NURSE-FAMILY PARTNERSHIP

ALWAYS A WORK IN PROGRESS

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Nurse-Family Partnership (NFP) is a national nurse home visiting program that serves first-time, low-income mothers and their children until the child reaches age two. Three randomized clinical trials conducted in different communities and contexts have shown that NFP is effective at improving maternal and child health and life-course outcomes. In spite of NFP's grounding in randomized clinical trials with decades of follow-up, we consider NFP to always be a work in progress. This means the program will continuously require additional formative development and testing of clinical innovations and expansions to reach and better serve those most likely to benefit. The practice and research worlds are sometimes seen as not compatible or being somehow misaligned. For our practice-based activities to have the greatest impact, we must effectively incorporate scientific evidence into practice design and decision making. For research to be relevant, it must be grounded in the reality of the practice world and produce findings that are relevant and actionable. Instead of being at odds with one another, practice and research efforts will be stronger if the two disciplines are effectively integrated. In this chapter, we illustrate our approach to integrating practice and research efforts by outlining the way

we have approached the development and testing of a version of NFP for pregnant women who have had previous live births, or multiparous mothers.

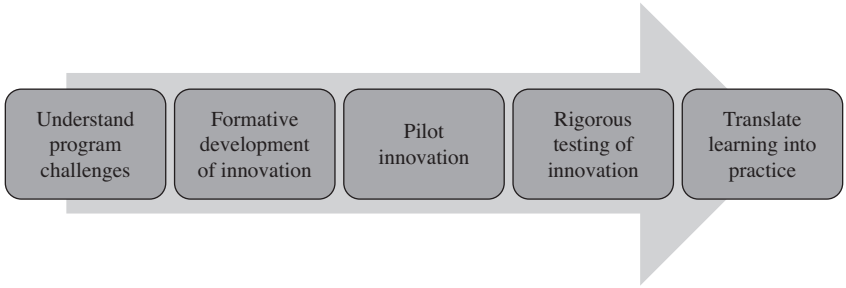
Our work began with funding from the Maternal Infant and Early Childhood Home Visiting (MIECHV) program in collaboration with Tribal Nations partners who encouraged flexibility surrounding program eligibility that respected cultural traditions and norms.[1] Given continued requests from community partners for NFP to serve multiparous mothers and their children, we have embarked on a series of research projects to adapt and refine NFP and test the effectiveness of NFP for this population. Serving multiparous mothers in NFP on a large scale will require a significant investment of resources from community partners implementing NFP, philanthropic organizations, and state and federal governments. Therefore, strong evidence for effectiveness is needed to determine whether these resources for delivery of NFP should be directed toward multiparous mothers, particularly when there is a risk of diverting resources from first-time mothers for whom NFP is known to be effective.

INNOVATION DEVELOPMENT AT NFP

In 2013, Dr. David Olds and colleagues published an article describing the process used to continue to study and improve NFP in community practice. Figure 1.5.1 shows this model for innovation development in NFP. In this piece, we describe the formative development and pilot testing of the innovation—NFP for mothers with previous live births. Our next steps are to conduct rigorous testing of the version of NFP for mothers with previous live births with a quasi-experimental design study and a randomized clinical trial.

To provide a real-world perspective to program innovations, NFP has organized an Innovations Advisory Committee (IAC) comprised of over 130 NFP home visitors, supervisors, and staff from around the United States who volunteer their time to address specific topics, such as substance use disorder, cultural awareness, and maternal morbidity and mortality. At the beginning of the formative study of NFP for mothers with previous live births, an IAC was formed to advise the research team regarding all aspects of study design and implementation.

FIGURE 1.5.1 NFP Model for Innovation Development



OBJECTIVES OF FORMATIVE STUDY OF NFP FOR MOTHERS WITH PREVIOUS LIVE BIRTHS

From 2017 through January 2021, we conducted a formative study with the following objectives developed in collaboration with NFP implementing partners: 1) determine the feasibility and learn ways of improving implementation of NFP for multiparous mothers experiencing risk factors for poor birth, parenting, and child development outcomes;[2] 2) evaluate existing criteria, referral sources, and process for defining and recruiting the target population of multiparous mothers; 3) assess and enhance collaboration and coordination of care between NFP and community stakeholders; 4) learn from NFP teams' experiences serving multiparous mothers and multiparous mothers' experiences in NFP to identify and strengthen program elements critical to serving this population; and 5) identify and integrate successful practices for serving multiparous mothers to inform the creation of program elements and educational materials.

