Improving the Nurse–Family Partnership in Community Practice

abstract

BACKGROUND: Evidence-based preventive interventions are rarely final products. They have reached a stage of development that warrant public investment but require additional research and development to strengthen their effects. The Nurse-Family Partnership (NFP), a program of nurse home visiting, is grounded in findings from replicated randomized controlled trials.

OBJECTIVE: Evidence-based programs require replication in accordance with the models tested in the original randomized controlled trials in order to achieve impacts comparable to those found in those trials, and yet they must be changed in order to improve their impacts, given that interventions require continuous improvement. This article provides a framework and illustrations of work our team members have developed to address this tension.

METHODS: Because the NFP is delivered in communities outside of research contexts, we used quantitative and qualitative research to identify challenges with the NFP program model and its implementation, as well as promising approaches for addressing them.

RESULTS: We describe a framework used to address these issues and illustrate its use in improving nurses' skills in retaining participants, reducing closely spaced subsequent pregnancies, responding to intimate partner violence, observing and promoting caregivers' care of their children, addressing parents' mental health problems, classifying families' risks and strengths as a guide for program implementation, and collaborating with indigenous health organizations to adapt and evaluate the program for their populations. We identify common challenges encountered in conducting research in practice settings and translating findings from these studies into ongoing program implementation.

CONCLUSIONS: The conduct of research focused on quality improvement, model improvement, and implementation in NFP practice settings is challenging, but feasible, and holds promise for improving the impact of the NFP. *Pediatrics* 2013;132:S110–S117

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KEY WORDS

continuous quality improvement, home visiting, maternal and child health, practice-based research

ABBREVIATIONS

CU—University of Colorado
DANCE—Dyadic Assessment of Naturalistic Caregiver–Child Experiences
IPV—intimate partner violence
NSO—National Service Office
NFP—Nurse-Family Partnership
PRC—Prevention Research Center for Family and Child Health

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The Nurse-Family Partnership (NFP), a home visiting program for families beginning in pregnancy and continuing through child age 2 years, focuses on low-income mothers bearing their first children. The nurses aim to improve the outcomes of pregnancy, child health and development, and maternal life-course by helping mothers improve their prenatal health, by supporting parents' early care of their children, and by supporting mothers with subsequent pregnancy planning, education, and work in ways that are consistent with parents' values and aspirations. Nurses address social and material conditions in the home that support or undermine mothers' and children's health and coordinate their work with office-based staff.[1]

The NFP is based on 3 decades of randomized controlled trials, with consistent and enduring effects on maternal and child health.[2–7] Families in the control groups of these trials were provided free transportation for prenatal and well-child care and referral of children with developmental needs to other health and human services in their communities; therefore, the NFP benefits estimated in these trials have to be understood as being above and beyond whatever good is derived from facilitated access to office-based care and other community services for children.

The results of these trials[2–7] have served as the primary evidentiary foundation for the Maternal, Infant, and Early Childhood Home Visitation Program supported by the US federal government.[8] Today, the NFP is operating in >440 counties throughout the United States, serving >26 000 families per year.[9] Significant efforts are underway to adapt, test, and replicate the program in the United Kingdom, Canada, and the Netherlands, and to adapt and evaluate it in partnership with indigenous-led health services in Australia, Alaska, and American Indian tribes. As the program is expanded to new communities, a great deal of emphasis is placed on delivering the program with fidelity to the model tested in the original trials.[1,10,11] We need, however, to discover even better ways of formulating the NFP model and its delivery. This focus on improving the NFP is consistent with the growing emphasis on improving health care by using methods that are appropriately rigorous given the nature of the issue being addressed.[12]

It is important to note that we refrained from offering the program for public investment until we had determined, through replicated trials, that we could reproduce the program and its effects through nurse education and consultation in varied settings.[1,10,11] We established a nonprofit organization in the United States, the NFP National Service Office (NSO), to support quality replication of the program. The NFP NSO focuses on ensuring that community and organizational conditions support effective development of the program, that nurses are educated and guided well in its delivery, that a uniform Web-based information system is used to monitor its performance, and that this information is used to improve its implementation.[10,11]

