Nurse Home Visitors' use of the Háblame Bebé app to support mother-child interactions in their home language during COVID

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Background and Project Aims

Introduction

This brief reports on a study in which we partnered with Nurse-Family Partnership (NFP) in Miami Dade County to support Hispanic mother-child language interactions in the home language, Spanish; to track developmental milestones by using the free, evidence-based parent coaching app, Háblame Bebé; and to improve developmental outcomes. Háblame Bebé teaches about the importance of sociolinguistic pride, developmental milestone monitoring, and tracking baby's bilingual language development. A rapid-cycle evaluation framework was utilized that allowed for continuous adjustments and new ideas to be added to our program, based on team-based ideas that are generated from iterations of data feedback via the Plan-Study-Do-Act Breakthrough Series Collaborative Model (Arbour et al., 2019; Langley, 2009). Across twelve months, nurse home visitors integrated the Háblame Bebé app into their virtual home visits with 20 mothers and babies. During this time, we implemented three Plan-Do-Study-Act cycles. At each team meeting, the 'faculty' (four authors of this brief) reported main data outcomes to the NFP nursing team. As a team, we then brainstormed ideas for the next cycle, with nurse home visitors always centered as the main ideators.

In this brief, we describe the theoretical base for implementing this home visiting innovation. We describe the Háblame Bebé app and explain how it supports parents in monitoring milestones and finding opportunities to engage in back-and-forth interactions with their infants to support Spanish-English bilingualism. We then present on some of our qualitative data and outcomes that came out of each Plan-Do-Study-Act cycle. Our goal is to detail how precision home modeling was implemented in South Florida and led to impact for nurses and Hispanic mothers and babies.

The impact of COVID on early childhood

Our team began to see the effects of COVID and how it was affecting Hispanic families from the beginning of our study, which began shortly before the pandemic. The rate of serious illness among young children from COVID is, to date, very low (Donohoe et al., 2020; Lu et al., 2020); however, systems supporting young children and their families are not fully functional. Across the nation, rapid changes were being made such as closures and adjustments in home visiting programs. All of these closures were deemed necessary to slow the spread of the virus. Incipient research is showing that profound disruptions on early childhood supports that are deemed critical to learning and social development are having negative and long-term impacts on child outcomes as a result of COVID (UNESCO; Viner et al., 2020; Auger et al., 2020; Bond et a., 2020). Additionally, despite parents' best intentions, the COVID pandemic created a new problem that puts children at risk: missed pediatric well child visits (Santoli et al., 2020; Wyckoff, 2020). Regular appointments with a child's primary care provider are essential to a child's health, particularly in the first two years of life when developmental milestones need close monitoring (Blair et al., 2016; Glascoe & Leew, 2010).

Hispanics, the largest uninsured population in the U.S., are the most likely of all Americans to say that the coronavirus pandemic changed their daily lives and disrupted their mental health, finances, and jobs (Pew Research Center, 2020). It is not enough for children and their caregivers to survive the pandemic. The systems designed to help them thrive must adjust to a new reality that supports child development now and in the future. Federal home visiting programs can redress COVID-related inequities in Hispanic children's development and health. This includes Nurse-Family Partnership (NFP), an evidence-based, protocol-driven model operating across the U.S. that arranges for home visits from registered nurses to low-income first-time mothers (Williams et al., 2020). However, social distancing due to COVID led to significant changes in how early childhood home visiting programs worked with families (Pew Research Center, 2020). After these restrictions were put in place nationwide, NFP nurses rapidly shifted from providing in-home visits to communicating with their patients by phone or video conference, building on lessons learned from three years of implementing telehealth as a supplement to face-to-face visits pre-COVID. Nevertheless, COVID was still amplifying existing inequities in health and education among Hispanic mothers and children enrolled in NFP. These post-COVID amplifications of inequities required precision home visitation innovation as a possible strategy to identify specific approaches that can mitigate poor long-term developmental outcomes in Hispanic children and provide precise services for different Hispanic groups and in different geographical locations.