STUDY SITE SELECTION

All community partners currently implementing NFP were invited to participate in the formative study. Interested sites completed a brief application, and sites were evaluated for readiness to participate in the study using specific criteria.[3] A total of thirty-one sites in fifteen U.S. states applied to participate and met the criteria.

DATA COLLECTION

We conducted a series of interviews from selected sites to understand the experiences of nurse home visitors, nurse supervisors, and other staff members in serving multiparous mothers. We also conducted interviews of key organizational partners, such as primary care providers and social services. The purpose of these interviews was to understand the challenges, barriers, and opportunities faced by NFP in the implementation of the program with multiparous mothers and to understand how collaboration with organizational partners might address these challenges. We interviewed multiparous mothers referred to NFP who had declined to enroll or had enrolled in the program and dropped out. Our goal in conducting these mother/client interviews was to learn: 1) how clients who participate in NFP experience the program and what important factors shape their perspectives, what they value in the program, what they do not value in the program, and how these factors influence their retention; and 2) why some multiparous mothers chose not to participate in NFP after being referred, paying attention to variation in non-participation by institutional partners such as primary care doctors and human service agencies. The findings from these interviews were used to develop recommendations to improve enrollment, engagement, and retention of multiparous mothers.

We gathered quantitative data from multiple sources, including data collected as part of routine program implementation and housed by the NFP National Service Office's data system, referral spreadsheets developed specifically for the formative study, and surveys of nurse home visitors and supervisors. Our goal was to understand the characteristics of multiparous mothers who were referred to NFP; the characteristics of those who chose to enroll; NFP sites' collaboration with healthcare providers; and the differences in clients with previous live births versus clients who were first-time parents.

In addition, we gained a wealth of information from monthly conference calls with the participating NFP sites. These calls were facilitated by a nurse consultant with extensive NFP experience. On these calls, the consultant provided updates about the formative study and nurses shared experiences in serving multiparous clients and recommendations for additional resources and adaptations. The consultant also reviewed each site's referral and enrollment numbers and discussed strategies for collaborating with referral partners.

RESEARCH AND PRACTICE INTEGRATION

Updates and findings from all data collection efforts were reviewed by the research team at weekly meetings to validate findings, adjust research approaches to best meet the needs of study sites, and inform ongoing program adaptations to more effectively serve multiparous clients. The research team, including the study nurse consultant, created brief research summaries. The study nurse consultant shared research updates and the research summaries with the IAC subcommittee at their monthly meetings and returned the IAC subcommittee's feedback to the research team. The research team also shared the research summaries and conducted webinars with the study sites to inform them of research findings on an ongoing basis. Finally, the study nurse consultant facilitated ongoing communication between the research team and participating NFP sites.

CHALLENGES AND RESPONSES

We encountered some challenges that are likely to be encountered by others conducting research in real-world settings. First, we experienced tension between the time required to conduct rigorous data collection and analysis and the need for rapid feedback for continuous quality improvement. For example, we wanted to use rigorous qualitative methods that reduce the likelihood of bias and ensure an accurate synthesis of people's perspectives and experiences to understand how to adapt NFP for women with previous live births. However, we also wanted to be able to use what we were learning from sites participating in the formative study to suggest ideas for improvement or changes they could make in real time. Our response to this tension was to build in intentional elements to enhance the translational nature of the project. We prioritized analysis that was especially relevant to ongoing program improvement efforts and, when needed, generated preliminary analysis to inform time-sensitive program improvement efforts.

Second, NFP sites participating in the formative study experienced competing demands, including the research team's needs and changing requirements dictated by funders, supporting community agencies, and state and local governments. Our response to this was to use both formal qualitative and quantitative methods and informal data gathering through monthly meetings facilitated by the nurse consultant to understand sites' competing demands and how this may have affected their ability to serve

multiparous mothers and participate in this research. We communicated to the NFP sites that whatever they were experiencing was part of our learning.

Third, at the beginning of the study, the research team did not clearly communicate the objectives of the formative study and what this type of study could and could not tell us; therefore, some NFP sites had unrealistic expectations regarding the study results. For example, some sites expected to learn whether NFP was effective for multiparous mothers based on our findings from the formative study. We had to clarify that determining effectiveness or impact requires a comparison group and doing so would be addressed at a later phase in the research process. We learned about the importance of setting clear expectations at the beginning of the study and have developed processes for ensuring we do this with our research going forward.