It is also important to understand the business arrangements that underpin the NFP and its replication. The University of Colorado (CU) owns the intellectual property on which the NFP is based, and it must approve alterations to the NFP model and Visit-to-Visit Guidelines. CU provides NFP NSO with a royalty-free license to replicate the program. Growth capital has been invested in the NFP NSO by 7 foundations (Edna McConnell Clark, Robert Wood Johnson, Bill and Melinda Gates, Kellogg, JPB, Kresge, and Robertson) to expand the program in the United States, with the expectation that the NSO eventually will become self-sustaining through revenues it generates from the services it provides to sites. The NFP NSO develops contracts with sites to deliver the program, ensuring fidelity to the program model through sites' contractual agreement to conduct the program with adherence to 18 model elements (eg, client and nurse characteristics, nurse education in the NFP model, site supports needed for quality implementation).[13] This contract gives sites access to public policy support, marketing and communications services, nurse education and consultation, NFP Visit-to-Visit Guidelines, an intranet service that links sites and nurses delivering the program, the NFP Web-based information system, and support for quality improvement.

Revenue generated by the NFP NSO's services is used to support NFP core functions, including support for improving the program model[13] through research orchestrated by the Prevention Research Center for Family and Child Health (PRC) in the Department of Pediatrics at the CU School of Medicine. The funds channeled back to the PRC catalyze research to improve the underlying program model and its implementation system. Program implementation and continuous quality improvement are housed in the NFP NSO, and research on model improvements is housed at the PRC. Quality of program implementation depends critically, in our view, on the clarity and coherence of the model itself, which affects nurses' abilities to grasp its fundamental features and embrace improvements. These functions involve considerable collaboration among the NFP NSO, NFP-implementing agencies, the PRC, and investigators based outside of CU using the types of information, research, and improvement activities shown in Fig 1.

SOURCES OF INFORMATION GUIDING IMPROVEMENT

Data from the original trials; sites' performance metrics, nurses, families, and other stakeholders; program evaluations; and updated standards of care are reviewed by a standing

