SCIENCE AND SUCCESS

Programs that Work to Prevent Subsequent Pregnancy Among Adolescent Mothers

Advocates for Youth

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Advocates for Youth—Rights. Respect. Responsibility.®
Advocates for Youth is dedicated to creating programs and advocating for policies that help young people make informed and responsible decisions about their reproductive and sexual health. Advocates provides information, training, and strategic assistance to youth-serving organizations, policy makers, youth activists, and the media in the United States and the developing world.

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Science and Success: Programs that Work to Prevent Subsequent Pregnancy among Adolescent Mothers

Introduction

Between 1991 and 2006, adolescent birth rates steadily declined in the United States. However in 2006, the steady decline reversed itself, moving upward among teenage women ages 15 to 19.[1] About one fifth of infants born to adolescent mothers is a second or third child.[1] Moreover, U.S. adolescent pregnancy and birth rates remain among the highest in the western world. Given the need to focus limited prevention resources on effective programs, Advocates for Youth undertook exhaustive reviews of existing research to compile a list of programs proven effective in preventing or reducing the incidence of second and higher order pregnancies or births* among adolescent mothers.

Criteria for Inclusion—All programs highlighted here had evaluations that:

- Were published in peer-reviewed journals (a proxy for the quality of evaluation design and analysis).
- Used an experimental or quasi-experimental design, with treatment and control / comparison conditions.
- Included at least 100 young women in treatment and control / comparison groups, combined.
- Collected baseline and post-intervention data from both treatment and control / comparison groups.

Further, the evaluations either:

- Continued to collect data regarding both groups at 18 months or later after the intervention, or
- Showed program effectiveness in reducing repeat pregnancies and/or births among intervention females, relative to controls.

Program Content— Each of the programs that met the criteria above provides specialized services that encourage the adolescent mother to: 1) use contraception correctly and consistently in order to prevent rapid, repeat pregnancy; 2) envision a brighter future for herself and her child; and 3) complete her education and/or learn useful job skills.

Reduction in Teen Pregnancy or Births—All the programs highlighted here showed statistically significant declines in repeat teen pregnancy and/or births among participants relative to comparison / control mothers.

Other Positive Outcomes—Although every program did not measure all of the sameoutcomes, several measured these significant outcomes among participants relative to comparison / control mothers:

- Two showed significant improvements in adolescent mothers' use of contraception.
- One showed a significant improvement in maternal health or reduction in maternal morbidity among the adolescent mothers.
- Two showed significant improvements in health outcomes and/or reductions in abuse and neglect among the infants and children of these young mothers.
- Two showed significant improvements in the number of adolescent mothers who completed their high school education or earned a general equivalency diploma (GED).
- Three showed significant improvements in employment outcomes and/or reductions in reliance on public assistance among young mothers.

*Some of the studies highlighted here assessed the incidence of subsequent pregnancies while others assessed the incidence of additional births.

Table A. Effective Programs and Their Impact on Adolescents and Their Children

Programs	*Decreased Number or Rate of Teenage Pregnancy/Birth*	*Increased Use of Contraception*	*Improved Health Outcomes among Young Mothers*	*Improved Health Outcomes/ Reduced Abuse & Neglect among Children*	*Increased Educational Attainment among Young Mothers*	*Increased Employment Outcomes/ Reduced Reliance on Public Assistance*
1. Queens Hospital Center Adolescent Program	★	★	★	★	★	★
2. Health Care for First-Time Teen Mothers	★					
3. Nurse Home Visiting for 1st Time Adolescent Mothers	★			★		★
4. Polly T. McCabe Center for Pregnant Adolescents	★					
5. Women's Centre of Jamaica Foundation	★	★			★	★
6. Home-Based Mentoring for 1st Time Adolescent Mothers	★					
7. Intensive School-Based Program for Teen Mothers	★					

Note: Blank boxes indicate either 1) that the program did not measure nor aim at this particular outcome/impact or 2) that the program did not achieve a signficant positive outcome in regard to the particular behvaior or impact.

Queens Hospital Center's Comprehensive Adolescent Program for Teenage Mothers and Their Children

Program Components

- Hospital-based, comprehensive program offering medical, psychosocial, educational, and family planning support
- Interdisciplinary team of obstetrician-gynecologist, pediatrician, social worker, and health educator assigned to each teenage mother and her infant
- Physician or practitioner on call 24 hours a day
- Reproductive health and family life education program with ongoing bi-weekly classes for the teen mother, her partner, and her family
- Multi-service center, offering mental health care, WIC (nutritional supplemental program for women, infants, and children), housing office, high school equivalency program, day care center, and adult and pediatric clinic

For Use With

- Economically disadvantaged, pregnant and parenting adolescents and their infants

Evaluation Methodology

- Quasi-experimental evaluation design, with treatment and comparison conditions of adolescents and their newborns, enrolled prior to delivery, and receiving care at Queens Hospital Center
- Pregnant adolescents receiving prenatal care in the comprehensive adolescent program (treatment group n=498) or in the adult obstetric clinic (comparison group n=91)
- Baseline data collected at enrollment, with follow-up to age 20 or 1989, whichever came first
- Data collected retrospectively from inpatient and outpatient charts prior to July 1985 and prospectively from July 1985 through 1989, or until adolescent mothers reached age 20

Evaluation Findings

- Reduced incidence of repeat pregnancy
- Increased use of contraception
- Reduced incidence of maternal morbidity
- Reduced incidence of infant injury and illness
- Increased educational attainment among young mothers
- Increased employment outcomes among young mothers

Program Description

This comprehensive program is designed with the belief that teenage pregnancy is only a symptom of an underlying problem which may be amenable to change. The basic philosophy of the program is that pregnant adolescents need comprehensive services to address complex issues and needs. The program stresses early intervention to: 1) reduce repeat pregnancy; 2) improve school completion among adolescent mothers; and 3) improve health outcomes among adolescent mothers and their children. To accomplish these goals, the program assigns each adolescent mother and her newborn to an interdisciplinary team, consisting of obstetrician-gynecologist, pediatrician, social worker, and health educator. The teen and her infant remain under the care of the assigned team until the adolescent mother reaches age 20.[2]

The Queens Hospital Center's comprehensive adolescent program also offers the young mothers 24-hour access to physicians and nurse practitioners. It also offers reproductive and family life education, consisting of ongoing bi-weekly classes for the adolescent, her partner, and her family. Located within a multi-service center, the program also offers referral for mental health care, WIC (nutritional supplemental program for women, infants, and children), a housing office, a high school equivalency program, a day care center, and adult and pediatric clinics.[2]

Evaluation Methodology

The study evaluated the impact of the comprehensive program on maternal and infant health and on subsequent reproductive and life choices of the adolescent mothers. The treatment group consisted of 498 adolescents and their newborns, enrolled prior to delivery, who received care at Queens Hospital Center's comprehensive adolescent program. Participants included those in the program from its inception in 1982 until 1989, when the study ended. The study followed the mothers until they reached age 20 or until 1989, whichever came first. The comparison group consisted of 91 adolescents and their newborns who received prenatal care at Queens Hospital Center's adult obstetric and gynecologic and pediatric clinics from 1980 to 1982 and who continued to receive care with their children at the hospital's adult family planning and pediatrics clinics until they reached age 20 or until 1989, whichever came first.[2]

All participants were under age 20 at delivery; mean age at delivery for both groups was 17. All retrospective data were abstracted from the outpatient and inpatient medical charts prior to July 1985; data were prospectively collected from July 1985 and onward. At delivery, there were no differences between the two adolescent groups in terms of age, socioeconomic status, completed years of school, prior poor obstetrical outcome (stillbirth, fetal death, or neonatal death), or employment status as head of the household. Standards of medical care were identical at both clinics. Adolescent mothers were excluded from the study if they had pre-existing hypertension, diabetes, cardiac or renal disease, diseases of the endocrine or neurologic systems, multiple gestations, or known or subsequently documented drug use.[2]