The impact of COVID on parent-child interactions

Our past research demonstrated that Hispanic mothers who had experienced linguistic racism, (e.g., discrimination because of their use of Spanish), spoke less with their infants in their native Spanish (Baralt et al., 2020). It is also known that maternal psychopathology and lack of resources associated with chronic environmental stress can lead to adverse effects on the developing child (Giuliani et al., 2019; Dickinson & Porche, 2011). When caregivers are affected, the relationship with their children can also be affected, and resultantly, their children's early brain development may be negatively affected (Forget-Dubois et al., 2009; Hoff, 2013). The back-and-forth, responsive interactions in the context of the parent-child relationship shape a child's brain architecture (Head et al., 2017). When an infant or young child babbles, gestures, or cries, and an adult responds appropriately with eye contact, words, or a hug, neural connections are built and strengthened in the child's brain that support the development of communication and social skills (Fernandez, 2011; Forget-Dubois et al., 2009; Landry et al., 2008).

We sought to support Hispanic mothers with trusted care providers: nurse home visitors. We would do so by emphasizing sociolinguistic pride, or the pride to be Hispanic, to be bilingual, and to use Spanish with their infants. Our theory of change articulates that by supporting mothers in having sociolinguistic pride, they engage in more language-rich interactions with their children in their home language, boost their sense of competence, and ultimately, promote positive outcomes for their children (Baralt et al., 2020). We decided to implement a precision home visiting model in which nurses would support at-risk Hispanic mothers in finding opportunities to talk, read, and sing more with their child in their native Spanish, and to track their child's language development and developmental milestones in the Háblame Bebé phone app. Because of our rapid-cycle evaluation approach, continuous adjustments and new ideas were able be added to our intervention based on team-based ideating and iterations of data feedback from nurses and mothers.

The Háblame Bebé phone app

Háblame Bebé is a federally funded, evidence-based, free phone app that teaches parents about the U.S. Center for Disease Control and Prevention (CDC) Aprenda los Signos, Reaccione pronto (*Learn the Signs, Act Early)* developmental milestones in Spanish. Parents are able to check off developmental milestones their baby has reached and show this checklist to their nurse home visitor to monitor together. It also gives parents access to a bilingual registry into which they enter the total number of words their baby knows in Spanish and in English, registering both receptive and productive knowledge. The app additionally provides parents with educational content related to developing sociolinguistic pride. Finally, the app supports parents in finding everyday opportunities to tune in and interact with their child, as well as the benefits and the how-to's of promoting bilingualism. Mothers can also engage with Háblame Bebé on social media (Facebook and Instagram) and share their baby's vocabulary development progress using the official hashtag, #enraicémonos (Let's get in touch with, let's be proud of our roots). Unique to our phone app intervention—the active ingredient within this innovative home visiting practice—is its promotion of increased sociolinguistic pride, which then leads to improved quantity and quality of mother-child interactions happening in the home language (Baralt et al., 2020; Larson et al., 2022). By supporting low-income Hispanic parents in feeling safe and proud to use Spanish with their children, they are empowered to engage in quality language interactions with their children in their native Spanish (Baralt et al., 2020; Larson et al., 2022). This component of intervention efficacy, tied inherently to culture, identity and language, has important implications for precision in practice.

