

Nurse-Family Partnership Improves Children's Cognitive Functioning

An interview with David Olds, Ph.D., a professor of pediatrics and director of the Prevention Research Center for Family and Child Health at the University of Colorado Health Sciences Center.

By Debra Gordon

Researchers from the University of Colorado conducted a randomized controlled trial of a Memphis, Tenn., program in which nurses visit low-income, first-time pregnant women during their pregnancy and for the child's first two years of life. The nurses assist with prenatal care, parenting skills, and help parents complete their educations and find work. The program is called the Nurse-Family Partnership and it is partially funded by The Robert Wood Johnson Foundation. The results of the Memphis study were published in the December 2004 issue of *Pediatrics*. Olds was the lead author.

Q: What was the impetus for the nurse-visiting program when it began nearly 25 years ago?

A: Prior to going to graduate school, I worked in inner-city Baltimore in a day care center with a classroom of 4-year-olds. I began that work with a great deal of optimism. I believed that if we could just get 4-year-olds off to a good start before entering school, they would have a better chance of succeeding in school and in life. But for many of the children in my classroom, it was too little, too late. Some had been abused. Some had been exposed to toxins during pregnancy that likely damaged their developing brains. I realized that if we were really going to make a difference in the lives of low-income children and their families, we needed to start much earlier and we needed to be more comprehensive.

Q: So the focus has always been on the child?

A: Not only the child. The experience in Baltimore also made me realize that there was a lot of despair among low-income families due to limited life options. Many families didn't have much of a sense of hope. So a component of this program was designed to help parents envision a future for their own lives. That element includes planning future pregnancies, staying in school and finding work. These goals are both achievable and are likely to help the parents become more economically secure so they can create a better life for themselves and their children.

Q: Why is it important that these visits take place in the home?

A: Two reasons. First is that many low-income mothers are reluctant to use office-based care. Their experience in using office-based care has sometimes been filled with discrimination. The second is that, by being in the home, the nurse is able to have a deeper appreciation for the physical and social environment and can work with the mother to improve the environment for the child's development.

For example, in some families, the housing conditions are so poor that parents are reluctant to put their babies on the floor to crawl around due to rats. The children have limited opportunity for physical mobility. It's also not uncommon for young mothers to be embedded in households where there is criminal activity, such as drug dealing. By observing the environment firsthand, the nurses can better see the conditions mothers are contending with, enabling them to help the mothers make smart choices for themselves. With the nurse's help, mothers sometimes make the decision to remove themselves from those environments to protect themselves and their babies.

Nurses Critical to Program's Success

Q: Why was it important that this program involve nurses?

A: The success of any preventive intervention depends upon parents wanting to engage in the service and finding it valuable. For this engagement to occur, they have to have a sense of vulnerability and believe that what we're offering is going to address that sense of vulnerability effectively. Pregnant women who are experiencing their first labor and delivery often are frightened. They don't know what caring for that newborn is going to be like. But nurses are viewed as service providers who are knowledgeable and who will be able to help parents reduce that sense of anxiety and vulnerability. This is an essential link with a family that allows the nurses to begin focusing on other issues of concern.

Q: Couldn't you use trained lay people, as similar intervention programs do?

A: We have another article published in this issue of Pediatrics that focuses on our Denver trial. It systematically compares the impact of the program delivered by paraprofessionals, who share many of the social characteristics of the families they serve, with those delivered by nurses. In an earlier study we reported that the nurses produced effects that were roughly twice as large as those produced by paraprofessionals and that the paraprofessional visitor effects were almost never clinically or statistically significant. In this current study, we find that nurses continue to produce effects on a wider range of outcomes, but we start to see some benefits for the paraprofessional-visited families with respect to the quality of care that mothers provide to their children. But those improvements in quality of care do not translate to corresponding improvements in child development, as we see with nurses.

Q: Why do you think that the outcomes are so much better for nurse-visited families?

A: Nurses are consistently rated by Americans as the service providers with the highest levels of trust of any helping professions. The general population trusts nurses. In addition to their clinical skills, they are able to address physical health, behavioral and social issues and to understand the complexities that exist in low-income families and deal competently with them.