Finally, many project partners have expressed a strong desire to move forward with expanding eligibility of NFP for multiparous mothers before we have the results of the next phase of our research that will measure the effectiveness of NFP for this new population. This desire is based on positive personal experiences serving multiparous mothers and their families, belief that NFP will be effective for this population, and a sense of urgency to reach and serve more families facing adversity. Our response has been to acknowledge partners' strong desire to do good and to communicate that we do not want to displace service to first-time mothers, among whom we know NFP does good based on the original trials and other studies of NFP in community practice.

FORMATIVE STUDY FINDINGS

The thirty-one NFP sites participating in the formative study enrolled 1,571 pregnant women with a previous live birth.[4] These enrolled women represent 37 percent of the multiparous mothers referred to NFP as part of the formative study. This "conversion rate" from referral to enrollment for multiparous mothers is similar to the conversion rate of 35 percent for first-time mothers. Sites that routinely employ a "warm handoff" (that is, a referral made when the potential client hears about the program from a trusted source and has the opportunity to ask questions) had conversion rates that were higher. Multiparous mothers experienced more nurse-assessed risks and were referred to needed services more frequently compared to first-time

mothers. Despite experiencing more risks and having more needs than first-time mothers, rates of program retention were higher for multiparous mothers, with an 80 percent retention through pregnancy, 63 percent through child age six months, 55 percent through child age twelve months, and 50 percent through child age eighteen months compared to 77 percent, 58 percent, 48 percent, and 37 percent, respectively, for first-time mothers.

While the formative study did not include a comparison group of similar women who did not receive NFP, we examined outcomes based on data collected by the NFP nurse as part of routine program delivery. The proportion of multiparous mothers enrolled in NFP who reported smoking decreased from 17.2 percent at intake to 14.0 percent at thirty-six weeks Estimation of Gestational Age (EGA). Among primiparous mothers enrolled at the same sites during the same time period, the proportion of those who reported smoking was 7.9 percent at intake and 6.7 percent at thirty-six weeks EGA. The proportion of multiparous mothers who delivered preterm was 14.2 percent compared to 12.4 percent of first-time mothers. Among multiparous mothers, 0.10 percent reported that the index child had been admitted to the hospital for injury and 0.10 percent for ingestion compared to 0.15 percent for injury and 0.07 percent for ingestion among children of first-time mothers. These data suggest that outcomes for multiparous women are similar to those for first-time mothers served by NFP. However, the lack of an equivalent comparison group of families who did not receive NFP prevents us from determining if NFP is truly effective for this population.

NFP nurses and community providers described the need for stronger collaborative relationships with community partners to better serve multiparous clients. Nurses and mothers also recommended additional nurse resources and training to effectively meet multiparous families' needs. Flexibility with visit schedule, length, location, and content was particularly important for engaging and retaining multiparous clients. At its core, NFP is intended to activate a mother's instinct to nurture her child. NFP nurses report that some first-time mothers express this verbally as a desire to "do right by this child." For some multiparous mothers, they expressed a desire to "get it right this time." We interpret this as an acknowledgment that experiences with their previous children might not have gone well but they desire a better experience with their current pregnancy. This consistency in how the NFP program activates a mother's desire to nurture her children suggests it may also produce effects with multiparous mothers.

APPLICATION OF RESULTS AND NEXT STEPS

Based on our findings from the formative study, the NFP nursing and education teams have developed additional education for nurses,[5] materials for nurses to use with their multiparous clients,[6] and an online learning community to support nursing teams serving multiparous mothers and their families. In addition to developing additional support for nursing teams serving multiparous clients, we are continuing to conduct research to determine the effectiveness of NFP for this expanded population. We have partnered with three sites that participated in the formative study to conduct a quasi-experimental design study to measure the impact of NFP for multiparous mothers. Using data from health plans' billing and electronic medical records, we will compare pregnancy, maternal, and child health outcomes for women who received NFP with a similar group of women, matched on sociodemographic and health characteristics, who did not receive NFP. We also are working with collaborators in Florida to explore the use of state-level data, including perinatal and infant risk screens, birth certificates, and centralized intake and referral system data to measure the reach and impact of NFP for multiparous mothers. Finally, we are pursuing funding to support a randomized clinical trial of NFP for multiparous mothers.

While a randomized clinical trial remains the gold standard for determining effectiveness of an intervention and findings from randomized clinical trials are the foundation for the current NFP program implemented in the United States and other countries, conducting these trials requires extensive resources, including money and time. The quasi-experimental study has increased risk of noncomparable intervention and control groups but has the advantage of requiring less time and money to complete compared to randomized clinical trials. We will use the findings from the quasi-experimental study to guide our next steps while awaiting the results of the trial. We have developed a timeline and a plan for how we will incorporate our findings from the studies into plans for NFP program implementation.