Outcomes

- **Behaviors—**
  - **Increased contraceptive use**—Adolescents in the treatment program were significantly more likely to use contraceptives and to use them regularly than were adolescents in the comparison group (85 versus 22 percent, respectively; $P \leq .0001$). By 1989, over 96 percent of adolescents in the treatment group reported regular contraceptive use.[2]
  - Improved attendance at gynecologic and pediatric clinics—Seventy-five percent of adolescents in the treatment group regularly completed their gynecologic and pediatric appointments, versus 18 percent of adolescent mothers in the comparison group ($P \leq .0001$). 2

Long-Term Outcomes

- **Decreased incidence of pregnancy**—Fewer adolescents in the treatment group than in the comparison group became pregnant again during their remaining teenage years—nine percent of treatment adolescents versus 70 percent of comparison group adolescents. Across all the years of the program, repeat pregnancy among adolescents in the treatment group declined significantly with each successive year. For all the years of the program, repeat pregnancy, whether ending in live birth or termination, declined significantly with each successive year ($P \leq .0001$).[2]
- **Decreased incidence of maternal morbidity**—Eighteen percent of adolescents in the treatment group suffered subsequent maternal morbidity (prolonged disease of the pelvic organs or of upper respiratory, circulatory, or gastro-intestinal systems, requiring multiple physician visits or hospitalization). By contrast, 36 percent of adolescent mothers in the comparison group suffered subsequent maternal morbidity, a difference that was statistically significant ($P \leq .0001$).[2]
- **Decreased incidence of infant morbidity**—Morbidity was significantly lower among infants in the treatment group versus the control group ($P \leq .001$). Infant morbidity included any accident or injury in a child under age two that required multiple physician visits or hospitalization.[2]
- **Increased educational attainment**—More adolescents in the treatment program than in the comparison group attended school regularly (77 versus 38 percent, respectively; $P \leq .0001$). By 1989, over 95 percent of treatment group

adolescents who had regularly attended school had also graduated from high school, earned a high school equivalency diploma, or were within six months of graduating from one of these programs. The differences between treatment and comparison groups in adolescents' educational attainments were statistically significant.[2]

- **Improved employment status**—More adolescents in the treatment program than in the comparison group sought and maintained employment (48 versus 22 percent, respectively; $P \leq .0001$). Again, the difference was statistically significant.[2]

For More Information, Contact

- ***Sociometrics, Program Archive*** on Sexuality, Health & Adolescence Phone, 1.800.846.3475; Fax, 1.650.949.3299; E-mail, pasha@socio.com; Web, http://www.socio.com

Health Care Program for First-Time Adolescent Mothers

Program Components

- Hospital-based, multifaceted program for low-income, first-time adolescent mothers and their infants
- Special teens' baby clinic offering well-baby care, contraceptive counseling, and infant care education
- Scheduled well-baby visits at two weeks and at two, four, six, nine, and 18 months, with appointments alternating between a nurse practitioner and a pediatrician
- Social worker interviews with each mother at her two-week visit, including referral to a contraceptive clinic, as appropriate
- Questions at each visit regarding the mother's plans to return to school, her use of contraception, and her satisfaction with her family planning method
- Health teaching about infant care
- Calls and regular reminders after missed appointments
- New copies of infant immunization records, if forgotten or lost

For Use With

- Urban, African American, low-income, first-time adolescent mothers

Evaluation Methodology

- Experimental health care intervention, including treatment and control groups in a large, urban, teaching hospital
- Adolescent mothers (n=243) and their infants, randomly assigned to treatment (120) and control (n=123) conditions
- Baseline data collected from mothers during their postpartum stay in the hospital (n=243); follow-up at two weeks, six months, and 18 months (n=221 or 223, depending on the outcome measured)

Evaluation Findings

- Reduced incidence of repeat pregnancy
- Improved attendance to recommended health care for infants

Program Description

This program provides routine well-baby care to the infants of first-time, socio-economically disadvantaged, adolescent mothers. The comprehensive program has four goals:

- Reduce repeat pregnancy among adolescent mothers
- Increase adolescent mothers' return to school
- Increase the proportion of infants having up-to-date immunizations; and
- Reduce use of the emergency room for non-emergency infant care.[3]

The program provides well-baby care at a teens' baby clinic within the hospital. As recommended by the American Academy of Pediatrics, each mother and her baby are scheduled for visits at two weeks post-partum and at two, four, six, nine and 18 months after the baby's birth. At each visit, the teen mother and infant see, alternately, a nurse practitioner or a pediatrician. At the two-week visit, the mother also sees a part-time social worker who counsels her about contraception and refers her to a birth control clinic, if appropriate. The social worker also models good parenting behaviors—such as how to hold an infant or how to feed a baby—and is available at other visits, if the mother requests her presence. [3]

At each visit, the pediatrician or nurse practitioner asks the adolescent mother about her plans for returning to school, her use of family planning methods, and her satisfaction with her chosen contraceptive method. Further referrals to the social worker follow, if necessary. In the waiting room of the teens' baby clinic, a nurse practitioner and trained volunteers provide health education, using videos, slide shows, and one-on-one demonstrations. Finally, if an adolescent mother misses a scheduled appointment, she receives reminder phone calls and letters for up to eight weeks after the missed appointment. Regardless of how many times an adolescent mother might lose or forget to bring her infant's immunization record, the clinic provides another free copy, along with a reminder about the importance of the immunization record for the child's eventual school or program registration. [3]

Evaluation Methodology

The population eligible for this study consisted of a consecutive series of 330 adolescents delivering their first baby at a large urban teaching hospital located in the eastern United States. The mothers were all 17 years of age or under. Mothers who had been pregnant previously but who had no children were included in the sample; however, those who intended to place the child for adoption were not. When asked during their postpartum stay to participate in the study, 18 percent of the mothers (n=58) refused; another 29 were lost to the study because of staff vacations or communication problems between the hospital and the researchers. The remaining sample of 243 mothers, consenting as emancipated minors, and their infants were randomly assigned to the study's treatment or control condition. Mothers and infants in the control condition received routine well-baby care that included no reminders regarding missed appointments. Mothers and infants in the treatment condition received routine well-baby care in addition to special care—including attendance at a special teens' baby clinic, health education, encouragement to return to school, referral for contraceptive services, encouragement to continue with a contraceptive method, health education regarding the care of infants, and repeated reminders to reschedule missed well-baby appointments.[3]

At baseline, there were no statistically significant differences, at the .05 level, between those in the experimental group, those in the control group, and those who refused to participate. Groups were similar in regard to maternal age, length of prenatal care received, history of previous pregnancy, or complications at delivery. For example, the mean age of the mothers in the experimental group was 16.5 years; mean age in the control group was 16.3 years; mean age in the refusal group was 16.7 years. Mean length of prenatal care received was 5.0 months in the experimental group and in the refusal group and 5.1 months in the control group. Twenty-four percent of women in the experimental group had a history of previous pregnancy, versus 18 percent of those in the control group and 16 percent of those who refused to participate. All (100 percent) of women in all three groups were black, unwed adolescents and were recipients of Medicaid.[3]

Information about these demographic variables was obtained at the initial interview during the mothers' postpartum stay. Attendance at clinic and use of the emergency room were measured by audits of the hospital's charts. Return to school was measured by: 1) interviewing the mother, either at the clinic during her infant's 18-month check-up or at home, if the mother did not keep the appointment; and 2) checking school attendance records. Repeat pregnancy was determined at the final interview by asking the mother, "Have you been pregnant since your baby was born?" Immunization data were gathered from audits of the hospital's charts and the charts of the city health district's clinic or, if the mother so indicated, the charts of a private physician. [3]

