Effects of a Prenatal Care Intervention for Adolescent Mothers on Birth Weight, Repeat Pregnancy, and Educational Outcomes at One Year Postpartum

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Abstract

About one-third of adolescent mothers receive inadequate prenatal care, and babies born to young mothers are more likely to be of low birth weight. The objective of this study is to evaluate a peer-centered prenatal care program for adolescent mothers. Pregnant adolescents were randomly assigned to an experimental or control group in a mastery modeling peer-support intervention designed to improve long- and short-term perinatal outcomes. A sample of 282 urban pregnant adolescents (94% African American, 4% Caucasian, 2% other) participated in the study. Participants were recruited from five clinics located mainly in Detroit, Michigan. Participants in the experimental group received care in a small group setting and learned to perform critical measurements with a peer partner during prenatal visits. Participants in the control group received individual prenatal care in the same clinics. Outcome measures included birth weight, years of schooling completed at one year postpartum, planned and unplanned pregnancy at one year postpartum, and employment and school attendance at one year postpartum. Mothers in the experimental group had a lower rate of low birth weight (6.6% vs. 12.5%, $p = 0.08$). The rate of unplanned pregnancy was also lower for adolescents in the experimental group (13.4% vs. 15.9%), although this difference was not statistically significant. Adolescents who participated in the intervention were more likely to have continued their education during the pregnancy and the postpartum year. The mastery modeling, peer-centered, prenatal care program produced some positive pregnancy outcomes for adolescent mothers.

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Introduction

Childbearing often proves a difficult experience for adolescent mothers. About one-third of adolescent mothers receive inadequate prenatal care, and babies born to young mothers are more likely to have low birth weight and childhood health problems (Alan Guttmacher Institute, 1994; Kinsman, & Slap, 1992; Ventura, Martin, & Curtin, 1997). Women most at risk for obtaining inadequate prenatal care are low-income women who are younger than 20 years of age, have less than a high school education, and are unmarried, African American, Hispanic, or first-generation children (Bandura, 1986). While 70% of adolescent mothers complete high school, they are less likely to attend college (Alan Guttmacher Institute, 1994). Prenatal care programs for adolescent mothers need to improve pregnancy outcomes and support the adolescent mother's own health and development. The objective of this paper is to examine the effect of a prenatal care intervention on low birth weight, repeat pregnancy, and educational and employment outcomes for adolescent mothers.

This prenatal care intervention was based on social cognitive theory. Social cognitive theory conceptualizes human functioning as a reciprocal interaction between personal factors (e.g., self-efficacy and outcome expectancies), environmental factors, and behavior (Bandura, 1991, 1997). Self-efficacy refers to one's confidence in the ability to regulate his/her own motivation, thought processes, emotional states, and social environment to effect a given behavior (Bandura, 1997). Guided by social cognitive theory, the intervention was a mastery modeling, peer support-group intervention designed to increase self-efficacy, improve self-concept, and affect short- and long-term perinatal outcomes. A creative educational program was developed and included modeling and rehearsing of skills to achieve the following: (1) increase knowledge about pregnancy, (2) prepare for childbirth, (3) work with the health care system including clinics, hospitals, physicians, midwives, and nurses, (4) assess the adolescent's own and her baby's health, and (5) prevent unplanned repeat pregnancy.

Methods

Pregnant adolescents were randomly assigned to either the experimental or control condition. Adolescents in the experimental condition were also assigned to groups of 6–8 participants with similar estimated dates of confinement. Adolescents in the experimental group were paired with another pregnant teen. Intervention groups met at a scheduled clinic time and, as a group, were shown how to perform critical measures on each other that are consistent with routine prenatal care. These measures included fetal heart tones, fundal height measurements, weights, urine monitoring using dip sticks, and blood pressure measures. Blood pressures were taken using a double-headed stethoscope. A nurse practitioner or other health professional verified the blood pressures and other measurements; however, individual appointments with a care provider occurred only when problems needing referral were noted.

An additional part of the intervention provided education for prenatal care in a group setting. Educational content included information on healthy eating habits during pregnancy, the importance of exercise and a healthy lifestyle, preparation for childbirth, signs of labor, caring for a newborn, and the significance of prenatal, postpartum, and well-baby care. Participants in the control group received their care from the same sites; however, they were not assigned a group or partner and they received individual, traditional care from health professionals. All teens were given a box of educational materials that included written information on the three trimesters of pregnancy. Data for this study were collected from self-administered forms completed at intake, medical records, and telephone interviews conducted about one year postpartum.

Statistical Methods

Initially, chi square tests were used to evaluate changes before and after the intervention in the outcome measures. Following this, logistic regression models were estimated to examine the findings for differences after controlling for the intake variables of age and parity.