Methods

The Research Study

It is important to highlight that because of the COVID-19 pandemic, our protocol had to be adapted to address the shift of most family contact to virtual home visits. We adjusted everything to be fully virtual, and then implemented our protocol across three Plan-Do-Study-Act cycles with the nurse home visiting team:
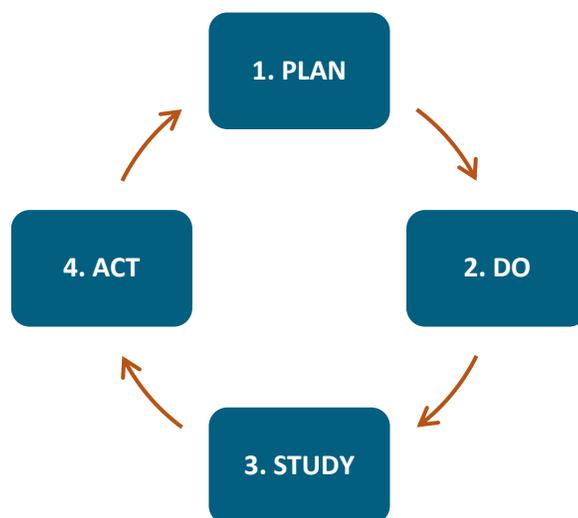
We collected pre- and post-intervention measures examining mothers' understanding of and feelings around language interactions with their child, using Spanish at home, bilingual language development, and developmental milestone monitoring. The design of our study, conducted fully online, can be seen in the figure below:
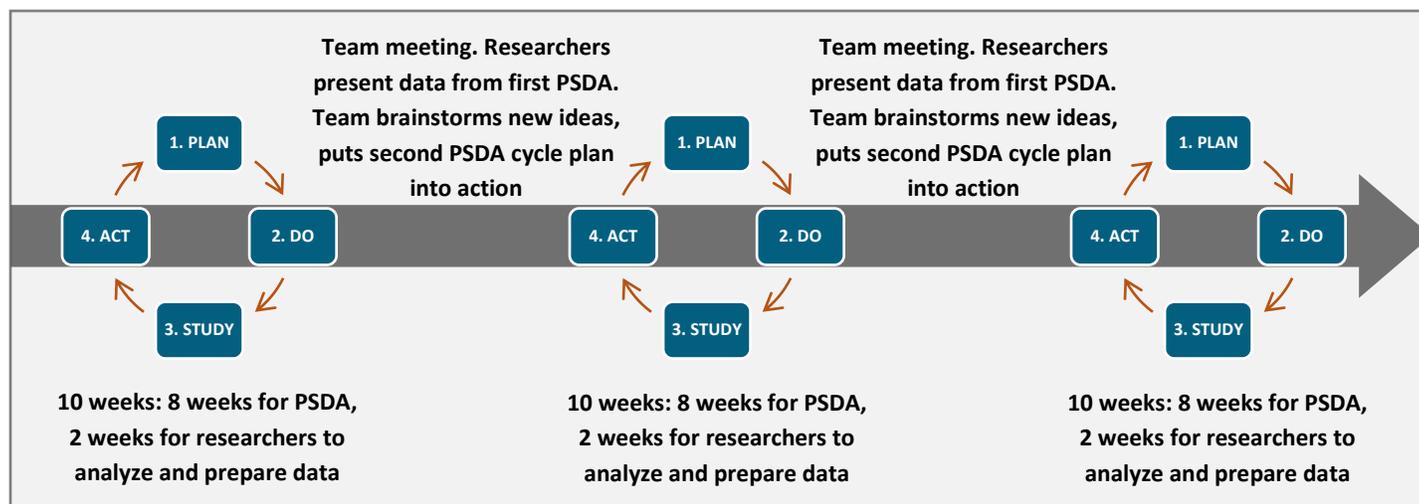
Below, we report on some of the qualitative data that came out of our study with nurse home visitors as the main innovators (analysis of our quantitative data is still ongoing). We conclude with the next steps and recommendations.

