Developing the Nurse-Family Partnership

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We dedicate this chapter to the memory of Harriet Kitzman. And we wish to thank the thousands of nurses and families who have inspired us, guided us, and challenged us to make this program even better going forward.

Abstract

Nurse-Family Partnership © (NFP) is a program of prenatal and infancy/toddler home visiting by nurses for low-income mothers bearing first children. NFP nurses work with mothers, fathers, and other caregivers to address three goals: 1) to improve pregnancy outcomes, 2) to improve children's health and development, and 3) to improve maternal health and economic self-sufficiency. NFP is grounded in developmental epidemiology, and theories of human attachment, human ecology, and self-efficacy. Nurses deliver this program because they have strong interdisciplinary expertise to address the multitude of factors that influence maternal and child health; they are trusted by pregnant women and caregivers; and are the most widely trusted profession in US society.

Nurse-Family Partnership's enduring success can be attributed to its alignment with our shared human drive to protect our children, and by nurses' developing caring, respectful relationships with mothers and other caregivers that elicit and support that drive. By working with mothers during pregnancy and early years of the child's life, NFP nurses capitalize on the unique opportunities presented at this critical period in human development – when changes in maternal roles and neuroendocrine systems affect maternal and child health over the life-course. Program content and methods leverage these opportunities.

Starting Point

Nurse-Family Partnership © (NFP) is a program of prenatal and infancy/toddler home-visiting by registered nurses for low-income mothers with no previous live births. NFP nurses work with mothers, fathers, and other caregivers to address three overarching goals: 1) to improve pregnancy outcomes by promoting women's prenatal health; 2) to improve children's health and development by promoting parents' competent care of their children; and 3) to enhance parents' health and life-course by guiding women to reduce closely spaced subsequent pregnancies, complete their educations, and find work to sustain their family. Nurses link families with needed services and, when possible, involve other family members (especially children's fathers and grandmothers) in the visits. Program practices, as discussed below, are grounded in developmental epidemiology and theories of human-attachment (Bowlby, 1969), human-ecology (Bronfenbrenner, 1979), and self-efficacy (Bandura, 1977).

Today, the program is operating in 41 states in the US, the US Virgin Islands, five US Tribal Nations, and seven other countries, including England, Scotland, Northern Ireland, Norway, Bulgaria, Canada, and Australia, where it is offered exclusively to Aboriginal and Torres Strait Islander families. It is available in every community in mainland Scotland. NFP is adapted to individual needs and cultures while ensuring that it is conducted in alignment with its essential model elements that characterize the program tested in a series of randomized clinical trials conducted over the past four decades.

The program can be traced to David Olds's experience working in an inner-city daycare center in 1970 and 71, where he witnessed the aftermath of children's prenatal exposure to drugs and alcohol and child maltreatment. As a result of these observations, he created a parent-group meeting in the center held while children napped, but it was the parents of children he was least concerned about who showed up for the meetings. While this may have been a reflection of some parents' working during hours the center was open, those he wanted most to engage did not respond to his efforts to communicate with them. This experience led him to conclude that for many children in his preschool classroom, it was already too little and too late. These experiences led him to become interested in improving prenatal influences on health and development along with promoting parents' abilities to accurately read and

respond to young children's communicative signaling as a foundation for building a sense of security on the part of the child, preventing child abuse and neglect, and promoting children's language and cognitive development. Given that many adversities that compromise parents' care of themselves and their children were traced epidemiologically to conditions in the home and neighborhood, David decided to focus on low-income parents, supporting care of their children in their homes.

As an undergraduate at Johns Hopkins, David had studied and worked with Mary Ainsworth (Ainsworth et al. 1978), a professor of developmental psychology who was centrally involved in developing the evidentiary foundations for John Bowlby's attachment theory (Bowlby, 1969). This experience led David to develop a deep commitment to helping parents provide competent care for their children, building upon their evolutionary-grounded instinct to protect their offspring (Swain et al. 2014). Observing the inner-city environment in which families lived, however, drew his attention to those social and material contexts that limited parents' abilities to protect themselves and their children. After working two years in this setting, he went to graduate school at Cornell to work with Urie Bronfenbrenner, widely considered the father of human ecology theory (Bronfenbrenner, 1979). It was at Cornell that David developed his commitment to testing interventions in randomized trials to determine whether they deserved public-policy support. He developed the original proposal for the NFP while finishing his dissertation at Cornell and working in a non-profit agency in Elmira, NY that received the federal Maternal and Child Health research grant to conduct the first NFP trial.

Not knowing a thing about obstetrics or pediatrics, he developed a relationship with co-investigators Dr. Robert Tatelbaum (an obstetrician) and Dr. Robert Chamberlin (a pediatrician) from the University of Rochester. They were centrally involved in deepening the underlying health content of the program. Whatever David has come to know about nursing can be traced to his good fortune of having worked with incredibly passionate, insightful, and smart nurses, starting in 1977 with his daily collaboration with the Elmira team of nurse home-visitors: Georgie McGrady, Diane Farr, Liz Chilson, Lynn Scazafabo, and Jackie Roberts.

The commitment to strong evidence along with deep attention to program design (discussed below), help account for NFP's having been identified, so far, as the only prenatal or early childhood program that meets the "Top Tier" of evidence established by the nonprofit philanthropy Evidence-Based Programs (Social Programs That Work, 2020, https://evidencebasedprograms.org/)

Strategy and Theory of Change

Research-Based. The program has been grounded in an understanding of what segments of the population are at greater risk for poor pregnancy outcomes, compromised child health and development, and diminished economic self-sufficiency on the part of parents, and at what point in human development we have the greatest opportunity to improve maternal and child health. Reviews of this literature led to a focus on women who were bearing their first children and who were either poor, unmarried, or teenaged, given that women with these characteristics generally are at greater risk for poor maternal and child outcomes.