REFLECTIONS

In this project, we aligned program adaptation with research by embedding research and the dissemination of findings to inform ongoing program adaptation and improvements into the project. This goes beyond typical

Alignment with NextGen Evidence Principles

Principle	*In This Case . . .*
Centers on Practitioners *Grounded in practitioner needs, challenges, learning questions, and decisions. Examples: allows practitioners to make evidence-informed decisions in a timely manner; reflects the context in which practitioners operate; rigor is aligned to practitioner needs.*	The motivation for this translational research project came from needs communicated by practitioners. We also structured the project so that data gathering, analysis, results, and implications were all conducted within a real-word context to maximize the relevance of our results to practitioners. We included translational components in the research project such as practitioner/expert guidance and validation of the research process and results as well as dissemination products specifically intended to meet the needs of practitioners to inform program improvement efforts.
Embraces an R&D Approach *Builds practitioner capacity to continuously build evidence, advance a learning agenda, and translate evidence into action.*	Our entire project was grounded in one of the core principles of NFP, which is being evidence-based. We embrace the individual expertise and perspective of practitioners and researchers. We structured this project to integrate those perspectives and expertise into a project that adhered to high standards of research, practice, and the translation of evidence into action.
Elevates the Voices of Communities *Addresses the needs and challenges of communities, especially groups that face systemic disadvantages, and incorporates input from community stakeholders throughout evidence building and evaluation processes.*	We designed the qualitative portion of the project to capture diverse perspectives from community partners. This included qualitative interviews with partners from various sectors, including health care, child welfare, social services, mental health, substance treatment, and housing services. We also included qualitative interviews with multiparous mothers who participated in NFP and referred mothers who declined to enroll. Through these interviews, we incorporated the experience, perspectives, and expertise of diverse stakeholders into the project. While we learned a great deal from this effort, our project would have benefited from additional stakeholder and patient perspectives in determining the implications of our findings and the specific program improvement elements moving forward.

quality improvement efforts by enhancing the systematic collection of data and the rigor of data analysis to inform ongoing program development and improvements. More accurate data should lead to more effective decision making and, ultimately, greater program impact. The use of scientific evidence in program design and improvement is a foundational principle of NFP. The commitment to this foundational principle and a shared commitment to improve the lives of mothers and their children brought alignment between the objectives and activities of the practitioners and researchers, and we were collectively able to accomplish more as a result. Practitioners who want to be the most effective should partner with researchers to generate the best data and findings to inform their decision making. Researchers who want their work to be relevant and have an impact should partner with practitioners to have their results inform decision making. Funders and policymakers who want their priorities to be achieved should facilitate partnerships between practitioners and researchers.

NOTES

1. NFP replication in Australia with aboriginal and Torres Strait Islander people also has embraced NFP's serving multiparous mothers.

2. Risk factors include previous pre-term births, previous low birth weight infant, homelessness, mental illness, substance use, previous or current involvement with child welfare, less than high school education or GED, history of IPV, medical complications, developmental disability, and being nineteen years old or younger with the current pregnancy.

3. Criteria for participating in the formative study were: 1) secure funding for the three-year length of the study; 2) commitment from all staff and no conflicting projects; 3) commitment to collaborate with primary care and child protective services; 4) ability to enroll multiparous mothers without displacing first-time mothers; 5) demonstrated proficiency with using the NFP's client Strengths and Risks (STAR) assessment framework; 6) minimum of three full time nurse home visitors or part-time equivalents; 7) agree to meet with research consultants monthly; and 8) agree to participate in qualitative data gathering such as focus groups and interviews.

4. Enrolled women had the following characteristics: mean age of 27.8 years; 76 percent unmarried; 28 percent with less than high school completed; 25 percent Hispanic/Latinx, 39 percent Black/African-American and 49 percent white; 50 percent with depression and 27 percent with anxiety based on validated screeners. These characteristics were similar to those of enrolled

first-time mothers at the same sites except mothers with previous live births were older and more likely to be married and have a positive anxiety screen.

5. The topics for additional nurse education include case management, addressing the needs of other children in the home, engaging community partners, and addressing concerns for child maltreatment.

6. The additional materials developed for nurses to use with clients include topics such as birth planning for subsequent children, introducing a new baby to the family, parenting styles, and past experiences with breastfeeding.