PDSA Cycle 1

   In our first Plan-Do-Study Act cycle with the nurses, they reported that they did not feel confident coaching mothers on language interactions, nor on utilizing the Háblame Bebé in home visitation via the virtual home visit. In addition, mothers' reported interactions did not increase, at least not in their home language. Mothers reported not feeling confident in supporting their child's bilingual language development. It was also found that mothers did not read at home because of lack of books. Our team ideation for the next cycle produced some key actionable items. First, nurses reported needing more coaching on the importance of early language interactions for long-term health. They also needed concrete and visual examples of how to implement the Háblame Bebé app specifically into *virtual* home visits. Nurses also all agreed that mothers could benefit from books to add to their repertoire of tools to find opportunities to engage more with their infants. To meet these needs, the research team provided the nurses with a fully online training on the early language environment and why it matters for early brain development. They also curated videos that nurses could play for mothers during the home visit virtual calls. They created a script that nurses could use to introduce the app. Finally, the team agreed upon checking with mothers during each visit on the app's developmental milestone checklist and vocabulary bank. Looking upon local resources, it was agreed that the nurses would guide mothers in self-enrolling for the county's book club, a free, literacy-promoting resource that sends every child a free monthly book, with accompanying parent psycho-social education material, in Spanish. The nurses additionally produced the following goals to focus on the following in home visitation:

1. Have conversations with mom about the benefits of talking with baby and bilingualism for early brain development, education, health, and even for jobs later on.

2.   Ask moms what they like best about the Háblame Bebé app; then use those individualized answers to set goals to do between you and her.
3.   Ask moms to share updates with you each week – for example, did they register any new words in the app? Did they check off any new developmental milestones in the app? Ask mom to show these to you.

Nurses would also continue to brainstorm ideas as based on their virtual home visits. These 'Act' plans would inform the next Plan-Do-Study Act cycle.

PDSA Cycle 2

In this cycle, nurses reported feeling more confident in coaching mothers on early language interactions via the virtual home visit. In addition, there was a slight increase in mothers' understanding of and confidence in talking more, as well as an increase in reported interactions with their child. Mothers also reported reading more, which implied that the books mailed to them were effective. This PDSA revealed several of the challenges of home visitation via virtual call. For example, nurses reported that baby was often not on the call; it was mostly mothers who were on the zoom call. This sometimes made it challenging to model back-and-forth interactions to promote language development. They also reported on mothers' needs and suggested that the weekly survey (one of our study instruments) be sent out in the evening to better accommodate mothers' schedules. Nurses brainstormed extensively and shared that the new reality of virtual home visits would require creativity. Some asked how it was possible to model language interactions via zoom, especially if baby is not present on the call. Other nurses shared how they do it, and everyone agreed that texting short video clips to mothers could help. One nurse said:

"We could send them the videos and a personal text reminder that says: 'It's not anything extra, it's just narrating your day to your baby. It is not monumental to you, but to the baby it is. You are doing such an amazing job mom."

Nurses all agreed they needed more videos to be able to share via text, and that they needed prenatal video examples. Finally, nurses shared how they felt about the virtual training. Two quotes exemplify this:

"It was long. The way it was set up – I didn't really like this… four hours … but the training was informative. For NFP nurses that had never done a training before, this same content, given by a live instructor (even if zoom!) would be better and more useful rather than online. In person is better (live or zoom)."

"I liked the videos and appreciate seeing how others teach the parents. But it doesn't apply to how we can teach virtually. Once we go back, maybe we can adapt. I was thinking 'how can I use this info today?" and honestly, it didn't give me tools on how I can use this virtually."

This was feedback for the research team in terms of how to make training better and more relevant to nurse home visitors. The team brainstormed ways to move forward, and it was agreed that personalized videos, for both nurses *and* mothers, needed to be created for this specific context. The research team created six short videos that nurses could watch both individually and with mothers in their case load. Goals for the third and final PDSA cycle would be to watch these and continue with coaching about language interactions, and to encourage mothers to talk during simple, everyday interactions with their baby in their home language. Nurses would continue to check in with mothers on baby's developmental milestones, and check these off in the app. Nurses would also continue to ask mothers to share their updates as reported in the app, and to show their updates during the virtual home visit.