In addition, starting with the Elmira trial, we reviewed the epidemiological literature to identify modifiable factors that predict pregnancy outcomes, child health and development, and maternal life-course. These factors became the targets for behavioral change during pregnancy and the early years of the first child's life and served as the foundation for NFP program content. We continue to review this literature to ensure that program content aligns with state-of-the-art evidence on predictors of maternal and child health during pregnancy and the first two years of life.

Theoretical Foundations. The program has been guided by three fundamental theories that help organize influences on parents and children early in life into a coherent framework designed to facilitate nurses' support of parents' adaptive behavioral change. The first, noted above, is attachment theory. This theory emphasizes that responsive early parental caregiving attuned to infants' communicative signaling creates a sense of trust on the part of young children that allows them to explore the world with confidence (Bowlby, 1969; Ainsworth et al. 1978). And, evidence is accumulating that human caregivers, in spite of individual experiences and cultural influences on their parenting behaviors, are instinctually driven to protect their offspring (Swain et al. 2014; van't Veer et al. 2019). One young

mother revealed to her NFP nurse that she had been tortured as a child and that she had harmed babies she took care of as an adolescent; she pleaded with her nurse to help her not do the same thing to her own baby. Supporting parents early in life leverages those protective drives that mothers and fathers are developing during this critical period defined by women's first pregnancies, births, and early caregiving.

As noted above, however, contextual factors can either support or undermine parents' care of themselves and their children. The stresses of poverty, including having insufficient income to cover survival needs (food, housing, utilities, etc.), and coping with factors like neighborhood crime, can distract parents from protecting themselves and their children. In addition, informal social systems can either amplify or buffer those adversities. Having family-members or friends who are engaged in disruptive, antisocial behavior can contribute to vulnerable parents' engaging in dysfunctional behavior themselves, while having family members and friends who are protective of the mother and child can reduce those forces that distract parents from their caregiving roles. Nurses help parents address their basic needs by linking them with other health and human services, and in engaging other family members and friends in the program, insofar as possible, to build an informal social support system that promotes maternal and child health.

Attachment theory and human ecology theory provide broad frameworks for organizing elements of an early intervention, but neither provides guidance about how to support adaptive behavioral change. For this, we turned to Bandura's self-efficacy theory (Bandura, 1977). This well-tested approach to behavioral change provides guidance to nurses about how to promote behaviors that support maternal health, fetal growth, early child health and development, and maternal economic self-sufficiency, focusing on what mothers and fathers are already doing well. The basic idea is that individuals will change their behavior to the extent that they believe change is important and they have confidence in their ability to make needed changes. Nurses guide mothers and fathers to reflect on what is important to them and to identify small, achievable objectives that will help them accomplish their goals.

Creating Content

While the goals and core ingredients of the program have remained the same over the four-decade period during which it has been developed and tested, the specific content and methods of accomplishing NFP behavioral objectives have evolved. The program always will be a work in progress.

Elmira Trial. In the original trial of the program, conducted in Elmira, NY, and begun in 1977, David (who had become an adjunct faculty member at Cornell when funding was secured) and team (including Bob Tatelbaum and Bob Chamberlin) decided that the evidence on particular sociodemographic risks that characterize maternal vulnerabilities for poor outcomes were not definitive. So, we actively recruited women before the 24th week of gestation and who had any of these three risks: 1) being poor (indicated primarily by their seeking free prenatal care through the local health department), 2) unmarried, or 3) young (< 19 years of age as teen pregnancy created a risk for school drop-out). In order to create a program that was not stigmatized as being for the poor or for people with problems, we made the program available to anyone in the community as long as they had no previous live births. Eighty-nine percent of those enrolled were white, 47% were less than 19 years old, 62% were unmarried, and 61% came from households headed by semi-skilled or unskilled laborers. The benefits of the program were greater for those with overlapping risks, which led us to focus recruitment in subsequent trials on those with concentrated vulnerabilities (Olds, 2002).

In planning the trial, we created a community advisory group, made up of representatives of the local medical community, public health department, department of social services, and county mental health service. Representatives of the medical community, at stages of program planning, made it clear that they would work with nurse home visitors, but not paraprofessional or community health workers, in serving pregnant women and young children. And while human ecology theory led us to consider including neighborhood parent-support groups to augment the nurses' work, we decided not to include this element in the intervention as women assigned to the control group would be eligible for this service, undermining the estimate of nurse-home-visiting effects. Control-group participants did receive other services through the study, however, including regular screening and referral of the child for suspected developmental problems and free transportation for regular prenatal and well-child care.

In the Elmira trial, the team had 6 months at the beginning of the study to identify the specific content that nurses would use in pregnancy and the first two years of the child's life, and to begin testing and adjusting features of the program based upon their work with a set of pilot families. The Elmira team brought obstetrics, pediatrics, nursing, and developmental psychology perspectives to the task, and outlined those topics that should be addressed at various stages of pregnancy and the first two years of the child's life. Program content was shaped by this outline, which was informed by an understanding of typical biological, psychological, and social changes women experience during pregnancy, the postpartum period, and phases of infant and toddler development. Nurses were encouraged to adapt this content to individual families' needs and interests. Bob Tatelbaum made the case for promoting maternal health and self-sufficiency as a separate program goal in and of itself rather than simply a means of improving child health and development.