Q: Can you provide an example of a nurse's ability to affect overall outcomes?

A: We find that nurses are more successful than paraprofessionals in helping women improve their prenatal health, especially when it comes to cutting down on use of tobacco during pregnancy. They are also better at helping women space subsequent pregnancies. Those kinds of effects, we think, are part of the explanation for why the nurse-visited children are performing better in terms of their cognitive functioning than their counterparts who were visited by paraprofessionals.

Long-Term Effects of Smoking Cessation Critical

Q: How can helping women quit smoking during pregnancy affect a child's later cognitive development?

A: There are now at least seven longitudinal studies conducted around the world that show a relatively unique relationship between prenatal tobacco exposure and severe antisocial behavior once children reach adolescence. There's roughly a twofold higher risk for severe antisocial behavior in children prenatally exposed to tobacco than in those not exposed. And we see earlier developmental connections to prenatal tobacco exposure. For instance, babies exposed to

tobacco in utero are fussier and more irritable following delivery. They have a harder time tuning out auditory stimuli. In the first six months or so of life they're at greater risk for having colic. In the second year of life they are at greater risk for exacerbations of the terrible twos, especially when parents don't know how to care for their children effectively. Once they reach school age, these children are at greater risk for oppositional defiant disorder. The nurses are able to alter these specific risks, not just by reducing tobacco use, but also by reducing the use of illegal drugs and alcohol during pregnancy and by identifying emerging obstetric complications. By insuring women get those problems treated more promptly and reliably, the developing fetal brain isn't compromised by these alterations in health.

Q: And a healthier newborn translates into easier parenting?

A: Yes. To the extent that the nurses are successful in helping improve the uterine environment, babies are less likely to be irritable and inconsolable and harder to care for. Parents find their efforts at caring for the children are more rewarding because the babies smile and coo at them rather than arch their backs and cry and fuss. Then, the nurses' efforts at helping parents learn how to care for the children and find joy in the care of their children also are more rewarding. That, in turn, reduces the risk of child abuse.

Q: What kinds of things do the nurses focus on during the first two years of life?

A: The first is simply helping mothers and other caregivers learn how to care for the child competently by helping them learn how to read and interpret their babies' communicative signals accurately. It's not uncommon for parents who have been mistreated themselves as children to interpret their children's behavior as somehow having negative intent.

Q: Why is it so important that parents learn to read their baby's signals accurately?

A: It enables the baby to develop a sense of trust that the caregivers in his or her environment are going to meet his or her needs. That trust is really crucial.

Q: And the other focus during the child's first two years?

A: The nurses help mothers start to develop a vision for their own future. They ask them what it was like when they were growing up. Then they ask if they want their children to have similar lives, or if they want to do something different for their children. That conversation is fundamental in helping young mothers and fathers start to visualize the kind of life they want for themselves. For many young women who have not had a lot of experience, that visualization process can be really challenging. But the nurses are so compassionate and so caring that they are able to find a way of establishing relationships and building that sense of hope and a future that is fundamental if the mother is to transform her own life.

Changing a Child's Trajectory

Q: Were there any findings in the study of the Memphis program published in the December Pediatrics that were surprising or that you didn't expect?

A: The conventional wisdom is that home-visiting programs, because they are focused on parental behavior and not on altering the child's day-to-day experience as in a classroom, will have limited impact on things such as cognitive performance and language functioning. But we find that, with a program that is well crafted and that alters several domains of risk for compromised intellectual functioning, we have not only affected children's intellectual functioning but also discovered that this effect endures for four years after the program ends. These children are simply better prepared to enter school. The fact that what happens during pregnancy and the

first two years of a child's life might alter a child's readiness for entering school is the most important part of this story.

Q: As part of the testing you performed, you had children complete the beginnings of stories. What did that show you?