Outcomes

- Behaviors—
  - Attendance at well-baby clinic—At the initial two-week visit, 92 percent of mothers in the treatment group brought their babies to the clinic, compared to 76 percent of mothers in the control group, a statistically significant difference that persisted and increased throughout the study. Both groups had high rates of dropout from attending the well-baby clinic; but by 18 months after baseline, mothers in the treatment group were half as likely to have dropped out as those in the control group. Forty versus 18 percent, respectively, still attended the well-baby clinic. [3]

- **Immunization status of infants**—After 18 months, 60 percent of the infants in the treatment group whose mothers continued to attend the well-baby clinic had received all their immunizations, compared to 36 percent of infants in the control group whose mothers continued to attend the well-baby clinic. The difference was statistically significant for mothers and their infants who continued to attend the well-baby clinic. [3]
- **Use of the emergency room for infant care**—After 18 months, there was no significant difference in the proportion of all participants who used the emergency room at least once for infant care (76 percent, or 84 of 110 mothers, in the experimental group versus 85 percent, or 96 of 113 mothers, in the control group). However, among mothers who returned for *all* the scheduled well-baby visits (continuers), there was a significant difference between those in the experimental group and the control group. Among continuers, 81 percent of mothers in the experimental group (39 of 48) used the emergency room at least once, compared to 100 percent (22 of 22) in the control group. [3]

Long-Term Impact

- **Reduced incidence of pregnancy—**At 18 months after baseline, 12 percent of the mothers in the experimental group had experienced another pregnancy (n=13 of 108). By comparison, 28 percent of the mothers in the control group had experienced another pregnancy (n=32 of 113). Analysis showed that the repeat pregnancy rate in the experimental group was significantly lower than in the control group. Both participants and dropouts from the treatment group, who were followed for 18 months, had a repeat pregnancy rate approximately half that of the corresponding control group. Dropouts from the experimental program (n=60; nine repeat pregnancies) experienced significantly fewer pregnancies than did dropouts from the control program (n=91; 29 repeat pregnancies). [3]

Note: In regard to the other goal of the program (encouraging a return to school), the program had less effect. More than half of participants in each group returned to school (60 of 108 in the experimental group and 62 of 113 in the control group); the difference between the two groups was not significant. [3]

For More Information, Contact

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Nurse Home Visiting for First-Time Adolescent Mothers

(**Elmira NY, Memphis TN, and Denver CO**)

Program Components

- Home-based, prenatal, nurse visiting and continuing nurse home visits until the child's second birthday
- Detailed curriculum to guide nurses in their home visits
- Sensory and developmental screening and referral services for infants at 12 and 24 months of age
- Optional free, round-trip transportation for scheduled prenatal care appointments and for babies' well-care appointments

For Use With

- Urban and rural white, first-time, adolescent mothers living in poverty
- Urban Latina and African American, first-time, adolescent mothers living in poverty

Evaluation Methodology

Elmira NY

- Experimental design with two treatment and two comparison conditions
- Pregnant women at less than 30 weeks gestation, bearing their first child (n=400), randomly assigned to two treatment (n=90 and 94) and two control (n=100 and 116) conditions
- Baseline data on women and follow-up data at the child's sixth, 10th, 22nd, and 46th month of life
- Data from infants' medical records and states' child abuse and neglect records
- Social services data on public assistance through the child's fourth birthday
- Follow-up on participants (n=324) when the child reached age 15

Memphis TN

- Experimental design with two treatment and two control conditions
- Pregnant women at less than 29 weeks gestation, with no prior live births and either unmarried, unemployed, or lacking 12 years of education (n=1,139), randomly assigned to two treatment (n=230 and 228) and two control (n=116 and 515) conditions
- Baseline data on women; follow-up at delivery (n=1,126), at six months postpartum (n=672), at 12 months postpartum (n=682), and at 24 months postpartum (n=675)
- Baseline data on infants one to three days after birth (n=1,082) and at 24 months after birth (n=697)

Denver CO

- Experimental design with two treatment and one control conditions
- Pregnant women with no previous live births (n=735) randomly assigned to nurse visiting (n=235), paraprofessional visiting (n=245), or control (n=255) condition
- Baseline assessment of pregnant women, using interviews, brief tests of intellectual functioning, and urine tests for tobacco, alcohol, and other drug use
- End-of-pregnancy assessment at 36 weeks of gestation, using interviews and urine tests
- Follow-up assessment at 12, 15, 21, and 24 months postpartum to assess subsequent pregnancies, educational achievement, and workforce participation
- Assessment of infants' emotional, mental, and behavioral development at six, 12, 15, 21, and 24 months of age

Evaluation Findings

- Reduced incidence of repeat pregnancy and births (Elmira NY, Memphis TN, and Denver CO)
- Improved emotional vitality and increased mental development in infants (Denver CO)
- Reduced incidence of child abuse and neglect and of accidents among children up to age 15 (Elmira NY) and among children under age two (Memphis TN)
- Reduced incidence of arrests or convictions or use of public assistance among mothers (Elmira NY)

Program Description

This program for first-time mothers living in poverty provides nurse home visiting for pregnant and parenting women, especially adolescents. Based in theories of human ecology, human attachment, and self-efficacy, the program operates through public and private health care settings. The program may also provide women with free round-trip transportation to scheduled prenatal appointments and to well-baby appointments after their infant's birth.[4,5]

Each participating mother is assigned to a nurse for home visiting and receives intensive home visits during pregnancy and for 24 months after her child's birth. Nurses promote a healthy pregnancy, including attention to diet, weight gain, substance use, hypertension, and urinary and reproductive tract infections. Visiting nurses help mothers and other caregivers to improve the physical and emotional care given the children, have positive parent-child interactions, understand infants' and toddlers' cognitive development, and create safe households. The nurses also help the young women to clarify their personal goals and to solve problems that could interfere with completing their education, finding work, and planning future pregnancies. As needed, young mothers are referred to vocational training, family planning and mental health clinics, and for legal aid and WIC (the nutritional supplemental program for women, infants, and children). Using a detailed curriculum to guide their activities and tailoring the activities to the individual needs of each young family, the nurses' central focus is an emphasis on the strengths of the women and their families.[4,5]

Evaluation Methodology

Elmira NY: Pregnant women were recruited if they had no previous live births, were less than age 19, were unmarried, and/or were of low socioeconomic status (SES). Other pregnant women bearing a first child were not recruited but were allowed to enroll. All enrollees were at less than 30 weeks gestation. Between April 1978 and September 1980, researchers interviewed 500 young women and enrolled 400. Researchers found no differences in age, marital status, or education between those who participated and those who declined. At registration, 47 percent of participants were under age 19, 62 percent were unmarried, and 61 percent were of low SES. Twenty-three percent of participants were 'at risk' according to *all three* indicators. The 48 non-white participants were not included in the evaluation due to their small sample size.[4]

The infants of all the women (both experimental and comparison groups) received sensory and developmental screening at their 12th and 24th month of life. Where indicated, children were referred for further evaluation and treatment. Participants were randomly divided into four groups:

- Women in comparison group #1 (comparison group; n=90) received no further assistance.
- Women in comparison group #2 (comparison group; n=94) received free transportation for regular prenatal and well-baby care.
- Women in treatment group #3 (treatment group; n=100) received free transportation for regular prenatal and well-baby care and nurse home visiting regularly throughout pregnancy.
- Women in treatment group #4 (treatment group; n=116) received free transportation for regular prenatal and well-baby care and nurse home visiting regularly throughout pregnancy. In addition, they received regularly scheduled nurse home visits during the first two years of their child's life.[4]

Data was collected through interviews and infant assessments, carried out at registration (prior to 30th week of pregnancy) and at six, 10, 12, 22, and 24 months of the infant's life. Medical records were abstracted for the infant's first two years of life and child abuse and neglect registries for the states in which families lived (or the two states to which families moved) were reviewed by qualified state social services workers. For evaluation, the two comparison groups were combined when data showed that there were no differences between these two groups in their use of routine prenatal and well-baby care.