The Elmira nurses reviewed (prior to the internet!) the most up-to-date health-education literature on modifiable factors that contributed to poor pregnancy outcomes, child health and development, and compromised maternal health and economic self-sufficiency. In organizing this literature, nurses gave particular attention to: 1) the phases of mothers' adjustment to pregnancy and anticipation of birth; and 2) parents' adjustment to the newborn and phases of caring for the child during the first two years of life. Nurses continuously focused on maternal physical and mental health, gradually building parents' capacity to financially support themselves and their children. In all of this, program content and timing of its delivery were organized around parents' natural interests in these topics at typically-occurring phases of gestation and the first two years of life, and the role that specific influences play in shaping maternal and child health and development.

We designed the program to elicit and align with mothers' growing motivation to protect their developing child and to attune program content to that motivation. We addressed women's natural concerns about changes in their bodies during pregnancy, the prospect of giving birth, and how those concerns could be addressed with nurses' support. We aligned program content with parents' natural concerns and aspirations that unfold during this critical phase in human development, especially for those

going through this experience for the first time, including caring for a vulnerable newborn and young child during periods of rapid motor, behavioral, language, and cognitive development. We selected program content on developmental epidemiologic grounds (modifiable behavioral and contextual factors that predict later health and development) and adjusted that content to parents' developing motivation to protect their child and themselves. We created a data collection system that aligned with the content and methods of program delivery to remind nurses about what content should be addressed at various developmental stages and to monitor variation in program delivery.

In the Elmira trial, nurses had caseloads that ranged between 20-25 families, and were scheduled to visit women every other week following registration (which occurred prior to the 24th week of gestation) and then once a week for the first six weeks after delivery, every other week through the child's 4th month of life, every three weeks through the 14th month of life, and then every four weeks until the child turned two. Nurses completed an average of nine visits during pregnancy and 23 visits from birth through child age two. Nurses visited more frequently when crises occurred. Visits lasted about 75 minutes. It became clear that nurses could not visit all families with the same frequency originally conceived, so we attempted to visit those at greatest risk in accordance with the planned schedule. Families with fewer needs, we reasoned, could manage just fine with fewer visits.

Finally, and maybe most importantly, nurses were selected on the basis of their personal attributes – their ability to be caring, non-judgmental, and respectful. We could have exquisitely developed program content, but without employing home-visiting nurses who were empathic and non-judgmental the program would have failed. As a part of their employment interviews, we asked nurses to reflect on a series of case scenarios designed to reveal their approach to dealing with situations that might lead some to be judgmental. Nurse selection gave priority to their capacity for empathy and respect. The capacity for developing authentic, trusting, caring relationships was fundamental. Georgie was fond of reminding us that the young mothers we served "could spot a phony a mile away." Nurses from around the world have repeated nearly the same observation over and over since Georgie's original insight.

Given that this work can be highly challenging and emotionally draining, nurses are susceptible to experiencing secondary trauma. In the Elmira trial, we addressed this issue in two fundamental ways. First, nurses were paired in teams of two. They visited one another's families at periodic intervals so they would have a foundation for reflecting on the needs of their partners' highest-risk families, and they might visit their partners' families during illnesses or vacations. Second, we held weekly case conferences to discuss challenging cases as a group. We organized weekly case conferences in addition to weekly one-to-one supervision, both of which today would be thought of as reflective supervision and teamwork.

Prenatal Content. Our first overarching goal was to improve pregnancy outcomes, especially prematurity, low birthweight, and compromised neurodevelopmental functioning. We sought to do this by educating parents about the needs of the developing fetus and what mothers could do to support healthy fetal development, such as avoiding exposures to substances, prompt treatment of emerging obstetric complications, eating a nutritious diet. This work was designed to support parents' motivation for protecting their developing fetus. We elicited parents' reflections on their current behavior and what they might do to improve the life-prospects of their child.

Nurses are uniquely positioned to do this work because they can use their physical assessment skills, such as taking blood pressures in the home and checking for protein in urine or signs of edema to identify women with emerging hypertensive disorders of pregnancy to support office-based providers' care in addressing these emerging problems. Nurses taught mothers the basics of safe sex and linked them with Planned Parenthood and their primary-care providers to obtain contraceptives. Nurses also taught the basics of pregnancy physiology and fetal development to mothers and fathers, which we thought would serve as an additional incentive for behavioral change, and encouraged women to discuss their health concerns with their primary care providers during their next scheduled visit. If there were imminent concerns, such as elevated blood pressure, symptoms of genito-urinary tract infections, or signs of preterm labor, nurses urged women to call their prenatal-care providers' offices to determine whether a more immediate visit were warranted.

Finally, nurses helped women anticipate and plan for labor, delivery, and care of the newborn. During pregnancy, nurses introduced the ideas of breast feeding, effective bottle and formula feeding, bonding with the newborn, common patterns of infant behavior, including patterns of crying, early care of the child, and planning the timing of subsequent pregnancies. Nurses helped women anticipate their newborns' needs, including baby supplies, infant car seats, and safe sleeping arrangements with the child protected from undue noise or commotion.

