The Nurse-Family Partnership in Colorado: Supporting High-Quality Programming With Implementation Science

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Abstract

Purpose: The purpose of this article is to describe how the Nurse–Family Partnership (NFP) has been scaled up and supported in Colorado. As an intermediary, Invest in Kids (IIK) provides implementation support for the NFP in Colorado using a generalizable implementation framework, the Active Implementation Frameworks (AIF).

Organizing Construct: An overlay of the AIF and the clinical nursinginformed implementation support that IIK offers to NFP providers across Colorado is explored, and relevant examples are highlighted.

Conclusions: Without the use of the AIF in combination with clinical nursing expertise to support high fidelity use of the NFP throughout Colorado, promised NFP program outcomes may likely not be realized and sustained.

Clinical Relevance: Further understanding of how to utilize implementation frameworks to support evidence-based clinical nursing programs and interventions may allow for results found in research studies to be more widely attained and maintained across practice settings.

Supporting our youngest children has proven to be one of the best investments we can make. A wealth of research shows the earlier we make this investment, the greater the returns (Heckman, 2011). When a child grows into an adult leading a productive life, the social and economic gains are profound. However, for those children whose lives are compromised by living in poverty, the societal costs can be significant (McLaughlin & Rank, 2018).

In Colorado, 166,000 children (12%) live in poverty (Annie E. Casey Foundation, 2018), and the state received a C+ rating in early beginnings in 2016, which factors in smoking rates during pregnancy, low birthweight babies, vaccinations, among other indicators (Colorado Health Foundation, 2016). These and other effects of poverty on children's health and wellbeing are well documented. Children in poverty have increased rates of infant mortality, more frequent and severe chronic diseases such as asthma, poorer nutrition and growth, less access to quality health care, lower immunization rates, and increased obesity and its complications (American Academy of Pediatrics, 2013).

The prenatal period is the ideal time to begin ameliorating the impact of poverty. Even with prenatal services, we know that pregnant women face many challenges, both during pregnancy and after the birth of their child. Young mothers need caring support and guidance to successfully navigate this crucial period in their lives. One evidence-based nursing program proven to change the life trajectory of such families is the Nurse-Family Partnership (NFP). Research has demonstrated that this evidence-based program, with high-quality implementation supports, yields programmatic outcomes that can be reliably and consistently produced in community settings. The purpose of this article is to detail the scale-up of the NFP in Colorado and how implementation science combined with nursing expertise is used to support and sustain the NFP. This article first describes the NFP as an evidence-based program, then offers a broad overview of one implementation framework, the Active Implementation Frameworks (AIF), and moves on to explain the role of the intermediary (Invest in Kids [IIK]) in supporting implementation of the NFP. Centrally, this article proposes an NFP hierarchy of program needs that filters

the AIF through a clinical nursing lens, and that guides the work of the intermediary organization in ensuring high quality and sustained use of the NFP throughout the state of Colorado.

The Nurse-Family Partnership

The NFP is designed to improve the health and well-being of low-income, first-time parents and their children. Starting early in pregnancy, and continuing until the child's second birthday, the program produces improved pregnancy outcomes, better child health and development, and more economic self-sufficiency for families (Olds et al., 1997). The NFP is a proven model of nursing care that pairs baccalaureate and NFP-trained registered nurses with low-income, first-time moms and their babies. Each nurse carries a caseload of 25 to 30 clients.

NFP nurses are accepted into the homes of the vulnerable families they serve as trusted and respected professionals. The development of a trusting, long-term therapeutic relationship is key to attaining the goals of the NFP (Brenan, 2017; Olds et al., 2013). NFP nurses work with each client, focusing on improving maternal physical and mental health, child health and development, environmental health, life course development including family planning, work and school participation, using community resources, and achieving economic self-sufficiency.