Evaluators assessed outcomes related to the differences between the combined comparison group and treatment group #4—the group that received nurse visits both during pregnancy and throughout the first two years of the infants' life. [4]

Memphis TN: From June 1, 1990, through August 31, 1991, researchers invited the participation of 1,290 consecutive women attending the obstetrical clinic at the Regional Medical Center in Memphis, Tennessee. All those invited were at less than 29 weeks gestation, had no previous live birth, had no specific chronic illness that might retard fetal growth or contribute to preterm delivery,* and met at least two of the following socio-demographic conditions: were unmarried, had less than 12 years of education, and/or were unemployed. Eighty-eight percent (n=1,139) elected to participate, gave informed consent, and were randomly assigned to one of four study conditions. At enrollment, participants were mostly African American (92 percent), unmarried (98 percent), 18 or younger (64 percent), and from households with incomes at or below federal poverty guidelines (85 percent of participants).[5]

The four study conditions included two treatment and two control groups. Women in:

- Group one (control; n=166) received free round-trip taxicab transportation to scheduled prenatal visits. They received no other special treatment.
- Group two (control; n=515) received: 1) free transportation to scheduled prenatal visits; and 2) developmental screening and referral services for the child at six, 12, and 24 months of age.
- Group three (prenatal treatment; n=230) received: 1) free transportation to scheduled prenatal visits; 2) developmental screening and referral services for the child at six, 12, and 24 months of age; 3) intensive home visits by a nurse during pregnancy; 4) one postpartum visit by the nurse in the hospital; and 5) one postpartum home visit by the nurse.
- Group four (prenatal and postnatal treatment; n=228) received: 1) free transportation to scheduled prenatal visits; 2) developmental screening and referral services for the child at six, 12, and 24 months of age; 3) intensive home visiting services from a nurse during pregnancy; 4) one postpartum visit by the nurse in the hospital; and 5) continuing home visits by the nurse until the child's second birthday.[5]

Research staff interviewed participants in an office setting at the time of their enrollment (before their random assignment to one of the four treatment/control conditions). Thereafter, participant interviews, records searches, etc., were performed without researchers knowing to which conditions participants had been assigned. Participants were interviewed by phone at the 28th and 36th weeks of pregnancy.[5]

Participants were interviewed in the office setting at the sixth, 12th, and 24th month of their child's life. Questions assessed: 1) whether or not they breast-fed and, if so, for how long; and 2) their attitudes associated with child abuse and neglect.** At 12- and 24-months postpartum, women also answered questions regarding the number and outcomes of subsequent pregnancies, their educational achievements, and the number of months since giving birth that they held a paid job. Medical records, including obstetrical, newborn, pediatric, and emergency room records were consulted for data on sexually transmitted infections (STIs), marijuana and cocaine use, and urinary tract infections prior to birth; well-baby care, including immunizations; and emergency room visits for illnesses and/or injuries in the child. Social services records were consulted for data related to women's use of Aid to Families with Dependent Children (AFDC). During home visits, mothers and their children were observed and assessed on qualities related to the home environment. Finally, at the 24-month office visit, children were assessed on scales of infant development and their mothers completed a child behavior checklist.[5]

For evaluation of the prenatal phase of the program, groups one and two (controls; n=681) were combined to form a single control group; groups three and four (prenatal treatment; n=458) were combined to form a single treatment group; and these two larger groups were compared. For evaluation of the postnatal phase of the program, group two (control; n=515) was contrasted to group four (postnatal treatment group; n=228). The four groups were equivalent on background characteristics with few exceptions—namely that women in treatment group four lived in households in which the head was more likely to be unemployed and in which there was less discretionary income than did women in control group two.[5]

* Disorders, such as chronic hypertension, severe cardiac disease, or large uterine fibroids

** Belief in physical punishment, unrealistic expectations of babies, lack of empathy, and role reversal

Evaluation of prenatal groups found no treatment effects for birth weight, length of gestation, low birth weight, spontaneous preterm delivery, indicated preterm delivery, or Apgar scores. However by the 36th week, women in the combined treatment group were more likely than comparison women to use other community services (29 versus 20 percent; odds ratio [OR] 1.8) and more likely to be working (six versus three percent; OR 0.6).[5]

Denver CO: From March 29, 1994 through June 15, 1995, 1,178 consecutive women were invited to participate in the study while attending prenatal clinics (n=21) in Denver that served low-income women. Women were recruited if they had no previous live births and either qualified for Medicaid or had no private health insurance. They could enroll at any time prior to delivery. Compared to those who refused to participate, participants were more likely to be Hispanic and less likely to smoke cigarettes. Otherwise, the groups were similar on other socio-demographic measures, such as maternal age, language preference, and marital status.[6]

Participants were randomly assigned to:

- Control group (n=255), receiving developmental screening and referral services for their children when the infants were six, 12, 15, 21, and 24 months of age;
- Nurse visiting treatment group #1 (n=235), receiving infant screening and referral (as above) as well as home visiting by a registered nurse during pregnancy and the first two years of the child's life; and
- Paraprofessional treatment group #2 (n=245), receiving infant screening and referral (as above) as well as home visiting by a paraprofessional during pregnancy and the first two years of the child's life.[6]

Participants were mostly unmarried (85 percent of controls compared to 86 percent of treatment group #1 and 87 percent of treatment group #2). The three groups were similar by race/ethnicity (46, 44, and 45 percent Hispanic, respectively; 16, 16, and 17 percent African American, respectively; and 35, 37, and 35 percent white, respectively). Similar proportions smoked cigarettes (25, 21, and 24 percent, respectively) or suffered domestic violence in the previous six months (16, 16, and 18 percent, respectively). Among those with few psychological resources, proportions were similar between the groups as a whole, except that women in both treatment groups were more likely to have suffered domestic violence (18, 27, and 30 percent, respectively).[6]

Findings showed statistically *insignificant* results for the visits of paraprofessionals, even though they were well suited for the work and shared many of the social characteristics of the families they served. Overall compared to nurse visitors, paraprofessionals had a higher average number of scheduled visits in which the family was not at home or did not answer the door ($P=\leq .001$). By the end of the program, 48 percent of the paraprofessional-visited families had dropped out of the program, compared to 38 percent of those visited by nurses ($P=.04$). As a result, *the findings pertain only to the nurse-visited women and their infants*.[6]

Outcomes:

- **Reduced incidence of emergency room visits—**
  Elmira NY: During the first year of life, infants of nurse-visited women (treatment group #4) were taken to the emergency room significantly less often than infants of comparison women (0.74 versus 1.02 visits per woman) and the effect was even greater among poor, unmarried teens (0.95 versus 1.66 visits per woman, respectively).[4,7]
- **Reduced incidence of smoking during pregnancy—**
  Denver CO: In contrast to control group women, nurse-visited smokers had significantly reduced levels of cotinine (a form of nicotine) from baseline to birth (reduction of 259.00 versus 12.32 ng/ml, $P=.03$).[6]