Nurses also guided mothers and fathers to think through plans for continuing their educations, finding or continuing work following the birth of their baby, and, critically, planning the timing of their next pregnancy. Growth in education and work are enhanced to the extent that women are able to space subsequent pregnancies. Moreover, parents' care of their first child is strengthened by not having to care for two very young children at the same time. And, it turns out, that having conversations about subsequent pregnancy planning are enhanced, from women's perspectives, by nurses' raising these issues in the last few weeks before delivery. One stable, married couple informed their nurse that they wanted to have all of their children within a relatively short period of time so they could get on with their lives after child rearing. This was a wonderful reminder to us that this program is really driven by parents' visions for what they want for their lives and their children. These conversations about maternal life-course continued after delivery as mothers and fathers embraced the challenges of caring for a newborn or an inconsolable six-week old.

Where possible, we involved fathers or other family members in visits to encourage them to support maternal behavioral change and health. And, given challenges with basic survival (e.g., food insecurity, homelessness, drug abuse, family violence), nurses helped mothers make use of existing services in the community to address those needs. In all of this, nurses adapted the timing of program content to reflect the expressed interests and needs of mothers and fathers. These individualized adaptations were designed to increase program engagement, to support parents' adjustment to their new roles, and to develop a personalized vision for each family about what life might be like for themselves and their children.

Infant and Toddler Content. After delivery, nurses focused on helping parents learn the meaning of their infants' behaviors and communicative signals and learn to become sensitive, growth-promoting caregivers. Nurses reviewed existing literature on early health, development, and behavior with an eye toward helping parents recognize and respond sensitively to their newborn's signals. This work integrated human attachment theory (Bowlby, 1969) with current research and practice recommendations that aligned with our effort to promote parent-infant communication. This included helping parents with breastfeeding and the promotion of safe and well-regulated sleep patterns. In the Elmira program (before rapid discharge following delivery was standard practice), nurses visited mothers in the hospital after delivery to be with them during the discharge exam and to hear instructions from the primary care provider. Three days following discharge, the nurses conducted the Brazelton Neonatal Observation assessment (Brazelton, 1973) with parents and encouraged them to conduct the exam themselves to help parents understand their newborn's individuality and capabilities. Going forward, they encouraged sensitive, growth-promoting care through a range of activities designed to support behavioral regulation (starting with anticipating and comforting crying newborns, regulating infant sleep and feeding, and eventually helping inquisitive toddlers regulate their behavior through effective, measured limit-setting). The particular activities promoted in these areas shifted over the course of subsequent trials as new activities were developed to support parents' skills in addressing their infants' and toddlers' needs.

Nurses supported mothers and infants in a range of other ways that addressed infant health and development. Nurses continued to apply their physical assessment skills in monitoring children's physical health and growth, noting signs of compromised development and common health problems (such as fever, respiratory and skin infections, gastroenteritis, and minor trauma) and encouraged appropriate use of primary care and the emergency department when problems emerged. They helped parents create safe home environments to prevent injuries, ingestions, and exposures to environmental toxins. And, of course, nurses employed a variety of methods to promote parent support of their children's language and cognitive development, all adapted to the child's stage of development. Nurses

created or relied upon publicly available materials distributed during visits to support the goals and objectives of the program and created a lending library of books for those mothers who were interested in learning more about particular topics. Nurses administered the Denver Developmental Screening (Frankenburg et al. 1971) to infants and toddlers at periodic intervals throughout the first two years of life and referred children for further evaluation and treatment when they identified potential problems. In later replications, we switched to the Ages and Stages Questionnaire (Squires, Bricker, & Potter, 1997) as a means of screening for developmental delays and guiding parents' understanding of their children's development.

Given our concern about preventing child abuse and neglect, making sure that children at imminent risk were removed from harm's way, and ensuring the nurses were complying with child maltreatment reporting laws, we set up systematic communications with the local child welfare agency. We did this to make sure that high-risk cases were reviewed anonymously with department staff and to make sure that cases were reported when warranted. Nurses were guided to let families know when they were making reports, to explain why, and to offer support to the family as they went through the child protection review process.

Memphis Trial. While many people urged us to replicate the Elmira program outside of research settings once early findings from the Elmira trial were promising, we decided not to offer the program for public investment until we had evidence that the program effects would endure and would work with minority families living in a major urban area. In 1984, David joined the Department of Pediatrics at the University of Rochester, where he formed a lasting collaboration with Harriet Kitzman, a UR Professor of Nursing and Pediatrics. Harriet had been instrumental in launching the national nurse-practitioner movement, putting her in a unique position to integrate the NFP program more formerly into the nursing profession.

After reviewing every major metropolitan area in the country as a possible site for replication of the trial, we settled on Memphis, TN. We selected Memphis because of the ease of identifying prospective participants through a free antepartum clinic for the poor sponsored by the University of

Tennessee and the Memphis-Shelby County Health Department, and because healthcare for the indigent throughout the county was provided through a single system operated jointly by those entities. Moreover, all emergency care and hospitalizations of children was provided by le Bonheur Children's Hospital, which would make records of maternal and child heath relatively easy to gather and interpret, given wide access to healthcare delivered under common protocols.

It took us four years and nine funding sources to raise funds for the Memphis trial. Those sources of funds came together in 1987 to launch the second trial of the program, which we named the Memphis New Mothers Program. For the Memphis trial, three additional co-investigators from the University of Tennessee joined the team: Dr. Kay Engelhart, Professor of Nursing, Dr. David Shafer, Professor of Obstetrics and Gynecology, and Dr. David James, Professor of Pediatrics. They were instrumental in integrating the program into the Memphis healthcare system. The program was administered through the Memphis-Shelby County Health Department and overseen by Jann Belton, a public health nurse leader in Memphis.