Findings from more than 40 years of randomized controlled trials and longitudinal research have demonstrated that children whose parents received the NFP program were healthier; experienced less child abuse and neglect; exhibited fewer injuries; developed better language, behavior, and thinking skills and school readiness than their peers. The mothers smoked less during pregnancy, and they experienced less interaction with the judicial system, more employment, a longer interval between the first and second child, fewer subsequent pregnancies, and reduced use of welfare (Olds, 2006). While the overwhelming evidence behind the NFP supports the case for widespread replication, selection of the program alone does not ensure that high-quality outcomes will be achieved.

From Research to Replication: The Application of Implementation Science

Based on research, the promise of positive and sustained outcomes for those received the NFP program is great, but obtaining the same results in community practice settings is not a simple task. The use of implementation science intertwined with nursing expertise can ensure that the NFP is replicated with high fidelity (Rapport et al., 2018). Attention to supporting highfidelity replication (through ensuring the 19 NFP core model elements are in place) is paramount to getting the outcomes demonstrated by the many NFP clinical studies. Fidelity is the extent to which delivery of a program adheres to the protocol or program model that was developed, tested, and found to produce positive outcomes in previous research (Mincic, Smith, & Strain, 2009).

Within the nursing-specific literature, there is a dearth of implementation science research and practical application. DiNapoli (2016) reviewed academic literature by searching for both nursing and implementation science, finding only 17 citations. Removing nursing as a search field resulted in over 150 citations for implementation science in health. As van Achterberg, Schoonhoven, and Grol (2008) echoed, the documentation of specific strategies to promote implementation in nursing is scarce. Given these challenges to identification and application of nursingspecific implementation strategies and frameworks, the perspective that implementation science and best practices are universal, regardless of the field of application, may be useful. It has been widely discussed that the collection of what we know about implementation science from a variety of fields can be synthesized and thus can be applicable to all fields (Fixsen, Boothroyd, Blase, Fixsen, & Metz, 2018; May, 2013; Meyers, Durlak, & Wandersman, 2012). Implementation can be thought of as a universal construct.

One generalizable implementation framework that has been applied across disciplines is the AIF (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). In addition to demonstrating utility in human services, the evidence-based AIF has been used in several studies within health care (Drozd, Haga, Lisoy, & Slinning, 2018; Drozd et al., 2016; Lala, 2018; Scovil et al., 2014). One intermediary organization, IIK, has worked to utilize implementation theory and principles from the AIF to support the high-quality implementation, scale-up, and sustainment of the NFP in Colorado.

Within the AIF, implementation is defined as "a specified set of activities designed to put into practice an activity or program of known dimensions" (Fixsen et al., 2005, p. 5). This definition calls attention to both the program to be used in practice, as well as the activities or implementation strategies used to support the full and effective use of the program. Given this, the six frameworks that comprise the AIF attend to both the program and to implementation. The six frameworks are usable innovations,

implementation drivers, implementation stages, improvement cycles, implementation teams, and systemic change.

Usable innovations refer to the innovation, or the new program or practice, being introduced into the setting. Usable innovations must be teachable, learnable, doable, assessable, and scalable in practice. The criteria for a usable innovation are a clear description of the innovation and the essential or core components that define it, operational definitions of the components, and a practical assessment of the practitioners' use of the innovation.

Implementation drivers are the engine of change. Given that usable innovations require new ways of work, the drivers can be proactively utilized to support the innovation in practice. The three categories of supports are competency, organization and leadership. Competency drivers focus on the practitioners who will engage with the innovation; organization drivers focus on reducing barriers at the organizational and systems level, so that the innovation can thrive; and the leadership driver focuses on both the technical and adaptive skills of leaders that are used to ensure new ways of work are initiated and maintained.

Implementation stages acknowledge that implementation is not a one-time event, and that it is a process. The process is not linear and moves between exploration, installation, initial implementation, and full implementation. Improvement cycles are enacted to ensure that, when needed, implementation supports (drivers) are refined over time and that a process of innovation improvement is established. The use of plan-do-studyact cycles is encouraged, as is usability testing to first apply changes that are limited in scope, ensure such changes result in a positive outcome, and then roll out the changes to larger numbers of practitioners or service units.