Long-Term Findings

- **Reduced incidence of repeat pregnancy and birth—**
  Elmira NY: By 24 months postpartum, nurse-visited, poor, unmarried women had one-third as many subsequent pregnancies as poor unmarried comparisons. Between birth and 46 months postpartum, this reduction was present for all nurse-visited participants, but was strongest among poor, unmarried participants (23 versus 43 percent reduction, respectively). Nurse-visited unmarried women from low-SES households had fewer subsequent pregnancies (1.5 versus 2.2, respectively; $P=.03$) and live births (1.1 versus 1.6, respectively; $P=.02$) and greater birth spacing (64.8

versus 37.3 months, respectively; *P*=.001) than did comparison women. The differences were statistically significant.[4,7]

A later statistical analysis found that the differences were also statistically significant at 24 months, 36 months, and 45 months.[8]

***Memphis TN*:** By 24 months postpartum, 47 percent of women in control group two reported a subsequent pregnancy, compared to 36 percent of nurse-visited women in treatment group four (OR=0.6). This finding was statistically significant.[5] By 54 months postpartum, women in treatment group four (n=203) had experienced significantly fewer subsequent pregnancies (1.15 versus 1.34, respectively; *P*=0.3) compared to women in control group two (n=443). Moreover, the average length of time between the birth of the first and second child was significantly longer in women in treatment group four compared to women in control group two (30.25 months versus 26.6 months, respectively; *P*=.004).[5,9]

A later statistical analysis also found that the differences were statistically significant overall and at 24 months, 36 months, and 45 months.[8]

***Denver CO*:** By 24 months postpartum, nurse-visited women were significantly less likely to have had a subsequent pregnancy (29 versus 41 percent; *P*=.02). At 24 months postpartum, nurse-visited women were significantly less likely to have had a subsequent birth (12 versus 19 percent; *P*=.05).[6]

- **Improved emotional and mental outcomes among infants—**
  Denver CO: At 24 months of age, children of nurse-visited women with few resources were significantly less likely than control children to respond inappropriately to joyful stimuli (24 versus 40 percent, respectively; *P*=.04) or to anger stimuli (13 versus 32 percent, respectively; *P*=.04). At 21 months, children of nurse-visited women were significantly less likely than controls to exhibit language delay (six versus 12 percent, respectively; *P*=0.5) and the finding was even stronger among children of nurse-visited women who had few resources (seven versus 18 percent, respectively; *P*=.04).[6]

- **Reduced incidence of child abuse and neglect and childhood injuries—**
  Elmira NY: During the first two years of the children's lives and among those at greatest risk (unmarried, poor teens), 19 percent of comparisons and four percent of the nurse-visited women abused or neglected their children (*P*=.07).[4,7]

  At 15-year follow-up, there were significantly fewer verified reports of nurse-visited women abusing or neglecting their child (*P*≤.001). This effect was even greater for women who were unmarried and of low SES at baseline (*P*≤.001) and the effect was especially strong for the four- to 15-year period after the birth of the child. Among women who were victims of domestic violence, those who received nurse visits through their child's second birthday were reported significantly less often for child maltreatment (*P*=.04) than women who did not receive nurse home visits. This effect decreased as the incidence of domestic violence increased.[10,11,12]

  Memphis TN: By age 24 months, children in the home-visiting group (treatment group four) had statistically fewer outpatient visits associated with injuries or accidental ingestion of injurious material compared to children in control group two (0.11 versus 0.20, respectively; *P*≤.05). By age 24 months, children in the home-visiting group also had statistically fewer days of hospitalization associated with injuries or ingestion of injurious material, compared to control children (0.04 versus 0.18, respectively; *P*≤.01). These program effects were greater for children born to women with few psychological resources than for children born to women with more psychological resources (0.41 versus 0.67; *P*=.003 for total health care encounters related to injuries or ingestion of poisonous substances *and* 0.02 versus 0.26; *P*≤.001 for hospitalizations related to injuries or ingestions).[5]

- **Decreased incidence of drug impairment; arrest, conviction, or jail time; or use of food stamps and other public assistance—**
  Elmira NY: At 15-year follow-up, nurse-visited women who were of low SES and unmarried at baseline were also significantly less likely, versus unmarried, low-SES comparisons, to have been impaired by alcohol or other drugs or to have been arrested or convicted for drug-related offenses (*P*=.005; *P*≤.001, *P*=.008, respectively); they had also spent

fewer days in jail ($P \leq .001$). Finally, at 15-year follow-up, nurse-visited women who were of low SES and unmarried at baseline reported using AFDC and food stamps for fewer months than did unmarried, low-SES comparisons ($P=.005$ and $P=.001$, respectively).[12]

For More Information, Contact

- ***The Prenatal and Early Childhood Nurse Home Visitation Program***—Contact Ruth O'Brien, Kempe Prevention Research Center for Family & Child Health, 1825 Marion Street, Denver CO 80218; Phone 303.864.5210; fax 202.864.5236; or Obrien.ruth@tchden.org

Polly T. McCabe Center for Pregnant Adolescents

Program Components

- Alternative school for pregnant public school students
- Same school calendar, schedule, and curriculum as the rest of the public school system
- Comprehensive services, including social and medical services
- Close connection between the school and Yale-New Haven Hospital
- Nurses leading daily classes in childbirth, prenatal development, family planning, and infant care
- Teams of nurses providing individual counseling as well as monitoring appointments and adherence to obstetricians' instructions
- Counseling to help pregnant or parenting teens plan their immediate and long-term future
- Trained teachers, nurses, and social workers of varied racial and ethnic backgrounds

For Use With

- In-school, pregnant and parenting, African American adolescents from low-income families

Evaluation Methodology

- Quasi-experimental design with nearly random treatment and comparison conditions determined by the length of time after delivery that students remained at the Center
- Birth cohort of low-income, African American, first-time adolescent mothers in New Haven, delivering a live infant between March 1, 1979 and February 29, 1980
- Data on adolescent mothers who had not graduated from high school at the time of delivery but had attended the McCabe Center (n=106)
- Portion of the young women who either returned to school or graduated after delivery (n=102; 69 percent of entire birth cohort)
- Two-year and five-year follow-up for repeat childbearing

Evaluation Findings

- Reduced incidence of repeat childbearing within two years of the first baby's birth
- Reduced incidence of repeat childbearing within five years of the first baby's birth

Program Description

Polly T. McCabe Center, in New Haven, Connecticut, is an alternative, separate public school for pregnant students. It is fully integrated into the New Haven school system, is operated by the New Haven Board of Education, and follows regular school calendars, schedules, and curricula. In addition, it provides social and medical services. Staff includes teachers, nurses, and social workers of varied racial and ethnic backgrounds. Students receive counseling to help them plan their immediate and long-term future. Counseling also includes grappling with child care issues, completing high school, delaying subsequent childbearing, coping with family conflict, and finding housing, if living with a parent or guardian is not possible.[13]

The school is closely associated with Yale-New Haven Hospital and nurses from the Yale School of Nursing provide daily classes in childbirth, prenatal development, family planning, and infant care. The nurses also educate pregnant students about the importance of regular prenatal care, monitor their prenatal appointments, and encourage compliance with obstetricians' instructions. The nurses use a team approach that allows for both individual counseling and group teaching.[13]

Students are referred to McCabe from their regular school when their pregnancy becomes apparent or when they notify a teacher or counselor of the pregnancy. The students remain at McCabe through the quarter when the infant is delivered, except that students who deliver during the third quarter may remain to complete the fourth quarter as well. [13]