A: In earlier reports on the program in Elmira, N.Y., a rural, mostly white area, we found that nurse-visited children were less likely to be arrested and convicted by the time they were 15. So one of the things we wanted to do in this current study was to replicate those findings with minorities in a major urban area. But, of course, 6-year-old children are not likely to be arrested. So we wanted to learn whether there were early indications that the program was altering early developmental trajectories that would likely lead to a reduction in arrests and severe antisocial behavior by the time the children reached adolescence. We introduced a measurement strategy in which we presented the beginnings of stories to children and asked them to complete them. For instance, in one story, the child spills his juice in the kitchen while his mother is in the room. We ask, "What happens next?"

Children can respond all kinds of ways to those stories. But some children talk about the mother coming over and slapping the child and the child fighting back with out-of-control aggression. We found it quite remarkable that nurse-visited children, whose mothers had higher rates of mental health problems in contrast to the control group, showed much less aggression and their stories were less likely to be incoherent.

Q: Why is that important?

A: We know from previous research that high levels of dysregulated aggression and incoherence are associated both with children having been abused and neglected and with behavioral problems observed in other settings. This finding is intriguing because it suggests to us that the program is altering both early experiences and the child's internal way of representing those experiences. This internal representation may predispose some children to antisocial behavior later in life. Our findings give us some hope that we may see enduring effects on behavior once these children reach adolescence. It's also important that the mothers of nurse-visited children in this study reported fewer behavioral problems on the part of their children severe enough to warrant referral for mental health treatment than their counterparts in the control group.

Q: Why are these effects still so strong four years after the program ends?

A: Because the program affects prenatal health, which we think has a bearing on a child's later development, particularly neurological functioning. We also know that the nurse-visited parents provided better care for their children in the first two years of life. And that the mothers started to improve their own living conditions by spacing subsequent births, working more and staying off welfare more. Those kinds of changes in prenatal health and family economic resources, and in the home environment, in addition to improvements in parenting, are domains of functioning that other home visiting programs have not affected.

Message to Policy-makers

Q: What are the implications of these findings for policy-makers and others who work with this population?

A: The bottom line is that we have tested this program, using the most rigorous scientific methods available, over and over and over again with different populations living in different contexts at different points in our country's history — with rural whites, urban blacks, urban Hispanics, in the 1970s, 1980s and 1990s — and we show relatively consistent effects on socially important

outcomes. It's nearly unprecedented for an intervention to have this level of scientific scrutiny and consistently determined beneficial effects.

Q: What about the cost of these programs?

A: The Washington State Institute for Public Policy recently produced a report evaluating dozens of preventive interventions on an economic basis. Of all the home visiting, child welfare and early intervention programs examined, the Nurse-Family Partnership comes out at the top of the list in per-family savings: roughly \$17,000 per family in savings over the child's lifetime, above and beyond the cost of the program. The program costs about \$3,000 to \$3,400 per family per year.

Q: How many programs are running throughout the country?

A: The Nurse-Family Partnership is currently operating 170 local sites in 250 counties nationally. And that's only since we began replicating the program five years ago. We're very pleased with the level of interest that we see policy-makers taking in this program. They're showing this level of interest in part because they realize they have to be careful guardians of taxpayers' dollars and make sure they're spending public dollars wisely. So they're increasingly turning to programs like the Nurse-Family Partnership that have very strong evidentiary foundations.

Key Findings

The article "Effects of Nurse Home Visiting on Maternal Life-Course and Child Development: Age-Six Follow-Up of a Randomized Trial," published in the December 2004 issue of *Pediatrics*, describes the results of a study of 743 primarily African-American women who were randomly assigned to receive either nurse visits or comparison services beginning in mid-pregnancy and continuing throughout their child's first two years of life. The program was partially funded by The Robert Wood Johnson Foundation. Key results are described here.

Four years after the program ended, it continued to produce effects on the lives of urban, African-American women and their children. Specifically, nurse-visited women:

- Had fewer subsequent pregnancies and births.
- Used less welfare.
- Had longer relationships with their partners.

Nurse-visited children:

- Had higher IQs and language scores.
- Had fewer behavioral problems in the borderline or clinical stage.
- Exhibited behaviors that research suggests should increase their academic and behavioral adjustment to elementary school.