Given that the effects of the Elmira program on maternal and child health were more pronounced among mothers and children where there were overlapping sociodemographic risks, we concentrated recruitment in the Memphis trial on women with at least two of the following risk characteristics: unmarried, less than 12 years of education, and not working. This led to a highly disadvantaged sample, where 85% of the mothers were living in households below the federal poverty level, 98% were unmarried, and 64% were less than 19 years old. Note that families in the Memphis trial, including the control group, received developmental screening and referral services as well as free transportation for regular prenatal care. This contributed to high rates of participant enrollment: 89% of those offered participation enrolled in the trial, and retention of those randomized has remained high in Memphis through an 18-year follow-up. Note that we allowed women in Memphis to register through the 28th week of gestation. We changed the standard visit schedule in Memphis, and all subsequent implementations, as follows: four weekly visits following registration (to establish a relationship quickly and address pregnancy risks as early as possible), bi-weekly visits until birth, weekly visits for six weeks after birth

(given the high level of change and new responsibilities mothers take on during this period), bi-weekly visits until child-age 18 months, and then, weaning mothers off the nurse's support, once-a-month visits until child age two.

In moving the program from serving a largely white, semi-rural sample to an inner-city African-American sample, we were deeply concerned about aligning the program content and methods with the cultural beliefs and sensibilities of the families we were about to serve. To address this set of issues, we created a community advisory committee of African Americans in Memphis who provided advice about needed program adaptations. We invoked numerous surface-level adaptations, such as altering dietary recommendations to align with customary diets in the community while striving to achieve optimal nutrition for both mothers and children; making sure that images in the program materials reflected the families we were serving; and using customary language for various topics covered in the program. At a deeper level, we were concerned that in multigenerational households, where care of children may be provided in a more significant way by grandmothers or other family members, that the focus on mothers may be misplaced. The grandmothers in our advisory group told us, however, to keep the focus on the mothers as they needed to learn the skills provided by the nurses. As in the Elmira program, we made significant efforts, nevertheless, to engage fathers, grandmothers, and other caregivers in an effort to create shared approaches to caregiving among those responsible for the child.

Harriet was instrumental in transforming the Elmira program into a format that aligned with nursing education and practice that continues to shape program design today. One of Harriet's many insights was that in order to build a foundation for nurses' learning the program and for our disseminating it reliably, it would need to align with the way nurses are taught to practice, with a particular focus on the "Nursing Process" (Orlando, 1961, 1972), that is, assessing parents' needs, exploring with parents the extent to which the nurse's assessments are correct from parents' perspectives, setting in motion a plan of action in concert with parents, and evaluating those actions. The essence of the program remained the same as that tested in Elmira, but it was strengthened by building upon generations of nursing science and practice that has led nursing to be the most trusted profession in the US for generations (Brenan, 2018).

Harriet's insight was to take the Elmira program and break it into the following domains: 1) maternal health, 2) maternal role, 3) maternal life-course, 4) family and friends, and 5) environmental health in a way that built upon the underlying epidemiology and theory of the Elmira program. These program domains have continued to organize the nurses' work to this day, with the recent addition of an explicit domain that, consistent with the Elmira program design, encompasses nurses' orchestrating families' use of needed health and human services. In addition, nursing scientists had developed theories of human caring that had become fundamental to all of nursing practice (Watson, 1979). As a result of Harriet's work, caring became an explicit feature of the program, which had been fundamental to the Elmira program, but not explicitly identified.

Another of Harriet's insights was that the program would be replicated more reliably if it were divided into a visit-by-visit structure, with particular content recommended in the five program domains at specific visits throughout pregnancy, infancy, and toddlerhood. This approach differed from the one employed in Elmira, where nurses were guided by an outline of content organized around phases of prenatal and infant/toddler development, and encouraged to adapt it to individual families' concerns and interests. The visit-by-visit structure set in motion in Memphis was designed to help ensure consistency for mothers and nurses, but with clear guidance that nurses adapt program content and dosage to the needs of families on a visit-to-visit, moment-to-moment basis.

Moreover, to elicit mother/caregiver engagement in targeted behavioral change, Harriet transformed the program content into "facilitators," that is a set of interesting questions and game-like formats designed to elicit participant reflection on every topic covered under the five program domains most relevant during specific stages of pregnancy, postpartum, infancy, and toddlerhood. Those reflections were used as the starting point for behavioral change, organized around program goals and objectives. In all of this, nurses educated mothers, fathers, and other caregivers to promote maternal and child health and development, grounded in their desire to see their child thrive. Nurses helped them develop small achievable objectives and celebrated successes at every visit. We gave mothers notebooks with new informational materials added to the notebook at each visit, which mothers kept for reference.

Mothers were observed sitting on their front steps using these materials to educate other family members, friends, and neighbors who might benefit from them.

Finally, we invited Kathy Barnard, a professor of maternal-child nursing from the University of Washington, to join the Memphis team. Our team was constantly reviewing the literature on maternal and child health to identify new methods of promoting maternal and child health and was delighted to see that Kathy had developed a measure of parent-child interaction - the NCAST (Nursing Child Assessment Satellite Training), which we introduced as a clinical component of the program. The NCAST Feeding and Teaching Scales were a natural extension of the program's focus on supporting sensitive, growth-promoting parental caregiving (Sumner & Speitz, 1994). The integration of NCAST into NFP was one of the first systematic methods of promoting early parenting that relied upon observations of parent-child interaction as the starting point for education. All nurses were trained in the NCAST and were encouraged to integrate it into their practice when discussing child development.