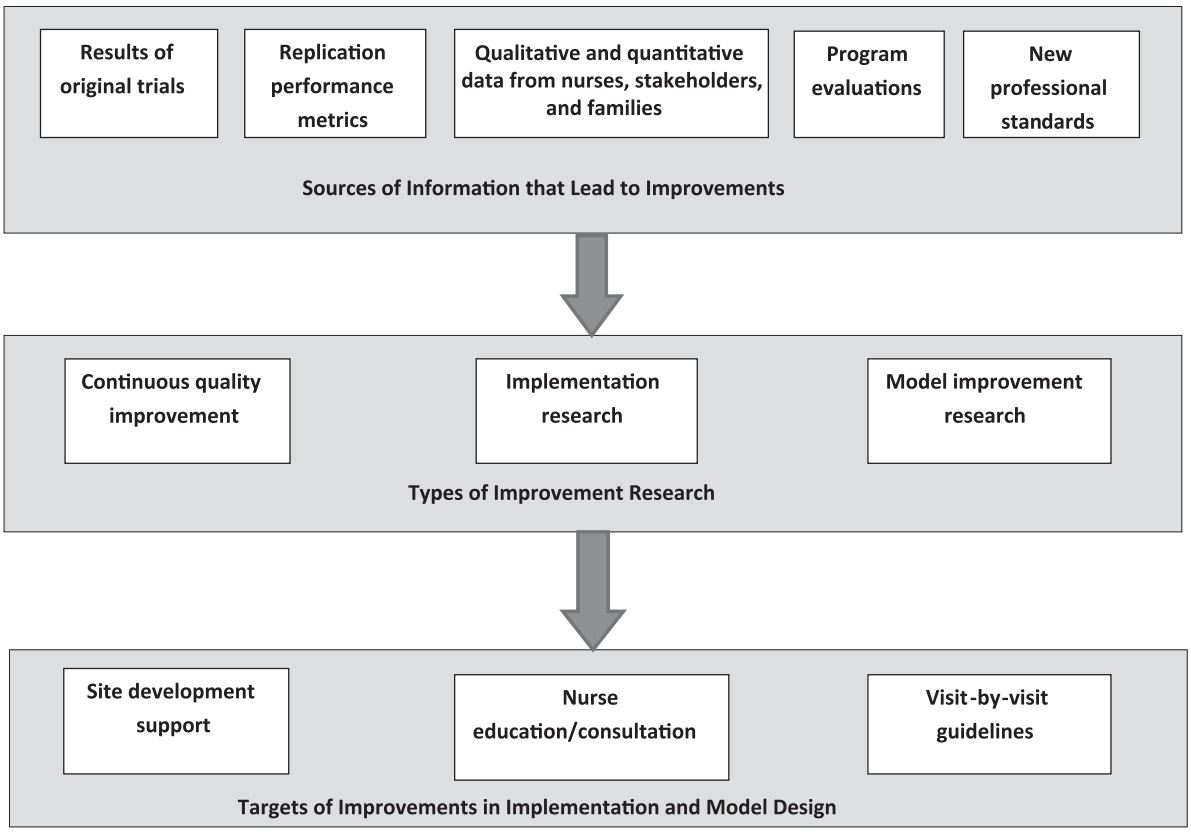

FIGURE 1
Sources of information, types of research, and targets for improving the NFP in community practice.

committee composed of representatives of the NSO and PRC who evaluate the data and make preliminary decisions about the most sensible approach to improving outcomes while ensuring fidelity to NFP's evidentiary foundations. The results of program evaluations deserve particular attention. A series of retrospective cohort studies, using propensity matching, have been used to evaluate NFP's impact in Pennsylvania[14,15] and Oklahoma.[16] Quasi-experimental evaluations such as these are limited in the extent to which selection biases can be controlled and must be interpreted with great caution. We give particular attention to these propensity-matching evaluations in guiding quality improvement efforts, however, because they include matched control groups and outcomes on all registered NFP clients in community settings. This method brings added rigor to our efforts to identify aspects of the program and its delivery that need to be strengthened.

Our response to the review of these data often leads to 1 of 3 types of improvement research and targeted activities, which are described in the following sections.

TYPES OF IMPROVEMENT RESEARCH AND TARGETS OF IMPROVEMENTS

Continuous Quality Improvement

NFP NSO generates regular reports for sites that compare features of implementation and maternal and child health with national averages and results of the original trials. Administrators, supervisors, and nurses use these reports and results of program evaluations to reflect on their performance and to devise improvements in practices. Performance is monitored over time as teams make adjustments to improve implementation and outcomes. The NFP NSO also has developed a framework for quality improvement that specifies separate implementation standards for program sites through all phases of their development and operation.

Moreover, at periodic intervals, we review and update the NFP Visit-to-Visit Guidelines to ensure that their content aligns with practice standards promoted by the American College of Obstetrics and Gynecology, the American Academy of Pediatrics, and the American Nurses Association.[9]

Implementation Research

We conducted analyses of quantitative and qualitative data at the level of the entire implementation system with the goal of gaining insights to improve its performance. Most, but not all, of these analyses are conducted by the NSO or

PRC. The results of this work can lead to quality improvement efforts at the level of the NFP system (eg, simultaneous adjustments to site development support and nurse education) or to additional work leading to Model Improvement Research (as described in the following section). System analyses are multilevel and focus on organizational factors at the levels of sites or states or within the NFP NSO that support or impede effective delivery of the program. Our multilevel, mixed methods study of participant retention, described here, illustrates this approach.[17]

Model Improvement Research

Figure 2 summarizes the steps we follow in conducting model improvement research. We start with an effort to understand program challenges (reviewing implementation data, conducting focus groups and key informant interviews with stakeholders [nurses, supervisors, clients, agency administrators]), and we review the scientific literature to inform potential solutions.

