** presents numbers of articles and recipes viewed and lessons completed by WIC clients across the implementation period.

Table 4.2. Trends in ONE Articles Viewed, Recipes Accessed, and Lessons Completed by WIC Clients from Q1/2022 to Q2/2023 in MI

Variable	Q1/2022	Q2/2022	Q3/2022	Q4/2022	Q1/2023	Q2/2023
	Number (n)[a]					
Articles viewed by WIC clients	8 (n=2)	19 (n=6)	14 (n=7)	5 (n=3)	5 (n=2)	3 (n=1)
Recipes accessed by WIC clients	1 (n=1)	0	12 (n=2)	1 (n=1)	7 (n=1)	0
Lessons completed by WIC clients	1 (n=1)	5 (n=2)	2 (n=2)	5 (n=1)	1 (n=1)	1 (n=1)

Source: ONE metadata, MI State agency
[a] The n in parentheses represents unique users.

Over the project's duration, between 1 and 7 clients viewed articles; the number of unique articles viewed by clients ranged from 1 to 9. The number of unique recipes viewed by two clients during the project's duration ranged from 1 to 7, and the number of lessons completed by two clients ranged from 1 to 5.

4.3 Barriers to Accessing WIC Services

4.3.1 Availability of Technology at Home

Most Client Survey respondents had access to a smartphone and computer at home. As seen in **Table 4.3**, 90 percent had a smartphone, and slightly more than 80 percent had a computer or Chromebook at home. Respondents connected to the Internet primarily using home connect (61%) followed by cellular connect (37%). Among those who used home connect, slightly more than 5 percent encountered problems often and about 30 percent encountered problems sometimes when it came to connecting with the Internet. Among those not using home connect, common reasons for not doing so included Internet cost (29%), followed by the ability to connect somewhere else (about 21%).

Table 4.3. Availability and Use of Technology at Home among Client Survey Respondents in MI

Availability and Use of Technology	Overall	Intervention	Comparison	p-value[a]
	%			
Which of the following do you have at home?[b]	N=209	N=109	N=100	
Desktop/laptop computer	47.4	45.0	50.0	0.4655
Tablet computer	27.3	27.5	27.0	0.9324
Chromebook	8.1	10.1	6.0	0.2797
Smartphone	90.4	90.8	90.0	0.8394
Other	1.0	0.0	2.0	0.1379
No devices in the home	1.9	1.8	2.0	0.9306
How do you most often connect to the Internet?	N=202	N=104	N=98	0.2591
Home connect	61.4	56.7	66.3	
Public connect	0.0	0.0	0.0	
Cellular connect	37.1	42.3	31.6	
Do not connect	1.5	1.0	2.0	
Among Those Who Use Home Connect				
How often do you have problems with the speed, reliability, or quality of Internet connection at home in a way that makes it hard to do things you need to do online?	N=116	N=57	N=59	0.3051
Often	5.2	7.0	3.4	
Sometimes	32.8	28.1	37.3	
Rarely	40.5	47.4	33.9	
Never	21.6	17.5	25.4	
Don't know	0.0	0.0	0.0	
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=66	N=39	N=27	0.6080
Not available	9.1	10.3	7.4	
Internet cost	28.8	30.8	25.9	
Device cost	9.1	10.3	7.4	
I connect somewhere else	21.2	25.6	14.8	
I don't want to	18.2	12.8	25.9	
Privacy/security	13.6	10.3	18.5	

Source: THIS-WIC Client Survey

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

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

Among the 63 clients who refused telehealth appointments, the most common reason for doing so was that they liked seeing WIC staff (n=21), followed by lack of private space for telehealth appointments or not being comfortable (n=12), and lack of technology to do so (n=10).

4.3.2 Comfort with Technology and Frequency of Videochat Use

Overall, 53.7 percent of the Client Survey respondents were very confident with their use of technology, and 34.6 percent were somewhat confident; 3.2 percent indicated they were somewhat uncertain when it came to the use of technology (**Table 4.4**). Slightly more respondents from the intervention agencies than comparison agencies were very confident about their use of technology (60.2% vs. 46.7%). About 30 percent of the respondents used videochat daily to communicate with and stay connected with friends and family and an additional 22.1 percent used it about two times per week; 16.8 percent never used videochat to stay connected with friends and family. The frequency of use of videochat was similar for respondents in the intervention and comparison agencies.

