Effects of a Prenatal Care Intervention on the Self-Concept and Self-Efficacy of Adolescent Mothers

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Abstract

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The objective of this study was to examine changes in self-concept and self-efficacy during the childbearing year among adolescent mothers (defined as young mothers up to age 20) who were involved in a behavioral intervention. Subjects included a sample of 282 urban, pregnant adolescents (94% African American, 4% white, 2% other). The Tennessee Self-Concept Scale (TSCS) was used to measure self-concept. A scale to measure the self-efficacy of the adolescent mother during the childbearing year was developed and evaluated. Questionnaires were administered during intake for prenatal care and in the postpartum period. In the larger study, the intervention was a peer-centered, mastery modeling intervention designed to increase self-efficacy, improve self-concept, and improve long- and short-term perinatal outcomes. The results in this portion of the data showed that self-concept increased significantly for young women in the experimental group but did not change significantly for young women in the control group. Changes were noted in the TSCS for overall self-concept as well as for several subscores, including identity, self-satisfaction, behavior, the personal self, the family self, and the social self. However, differences between groups did not reach significance once age, parity, site, and time were accounted for, except on TSCS subscales of identity and personal self. Between intake for prenatal care and postpartum, self-efficacy changed significantly for both the experimental and the control groups. Both groups increased in self-efficacy for labor and delivery and decreased in self-efficacy for infant care. In this group of mostly African American teens, peer support and small group care demonstrated positive effects on self-concept. Professional and peer interactions were equally associated in intervention and nonintervention groups with regard to self-efficacy.

Journal of Perinatal Education, 10(2), 15–22; self-concept, self-efficacy, adolescent pregnancy.

Introduction

Births to adolescent mothers comprise 13% of births in the United States (Ventura, 1997). Because adolescent mothers frequently may receive inadequate prenatal care (Alan Guttmacher Institute, 1994), efforts are needed to improve the experience of adolescent mothers in receiving quality prenatal care. Quality care takes effort by both the provider and the recipient of care. The contribution of the adolescent to receiving high-quality care may be related to behaviors influenced by her self-esteem and self-efficacy. Thus, in order to provide optimal care, these characteristics may need to be addressed. The objective of this paper is to examine the effect of a prenatal-care intervention on the self-concept and self-efficacy of adolescent mothers.

Low self-concept has been shown to be associated with adolescent pregnancy and has been associated with decreased attendance at prenatal and postnatal care and with repeat pregnancy.

Low self-concept has been shown to be associated with adolescent pregnancy and has been associated with decreased attendance at prenatal and postnatal care (Streetman, 1987) and with repeat pregnancy (Paik, 1992). Using the Tennessee Self-Concept Scale (TSCS), Horn and Rudolph (1987) reported a lower self-concept in adolescent mothers in comparison to the norm established for adolescents for the scale. Using the Offer Self-Image questionnaire, Pete-McGadney (1995) found similar results. The individual's self-concept has been shown to be highly influential in much of his or her behavior (Roid & Fitts, 1998). Individuals who see themselves in a positive light tend to act accordingly. Thus, without attention to her self-concept, the pregnant adolescent can be predicted to be a risk for contributing to less than quality prenatal care.

Self-efficacy is another attribute that can be predicted

to influence prenatal care. Social cognitive theory conceptualizes human functioning as a reciprocal interaction between personal factors, such as self-efficacy and outcome expectancies, environmental factors, and behavior (Bandura, 1986, 1997). Self-efficacy refers to people's confidence in their ability to regulate their motivation, thought processes, emotional states, and social environment to effect a given behavior (Bandura, 1986, 1991).

Guided by social cognitive theory, the intervention was a peer-centered, mastery model intervention (PCMMI) group intervention designed by the researchers to increase self-efficacy, improve self-concept, and affect short- and long-term perinatal outcomes. For the larger study, a creative PCMMI program was developed that included modeling and rehearsal of skills to achieve the following: (a) increase knowledge about pregnancy; (b) prepare for childbirth; (c) work with the health care system, including clinics, hospitals, physicians, midwives, and nurses; (d) enable the expectant mother to assess her own and her baby's health; (e) prevent an unplanned repeat pregnancy; and (f) improve health self-care. In an earlier report, Hoyer, Weglicki, Kershaw, and Ford (1999) noted a lower number of low birth weight infants in the experimental group. In this paper, researchers examine the effect of the intervention on the self-efficacy and the self-concept of the adolescent mother.