We use these findings to formulate initial innovations in the model. It is crucial that preliminary model modifications align with current NFP practice and theory because compatibility and complexity of innovations affect the degree to which they are incorporated into practice.[18] Modifications must be feasible for nurses to accommodate and must resonate with program participants. We address these issues through piloting and making iterative adjustments to the innovation. Once we have confidence that it is feasible and promising, we usually conduct quasi-experimental or experimental trials of those innovations that represent fundamental model changes or that will require new resources. When we develop an innovation that substitutes 1 component of the model for another (such as our substitution of a new measure for nurses' assessment and support of parents' care of their children [described later in the article]), we simply replace the old with the new, as long as the new element is consistent with the NFP's theories and model elements[9,13] and the evidence indicates that it is superior and costs no more to implement.

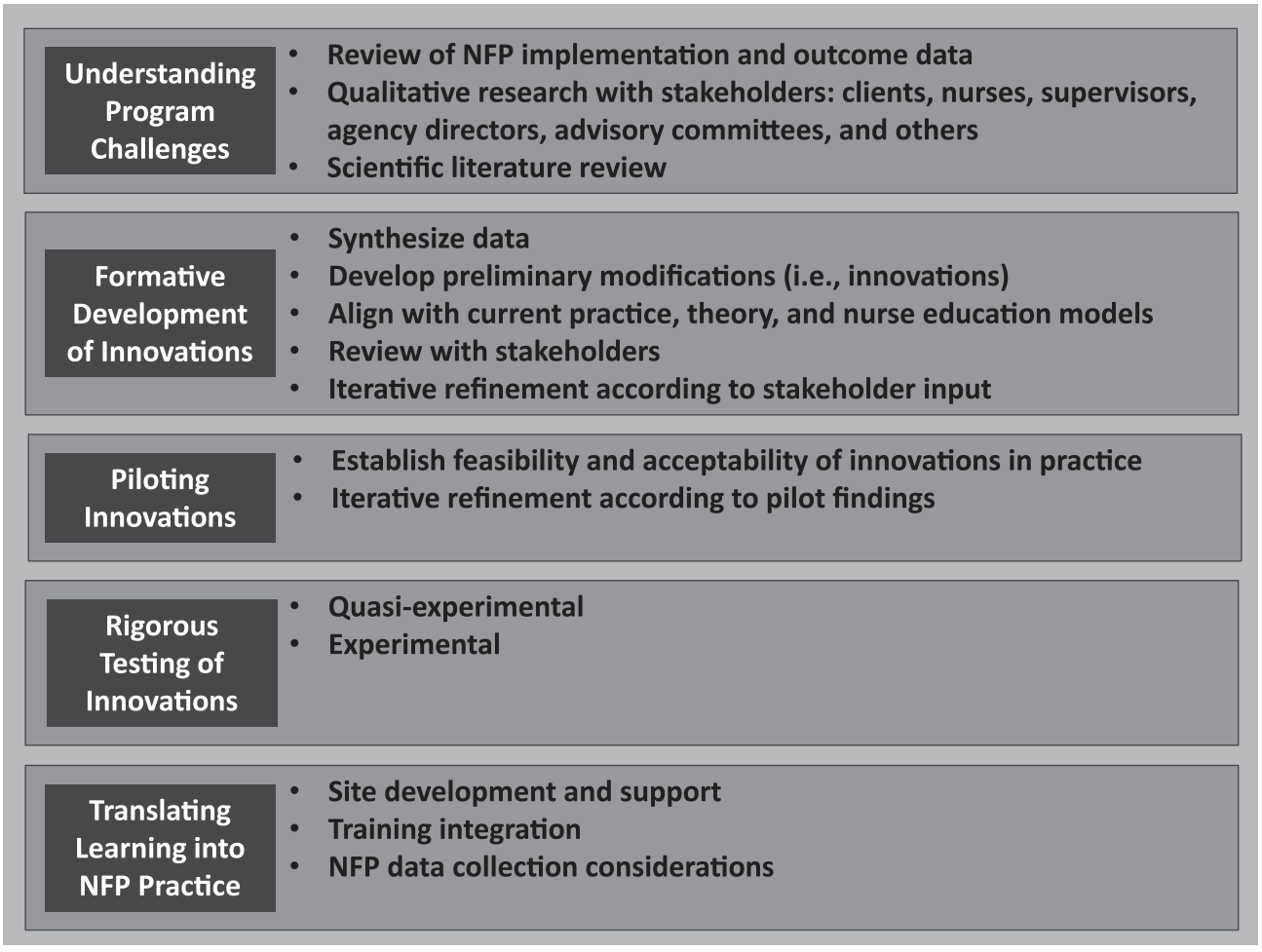

FIGURE 2
Steps in developing innovations in the NFP model.

Finally, once a new model component has been developed and found to improve implementation or outcomes, we integrate this innovation into practice. This step may require changes in site development activities, nurse education and consultation, the NFP Web-based information system, and quality improvement benchmarks.

We present next examples of studies we have undertaken aimed at model improvement.

Increasing Participant Retention and Completed Home Visits

We found that nurses in community replication sites in the United States were not retaining families as well as nurses did in the original trials, and that there was significant variation in retention among sites.[17] Using qualitative analyses, we found that sites with the lowest levels of retention employed nurses who used more directive, prescriptive approaches to working with clients and that those with the highest rates of retention employed nurses who adapted the program more completely to clients' needs. Although the program is designed to be adapted to each family's needs,[9] we developed an intervention that gave more explicit control of visit frequency and content to families. We tested this modification first in a 16-site quasi-experimental pilot study[19] and then in a 26-site randomized trial. Given consistent, promising results from these trials, we changed program guidelines, nurse education, and site consultation to promote more flexible collaboration between nurses and families to meet families' needs regarding visit frequency, content, and location of visits.

Improving Nurses' Observation of Caregiver–Child Interaction and Promotion of Parenting