Table 4.4. Comfort with Technology and Frequency of Videochat Use among Client Survey Respondents in MI

Comfort with Technology	Overall	Intervention	Comparison	p-value[a]
	%			
When it comes to the use of technology, which of the following best describes you?	N=188	N=98	N=90	0.3167
Very confident	53.7	60.2	46.7	
Somewhat confident	34.6	29.6	40.0	
Neither confident nor uncertain	8.5	7.1	10.0	
Somewhat uncertain	3.2	3.1	3.3	
Very uncertain	0.0	0.0	0.0	
Don't know	0.0	0.0	0.0	
How often do you use video chat to communicate and stay connected with family and friends?	N=190	N=98	N=92	0.6111
Daily	29.5	30.6	28.3	
2 times per week	22.1	20.4	23.9	
1 time per week	10.0	12.2	7.6	
2 times per month	7.4	7.1	7.6	
1 time per month	3.2	1.0	5.4	
Less than 1 time per month	9.5	11.2	7.6	
Never	16.8	16.3	17.4	
Don't know	1.6	1.0	2.2	

Source: THIS-WIC Client Survey
[a] p-values are based on chi-square tests.

4.3.3 Barriers to Accessing WIC Services

Client Survey respondents reported the barriers to accessing WIC services for their most recent WIC appointment. Barriers included administrative factors (receiving a specific appointment time and experiencing long wait times), individual-level factors (transportation, childcare, and getting off work); and staff interactions (language barriers, racial/ethnic barriers, and Internet connectivity). As seen in **Table 4.5**, mean scores for all measures ranged from 2.4 to 2.8, indicating low frequency of experiencing barriers. There were no differences in the frequency of barriers faced to receive services at their most recent WIC appointment among respondents from intervention and comparison agencies.

Table 4.5. Barriers to Accessing WIC Services among Client Survey Respondents in MI

Barriers[a]	Intervention (N=122)	Comparison (N=108)	Δ (95 CI)	p-value[b]
	Mean (SE)			
Not given a specific appointment time	2.6 (0.15)	2.4 (0.14)	0.25 (-0.24, 0.73)	0.274
Wait too long	2.8 (0.11)	2.6 (0.11)	0.22 (-0.17, 0.61)	0.219
Transportation issues	2.6 (0.12)	2.5 (0.11)	0.06, (-0.33, 0.45)	0.704
Childcare issues	2.7 (0.10)	2.6 (0.10)	0.08, (-0.26, 0.42)	0.591
Difficulty getting off work	2.6 (0.13)	2.6 (0.12)	0.02, (-0.43, 0.47)	0.901
WIC staff language barrier	2.8 (0.08)	2.8 (0.08)	0.05 (-0.22, 0.32)	0.655
WIC staff racial/ethnic barrier	2.4 (0.18)	2.4 (0.17)	-0.02 (-0.57, 0.54)	0.952
No or poor Internet connection	2.5 (0.13)	2.6 (0.12)	-0.07 (-0.47, 0.33)	0.703

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 intervention and comparison agencies.

4.4 Satisfaction with WIC Appointments

The unadjusted mean client satisfaction level was high and not significantly different between Client Survey respondents from intervention and comparison agencies, thus satisfaction with WIC appointments is just as high for telehealth as it is for WIC services delivered via usual care (**Table 4.6**). An adjusted model was attempted for satisfaction but was not possible because none of the demographic/household variables demonstrated statistically significant differences between intervention and comparison agencies.

Table 4.6. Satisfaction with WIC Appointment among Client Survey Respondents in MI

Client Satisfaction	Intervention (N=122)	Comparison (N=108)	Δ (95 CI)	p-value[b]
	Mean (SE)			
Client Satisfaction Index[a]	90.5 (1.70)	87.8 (1.55)	2.69 (-3.28, 8.66)	0.297

Source: THIS-WIC Client Survey
[a] Client satisfaction index (range: 20−100) is based on 8 items (interitem correlation, alpha = 0.93)
[b] Hierarchical linear regression models (unadjusted) were used to compare differences in means for intervention and comparison agencies.