Methods

Two hundred eighty-two pregnant adolescents were randomly assigned to either the experimental or control condition and to groups of 6 to 8 participants. Adolescents in the PCMMI experimental group were taught to provide prenatal care to each other in a group setting supervised by a nurse-midwife, obstetrician, or nurse practitioner. These young women did not see an individual care provider unless special problems were noted. They were paired with another pregnant teen and shown how to perform critical measures that are part of usual prenatal care. These measures included fetal heart tones, fundal height measurements, weights, urine dipsticks, 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. An additional part of the intervention included education for prenatal care in a group setting. In this total intervention, the adoles-

cents were encouraged to actively take charge of and monitor their own health and progress. The researchers hypothesized that the adolescents would increase their self-esteem and self-efficacy by becoming active in providing the needed health care to themselves and their peers. Members of the control group received care from the same sites, but they were not assigned a group or partner and had all care traditionally and individually delivered by health professionals. All teens were given a box of educational materials that included information on all three trimesters of pregnancy. The researchers hypothesized that adolescents in the intervention group would increase in measures of self-efficacy and self-esteem significantly more than the control group.

Data Collection

The data were collected at intake for prenatal care and again within 6 to 8 weeks after the baby was born. Postpartum data was collected in the home, by mail, or by telephone. Both instruments were self-administered in the same session. Appropriate institutional review boards examined the procedures. The adolescents signed consent forms and could withdraw from the study at anytime.

Sample

Subjects were drawn from five clinics in a large urban setting. The subjects ranged in age from 13 to 20 years (mean = 17.6 years). Nearly 42% were 18 years or older. Thus, *adolescent* was operationally defined as less than 21 years old (see Table 1). 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 white, and 2% were of other races.

Measures

Measure of Self-efficacy. A pregnancy self-efficacy scale was developed for this study. Items for the self-efficacy scale were initially selected to measure several behavioral domains: (a) being able to obtain health care during pregnancy; (b) being able to obtain health care for the baby; (c) being able to work with clinics, doctors, and

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

nurses; (d) being able to cope with labor and delivery and to work with doctors and nurses during this time; and (e) being able to obtain postpartum care (Table 2). To establish reliability, the item pool was evaluated by members of the research team who functioned as a panel of experts and pretested at clinic sites. A total of 12 items were retained for the final measure of the self-efficacy scale. A self-administered questionnaire was given to each subject in the study. The preface to the self-efficacy instrument said, “The following statements talk about you and how you feel about your pregnancy, your health, and your coming baby. Please look at each one of these statements and decide which ones are true for you.” Using a Likert scale, the subject then checked one of five boxes that were labeled (1) *not at all*, (2) *a little bit*, (3) *sometimes*, (4) *most of the time*, and (5) *all of the time*. The possible scores ranged from 5 to 60.

Cronbach’s alpha computed for the sum of items for the self-efficacy scale was 0.65, indicating a lower bound reliability estimate for the total scale score (Green, Lissitz, & Muliak, 1977). Means of individual items ranged from 3.60 to 4.94 and standard deviations ranged from 0.30 to 1.34. Responses tended to have a negative skewness with a tendency to choose items at the higher values of the scale. Correlations between items ranged from 0.08 to 0.35, indicating no redundancy between items.