Denver Trial. In 1993, David was recruited to the University of Colorado to conduct the third trial of the program and to develop the Prevention Research Center for Family and Child Health in the Department of Pediatrics in the CU School of Medicine. Ruth O'Brien, professor of nursing at the CU College of Nursing joined the investigative team to bring an additional nursing science perspective to this work. The Denver trial was designed to test the relative impact of the program when delivered by nurses versus community health workers; both of these groups were compared to a control group offered child developmental screening and referral services. The Denver sample included a large portion of Hispanics. The inclusion of Hispanics in the Denver trial broadened the program's solid foundation, further generalizing its positive effects to large portions of the population in need in US society.

The nursing supervisor in the Denver trial was Pilar Baca, MSN. Pilar led work on adapting the program to Latino culture, including translating all program guidelines and materials into Spanish. All program materials were reviewed and adapted to ensure that they reflected images familiar to Latino families and that nutritional, health behavior, and childrearing recommendations were brought into alignment with the prevailing sensibilities of Latino families. Some Latino families, for example,

especially recent immigrants, place considerable value on child behavioral compliance with rules, which shaped the way limit-setting was framed with Latino families. Pilar also brought to this effort a skill in distilling key features of the program into aphorisms that are easily remembered and that helped deepen the culture of the program. They include "The mother is the expert in her own life;" "Follow the mother's heart's desire;" "Only a small change is needed;" "Focus on strengths;" and "Focus on solutions." In addition to developing more program "facilitators" to help address issues that new mothers and fathers often encounter, Pilar led the development of additional visit-by-visit program guidelines. She and Ruth O'Brien augmented the self-efficacy foundations of the program by adding Solution-Focused approaches to working with families (O'Brien and Baca, 1997). This approach was later integrated with the emerging field of Motivational Interviewing (Miller & Rollnick, 1991). These approaches represent clinically sophisticated methods of eliciting mother's primary motivations - "heart's desire," by "focusing on strengths," and to support behavioral change. This approach provides a systematic way of eliciting parents' deepest motivations, which are used to support and guide parents' efforts to protect their children and promote self-efficacy in accomplishing their other goals.

Refining, Expanding, Disseminating

After nearly 20 years focused on developing the program and its evidentiary foundations, we began to consider invitations to replicate the program outside of research settings.

US Community Replication. In 1996, we accepted an invitation to replicate the program in high-crime communities under an initiative sponsored by the US Justice Department. The early community replication work was managed through a new center (the National Center for Children, Families, and Communities) we created in the University of Colorado School of Nursing with a significant investment from the Robert Wood Johnson Foundation. Pilar continued to serve as director of nursing in the newly created NCCFC. In this capacity, she further articulated reflective supervision in the model as a natural extension of the program's focus on deep clinical supervision that aligns with its core components (Gibbs, 1981). In laying the groundwork for community replication, we developed a model that considered nurse-education, organizational, and community conditions needed to ensure reliable

reproduction of program effects in new community settings (Olds, 2002; Olds et al. 2003). David Racine and Gerry Sommerville from Replication and Program Strategies, a non-profit based in Philadelphia, provided great insights that helped us develop our model of community replication. The work we had conducted in the original trials provided a foundation for having a reasonably well articulated program when we began community replication. During the conduct of the trials, we had built an information system that was integrated into the program so that key features of program implementation and maternal and child outcomes could be monitored in the process of community replication.

In 2003, once it became clear that there was considerable interest in new communities' investing in the program (with the program operating in nearly 250 US counties), we created a separate non-profit devoted to further expanding it throughout the US. The program was then given its current name: Nurse-Family Partnership. This name, we think, reflects its underlying sprit of collaboration between the family and nurse. It is important to note that the University of Colorado owns the NFP intellectual property and gives the NFP non-profit a royalty-free license to replicate the program – in accordance with 19 core model elements constructed to help ensure that the program is replicated with essential fidelity to the model tested in the original trials. These elements cover a range of program features, including target population characteristics, program staffing and training, adherence to program content and methods of delivery, caseload size, supervision, data collection requirements, organization capacity, and evidence of community commitment.

Elly Yost, was an early director of the NFP national nursing department who later joined the CU Department of Pediatrics as an instructor at the PRC, where she oversees work focused on formatively developing innovations to improve the underlying NFP model and its implementation in community settings. Elly has convened an innovations advisory committee composed of over 120 NFP nurses, supervisors, and agency administrators devoted to strengthening the program model and its implementation. These volunteers are passionately committed to making the program as strong and efficient as it can be.

We also have developed a model for improving the NFP in community practice (Olds et al. 2013). One of the innovations set in motion during community replication consists of a new method for nurses to use in observing and supporting early parental care of the child. This new method is known as DANCE (Dyadic Assessment of Nurse Caregiver Experiences) and is led by Dr. Nancy Donelan-McCall at the PRC. DANCE was developed in response to difficulties nurses reported in learning and using the NCAST procedure to promote parent-child interaction. DANCE consists of scales that apply to very young children and that are linked directly to program "facilitators" designed to promote parent-child interaction. The scales are grounded in reviews of the literature on influences on child development, infant mental health, and parent-child interaction. Studies of video-taped interactions of participants in the Denver trial found that DANCE assessments over the first two years of life are predictive of children's directly-measured cognitive, language, and academic abilities during preschool and early elementary school years.