4.5 Retention in WIC

Six months after completing the survey, 25 percent of Client Survey respondents continued to receive WIC services (**Table 4.7**). Although more respondents from intervention than comparison agencies were retained in WIC for at least 6 months, these were not significantly different. Retention data were not examined by participant type. The percentage of participants classified as children were similar in intervention and comparison agencies, and it is likely children may have aged out of the program at a similar rate for intervention and comparison agencies.

Table 4.7. Client Survey Respondents' Retention in MI WIC[a]

Participant Retention	Overall	Intervention	Comparison	p-value[c]
	N=87	N=53	N=34	
	%			
Retained for 180 days or more[b]	25.29	26.42	39.08	0.763

Source: MI MIS linked to THIS-WIC Client Survey data
[a] Analysis restricted to respondents who completed the THIS-WIC Client Survey in the first six months of the intervention
[b] Availability of data on WIC benefit redemption after 180 days of survey completion used as a proxy for retention
[c] p-value based on chi-square test.

4.6 Intent to Change Dietary Behaviors

In general, the intent to change dietary behaviors following their most recent WIC appointment was comparable for Client Survey respondents in the intervention and comparison agencies. As seen in **Table 4.8**, mean scores for intentions to “change how I eat” and “how I feed my family” ranged from 3.6 to 3.8, indicating that respondents were neutral or agreed with these statements. The mean score for the perceived value of WIC nutrition education (i.e., taught me things that will help me choose nutritious foods for me or my family) was 4.1 and 4.0 for respondents in the intervention and comparison agencies, respectively, indicating agreement or strong agreement that the lesson would help them make healthy choices.

Table 4.8. Intent to Change Dietary Behaviors Following the WIC Nutrition Education Lesson among Client Survey Respondents in MI

Statement[a]	Intervention (n=122)	Comparison (n=108)	Δ (95 CI)	p-value[b]
	Mean (SE)			
After my WIC nutrition education lesson, I wanted to change how I eat.	3.7 (0.12)	3.6 (0.11)	0.10 (-0.28, 0.49)	0.544
After my WIC nutrition education lesson, I wanted to change how I feed my family.	3.8 (0.11)	3.6 (0.11)	0.21 (-0.16, 0.58)	0.217
My WIC nutrition education lesson taught me things that will help me choose nutritious foods for me or my family.	4.1 (0.13)	4.0 (0.12)	0.12 (-0.31, 0.55)	0.541

Source: THIS-WIC Client Survey
[a] Response options: 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 intervention and comparison agencies.

4.7 Daily Fruit and Vegetable Intake

Following their appointment, survey respondents self-reported their daily fruit and vegetable intake, with response options ranging from none to 4 or more cups. As seen in **Table 4.9**, about 2 percent of respondents did not eat any fruits and about 3 percent did not eat any vegetables. Almost 10 percent ate ½ cup to 1 cup of fruits and 13 percent ate ½ cup to 1 cup of vegetables. Slightly more than a quarter of respondents (27.1%) ate 1 to 2 cups of fruit, and 25.5 percent ate 1 to 2 cups of vegetables. The distribution of fruits and vegetables were not statistically different for the intervention and comparison agencies, but chi-square may not be a valid test for fruits per day because of low cells counts.