Table 2 Means and Standard Deviations of Self-Efficacy Scale Items at Intake

Item	Mean	Standard Deviation
<i>Factor 1. Care of self during pregnancy</i>		
1. I can take care of myself while I am pregnant.	4.51	0.68
2. I know how to get good medical care while I am pregnant.	4.61	0.79
3. I can tell the doctors and nurses who are working with me about any problem that I am having during my pregnancy.	4.82	0.44
4. I want to be active in the planning of my care during childbirth.	4.74	0.73
<i>Factor 2. Self-efficacy during labor and delivery</i>		
5. I can cope with the pressure of a normal delivery experience.	3.51	1.37
6. The doctors and nurses who are with me during labor and delivery will work with me.	4.73	0.62
7. I will be able to tell the doctors and nurses how I feel and what my wishes are when I am in the hospital.	4.75	0.65
<i>Factor 3. Self-efficacy for postpartum and infant care</i>		
8. I will be able to get to my postpartum checkups.	4.89	0.37
9. I can take good care of my baby.	4.94	0.27
10. If my baby gets sick, I will be able to take him/her to a clinic.	4.92	0.35
11. When I take my baby to a clinic, I will be able to explain any problems that the baby is having to the doctor or the nurse.	4.85	0.44
12. I will be able to take my baby to a doctor or clinic for checkups.	4.93	0.35
N	282	

Item-to-total correlations ranged from 0.15 to 0.40 with only one item having an item to total correlation below the 0.25 value recommended by Nunnally and Bernstein (1994) for a new scale.

To explore the underlying dimension of the self-efficacy scale, a principal components-factor analysis was conducted. Oblique rotation was employed because this is the preferred method of rotation when the factors are expected to be correlated (Nunnally and Bernstein, 1994). Decisions regarding retention of items and consistency of factor structure with original domains were based on the following criteria: (a) item factor loadings of

0.50 or more, (b) ability to interpret factors, and (c) items loading higher on one factor than all the others (Carmines & Zeller, 1979). The factors from each resulting subscale were also subjected to reliability analysis.

The principal-components factor analysis revealed that three factors had eigenvalues greater than 1. Together, these three factors accounted for 46% of the variance. The first factor included four items related to self-care and using clinic services during pregnancy. This factor was labeled *self-care during pregnancy*. The second factor, named *self-efficacy during labor and birth*, included three items related to management of labor and delivery. The third factor incorporated three items concerned with obtaining health care for self and baby after childbirth. It was labeled *self-efficacy for postpartum and infant care*. The correlations among the three factors ranged from -0.246 to 0.20 , indicating a low to moderate level of correlation and, thus, little or no overlap. Cronbach's alpha statistics, which were computed on simple additive indices constructed from the three factors, are shown in Table 3. The values of these statistics ranged from 0.44 to 0.61. Thus, the self-efficacy scale was confirmed to be a reliable scale at the lower band of reliability with three separate subscales.

Measure of Self-Concept. The Tennessee Self-Concept Scale (TSCS) was used to measure self-concept (Roid & Fitts, 1988). The TSCS is a widely used instrument developed as a multidimensional approach to the measurement of self-concept. The scale consists of 100 self-descriptive statements. It can be used with any individual 12 years or older who can read at a fourth-grade level. Several measures were presented from this scale:

- **Total score**—The total score reflects the overall level of self-concept. An individual with a high total score tends to value herself, feels that she is a person of

Table 3 Reliability Analysis for Subscales

Factor	Alpha
Factor 1. Self-efficacy for care during pregnancy	0.56
Factor 2. Self-efficacy for labor and delivery	0.44
Factor 3. Self-efficacy for postpartum and infant care	0.53
Factor 4. Total Self-efficacy	0.64

value, and exhibits self-confidence, acting accordingly (Roid & Fitts, 1988).

- Identity—Identity items describe an individual's basic self-perceived identity.
- Self-satisfaction—This score reflects the individual's level of self-acceptance or how satisfied she is with her perceived self-image.
- Behavior—This score reflects the individual's perception of her behavior.
- Physical self—This score represents the subject's view of her body, state of health, appearance, and sexuality.
- Moral/Ethical self—This score represents the subject's moral worth, feelings of being a "good" or "bad" person, and satisfaction with religion or lack of it.
- Personal self—This measure reflects the individual's sense of personal worth and self-evaluation of her personality.
- Family self—The family self reflects the individual's feelings of adequacy as a family member. It reflects the subject's sense of worth among her family members.
- Social self—Social self reflects the subject's sense of worth in dealing with other people in general.
- Self-criticism—This scale is composed of 10 mildly derogatory statements about a person. An individual who denies most of these statements could be seen as being defensive and making a deliberate effort to present herself in a positive light. The average score for this population is in a normal range.