PDSA Cycle 3

     All nurses completed the online training and all reported using the videos for their training and during home visitation. Nurses' confidence in coaching mothers on monitoring developmental milestones and on early language interactions continued to increase. Mothers reported a continued increase in reading. Mothers' understanding of and confidence in talking more, as well as reported interactions with their child, also increased. The team discussed future ways that coaching to nurses might be improved for virtual home visit delivery of coaching about the importance of language interactions. Nurses shared personal stories, and one of the nurses modeled for the entire team how she does it. Everyone praised her and said that her example was very helpful. Everyone agreed that they would continue to coach on mothers' roles as their child's first and best teacher in the home, and that they can and should interact with their baby in their home language. The Háblame Bebé app was a tool that assisted nurses in accomplishing this goal.

Discussion

Overall, and despite the challenges of operating project activities virtually due to the COVID-19 pandemic, the voices of nurses, mothers, and program partners (e.g., WIC clinic providers) were fully centered in our study. The PDSA cycles in this study adapted and changed based on *their* feedback and input (and not researchers' input). The creative innovation that they team saw happened precisely because of these centered voices. For example, nurses explicitly told the team what videos they needed to model interactions during virtual home videos. They reported that none existed in Spanish, and none existed for the prenatal stage. As a result, we created videos for training purposes for the nurses to use with mothers during their home virtual visits, including one featuring a team member talking to baby while in utero.

The qualitative data that we collected from the PDSA cycles informed program practice. One example was the unexpected finding that mothers in our study had no books in their home. As a result, we brought in an early literacy program partner and helped nurses to sign mothers up for a free bilingual home book delivery program. Finally, another positive outcome was mothers' and nurses' excitement over using the app as a tool together. Below is an example: a screen shot that a mother sent to her nurse home visitor, because she wanted to show her baby's language progress:

The nurse home visitor is Haitian, the mother is Hispanic, and they do not share the same first language. But the innovations explored in this study helped to promote sociolinguistic pride and interactions with the baby, encouraging the family to use their native language even when the nurse home visitor did not speak that language. This had never been done before in this nurse home visiting program.

Finally, a key outcome of this study was the increased focus on the need of nurses as they adapted to implement supports to mothers via virtual home visits. It is thanks to the Plan-Study-Do-Act Breakthrough Series Collaborative Model that we were able to zoom in on what was working, and most importantly, what was not.

Conclusion

Our goal was to improve the impact of Nurse Family Partnership more precisely for the Hispanic families for whom the program may not be working well, specifically on mother-child interactions and child language outcomes. In this study, we were significantly and negatively impacted by COVID. All Nurse-Family Partnership activities and home visits came to a complete stop once the pandemic happened. We had to rehaul our entire data collection plan and even change some of our methods and instruments. Albeit these circumstances, the very nature of our Continuous Quality Improvement approach taught us a great deal about the importance of listening to nurses' and mothers' voices for the implementation of a parent coaching program. In our context in South Florida (a highly Hispanic and bilingual community), linguistic racism exists, and language ideology can negatively impact how Spanish-speaking parents interact with their infants. At-risk mothers need support in using their home language with their infants. Nurses also need explicit modeling on how to coach mothers to overcome these larger and harmful language tropes in U.S. society, and how and why to talk to their baby as much as possible in their home language. A goal of future research will be to examine how promotion of sociolinguistic pride and talk in the home language mediates subsequent mother-child interactions, feelings of self-efficacy, and cognitive development – the very underpinnings of a child's development before starting Kindergarten, and in turn, the child's health. We made videos for the nurses and adapted them to meet their needs to support mothers in doing so. This is where making NFP home visiting more 'precise' to mothers and children in South Florida can have a significant impact in the long-term.

In summary, we were able to successfully pilot a program to help low-income, at-risk Hispanic mothers talk more with their infants in their native Spanish and to track their language and developmental milestones. Nurses were the implementers of the intervention, and the free and engaging Háblame Bebé app facilitated goal setting and sharing between nurse home visitor and mother. Nurses needed additional coaching support, particularly with virtual delivery of the intervention. Thanks to the nurses' brain-storming that came out of the Plan-Do-Study-Act cycles, we were able to deliver a virtual service to support mothers and babies, fostering more quality interactions in their home language.

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