In analyses of program implementation data, we discovered that nurses in community replication sites were not spending as much time during home visits on helping parents care competently for their children as nurses did in the original trials. Through surveys and interviews with nurses and supervisors, we found that the original tool nurses used to observe qualities of caregiver–child interaction was hard to learn and that it insufficiently guided clinical implementation of the program. Dr Donelan-McCall has been leading a program of research to address this issue through development of a new observation tool called the Dyadic Assessment of Naturalistic Caregiver–Child Experiences (DANCE) and clinical pathways called DANCE STEPS that integrate DANCE into the existing parenting content of the program.[20]

We did not conduct a trial of DANCE because it was designed to replace an existing tool in the program. We conducted studies to ensure that DANCE had adequate predictive validity and reliability, superior clinical utility, and that it could be implemented in a cost-effective way relative to the old tool. DANCE and DANCE STEPS are now integrated into nurses' NFP education, and nurses in all existing sites are being educated in DANCE and DANCE STEPS with funding from the JPB Foundation.

Improving Nurses Resources in Addressing Intimate Partner Violence

In the first trial of the NFP, we found that its impact on state-verified rates of child abuse and neglect through child age 15 years was attenuated in households with moderate to high levels of intimate partner violence (IPV).[1,21] Although there was some evidence that NFP reduced IPV in the third trial,[5] that finding has not yet been replicated. Moreover, nurses in many sites reported that the program was deficient in guiding them to address this problem, and there were no evidence-based methods for preventing or addressing IPV.[22] Dr MacMillan and Dr Jack developed a new intervention for NFP nurses to use in the presence of emerging IPV that is designed to align with NFP's underlying theories and operating procedures. This curriculum is now being tested in a 15-site randomized controlled trial with funding from the Centers for Disease Control and Prevention.[23]

Improving NFP Nurses' Resources for Improving Pregnancy Planning

Although the NFP has produced consistent effects on delaying subsequent pregnancies,[1,3,5] an outcome of considerable public health importance,[24,25] analyses of NFP nurses' records suggest that there is room for improvement.[26] Dr Melnick, Teresa Gipson, and Marni Storey have been leading a randomized trial of an innovation in the NFP program that gives nurses the resources to distribute hormonal contraception to NFP mothers during home visits.[27] If effective, we will expand nurses' roles to include distribution of hormonal contraception, which will be challenging in some settings. Recent legislation in California allows nurses to dispense hormonal contraception,[28] illustrating how favorable policies support the NFP and its innovations.