Statistical Methods of Analysis

Initially, t tests were used to evaluate changes before and after the intervention in the psychosocial measures for the experimental and control groups, separately. Following this, linear models were estimated using the SAS (Statistical Analysis System version 6.2) procedure Proc MIXED. This procedure uses restricted maximum likelihood estimation (REML) for parameter estimation and allows adjustment for covariance between individuals, due to study site. The model included study site as a random variable and age, parity, condition, time, and time*condition (the interaction of time and condition) as independent variables that can be held constant using statistical methods that allow a more accurate calculation of the influence of the intervention. The coefficient of the variables time*condition is of importance to the evaluation of the intervention because it indicates if the rate of change in the dependent variable is different for the two groups. The F test for the significance of this interaction is reported in the tables.

Results

Self-Efficacy

Table 4 shows the changes in self-efficacy between the intake and postpartum scores for the two groups. The total measure of self-efficacy only increased slightly for the experimental group (4.70 to 4.75, $p = 0.09$) and for the control group (4.70 to 4.74, $p = 0.26$). Thus, self-efficacy for care during pregnancy did not significantly increase for either group. Self-efficacy for labor and delivery increased significantly for both groups (experi-

Table 4 Intake and Postpartum Measures of Self-Efficacy

Item	Experimental (N = 136)			Control (N = 94)			F Statistic
	Mean Intake	Mean Postpartum	t	Mean Intake	Mean Postpartum	t	
Total self-efficacy	4.70	4.75	-1.7 ($p = 0.09$)	4.70	4.74	-1.12 ($p = 0.26$)	1.71 ($p = 0.59$)
Pregnancy	4.67	4.71	-0.7 ($p = 0.45$)	4.66	4.72	-0.9 ($p = 0.33$)	0.22 ($p = 0.64$)
Labor/Delivery	4.34	4.62	-4.0 ($p = 0.00$)	4.35	4.62	-3.6 ($p = 0.00$)	0.02 ($p = 0.89$)
Postpartum/Infant	4.93	4.80	3.93 ($p = 0.00$)	4.92	4.78	2.98 ($p = 0.00$)	0.07 ($p = 0.80$)

mental: 4.34 to 4.63, $p = 0.00$; control: 4.35 to 4.62, $p = 0.00$) at approximately the same rate.

Self-efficacy for care of the self and the baby postpartum decreased significantly for both the experimental ($p = 0.000$) and the control group ($p = .000$). The very high ratings of self-efficacy at time of intake (4.93 experimental, 4.92 control) decreased to lower levels in the postpartum period (4.80 experimental, 4.78 control). The F tests from the interaction coefficients of the mixed models were not significant, indicating that the rates of change in self-efficacy did not differ between the two groups.

Self-Concept

Trends in the TSCS showed significant differences between the experimental and the control groups (see Table 5). The experimental group showed significant increases in overall self-concept ($p = 0.000$), identity ($p = 0.02$), self-satisfaction ($p = 0.05$), behavior ($p = 0.02$), the personal self ($p = 0.05$), the family self ($p = 0.000$), and the social self ($p = 0.05$). In contrast, none of the

measures of self-concept showed significant increase in the control group.

Evaluation Models

Differences in age and parity existed between the experimental and the control groups. In assessing within group differences, a second analysis was conducted, one that adjusted for the age and parity distribution. This adjustment did not markedly change the results. In addition, the mixed linear models that included the time*condition interaction included the variables age and parity in the model so that any influences in the differences between experimental and control were controlled for in these tests. Hence, age and parity differences did not confound the study results.