Measures

Age was measured in single years from the intake records. Parity was measured as the number of live births. The years-of-education variable was measured in single years and in two time periods, at intake and at one year postpartum. The term *currently in school* was defined as in school at one year postpartum; *currently working*

Table 1 Demographic Characteristics of Subjects

	Total	Experimental	Control
Age (%)			
≤14 years	7.8	12.1	1.7
15–17 years	50.4	55.2	43.6
18–20 years	41.8	32.7	54.7
Total	100.0	100.0	100.0
Parity (%)			
0	61.3	65.5	55.6
1+	38.7	34.5	44.4
Total	100.0	100.0	100.0
Marital Status			
Not Married (%)	98.6	99.4	97.4
Years of Schooling			
Mean	11.3	11.0	11.7
Range	8–14	8–14	9–14
African American Ethnicity (%)	93.1	95.7	89.4
N	282	165	117

was defined as working at one year postpartum. Low birth weight was defined as births below 2500 grams.

Sample

Subjects (n = 282) were drawn from five clinics located primarily in Detroit, Michigan. Table 1 outlines the demographic characteristics of the participants. Subjects ranged in age from 13 to 21 years (*mean* = 17.6 years). Ninety-eight percent of the women were not married. More than half (58.1%) of the women were still attending school and the mean grade level was 11.0. Thirty-eight percent of the women had been pregnant before. Ninety-four percent of the women were African American, 4% were Caucasian, and 2% were of other races.

Results

Table 2 shows the differences between the two groups in birth weight and several other measures at one year postpartum. The percentage of births that were of low birth weight differed between the two groups in a trend that was close to statistical significance. In the experimental group, 6.6% of births were of low birth weight. In the control group, 12.5% of births were of low birth weight (p = .08). This difference remained after controlling for age and parity.

The percent of the sample who were pregnant within one year was lower for the experimental group compared to the control group, but this difference was not statistically significant (15.8% experimental, 20.4% control, p = 0.52). Similarly, the percentage of women who had an unplanned pregnancy within one year was lower in the experimental group, but the differences were not statistically significant (13.4% experimental, 15.9% control, p = 0.44). These differences remained after controlling for age and parity.

The demographic variables of years of education completed and percentage of those attending school at follow up were very close for the experimental and control groups (about 11.5 years of education and 54% attending school at one year postpartum). However, after controlling for age, parity, and education at intake, women in the experimental group had completed 0.5 more years of education since the intake interview (p < .01) compared to the women in the control group (see Table 3).

Discussion

Results of the intervention study lend some support for this method of delivering prenatal care to adolescent

Table 2 Differences Between Intervention Group and Control Group on Outcome Measures

Outcome Measure	Experimental Group	Control Group	Total	*N*	*P* Value
Low Birth Weight	6.6%	12.5%	9.0%	255	0.08
Pregnancy within One Year	15.8%	20.4%	17.5%	126	0.52
Unplanned Pregnancy within One Year	13.4%	15.9%	14.3%	126	0.44
Years of Education Completed at One Year Follow-Up	11.55	11.58	11.56	125	0.86
Working at One Year Follow-Up	54.9%	50.0%	52.3%	126	0.37
Attending School at One Year Follow-Up	53.7%	54.5%	54.0%	126	0.54

Table 3 Multiple Regression Model of Number of Years of Education Completed

Variable	Coefficient	*t*	*P*
Intake Years of Education	0.55	6.55	0.00
Intake Parity	-0.03	-0.17	0.86
Intake Age	0.04	0.54	0.59
Experimental Group	0.30	2.03	0.04
Constant	4.42	5.46	0.00
R^2	0.50		
F	26.79		
N	112		

mothers. Adolescents in the experimental condition had fewer infants with low birth weight and were more likely to continue their education than those in the control condition. Furthermore, additional analyses not shown here indicated that the intervention was particularly effective in preventing repeat pregnancies among women who began their pregnancy with a low level of self-esteem.

Probably the greatest limitation of the study was its sample size. While 282 women enrolled in the study, less than half of these women participated in the telephone interview one year after birth. Women in this study often changed residence. While it was possible to keep track of their location during the childbearing year, many could not be located during the year interval after the birth.

This project and other studies of pregnancy care for adolescent mothers demonstrate that a small amount of additional attention to the needs of adolescent mothers can have substantial benefits (Koniak-Griffin, Anderson, Verzemnieks, & Breccht, 2000; Norbeck, DeJoseph, & Smith, 1996; O'Sullivan & Jacobsen, 1992). The costs of this program are small because it is conducted by the health care provider during regularly scheduled prenatal care and requires only a small amount of specialized equipment (double-headed stethoscope). With only minor purchases of equipment and educational materials, this program can be conducted in any prenatal care setting and improve outcomes for adolescent mothers and infants. Use of this program among urban adolescent mothers may help reduce health disparities in the United States.

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