Implementation teams represent who does the work of supporting implementation. Developing a dedicated, purposeful team to support the implementation of the innovation ensures that the innovation is more fully supported and sustained in practice. Lastly, systemic change is required for innovations to become fully embedded in new contexts. New ways of work are not the status quo, and thus systems must change in order to initiate and sustain new practices and improved outcomes. The goal is to establish and support an enabling context so that the innovation can thrive. Using the AIF in planned and purposeful ways to support high-quality evidence-based programs yields reliable and consistent use of the programs, which in turn ensures that program participants reach the outcomes that are promised.

The Role of the Intermediary

As the Colorado launch pad for the NFP, IIK was founded in 1998 and has since helped to put more than 25,000 families on a path toward self-sufficiency, with ripple effects throughout multiple generations and the communities in which they live. As an intermediary organization, IIK works to bridge the gap between research and practice in Colorado. IIK was founded to work in partnership with communities to identify programs in early childhood with proven track records of success, introduce the programs to communities to ensure fit, support communities to implement the programs, and ensure the ongoing success of the programs. Prior to the formation of IIK, the support needed to bring the NFP out of research and into local communities was limited. In 2003, the NFP National Service Office (NFP-NSO) was founded to provide training and support for the NFP across the United States. The NFP-NSO engages with Colorado sites primarily to train nurses, while IIK works intensively with NFP staff in Colorado to ensure high-quality implementation over time.

The central role of an intermediary is to support high-fidelity use of programs in the community through applying ". . . expertise in implementation science to support dissemination" (Lang, Randall, Delaney, & Vanderploeg, 2017, p. 19). Through an implementation lens, Franks and Bory (2017) have described seven core intermediary roles (Table 1), all of which are reflected within the AIF. IIK staff work to exemplify the role of the intermediary in numerous ways to ensure each NFP site's ongoing success through strict adherence to excellence in nursing practice, NFP program guidelines, and core model elements, and to ensure the use of data with a commitment to continuous quality improvement (see Table 1 for key examples).

IIK does not engage in implementation support work in a silo and positions itself as a strong link in the value chain from program development, to replication in community settings, and, ultimately, to client outcomes. Local public health departments, community health centers, community nursing agencies, and hospital systems are responsible for day-to-day operations of the NFP at 22 sites, serving all 64 Colorado counties. A site's geographic service area ranges from citywide to multicounty in scope, and each is managed through collaborative partnerships that are supported and facilitated by IIK.

NFP Hierarchy of Program Needs

IIK supports high-fidelity use of the NFP in Colorado by applying the AIF through a nursing practice lens.

Nurse-Family Partnership in Colorado

Table 1. Role of the Intermediary

Franks & Bory (2017): core	
intermediary roles	IIK implementation support examples
1. Consultation and technical assistance activities	Leadership and fidelity oversight using nursing expertise Provide resources and ongoing consultation to supervisors using public health nursing
	leadership skills
2. Best practice model development	Maintain relationship with NFP program developer to support the replication of the NFP in Colorado Participate in projects to improve the NFP
	program
3. Purveyor of evidence-based	Planning support for expansion of NFP services
practices	Coordinate NFP operations with community advisory boards or other local and state planning efforts
4. Quality assurance and continuous quality	Identify and utilize data to assist sites in maintaining targeted caseload size and/or to plan for program size
improvement	Support sites in identifying CQI targets
5. Outcome evaluation	Assist sites in navigating the NFP-NSO data system
	Advocate for improvements to the NFP-NSO data system Help sites identify, analyze, and report outcomes to local, regional, and state stakeholders
	Write yearly report to the legislature about NFP outcomes
6a. Training	Provide one-on-one NFP supervisor orientation with a focus on reflective supervision capacity building
	Develop and deliver professional develop- ment to NFP nurses
	Provide in-depth training to NFP supervisors on using data and reports to guide nursing practice
	Provide training to data entry staff to successfully navigate the data collection system
6b. Public awareness and education	Maintain two main communities of practice for NFP nurses and supervisors to foster sharing and implementation of best practices
	Participate in state-level committees representing the NFP's contribution to the overall early childhood agenda
7. Policy and systems development	Support NFP sites to attract and sustain community support and involvement Meet with legislators and state level stakeholders to garner and maintain support to sustain funding

Note. CQI, continuous quality improvement; IIK, Invest in Kids; NFP, Nurse–Family Partnership; NSO, National Service Office.