Evaluation Methodology

Approximately two-thirds of all low-income, in-school mothers in New Haven were referred to the McCabe Center. Almost all (87 percent) were low-income and were also referred for WIC or had their birth expenses paid by the federal or state government. This study looked specifically at low-income, African American women who gave birth between March 1979 and February 29, 1980, *and* who were less than 19 years old when they delivered their first baby *and* had not yet graduated from high school when they became pregnant. Of 106 African American, low-income teens who regularly attended the McCabe Center, all but four either returned to their regular school or graduated after delivering their infant. Thus, 102 African American, low-income young women were the sample for the study, nearly randomly distributed between those who stayed less than seven weeks at the Center (n=52) and those who had seven weeks or more at the Center (n=50). They represented 69 percent of the entire population of African American, low-income first-time, school-aged mothers in New Haven who delivered during the index period. Of the remaining 31 percent, some had dropped out of school before or during pregnancy; and some attended their regular school during their pregnancy. [13]

Rules governed when students must leave the McCabe Center and return to their regular school. These rules established a regular relationship between timing of delivery and duration of postnatal attendance at McCabe. For example, students who delivered in January through April could remain for the fourth quarter, receiving more than the median time at McCabe. Students who delivered in May through August received less than the median time before they returned to their regular school in September. In other months, postnatal attendance depended on when the birth occurred relative to the end of the academic marking period. Thus, although random assignment was not used to determine the duration of postnatal attendance, the effects of the attendance rules nevertheless seemed to mimic random assignment in determining the duration of each young mother's postnatal intervention. In theory, the maximum permissible postnatal time was 22 weeks. In reality, three students were allowed to stay longer, including one who stayed 23 weeks in order to graduate from McCabe and two 14-year-old, developmentally disabled students who were allowed to remain the entire year although each delivered in the fall. Deviations from the rules were rare.[13]

Researchers contacted the young mothers when their babies were 18 months of age. All the mothers agreed to be interviewed and allowed examination of their school and medical records. Most mothers (n=98) had relocated by the time their child was six years old. One mother, who died, had delivered a second child shortly after her first child. Thus, researchers had information on whether a second child had been delivered to 99 mothers (97 percent of the sample).[13]

Each mother was interviewed for one-and-a-half to two hours, when her first child was 18 months old and again when the child was six. The young woman's mother or guardian was also interviewed when the baby was 18 months old. Maternal medical records were reviewed from the first prenatal check-up (or baby's birth, if there was no prenatal care) until six years postpartum. For all pregnancies, researchers recorded dates of occurrence and outcomes. In addition, researchers elicited information about contraceptive use, accidents, illnesses, and general health and reviewed school records for the period from 18 months prior to delivery until two years postpartum. [13]

The total number of weeks of postnatal attendance at McCabe varied from zero to 32, with a median of 7.1 weeks. After assessing for selection bias, evaluators determined that the group of those who had less than the median of seven weeks after delivery at McCabe (comparison, n=52) were equivalent to those who had seven weeks or more (treatment, n=50). For example, median age at delivery was 16.8 in both groups; median age at menarche was 12 in both groups; 24 of the treatment group had a previous pregnancy, compared to 19 of comparison mothers. Highest grade point average in the year prior to pregnancy was 2.1 for the treatment group; 1.9 for the comparisons. The primary difference between the groups was the median length of time at McCabe after delivery—13.7 weeks for the treatment group; 2.6 weeks for the comparison mothers ($P \leq .001$). [13]

Long-Term Outcomes

- **Reduced incidence of repeat childbearing within two years**—Within two years of delivering their first child, mothers who stayed longer at McCabe Center were significantly less likely than comparison mothers to have delivered a second child (12 versus 36 percent; six of 50 versus 19 of 52; *P*=.005).[13]
- **Reduced incidence of repeat childbearing within five years**—After five years, 45 percent of treatment mothers had delivered at least one more child, compared to 70 percent of comparison mothers (22 of 49 versus 35 of 50; *P*=.015). Evaluators looked at the medical records of all women who had *not* had a second child within five years, discovering that four had miscarried and six had become sterile. The sterile women were deleted from the five-year follow-up while the four who had miscarried were recoded as having had a second pregnancy. Re-evaluation at this point found that almost half of mothers in the treatment group (n=21 of 45; 47 percent) *successfully avoided* subsequent childbearing for five years following the birth of their first child, compared to one-fourth of comparison mothers (*P*≤.02).[13]

In addition, among the teens who had not had a second child within two years of the first, 69 percent had remained in school and earned passing grades or graduated, compared with 35 percent of the teens who delivered a second child within two years (*P*≤.001). At six years postpartum, the educational percentages were 72 versus 46 percent, respectively, who had earned a high school diploma or a GED equivalent (*P*≤.05). Finally, at six years postpartum, the proportions relying solely on public assistance to support their families were nine and 30 percent, respectively (*P*≤.05).[13]

For More Information, Contact

- ***Polly T. McCabe Center***, 21 Wooster Place., New Haven, CT 06511; Phone: 203.946.8758 or 203.946.6423; Fax 203.946.5374; Web and/or http://www.greatschools.net/modperl/browse_school/ct/596/

Women's Centre of Jamaica Foundation Programme for Adolescent Mothers

Program Components

- Community-based pregnancy prevention program for adolescent mothers
- Parenting and child nutrition education
- Family planning counseling and services for adolescent mothers
- Activities to develop self-esteem and life skills for adolescent mothers
- Classroom instruction to support young women in returning to school
- Job training and job placement assistance for adolescent mothers
- Counseling and support services for adolescent fathers
- Advocacy efforts to change laws and policies affecting pregnant and parenting teens

For Use With

- Pregnant and parenting Caribbean teenage women

Evaluation Methodology

- Historical cohort study in select Jamaica parishes to identify repeat pregnancies among mothers ages 15 through 20 who had a first live birth in 1994, while between the ages of 11 and 16
- Data from interviews with a sample of young women who gave birth in 1994 (total teenage births n=1,453; sample n=266), yielding treatment (n=87) and comparison groups (n=173)
- Retrospective data used to identify and interview young women regarding pregnancies that occurred in 1995 through 1998, from one to four years after the index birth in 1994

Evaluation Findings

- Increased use of contraception
- Reduced incidence of repeat pregnancy
- Increased educational attainment among young mothers
- Increased employment outcomes among young mothers

Program Description

The Women's Centre of Jamaica Foundation (WCJF) addresses the health of adolescents in the broad context of their educational and employment needs. As such, its Adolescent Mothers Programme provides classroom instruction and support for mothers 16 years of age and under with the two aims of: 1) returning them to the formal school system and 2) delaying the birth of a second child. For unmarried and unemployed mothers over age 18, the program provides employment skills and job placement assistance. Participants in the program must accept and use a family planning method. WCJF operates the program at seven centers and 13 outreach stations throughout the island. [14]

In particular the program continues the education of pregnant teens under age 16 and provides needed support services after they return to school in order to ensure that they remain in school until graduation from secondary school. The program provides intensive counseling, both to individuals and groups, regarding family planning and provides family life, parenting, and child nutrition education as well. The program encourages young women to develop the inner strength, self-respect, and dignity to withstand pressures associated with low economic status and helps them to create a positive self-image. In addition, the program provides young women with practical life skills so that they can be self-reliant. Young fathers also receive counseling and support services.[15]

The WCJF works consistently to overturn persistent myths and prejudices in Jamaican society about pregnant school students, including resistance by school officials to allowing young mothers to return to school, attitudes of antenatal nurses and teens' own parents, and laws that discriminate against adolescent mothers.[16]