Table 4.9. Daily Fruit and Vegetable Intake among Client Survey Respondents in MI

Variable	Overall	Intervention	Comparison	p-value[a]
	%			
Fruits per day	N=188	N=96	N=92	0.7917
None	2.1	2.1	2.2	
1/2 cup or less	10.6	11.5	9.8	
1/2 to 1 cup	21.3	18.8	23.9	
1 to 2 cups	27.1	24.0	30.4	
2 to 3 cups	22.3	24.0	20.7	
3 to 4 cups	11.7	14.6	8.7	
4 or more cups	4.8	5.2	4.3	
Vegetables per day	N=188	N=96	N=92	0.3883
None	2.7	3.1	2.2	
1/2 cup or less	13.3	10.4	16.3	
1/2 to 1 cup	23.4	29.2	17.4	
1-2 cups	25.5	21.9	29.3	
2 to 3 cups	20.2	21.9	18.5	
3 to 4 cups	8.0	8.3	7.6	
4 or more cups	6.9	5.2	8.7	

Source: THIS-WIC Client Survey
[a] p-values are based on chi-square tests. For fruits per day, 25% or more of the cells have expected counts less than 5 so chi-square may not be a valid test.

4.8 Breastfeeding Practices

Data captured in MI's MIS for Client Survey respondents 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. About one-quarter of the survey respondents (n=59) had an infant in their household. As seen in **Table 4.10**, a greater proportion of survey respondents in the comparison than in the intervention agencies ever breastfed (85.7% vs. 61.9%). Conversely, a greater proportion of survey respondents in the intervention than in the comparison agencies exclusively breastfed their infant (27% vs. 13.6%). These differences are not statistically significant.

Table 4.10. Breastfeeding Practices[a] among Client Survey Respondents in MI

Variable[a]	Overall	Intervention	Comparison	p-value[b]
	%			
Ever breastfed	N=28	N=21	N=7	0.2428
Yes	67.9	61.9	85.7	
No	32.1	38.1	14.3	
Exclusively breastfed	N=59	N=37	N=22	0.2301
Yes	22.0	27.0	13.6	
No	78.0	73.0	86.4	

Source: MI MIS
[a] Breastfeeding behavior is reported for households with at least one infant (0–12 months) during the intervention period.
[b] p-values are based on chi-square tests; 25% or more of the cells have expected counts less than 5 so chi-square may not be a valid test.

4.9 Trends in Breastfeeding Initiation and Exclusive Breastfeeding

As seen in **Table 4.11**, breastfeeding initiation and exclusive breastfeeding rates fluctuated considerably for both intervention and comparison agency clients, with lowest rates in Q1/2022. The rate of breastfeeding initiation increased steadily from Q1/2022 to Q1/2023.

Table 4.11. Trends in Breastfeeding Initiation and Exclusive Breastfeeding for 6 Months among WIC Clients in Intervention and Comparison Agencies Using Administrative Data in MI

Local Agency	Q1/2022	Q2/2022	Q3/2022	Q4/2022	Q1/2023	Q2/2023	Average Q1/2022-Q2/2023
	%						
	Ever Breastfed						
Intervention agencies							
Caseload (N)	642	1,431	910	785	66	0	798
%	9.19	20.20	37.58	41.78	43.93	-	30.95
Comparison agencies							
Caseload (N)	748	1,745	1,188	903	82	0	979
%	12.30	22.64	42.68	50.06	56.10	-	35.73
	Exclusive Breastfeeding						
Intervention agencies							
Caseload (N)	856	1785	969	882	498	252	877
%	6.07	7.84	11.04	9.18	9.24	8.33	9.01
Comparison agencies							
Caseload (N)	1102	2308	1283	1124	701	315	1146
%	9.44	10.88	13.25	13.43	12.55	14.92	12.34

Source: MI MIS

4.10 WIC Benefit Redemption Patterns

WIC benefit redemption patterns were examined for the month following the completion of WIC appointment/Client Survey completion using MIS data. About two thirds of the respondents redeemed between 10 and 90 percent of their WIC benefits in the month after their telehealth appointment (**Table 4.12**). Although 6 percent redeemed less than 10 percent of their WIC benefits in the month after Client Survey completion, nearly 30 percent redeemed more than 90 percent of their benefits. WIC benefit redemption patterns did not differ for survey respondents in the intervention and comparison agencies.

Table 4.12. WIC Benefit Redemption Following Client Survey Completion in MI

Benefit Redemption	Overall	Intervention	Comparison	p-value[a]
	N=179	N=95	N=84	
	%			
<10%	6.15	5.26	7.14	0.299
10-90%	64.25	69.47	58.33	
>90%	29.61	25.26	34.52	

Source: MI MIS linked to THIS-WIC Client Survey data
[a] p-value based on chi-square test.