The NFP hierarchy of program needs (Figure 1) combines clinical nursing expertise with the AIF to ensure that implementation supports are provided at the right level of the system or site, at the right time. The NFP hierarchy of program needs is portrayed as a triangle, with the most fundamental needs at the bottom. As these needs are satisfied, typically in early stages of implementation, IIK's implementation support then moves up the triangle. The barriers between the levels are porous, indicating that IIK may focus efforts at all levels simultaneously or sequentially from the bottom up, depending on the needs of individual sites.

For example, community support may diminish over time with the achievement of stable funding, all while a site continues to experience challenges with recruitment or retention of nurses. In this case, IIK would work to address nurse recruitment and retention issues and also develop a plan to re-engage community support. IIK's attunement to each site's contextualized needs is paramount in assessing what implementation supports can be provided, and when the support will be most well received by the site.

Community Support and Funding

Starting at the base of the triangle, IIK supports communities in their assessment and selection of the NFP and ensures funding for the program. As IIK began to scale the NFP in Colorado, these two activities were foundational. Community support and funding speak to both the exploration stage of implementation and to applying the systemic change framework to support the NFP.



Figure 1. NFP hierarchy of program needs.

A foundational study examined the impact of IIK's implementation support process on the outcomes of the NFP program, and led to the researchers coining the term transfer of commitment (Hicks, Larson, Nelson, Olds, & Johnston, 2008). Hicks et al. (2008) found that a community's engagement with an authentic collaborative implementation process produces a deeper, more lasting commitment to the NFP, which leads to greater community impact.

IIK's dedication to working in partnership with communities throughout all stages of implementation is key to the NFP value chain and has remained a core component of its work over the past 20 years. During the exploration stage of implementation, the transfer of commitment begins. Sites begin to engage with the NFP, in readiness planning, and consider the feasibility of implementation.

IIK facilitates and engages communities in an open and credible collaborative process, which has a significant impact on program outcomes as well as client outcomes (Hicks et al., 2008). In implementation research, an early focus on engagement and readiness has been shown to be predictive of later success with program start-up (Saldana, Chamberlain, Wang, & Brown, 2011). With the NFP, Hicks et al. (2008) drew an analogy to the influence of infant and early childhood development on an individual's well-being through childhood and into adulthood-a basic operating assumption of the NFP. Hicks et al. (2008) argued, ". . . the events and experiences in the infancy and early stages of the collaborative process have lasting effects on the commitment to and ultimate success of the programs that process engenders" (p. 473).

In 1998, IIK began taking on a purposeful site development role, tailoring engagement strategies to each community's needs to ultimately enable adoption of the NFP and establish ways of working together. IIK began convening local stakeholders in communities throughout Colorado to examine the continuum of programs available to address problems such as child poverty rates, negative health and development outcomes, and health and social disparities. IIK then introduced the NFP to community stakeholders with a focus on the target population of the NFP, as well as the goals, outcomes, and fidelity of the program. If the community deemed the NFP a fit within their continuum of services, IIK worked with them to determine the agency best suited to provide the program. Community stakeholders became the NFP Community Advisory Board (CAB). Maintaining a CAB proved to be so important for NFP support that it was later identified as a core model element.