The results from the mixed model—which tested for age, parity, site, and time as moderating variables—indicated that, after subtracting their influence, the rate of change of the TSCS did not differ significantly between groups. The F tests were not significant for the total TSCS or for most of the subscores (see Table 4). Only

Table 5 Intake and Postpartum Measures of Tennessee Self-Concept

	Experimental (N = 136)			Control (N = 94)			F Test
Tennessee Self-Concept	Mean Intake	Mean Postpartum	t	Mean Intake	Mean Postpartum	t	Time * Condition
Total Score	340.9	347.8	-2.83 ($p = 0.00$)	345.60	347.10	-0.52 ($p = 0.60$)	1.95 ($p = 0.16$)
Self-criticism	32.46	32.99	-1.26 ($p = 0.26$)	32.09	32.88	-1.26 ($p = 0.21$)	—
Identity	125.43	127.59	-2.43 ($p = 0.02$)	127.75	128.27	-0.54 ($p = 0.60$)	3.06 ($p = 0.08$)
Self-satisfaction	108.48	110.74	-1.97 ($p = 0.05$)	109.22	109.11	0.09 ($p = 0.93$)	2.01 ($p = 0.16$)
Behavior	106.97	109.48	-2.44 ($p = 0.02$)	108.53	109.83	-1.01 ($p = 0.31$)	0.42 ($p = 0.52$)
Physical self	73.10	73.86	-1.20 ($p = 0.23$)	73.74	72.96	1.08 ($p = 0.28$)	1.95 ($p = 0.16$)
Moral/Ethical self	68.70	69.72	-1.45 ($p = 0.15$)	69.26	69.51	-0.34 ($p = 0.73$)	0.76 ($p = 0.38$)
Personal self	68.87	70.20	-1.91 ($p = 0.05$)	70.89	70.16	0.85 ($p = 0.40$)	3.04 ($p = 0.08$)
Family self	66.84	69.40	-3.72 ($p = 0.00$)	66.79	68.25	-1.65 ($p = 0.10$)	1.29 ($p = 0.26$)
Social self	63.37	64.62	-2.01 ($p = 0.05$)	64.78	66.22	-1.69 ($p = 0.09$)	0.08 ($p = 0.77$)

the difference in scores for identity and personal self had p values below 0.10 when comparing the control and intervention groups.

Discussion

This study examined the effects of a mastery modeling intervention on the self-concept and self-efficacy of young women who participated in the study. Changes were seen in self-efficacy for both the intervention and control groups. When remeasured during the postpartum period, they both increased in self-efficacy for labor and delivery and decreased in self-efficacy for self and infant care. The rates of change did not differ significantly between groups.

It is interesting that the direction of change in self-efficacy was different for the two subscales that showed some evidence of change. While self-efficacy for labor and delivery (a completed event) increased, self-efficacy for postpartum care of self and the baby (a currently ongoing event) decreased. The reality of caring for an infant may have a depressing effect on the confidence and, thus, self-efficacy of the adolescent mother.

In the TSCS in the experimental group, trends towards an increased score showed some significance and change in that group based on the within-group analyses, although the rates of change between the experimental group and the control group in these measures did not reach significance. One reason for the lack of a significant rate of change between these groups may be the sample size of the study. A larger clinical trial may be needed to demonstrate the statistical significance of these measures.

The scores on the self-concept scale were on average higher than those cited in the normative group reported by the TSCS authors (Roid and Fitts, 1988). This finding is in agreement with a recent study of prenatal care for adolescent mothers conducted by Alpers (1998); yet, it is in contrast to studies conducted in the 1970s to mid-

1980s, which found lower self-concept in pregnant and parenting teens when compared with their nonpregnant contemporaries and normative data. As suggested by Alpers (1998), society's attitude toward adolescent pregnancy has become more accepting, which may contribute to the increased self-concept of these young women.

In summary, changes in self-efficacy and self-concept were noted between adolescent mothers who participated in a peer-centered, mastery modeling intervention. However, the rate of change of the two groups was not significantly different. Nonetheless, support for this model for prenatal care for adolescent mothers is provided through a previous analysis that indicated a lower number of low birth weight infants in the experimental group (Hoyer, Weglicki, Kershaw, & Ford, 1999) as well as the positive trend in self-concept.

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Implications for Childbirth Educators

Childbirth educators who teach adolescents could institute and evaluate a peer-centered, mastery model of childbirth education. This could be accomplished by putting the adolescents in the teacher role, to the extent feasible. Certainly, some of the measures to monitor prenatal health could also be incorporated into the class.

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