4.11 Summary of Findings: Clients

WIC clients in the intervention agencies received services via phone and the ONE telehealth platform account, accessing resources either synchronously during the appointments or asynchronously following the appointment. WIC clients in the comparison agencies received phone services and resources were shared via postal mail. This chapter described client experience 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 ONE:** Client Survey respondents who received WIC services through a telehealth appointment found it acceptable (agree or strongly agree) to do so. Most respondents indicated that the way they received WIC services was easier than going to a WIC clinic and expressed a preference to continue receiving services the same way at their next appointment. Respondents who used the ONE platform asynchronously found it easy to access and simple to use; all felt that language was easy to read. Respondents who used the ONE platform with video capabilities (synchronously) found it easy to talk with and see their WIC nutrition educator.
- **Adoption and use of ONE platform and resources**: Over the course of the intervention, use of ONE resources by WIC clients remained low. In any given quarter, articles viewed by WIC clients ranged from 3 to 19, recipes accessed ranged from 0 to 12, and lessons completed ranges from 1 to 5.

- **Barriers to accessing WIC services**: In general, most survey respondents had a computer (47% desktop/laptop; 27% tablet; 8% Chromebook) and smartphone (90%) and Internet connection at home (61%). Additionally, most were very confident (54%) or somewhat confident (35%) about using technology; less than 10 percent had never used videoconferencing to communicate with family and friends. Respondents had favorable experiences with their appointments. Mean barrier scores did not differ between those in the intervention and comparison agencies, which may be due to comparison agencies delivering services via phone. Lack of private space for telehealth appointments or not being comfortable (n=12), and lack of technology (n=10) were also cited as barriers to accepting appointments via telehealth.
- **Satisfaction with WIC appointment**: Consistent with low frequency of barriers, survey respondents in the intervention and comparison agencies had a high level of satisfaction with their WIC appointment.
- **Retention in WIC**: The overall unadjusted retention rate in WIC for Client Survey respondents was about 25 percent. Retention rates were about 13 percentage points higher for survey respondents in the comparison than for respondents in intervention agencies (39.08% vs. 26.42%).
- **Intent to change dietary behaviors**: Survey respondents in the intervention and comparison agencies have comparable scores (3.6 to 3.8 on a 5-point agreement scale) for intent to change their dietary behaviors (i.e., how they ate, how they feed their family) and the usefulness of lessons to make healthy choices (4.1 and 4.0 on a 5-point agreement scale for intervention and comparison agencies, respectively).
- **Fruit and vegetable intake**: About 20 percent of survey respondents ate ½ cup to 1 cup of fruits and about 25 percent ate 1 to 2 cups of fruits, with almost similar patterns for vegetable intake. In general, fruit and vegetable intake following respondents' WIC appointment was comparable for the intervention and comparison agencies.
- **Breastfeeding practices**: Unadjusted analysis of breastfeeding practices indicate that a greater proportion survey respondents in the comparison than in the intervention agencies ever breastfed (86% vs. 62%) but a greater proportion in the intervention agencies than comparison agencies exclusively breastfed their infant for 6 months (27% vs. 14%). These results should be interpreted with caution because of the small sample size. These rates of breastfeeding initiation and exclusive breastfeeding are higher among survey respondents than in the MIS aggregate data from the intervention and comparison agencies. MIS data from Q1/2022 (preintervention) to Q2/2023 (end of intervention) were used to examine breastfeeding practices for all clients in the intervention and comparison agencies. At the intervention agencies, breastfeeding initiation increased from 79% to 80% and exclusive breastfeeding rate increased from 14% to 16%. At comparison agencies, breastfeeding initiation rates increased from 69% to 75% and exclusive breastfeeding increased from 10% to 14%.

- **WIC benefit redemption:** Unadjusted analysis of WIC benefit redemption indicate that about two-thirds of survey respondents redeemed between 10 and 90 percent of their WIC benefits in the month after their telehealth appointment, with about 30 percent redeeming more than 90 percent. These redemption patterns are comparable in the intervention and comparison agencies.