While communities in Colorado began to identify the NFP as a needed program and started to develop structures like the NFP CAB to support the program, IIK began work at the state level to garner funding for the program. It was clear that finding a funding path for long-term sustainability was crucial. With the NFP program developer's assistance, IIK built a case to present to the state's public policymakers and administrators for prevention and investment in Colorado's families-especially those vulnerable and at-risk children at the very earliest stages of their development. IIK marshaled bipartisan support, and the Colorado General Assembly passed the Nurse Home Visitor Act in 2000. The Act was funded in perpetuity, to provide a sustainable revenue stream for the NFP. This key systemic change work provided foundational implementation support for IIK's ongoing advocacy for the NFP at both the local and state level in Colorado in order to safeguard this dedicated funding stream.

Once an agency is chosen by a community to provide the NFP program, with IIK's support, the agency then applies to the NFP-NSO and the state for approval to provide assistance by the NFP in Colorado. Facilitated by IIK, the NFP CAB then becomes a permanent, frequently meeting group to maintain support and referral resources for the NFP providing agency. Given the range of circumstances, conditions, and resources available in urban, suburban, rural, and frontier parts of Colorado, approaches to these exploration and installation stage activities vary tremendously.

Despite the variation in approach across Colorado communities, one central theme Hicks et al. (2008) found "was the perception of IIK as genuinely concerned about improving the future for children, as advocating for the well-being of children, as investing their time and resources in children, and in impacting in real and tangible ways the welfare of children. The model of cooperative behavior that is created by their commitment is transferred to the stakeholder group (the community)" (p. 472). This commitment, in turn, is transferred to the NFP supervisor and other local agency staff and ultimately the families they serve. "If the nurse supervisors are then able to transfer their commitment to the home visitation teams, they, in turn, may transfer this commitment to the client group (the first-time mothers)" (p. 473).

Recruitment and Retention of Nurses

While community support and funding are the base needs to be satisfied in the early stages of implementation, recruitment and retention of nurses can be focused on next in order to ensure high-fidelity use of the NFP and get to the desired client outcomes. IIK's work during installation and initial implementation stages is guided by the competency implementation drivers, which include effective selection, training, and coaching of staff.

Selection

The nursing shortage in Colorado is well documented and adds to the challenge of recruiting nurses into the NFP (). Most NFP nursing jobs are housed within public health departments or are classified as public health nursing jobs in other agencies providing assistance from the NFP. Public health nursing typically pays less than acute care positions, and the rural and frontier nature of many of Colorado's counties further exacerbates recruitment and retention issues Additionally, NFP nurses must possess critical thinking skills and be comfortable and prepared to work in a highly autonomous environment. Recruitment of the right nurse is paramount, given that the nurse-client therapeutic relationship is the ultimate key to achieving positive NFP results. To support NFP sites in recruiting and retaining nurses, IIK works with agencies to help them recruit, interview, and select nurses who are likely to be successful.

Training and Coaching

The NFP-NSO provides initial training for both supervisors and nurses, and IIK provides intensive NFP supervisor support beginning with one-on-one mentoring of new supervisors and continuing into monthly one-on-one individualized consultation. In addition, IIK facilitates a quarterly statewide NFP supervisor community of practice where supervisors gather to discuss challenges and work together toward solutions.

IIK, in partnership with the University of Colorado, College of Nursing, has created the NFP Nurse Residency Program. This systemic change in nursing education has resulted in a specialized training, support, and professional development program delivered through an online format to new graduate nurses working in the NFP. The NFP Nurse Residency Program shows promise, and preliminary results demonstrate that it is positively affecting the professional development and retention of new NFP nurses. This kind of support also shifts some of the burden of training from the new nurse's team and supervisor to IIK.

The Top of the NFP Hierarchy of Program Needs

Once aspects of community support, funding, and recruitment and retention of nurses are addressed, IIK can then work to offer support related to the upper levels of the NFP hierarchy of program needs. The ultimate long-term goal of IIK's support is focused on a site achieving high-fidelity use of the NFP to ensure positive outcomes, as well as supporting sites to continually improve over time. Implementation supports at the top of the hierarchy are informed through considering the AIF construct of fidelity, the organizational implementation drivers, and through attention to improvement cycles over time.