In addition, given that program effects in the Elmira trial on reducing state-verified reports of child abuse and neglect were attenuated in households characterized by moderate to severe intimate partner violence (Eckenrode et al. 2000), Drs. Susan Jack and Harriet MacMillan at McMaster University in Canada led a carefully conducted formative effort to develop nurse education and clinical skills to more effectively address IPV in the context of home visits. This augmentation of the model was tested in a cluster-based RCT that compared NFP sites delivering the program as usual to NFP sites that were taught to deliver the IPV intervention. While it had no effects on maternal reports of IPV and quality of life (Jack et al. 2019), nurses who received IPV education reported greater knowledge of IPV and confidence in addressing it. We are in the midst of conducting additional analyses to help sort out these findings.

We also tested an intervention designed to increase participant retention by encouraging nurses to adapt program content and dosage more completely to meet mothers' needs. We found that participant retention was reduced in community replication compared to the original trials, and that lower retention was linked to some nurses delivering the program with strict adherence to the visit-by-visit guidelines as opposed to adapting content and methods to families' needs. Nurses who adapted the program had higher

rates of retention (O'Brien et al. 2012). This retention trial produced promising findings in a cluster-based RCT (Olds et al. 2015) and has reinforced our commitment to guiding nurses in eliciting mothers' "heart's desire" and adapting program content and dosage to align with those desires.

NFP nurses have been guided since the Elmira trial to adapt program content and dosage to the needs of families on an individual basis, but until recently there has been no systematic approach for guiding those adaptations. This is now addressed through the STAR (Strengths and Risk) Framework, a systematic way for nurses to organize their assessments of individual and family strengths, and to characterize proximal and distal risks that affect maternal and child health. Proximal risks are those that have rather direct impacts on maternal and child health (e.g., substance use, depression, intellectual functioning), while distal risks indirectly influence maternal and child functioning (e.g., having insufficient money to pay rent, transportation challenges, friends involved in the drug trade). These strengths and risks are organized in accordance with program model domains, the underlying theories that have guided program design since Elmira, and the "nursing process."

Moreover, formative work is now being conducted in 31 sites to develop a version of the program for women with previous live births who have overlapping behavioral and psychosocial risks. This formative modification of the model builds upon work begun with indigenous populations in Australia and the US, but requires a randomized clinical trial before being delivered on a full-scale basis, given that all of the original trials were conducted with women who had no previous live births. A complementary initiative is under way to strengthen nurses' skills in addressing substance misuse, with a particular focus on serving those who are in treatment. This narrow focus on those either with or at risk of developing substance use disorders warrants testing in randomized clinical trials.

Today, the NFP National nursing department is led by Kate Siegrist, who is focused on ensuring high caliber nurse education and consultation to make sure that nurses are practicing at the top of their skill set in addressing the full range of factors that challenge maternal and child health. Kate has led work to create even greater alignment between the NFP nursing program and the American Nurses Association and Public Health Nurses standards for nurses delivering the NFP. Under Kate's leadership and in

concert with Elly, the NFP has recently developed an app used by mothers and nurses to track mothers' growth in establishing and accomplishing their individual goals. The "Goal Mama" app is being carefully evaluated and adjusted to ensure its functionality and use among mothers enrolled in the program.

In addition, the number of program "facilitators" has grown since Harriet introduced this approach in the late 1980's. Today, hundreds of "facilitators" are organized into an electronic, searchable database that nurses use to find guidance in addressing the unique needs of individual mothers and families throughout the two-and-a-half-year program. Nurses have confidence that if families need something, it's highly likely to be found in the NFP "facilitator" database.

International Replication. While the US national office managed replication of the NFP in the US, the PRC at the University of Colorado began considering invitations to replicate the program outside of the US. International replication was undertaken with deep appreciation for the need to adapt the program to other cultures and contexts, and to make the conduct of independent RCT's a condition for replication when feasible. As with US replication, there are a set of "Core Model Elements" that needed to be preserved for the University to grant use of its intellectual property. One of the earliest international replications took place in the Netherlands, starting with the conduct of a randomized trial with highly vulnerable families, which found effects comparable to key findings in the US trials. The Dutch effort did not include the development of an information system that could be used to monitor program implementation and guide improvements, however. Given that we could not be certain of quality program replication, we did not continue NFP in Holland. Similarly, we supported the development and testing of the program in Germany, but the German effort included non-nurses as home visitors in some settings, so we did not continue licensing the program there.

We have received numerous invitations to set up the program in low- and middle-income countries, where resources are scarce and political environments unstable. We have chosen not to invest resources in those contexts so far because we have been less confident that the program would gain traction in those settings. We were deeply interested in evaluating the program in dramatically different cultural contexts, however, so when we were invited to develop the program in aboriginal communities in

Australia, we accepted the invitation. We did so because it was clear that the Australian government was committed for the long-haul in supporting NFP adaptation, building community ownership, and imbuing the program with sufficient resources to give it a chance of gaining traction in these diverse settings. A government advisory committee indicated at the beginning of the Australian effort that in order for the program to be culturally appropriate in remote indigenous communities, nurses would need to serve all women, not only those with no previous live births. They also advised that nurses would need to be paired with community health workers who would introduce the program to families and others in an effort to create cultural safety. We gladly agreed to these modifications in the program model. Today, the NFP operates in 13 aboriginal led community health settings throughout the country. While the program is not going to be tested in the form of an RCT, given that depriving some families of the service would be considered culturally inappropriate, a well-conducted quasi-experimental evaluation has found effects that align with the US trials (Segal et al., 2018). Additional evaluative work is being planned.