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 understand whether and how telehealth influences impact, intermediate, process, and cost outcomes.

As planned, the project's intent was to deliver WIC nutrition education and breastfeeding support to WIC clients at intervention agencies through telehealth via Zoom paired with ONE for nutrition education content and at comparison agencies through in-person appointments. Project launch was delayed due to the COVID-19 pandemic, amid several changes to WIC service delivery at intervention agencies, including delays in launching telehealth services. Similarly, to ensure continuity in services, physical presence waivers enabled all WIC agencies including those at the comparison agencies to conduct phone-based appointments.

To accommodate the shift in service delivery, the evaluation of THIS-WIC in MI was adjusted to assess the implementation of Zoom and ONE; implementation, cost and client-level outcomes were compared for telehealth (Zoom paired with ONE) vs. usual care (phone-based service delivery under physical presence waivers or in-person appointments). Implementation evaluation findings are based on data collected from MIS, state responses to the implementation tracking tool, metadata from the ONE platform, and Staff Surveys and key informant interviews. Outcome evaluation findings are based on data collected from MIS, metadata from the ONE platform, and THIS-WIC Client Surveys.

5.1 Implementation of Telehealth in Michigan

Between Q1/2022 and Q2/2023 (January 2022 through June 2023), 17 local agencies (eight intervention and nine comparison agencies) participated in the 18-month evaluation. WIC staff generally perceived a high need to offer remote services to their clients and believed that offering telehealth services aligned with modern health care, provided clients a choice of appointment type, and allowed for personalized interactions among those who chose telehealth appointments.

More than two-thirds of the staff had prior experience delivering telehealth services before this project. Staff received training and ongoing technical support to implement telehealth services. Staff noted that future training should incorporate hands-on practice sessions using ghost accounts, which will provide them with an understanding of the staff and client side of telehealth service delivery. Staff indicated that the lag between training and launch required them to review and understand the telehealth system again. The frequency of always offering telehealth appointments ranged from 30 percent to 65 percent, and 70 percent or more staff completed their scheduled appointments via telehealth. Anecdotal information from the MI State agency project team indicated that because CPAs and clerical staff were the initial points of contact and

the ones scheduling/rescheduling appointments, they were offering and promoting telehealth. These staff were trained during the initial project kickoff, but the MI State agency team noted that ongoing training on promotion of telehealth for frontline staff would be valuable, as promoting and scheduling telehealth appointments is ultimately reliant on those staff.

Most nutrition education appointments conducted in person or virtually generally took about 16 to 30 minutes, whereas most appointments conducted via telehealth took 31 to 45 minutes or more. Anecdotal information from MI State agency staff noted that sharing information through the ONE platform during telehealth appointments likely contributed to increased telehealth appointment length. Specifically, the State agency team noted that WIC clients willing to attend a telehealth appointment and interact with the ONE material were likely more engaged, leading to better–and longer–conversations during appointments. In addition, the time needed to get situated on Zoom and ONE may have increased appointment times.

Overall satisfaction with delivering services via telehealth was high. Staff considered the education materials (documents and videos) on the ONE platform to be comprehensive and of high quality. Staff found the telehealth platform easy to use and interact with, but some reported that the approach to joining the telehealth appointment was not as seamless or straightforward from the client perspective. Staff also noted that clients needed to have an email address to setup their account on the ONE platform, which limited uptake.

During implementation, staff acknowledged the engagement and support of local and State agency staff, particularly the technical support to address problems in real time. Staff also appreciated the support provided by the liaisons to schedule appointments. Staff found telehealth services to be rewarding as they could interact with the clients and build rapport. Metadata on trends in telehealth platform use over time reveal that staff shared more resources from ONE platform during appointments than after the appointment. State agency staff noted that staff churn and fatigue contributed to varying levels of staff adoption overall and within agencies. Lack of private space in the clinic, convenience to conduct appointments by phone, and lack of technology/knowledge to use technology were commonly reported barriers to conducting telehealth/Zoom appointments. Despite these barriers, staff perceived telehealth to be an acceptable way to provide WIC services, and most hoped to continue using telehealth appointments after the end of the project. Although staff favored telehealth services, they acknowledged that their usage was driven by clients and that clients should be provided flexibility in choosing how they would like to schedule appointments and receive WIC services.