Development of a System for Classifying Families' Risks and Strengths

NFP nurses are required to oversee no more than 25 families, the maximum allowed in the original trials. Because nurses in the first 2 trials indicated that they could not serve all of their caseloads with the required number of visits, we encouraged them to follow the regular visit schedule with higher-risk families and to pay fewer visits to those with fewer needs.[29] With funding from the Annie E. Casey Foundation, we are working with 5 NFP sites to develop a more rigorous method of classifying families' risks and strengths, which will provide more explicit guidance to nurses and supervisors in adjusting their frequency of

visits, with the goal of improving program effectiveness and efficiency.

Improving Nurses' Resources in Addressing Maternal Depression and Anxiety

Nurses in community settings have requested more support in addressing parents' mental health; we therefore developed a set of mental health screening tools for NFP nurses to use, and we piloted these tools in New York City and Los Angeles County. Many nurses felt that they had a better understanding of mental disorders after this training but reported that few mental health services were available in their communities, and even when services were available, their clients used them infrequently.[30] Dr Beeber, has recently joined our team to develop mental health tools that are consistent with the NFP model and which can be implemented by nurses with limited burden.

Adapting the NFP to Indigenous Cultures and Serving Multiparous Women

We are working with indigenous health services serving Australian Aboriginal and Torres Strait Islander populations, Alaska Native people, and American Indian populations. In doing so, we are addressing 2 fundamental questions: What will it take to adapt core elements of the NFP to address the needs and aspirations of these more culturally distinct populations, and what would be needed to adapt the program to serve indigenous women who have had previous live births? The adaptation to local cultures and needs involves changes in the look and feel of the NFP program materials, and potentially deeper adjustments to program content and nurses' ways of building collaborations with families and communities. The changes required to serve multiparous women are significant because women with other children and previous births often have unique concerns, challenges, and aspirations that must be reflected in the evolving NFP program materials. Serving multiparous women represents such a significant departure from the existing NFP program that we will tread cautiously to ensure that the adapted program is experienced as deeply helpful to multiparous indigenous women. If serving multiparous women in these populations seems effective, we eventually may consider applying this learning to serve multiparous women in majority cultures.

CHALLENGES IN THE CONDUCT OF SITE-BASED MODEL IMPROVEMENT WORK

In conducting these programs of research, we have encountered a number of challenges that impede the conduct of practice-based research.

Participation in Research by Nurses and Local Administrators Is Burdensome

The kind of research described here often leads to nurses' having less time for clinical work. The NFP NSO has established a committee (Research and Publications Communications Committee) to review and approve proposed studies from the standpoint of burdens created by such studies.

Not All Sites Are Ready for Research

Some sites are not ready to participate in the kinds of studies outlined here. Participation in research is especially challenging when organizations are first learning to implement the NFP model, have additional site-level requirements, or are experiencing staffing or organizational transitions. Under these circumstances, it is likely that either the program or research will be discontinued. The Research and Publications Communications Committee reviews proposed studies from the standpoint of site readiness.

Need to Set Research Priorities and Coordinate Studies

It is crucial that studies be prioritized, well planned, and coordinated. Because resources for research are limited, it is important that these resources be marshaled in ways that ensure there are sufficient numbers of participants, nurses, and sites to meet sampling requirements and that study goals align with nurses' priorities.

Translating New Findings Back Into the NFP Program

Every time a new innovation is introduced, it creates reverberations throughout the program implementation system that cost money and time. Site development procedures may need to be changed, nurse education and consultation upgraded, the NFP information system adapted, and new performance benchmarks and continuous quality improvement procedures established.