Evaluation Methodology

By 1995, 18,581 teenage mothers had participated in the programs of the WCJF. This historical cohort study was conducted to assess the effects of the WCJF program on the educational attainment of participants and on the incidence of repeat pregnancies occurring between 1995 and 1998. Self-reported pregnancies that occurred during 1995 through 1998 were regarded as repeat pregnancies. Study participants were females in the parishes of Kingston and St. Andrew and St. Catherine and Manchester who were between the ages of 15 and 20 and who had a first live birth in 1994 when they were between the ages of 11 and 16. Given the difficulties of this type of study, the evaluators randomly selected 650 registered births as the evaluation cohort from the total (n=1,453) that met the study criteria. Every effort was made to locate and contact all 650 young women, and evaluators were able to locate 266. Of these, one refused to participate and five failed to meet the study criteria, resulting in a final number of 260 young women. Among the 260 women interviewed, 87 (33 percent) were registered WCJF participants; 173 (67 percent) were not and formed the comparison group.[14]

Outcomes

- **Increased use of contraception—**Evaluation found that WCJF participation was significantly associated with use of contraception after the first birth. In fact, 80 of 87 WCJF participants used contraception, compared to 147 of 173 non-participants (*P*=0.04).[14,15,16]

Long-term Outcomes

- **Reduced incidence of repeat pregnancy**—Evaluation found that program participants reduced their risk of one or more repeat pregnancies by 45 percent. The incidence of repeat pregnancy was 37 percent (32 of 87) among WCJF participants versus 60 percent (104 of 173) among non-participants. The cumulative incidence of repeat pregnancy among the entire study population was 52 percent (136 of 260). The differences were statistically significant (*P*=0.00).[14,15,16]
- **Increased Educational Attainment**—Evaluation found that WCJF participants were significantly more likely than non-participants to complete high school. Specifically, 32 percent (28 of 87) of participants had completed high school versus 20 percent (35 of 173) of non-participants (*P*=0.05).[14,15,16]
- **Increased Employment and Other Outcomes**—In addition, participants were significantly more likely than comparisons to be currently employed, enjoy a higher monthly income, more positively perceive their own socio-economic status, and belong to a social club with regular social activities. Specifically, 25 percent (22 of 87) of participants were employed versus about 13 percent of comparisons (23 of 173; *P*=0.02). In addition, 56 percent of participants (49 of 87) had a monthly income as high as J$10,000 to $20,000 versus 35 percent of comparisons (60 of 173; *P*=0.00). About 64 percent of participants (56 of 87) perceived their socio-economic status as fair or good versus 39 percent of comparisons (68 of 173; *P*=0.00). Finally, 39 percent of participants (34 of 87) belonged to a social club and engaged in social activities versus some 16 percent of comparisons (27 of 173; *P*=0.00).[14,15,16]

For More Information, Contact

- ***Women's Centre of Jamaica Foundation***—42 Trafalgar Road, Kingston 10, Jamaica; Phone: (876) 929-7608, 929-0977; Fax: (876) 960-7551; Web site, http://www.jamaica-kidz.com/womenscentre/; E-mail: womenscentre@cwjamaica.com

Home-Based Mentoring for First-Time Adolescent Mothers

Program Components

- Mentoring program for low-income adolescent mothers
- College-educated, single parent, female mentors, matching the participants' race/ethnicity and meeting with each participant twice a month
- 19-lesson curriculum, lasting one year and emphasizing adolescent development and parenting skills
- Condoms made available with every lesson
- Family involvement with the curriculum and the mentors
- Mentor training

For Use With

- Urban, low-income, black, first-time adolescent mothers

Evaluation Methodology

- Randomized controlled trial among black, first-time adolescent mothers, recruited shortly after delivery from three hospitals in Baltimore, MD
- Adolescent mothers (n=181), randomly assigned to treatment (n=87) and control (n=94) conditions
- Baseline evaluation for demographics, risk behaviors, depression, academic skills, self-esteem, relationships, sense of parenting competence, and life events; in-home follow-up evaluations at six, 13, and 24 months after baseline
- Compensation for participation in each evaluation visit
- Analysis of data from mothers who completed both baseline and 24-month follow-up evaluations (n=149)

Evaluation Findings

- Reduced incidence of second births

Program Description

This mentoring program is designed to provide the adolescent mother with: 1) negotiation skills for communicating with her own mother; 2) parenting skills for raising her infant; and 3) alternative strategies to achieving autonomy through a focus on personal values, decision-making, access to birth control, and goal setting. The program is based in social cognitive theory and relies on cultural norms, behavior and attitude modeling, and concepts of self-efficacy and social support.[17]

The 19-lesson, home-based curriculum is delivered by college-educated, young, single mothers of the same ethnicity as the adolescent. The first two lessons blend themes of adolescent development and parenting. Thereafter, mentors can deliver the remaining lessons in any order, combine lessons, or repeat lessons as required to meet the needs of the adolescent mother. Throughout, family members of the adolescent mother are involved as much as possible in the program. Social support is further strengthened through the mentors, who present themselves as "big sisters" who have also been through the experience of single parenthood and who are not authority figures.[17]

The mentors receive extensive training and also participate in weekly supervisory sessions. Mentors work 20 to 30 hours per week, with a caseload of up to 15 mothers. Mentors have a home visit with each mother twice a month. Each mentor provides her adolescent mothers with her own cell phone number and also keeps a log of visits completed, lessons covered, and responsiveness of the adolescent mothers.[17]

Evaluation Methodology

Participants included low-income, adolescent mothers who were living with their own mother (the infant's grandmother) and were eligible for WIC (Supplemental Nutritional Services for Women, Infants, and Children). The young mothers had a family income less than 185 percent of the federal poverty level. Participation was also limited to mothers who: were under age 18 at delivery; had no prior births; were of black race/ethnicity; had no indications in their medical charts of cocaine or heroin use; and had no chronic illnesses that would interfere with parenting or adolescent development. In addition, mothers were excluded if they had given birth to an infant at less than full term (37 weeks), of low birth weight (under 2500 g), or with congenital problems, chronic illness, or disability.[17]

Mothers were recruited, shortly after delivery, at one of three urban hospitals in Baltimore, MD, between September 1997 and December 1999. Those who expressed an interest in enrolling were scheduled for an in-home evaluation at three weeks after delivery. More than 83 percent (181 of 219 eligible to participate) completed the baseline evaluation. There were no differences in maternal age or education between those who completed the baseline evaluation and those who did not. Mothers ranged in age from 13.5 to 17.9 years; 95 percent were enrolled in school; three percent were completing a GED program; nine percent had a paying job outside their home; 66 percent were romantically involved with the father of their infant.[17]

After the baseline evaluation, all the young mothers received information on community resources for young mothers and their children. Then, stratified on maternal age and the gender of the child, mothers were randomly assigned to either the intervention or the control group. Families in the intervention group received home visits every other week until the infants' first birthday, for a maximum of 19 visits. Families in the control condition received no further contact until the evaluation visits. In-home, follow-up evaluations were conducted at six, 13, and 24 months after baseline. Evaluators were unaware of the intervention status of the adolescent mothers, who also received compensation for baseline and follow-up evaluation visits.[17]

At each evaluation visit, adolescent mothers provided demographic information on their education, marital status, living arrangements, romantic relationships, and whether they had given birth since their first delivery. Mothers also reported on their life aspirations, including the likelihood that they would have a second child within the next five years. In addition, evaluators used several survey tools at each evaluation visit to assess: 1) risk behaviors; 2) mental health status; 3) academic skills; 4) self-esteem; 5) the quality of the adolescent mother's relationship with her own mother; 6) the adolescent's sense of her parenting competence; and 7) positive and negative life experiences since the previous evaluation.[17]

To assess the impact of the intervention on having a second infant within two years, only mothers who participated in both the baseline and the 24-month evaluation (n=149) were included in the analysis. Thirty-two mothers (18 percent) did not complete a 24-month evaluation. There were no differences in maternal age, maternal education, infant birth weight, infant gender, or intervention status between mothers who did (149 of 181) and mothers who did not complete the 24-month evaluation (32 of 191).[17]