Staff indicated that providing telehealth services allowed them to build rapport with clients, understand their lifestyles, and use their expressions and reactions to guide discussions. Staff noted that some of their clients were not comfortable with technology and stressed that clients should be given flexibility in choosing how they would like to schedule their appointments and receive WIC services. Overall, staff found telehealth to be an acceptable way to provide WIC services and expressed a preference to continue scheduling telehealth appointments.

Staff traveled less frequently but spent more time traveling to other clinics to provide services. The startup cost to offer telehealth services was $147,659, of which about 87 percent was spent

on contracted services. Based on the monthly caseload data, it would take MI less than one month to recoup its investment in telehealth startup costs. The ongoing mean costs per enrollment were comparable at intervention and comparison agencies. At 12 months, the ongoing cost per appointment declined from $49 to $40 at intervention agencies but increased from $41 to $44 at comparison agencies.

5.2 Client Experience and Outcomes

In general, most Client Survey respondents had a computer and smartphone at home and were confident about using technology. Findings from the Client Survey at intervention agencies indicate a high level of acceptability to receive WIC services via telehealth appointments (synchronously and asynchronously). Respondents who had activated their ONE account accessed resources available on the ONE platform. Respondents expressed a preference to continue receiving WIC services the same way for their next appointment; however, metadata on ONE use indicated low adoption by WIC clients across the intervention period.

The collective findings on respondent's satisfaction and experience with WIC appointments and intent to change dietary behaviors indicate that telehealth resulted in outcomes that were comparable to usual care in a pandemic situation. Survey respondents from the intervention and comparison agencies had similar scores for level of satisfaction with their WIC appointment and barriers to accessing WIC services. The intent to change dietary behaviors and daily fruit and vegetable intake were also similar for respondents in the intervention and comparison agencies.

Overall rates of breastfeeding initiation and exclusive breastfeeding varied among respondents in the intervention and comparison agencies. Because breastfeeding practices were assessed immediately after respondents' telehealth appointment, and these practices are not likely to change based on a single appointment and factors contributing to these differences were not examined. Policies related to follow up on breastfeeding were the same for both telehealth and intervention agencies. Retention rates in WIC were about 25 percent for clients in intervention and comparison agencies.

5.3 Lessons Learned

Telehealth is a viable approach to deliver WIC services to high-risk WIC clients. Telehealth services can involve a phone-based appointment with synchronous or asynchronous resource sharing. Creating an integrated system that supports use of Zoom and ONE platform and streamlining the number of client accounts to access WIC information (e.g., MYWIC vs. ONE) is critical to avoiding confusion and ensuring take-up. Although staff and clients are comfortable with telehealth appointments for nutrition education, they prefer in-person appointments for breastfeeding support. Staff and clients expressed a desire to continue using telehealth for service delivery but noted that clients should be provided the flexibility in how they would like to receive WIC services.

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 equality in satisfaction with WIC services and the absence of statistical significance in outcomes demonstrates the feasibility of delivering virtual services successfully without diminishing the quality and impact of the WIC program. It is also likely that telehealth was limited to one contact over the intervention's duration because of the period in which the study took place (i.e., during the COVID-19 pandemic). Ongoing use of and exposure to resources on the telehealth platform may lead to long-term changes in outcomes. Additional studies and evaluations are needed to demonstrate its efficacy, particularly as WIC resumes offering in-person services. Understanding and deploying strategies to increase awareness, comfort, and use of the ONE platform synchronously may increase client use of resources on the ONE platform. The findings from this evaluation suggest that flexibility in providing telehealth services is essential. Training staff on the process and promotion of telehealth platform resources may lead to increased use of telehealth.