Human Subjects Review

A number of studies described here have required extended times for obtaining institutional review board approval. This has increased overall research costs, and, in some cases, led to reductions in resources for data collection and analysis. Some of these challenges are likely to be mitigated as new Human Subjects procedures are approved by the US Office for Human Research Protections.[31]

Funding and Human Infrastructure

The work we have described requires funding for key positions (human infrastructure) to support data gathering, analysis, and the translation of findings back into core functions such as site development, nurse education, and consultation. Some of this work is supported by

revenues generated from sites' purchase of services from the NSO. Realizing the potential of this approach, however, will require additional investments in research and implementation infrastructure.

CONCLUSIONS

For the NFP to achieve its full potential for affecting maternal and child health, it must continue to evolve through systematic quality improvement and research on implementation and the model itself. Our experience indicates that such work is challenging but feasible, and holds considerable promise for improving the lives of vulnerable children and families.

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Dr Olds helped conceptualize this work and drafted the initial manuscript; and Dr Donelan-McCall, Dr O'Brien, Dr MacMillan, Dr Jack, Mr Jenkins, Mr Dunlap, Ms Yost, Ms O'Fallon, Dr Thorland, Ms Gasbarro, Ms Pinto, Ms Baca, Dr Melnick, and Dr Beeber helped conceptualize the manuscript and helped draft particular sections. Drs Olds and Donelan-McCall oversaw the editing; all authors helped edit the manuscript. All authors approved the final manuscript as submitted.

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FINANCIAL DISCLOSURE: Dr Olds directs the PRC at the University of Colorado, which has a contract with the NFP NSO to support research aimed at improving the NFP program model and its implementation. This contract has covered parts of the salaries of Dr Olds, Ms Gasbarro, Ms Baca, and Ms Pinto. Dr Olds also has received funding from the WT Grant Foundation to conduct research aimed at improving NFP participant retention. Dr Donelan-McCall is the Principal Investigator and Director of the DANCE Program at the University of Colorado. To support this work, she has received funding from John and Marci Fox to develop DANCE and has partnered with the NFP NSO on a grant from the JPB Foundation to implement DANCE in US NFP community practice settings. Part of her salary is covered by the scope of work included in this grant. Drs Jack and MacMillan have received funding from the Centers for Disease Control and Prevention to develop and test an innovation in the NFP model to address intimate partner violence. Mr Jenkins, Mr Dunlap, Ms O'Fallon, Ms Yost, and Dr Thorland are employees of the NFP NSO. Dr Melnick has received funding from an anonymous donor to conduct research on supporting nurses' dispensing hormonal contraception to NFP clients. Dr Beeber has received funding from the NFP NSO and NFP sites in North Carolina, South Carolina, and Pennsylvania for providing training to NFP nurses in infant and parental mental health. Dr O'Brien has indicated she has no financial relationships relevant to this article to disclose.

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POTENTIAL CONFLICT OF INTEREST: Dr Olds was the principle architect of the NFP program model and has been the Principal Investigator on 3 of the original randomized controlled trials of the program. He has an interest in seeing the NFP succeed in improving maternal and child health in community practice. Dr Donelan-McCall has led a program of research designed to improve NFP nurses' work with clients to promote competent caregiving. She has an interest in seeing the NFP succeed in improving maternal and child health in community practice. Dr MacMillan is a co-principal investigator on the Centers for Disease Control and Prevention–funded study to develop and evaluate the intimate partner violence intervention for the NFP; she is also a co-principal investigator of a study to evaluate the NFP within the Canadian context. Dr Jack is a co-investigator on a qualitative case study to develop the NFP intimate partner violence intervention, on the randomized controlled trial to evaluate this component of the NFP program, and on a separate randomized controlled trial of the NFP in Canada; she is also a co-principal investigator of a study to evaluate the NFP within the Canadian context. As employees of the NFP, Mr Jenkins, Mr Dunlap, Ms O'Fallon, Ms Yost, and Dr Thorland have an interest in seeing the NFP succeed. The other authors have indicated they have no potential conflicts of interest to disclose.