Long-Term Outcomes

- **Decreased Incidence of Second Births**—At the two-year evaluation, 18 percent of the mothers (27 of 149) had given birth to a second child. Analysis showed that mothers in the control group were 2.5 times more likely than mothers in the intervention group to have given birth to a second child (24 versus 11 percent; *P*=.05). In addition, the number of intervention adolescents who had a second birth decreased with an increasing number of mentoring visits. Having two or more mentoring visits increased the likelihood of ***not*** having a second child by more than three-fold (odds ratio=3.3). When the number of mentoring visits rose to four and six, the likelihood of having a second infant fell even further (OR=3.6 and 4.3, respectively). Only one adolescent who received six mentoring visits had a second child within two years of the first birth. ***No*** adolescent who received eight or more visits had a second child within two years of the first birth.[17]

  Note: The 24-month multivariable logistic regression model showed that positive life events and control group membership were associated with increased likelihood of having a second infant (OR=1.2 and 2.9, respectively).[17]

For More Information, Contact

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Intensive School-Based Program for Teen Mothers

Program Components

- School-based program offering case management, comprehensive medical care and support group
- Intensive case management by a school-based social worker with frequent home visits and continuous availability by cell phone
- Weekly, school-based peer education / support group including involvement in service learning
- Comprehensive medical care for the adolescent mother and her child and continuous availability of pediatrician by pager
- Coordination between the social worker and the adolescent's physician

For Use With

- Low-income, African American adolescent females, enrolled in high school

Evaluation Methodology

- Prospective cohort study among pregnant and parenting adolescent females enrolled in a South Carolina high school
- Pregnant or parenting students known to the school or to their peers or self-referred (n=63) and a propensity-matched comparison group (n=252), randomly selected from state birth certificate data
- Follow-up at age 20 or three years after the index birth, whichever came later

Evaluation Findings

- Reduced incidence of births

Program Description

This home visiting model offers case management by a social worker who is based at the students' high school. The social worker is culturally matched to the adolescents, has a master's degree in social work, and also has an office, provided by the school, in a convenient but private location. The social worker provides client-centered care and support, ranging from coaching to direct assistance, referral to other services and agencies, and follow-up on each referral. In addition, the social worker facilitates the weekly group meetings that have no set curriculum but are designed by the social worker to address topics pertinent to the members. Such topics might include risk-taking behaviors, healthy relationships, parenting skills, academic performance, careers, contraception, and sexually transmitted infections (STIs). The group establishes a contract of behavior expected of each member. Each year, group members select a service learning project for the community and implement it with the assistance of the social worker.[18]

The program offers comprehensive medical care to each participant. A female pediatrician specializing in adolescent medicine sees participants and their children together on a designated weekly afternoon at the nearby university ambulatory care center. The physician uses a patient-centered approach with motivational interviewing techniques. The physician also uses: a developmental scrapbook, completed by the mother at well-child visits and including a new photo, taken at each visit; frequent developmental screening of the child, including involving the mother in interpreting and understanding the results of the screening; and a child's book, given at each visit. Participants also have 24-hour access to the pediatrician via her pager.[18]

The program requires cross-disciplinary collaboration. Weekly team staff meetings include positively-framed assessment of each participant. The social worker attends each participant's medical visits. The pediatrician occasionally attends group meetings and sometimes accompanies the social worker on home visits.[18]

Evaluation Methodology

Every eligible female student, known to the participating high school or to her peers as pregnant or parenting, as well as students who self-referred, were offered enrollment in the project. Seventy-two young women enrolled (97 percent of eligible pregnant or parenting female students). Two miscarried within two weeks and were removed from the program and one withdrew her consent prior to participating; these three were removed from analysis. Of the remaining 69 participants, 63 were in the program long enough to have an adequate period of risk (>24 months) and were included in the intent-to-treat analysis. Participants were African American (99 percent); had a mean age of 16 years; were all Medicaid eligible and eligible for free or reduced lunch. At enrollment, 52 percent of participants were currently pregnant; 47 percent were parenting and not currently pregnant. [18]

One participant was disruptive and removed from participation in group activities; however, she continued to receive other services and is included in the analysis. One participant had a toddler who failed to thrive. After prolonged unsuccessful intervention, including two hospitalizations, frequent medical appointments, coordination with WIC, and home visits by the pediatrician and the social worker, this young mother was reported to Social Services. She withdrew from participation in case management but continued to participate in other aspects of the program, including medical visits (without her child). She, too, was included in analysis of the program's effectiveness. [18]

Comparisons (n=252) were a propensity-matched group of adolescent females, four for each participant, randomly selected from the state's birth certificate data. Each comparison group member matched a participant for demographic information, including date of birth of the mother plus or minus six months, date of birth of the infant plus or minus three months, parity at the initial birth, and race/ethnicity. The only excluding factor was residence in either of two zip codes that constituted the attendance zone for the participating high school. [18]

The analysis was based on intent to treat and compared the intervention and comparison groups at enrollment on demographic and socioeconomic factors and differences in medical care, contraceptive choice, and other program components between those who were pregnant and parenting at enrollment. The Kaplan-Meier method was used to compute the rate of subsequent birth free survival at each observed time, calculated as the time from enrollment to when the mother's name or social security number reappeared in the state's birth registry, either within 24 months or until the mother reached age 20, whichever was later. [18]

In addition, a research assistant not involved in the program conducted focus group research with participants, using scripted questions. The project evaluator then reviewed the transcribed answers and summarized the common themes for each focus group. The research assistant also held qualitative interviews with parents and school personnel, using semi-structured, scripted interviews. The evaluator summarized answers from these interviews, too. [18]

Long-Term Outcomes

- **Decreased Incidence of Births**—"This intensive school-based intervention for teen mothers [was] effective in achieving a 50 percent reduction in the rate of subsequent births during adolescence." The rate of subsequent births was lower in participants (17 percent) than in the comparison group (33 percent). The difference was statistically significant (*P*=.001); was similar over time; and became significant at 30 months (*P*=.05). At 24 months, 11 percent of participants had another birth versus 20 percent of comparisons. At 30 months, 14 percent of participants had another birth versus 26 percent of comparisons. At 36 months, 17 percent of participants had another birth versus 29 percent of comparisons. The survival curve of time was also significantly different between participants and comparisons (*P*=.001). [18]
- Among program participants, there was also a trend of fewer subsequent births in those who participated more in two of the program components, specifically coordinated medical care and case management. Subsequent births occurred in 30 percent of participants who did not receive the medical care compared with 10 percent of those who did (P=.08) and in 66 percent of those who did not participate in case management, compared with 15 percent of those who did (P=.07). [18]

- **Notes:** Participation in program components was not as great as intended. For example, 63 percent of participants (n=40) took advantage of the offered medical care and saw the pediatrician for a mean number of slightly over six visits. However, overall participation in medical care was not statistically significant (P=.17). Participation in group meetings (76 percent; n=48; P=.06) was better, as was participation in case management (95 percent; n=60; P=.04). Participants' use of contraception included medroxyprogesterone (77 percent), combined oral contraceptives (12 percent), and transdermal contraceptive patch (eight percent). However, evaluation found no significant difference in overall use of contraception by participation in any of the three program components (group meetings, case management, or medical care). Finally, evaluation showed that there were fewer subsequent births in participants who graduated, transferred to another school, or were still enrolled in the intervention school (11 percent) than in those who dropped out, were expelled, or enrolled in a GED program (27 percent); but this difference, too, was not significant. [18]

For More Information, Contact

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