The promise of evidence-based programs to deliver results may be strong, but unless programs can be put into practice with fidelity and consistently produce the same outcomes as were found under research conditions, they may not deliver the same societal benefits. Fidelity to the NFP model and to the core model elements is critical to producing consistent client outcomes. IIK is continually improving implementation supports used to assist NFP sites in Colorado based on lessons learned from diverse communities statewide. Improving the use of the program at present makes it better for future clients.

One core model element essential for fidelity and key to producing outcomes is sustained client engagement. IIK has found that the issue of client recruitment and engagement throughout the full duration of the child's first 2 years of life is a challenge. During clinical research on the NFP, nurses did not carry the full weight of client recruitment as they do now in replication in Colorado. Additionally, IIK has found that clients currently do not stay engaged in the NFP as long as they did in the research studies.

To assist NFP sites in recruiting clients, IIK again engaged in systemic change and worked with Colorado's Medicaid Agency, Health Care Policy and Financing, to identify women eligible for the NFP through the Medicaid application process. IIK then created a statewide referral system to disseminate and track Medicaid referrals to Colorado's NFP sites. Another innovation in recruitment came about through IIK's convening of the Nurse Practice Council, comprising staff nurses representing all NFP sites. The Council spearheaded the creation of a client recruitment video now used by every NFP site in Colorado to attract eligible women to the NFP.

To assist NFP nurses in improving client retention, IIK has focused on providing professional development to enhance nurses' skill and ability to maintain longterm therapeutic relationships with clients. Examples of these professional development offerings are a biannual workshop focused on maintaining professional boundaries in the NFP, intensive case-study–based mental health workshops focused on working with clients who have experienced adverse childhood experiences, a refugee community of practice that provides a forum for nurses to discuss and learn about working with immigrants and refugees, and intensive one-on-one video feedback work on reflective communication.

Discussion

While the use of evidence-based programs is becoming increasingly widespread in nursing and health fields, many programs do not produce the same strong outcomes in practice that were found in research. Olds (2010) noted that, "in order to achieve its promise, the NFP must be replicated with fidelity to the model tested in randomized trials" (p. 73). Without an intermediary support structure like the one that IIK provides in Colorado, achieving consistent highfidelity use of the NFP in community settings would likely be difficult, and results likely to be less reliably produced. Today, IIK offers a cascading system of supports that impacts implementation at each level of the system. IIK supports 22 different implementing agencies and 230 NFP nurses, supervisors and ancillary staff, who serve all 64 Colorado counties with the NFP, with funding to see 3,600 families at any one time.

In ensuring that the NFP is well supported in practice, IIK draws from and applies a generalizable, evidence-based implementation framework, the AIF. The AIF helps to operationalize the process of implementation and offers a wide range of research-based implementation strategies to draw from in order to best support high-quality implementation. The conceptualization of the NFP hierarchy of program needs is a result of IIK's work over the past 20 years, combining a highly evidence-based program (NFP) with clinical nursing expertise and proactive research-based implementation supports (AIF) in Colorado.

Since 1998, more than 25,000 first-time, low-income mothers have been served by the NFP, with outcomes indicating that the NFP has been used with high fidelity. The outcome data in Colorado align with previous RCT findings. Health outcomes observed in Colorado among participating mothers and children include a 21% reduction in smoking during pregnancy, 30% reduction in alcohol use during pregnancy, 92% of mothers initiating breastfeeding, 91% of children fully immunized by 2 years of age, and 96% of children receiving developmental screening at 4 months and 10 months of age. IIK's work demonstrates that the proactive use of implementation science, combined with nursing expertise, can effectively support, sustain, and scale up an evidence-based program's consistent success across community settings.

Clinical Resources

- Invest in Kids Intermediary Organization. https://www.iik.org
- Active Implementation Research Network. https ://www.activeimplementation.org
- Nurse–Family Partnership. https://www.nurse familypartnership.org/

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