A similar approach to serving indigenous populations is being used in serving American Indian and Alaskan Native populations in North America, including British Columbia, Canada. In all of this work, we were uncertain whether the program would resonate to dramatically different populations with dramatically different histories and cultures. The essence of the model that aligns it with these populations is best expressed by an American Indian spiritual leader who told David that the program aligns with his peoples' aspirations because "Children are gifts of the Great Creator." In Alice Springs, Australia, the program was blessed with a smoke ceremony as part of its inauguration in that community. As human beings, we are wired to protect and promote the wellbeing of our offspring. This is a fundamental insight that, if we listen carefully, can be relied upon to help ensure that the program will gain traction if communities and individual families are engaged in a respectful way that reflects our shared humanity.

The first phase of a randomized trial of the program in England produced disappointing findings, perhaps because existing health visitors and midwives serving adolescents were told which families were in the control group, apparently leading them to provide more intensive services to the control group than

they would under "usual care." Nevertheless, the program currently is operating in 80 communities in England and every community in Scotland, as well as high-need communities in Northern Ireland. A follow-up study of the English trial is in the pipeline.

Preliminary work is being conducted in Norway and in Bulgaria (where it is primarily serving Roma families) to formatively develop an adapted version of the program and to lay the groundwork for a rigorous evaluation. In addition, a province-wide initiative is being undertaken in British Columbia where the provincial government has invested in a large-scale RCT, with appropriate adaptations made to local health and human service contexts, including to First-Nations (indigenous) communities served in the province. The results of the BC trial for the prenatal phase will be published soon.

The success of the international work has depended significantly on our engaging skilled nursing leaders from the UK and Canada in supporting broader international replication. After establishing the program in their own countries, several nursing leaders went on to support NFP international replication through the University of Colorado. Kate Billingham, Deputy Chief Nursing Officer in the UK Department of Health, served as the first director of the Family Nurse-Partnership (as it is called there) in England. Kate transitioned to serve as the first director of international replication of the Nurse-Family Partnership. Ann Rowe, who served as the first director of clinical operations for the Family-Nurse-Partnership in England has gone on to serve as the lead consultant guiding NFP international replication in new contexts. Debbie Sheehan, a nurse leader in Ontario, Canada, was instrumental in establishing the program in Hamilton, Ontario and guiding its development in British Columbia; Debbie supported international replication of the program for several years. Gail Trotter, a nurse leader who led development of the program in Scotland, has recently moved on to serve as a consultant to the PRC supporting the program. The clinical and leadership skills of these nurses have been critical in laying the foundation for quality program replication in growing international contexts.

As of this writing, the world is coping with the COVID-19 pandemic. Nurses delivering the program around the world are resorting to the use of telephone and other electronic means of conducting visits with participating families. Fortunately, Elly Yost had led an initiative to determine the feasibility

of using telehealth modalities in delivering the program and developed clinical guidance on the use of these methods to conduct visits. We are just at the beginning of this crisis and NFP is adjusting its information system to focus on families' needs during this crisis and to monitor families' course of coping with the virus and its societal and economic impact. Those families living on the margins are at greatest risk. They either do not have cell phone access or have unstable access; their sources of income are more vulnerable; and they live in crowded housing where the spread of infection is most likely to occur. NFP programs around the world are sharing resources and insights about how to confront this crisis.

Lessons Learned

The success of NFP can be attributed to four fundamental features that have guided its development. First, its grounding in theory has helped shape, in broad terms, what nurses are going to focus on in their work with families. The program's theories cover the map in addressing broad swaths of behavior and context that shape successful adaptation to parenting and promotion child health and development. Second, the program's grounding in epidemiology and its continuous updating to align with the latest evidence on risks and protective factors has guided the development of new program content, which ensures that NFP will continue to operate at the cutting edge of science and clinical practice. Third, its reliance on a well-developed information system allows its leaders' to monitor its performance. And fourth, NFP leaders' commitment to disciplined, research-based improvement efforts means that the model and its delivery will always be a work in progress

One of the key lessons learned from this work is that the enduring success of the program can be attributed to its alignment with our shared human drive to protect our children, and that the success of our efforts can be explained by nurses' developing caring, respectful relationships with mothers and other caregivers which elicit that drive and enable it to be used in a focused way to achieve cumulative small steps toward what matters most to mothers and other caregivers. By working with mothers during pregnancy and the early years of the child's life, we are capitalizing on unique opportunities presented at a critical period in human development – when changes in maternal roles and neuroendocrine systems

shape maternal caregiving skills going forward, and when fetal and infant development are particularly sensitive to a range of toxic and growth-promoting exposures.

Critically, the program is integrated with nursing, which builds upon caring, holistic assessment and evidence-based practice as the foundation for effective health promotion. Nurses have the education to address critical aspects of maternal and child physical-health, behavioral-health, and environmental-health that, during pregnancy and the early years of life shape mothers,' fathers', and children's life prospects for decades following the first child's birth.

In all of this, there is value in creating a program that is both structured and designed to be adapted to individual mothers, other caregivers, cultures, and contexts – while retaining its core elements. Adherence to these elements is crucial, but there are program elements that do not work as well as they need to and factors that will interfere with its implementation in some settings, elements that we will continue to seek to understand and improve. If we remember what matters most, and approach this work with humility and respect for those with whom we partner, we can make a growing difference in the lives of vulnerable mothers, children, and families.

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