The findings from cost analysis found that MI's telehealth program startup took about 10 months with total startup cost of $147,659 or $14,766 per month. In MI, most costs were for contracted services (87%) followed by labor (12%), and a small amount (1%) for equipment. Overall, cost analysis findings indicate that ongoing service delivery costs per enrollment and per appointment decreased at intervention agencies but increased at comparison agencies. The return on investment analysis suggests that it took less than 1 month for the state to recoup its investment in the startup costs of the telehealth solution.

The findings on the cost of Michigan's ongoing service delivery support the hypothesis that telehealth implementation can elicit potential cost savings. Costs reduced over time for the intervention agencies relative to the comparison agencies for both per-enrollment and per-appointments costs. Per-appointment costs for the intervention agencies decreased by $8.48 from pre-implementation to 12 months post-implementation ($48.77–40.29), whereas for the comparison group they increased by $2.81 ($40.83–43.64). The difference between these two values is $11.29 and represents potential cost savings per appointment associated with the intervention.

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 both intervention and comparison agencies were virtual during the height of the pandemic, this resulted in a 2.5-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 both 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, comparison agencies continued to offer remote services to their clients during the post-implementation period.

Additionally, agency-level costs can 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 we were not able to do so in this study given the 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, large number of participating agencies, and WIC staff and client participation in the evaluation. The evaluation employed a quasi-experimental study design and included a relatively large number of agencies in both the intervention and comparison groups. Intervention agencies were selected based on prior documented challenges of retaining qualified professionals, and the MI State agency factored in the RD/IBCLC staff-to-client ratio, barriers to WIC services, and current health outcome disparities in local agencies across the state while selecting intervention agencies. Comparison agencies were matched to intervention agencies based on caseload and client characteristics, such as race and ethnicity. In addition, the telehealth intervention was targeted to high-risk WIC clients, providing insights into the feasibility of improving service delivery for this population.

In the context of understanding telehealth service delivery, the response rate to the Staff Survey for the early and late phase surveys was relatively high, and State agency team tracking provided contextual information on implementation.

Regarding client satisfaction and client experience with telehealth, though the percentage of invited clients who consented to take part in the evaluation was below the target response rate of 5 to 10 percent, 100 percent of those who consented completed the Client Survey. In addition, MI collected information from clients who declined Zoom appointments, providing additional information on telehealth use. The availability of client-level MIS data and the high match rate (survey respondents with MIS data) indicate that survey respondents were generally representative of the clients at participating agencies.

This evaluation has several limitations. The COVID-19 pandemic reshaped usual care service delivery; under physical presence waivers, in-person appointments were replaced with phone appointments. Thus, the mode of service delivery was Zoom or phone for the intervention agencies and phone or in person for comparison agencies, but nutrition education resources were shared via ONE platform at intervention agencies and either discussed over the phone or sent via postal mail to WIC clients at comparison agencies. Because both intervention and comparison agencies offered phone-based appointments, differences in client outcomes should be interpreted with caution. In addition, data about appointment modality (i.e., Zoom vs. phone

vs. in-person) were not examined. The COVID-19 pandemic affected the timeline and the approach to using the ONE platform for resource sharing with clients. Staff turnover, formula crisis during the implementation period, and staff burnout also impacted capacity to promote telehealth use among clients in the intervention agencies. Due to low usage of telehealth and the small sample size, outcomes related to service delivery across intervention and comparison agencies could not be examined.

As noted in **Section 5.4**, there were limitations related to reporting of cost data. These included the lag between the pre-implementation period, which was pre-COVID-19, and the implementation period, as well as changes in staff and financial reporting systems, and burden associated with data collection.

It is important to highlight that comparable client- and respondent-level outcomes in the intervention and comparison agencies should not be interpreted as evidence of 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 gather client perspectives on facilitators and barriers to using resources via a telehealth platform.

5.6 Sustainability

Following the THIS-WIC evaluation, MI will discontinue the use of ONE and Zoom for client appointments, driven by the need to update their MIS for seamless integration of a nutrition education platform. Local agency staff acknowledged the high-quality materials available on the ONE platform but noted that clients were confused with two accounts, which limited client utilization of resources on ONE. Staff also noted client preferences for phone appointments and unease around Zoom use particularly for discussion of breastfeeding challenges.

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