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**PREDICTORS OF COMPLIANCE WITH THE POSTPARTUM VISIT AMONG
WOMEN LIVING IN HEALTHY START PROJECT AREAS**

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ABSTRACT

OBJECTIVES

Few studies have examined factors associated with compliance with a postpartum visit (PPV). The identification of such factors is of particular importance in populations with high rates of unintended pregnancies and medical complications of pregnancy. This study seeks to determine factors associated with compliance with a PPV among low-income women in the population served by fourteen Healthy Start sites.

METHODS

Data from the Healthy Start Survey of Postpartum Women were reviewed to identify variables associated with compliance with a PPV at or beyond 6 weeks. Multiple logistic regression models were created, based on a sociobehavioral model of health services use, to examine which types of factors (demographic, social, enabling or need) are most strongly associated with the use of a PPV.

RESULTS

The study population consisted of survey respondents interviewed six weeks or more following delivery. Eighty-five percent of respondents had had a PPV at time of interview. In a multiple regression analysis, enabling factors such as multiple moves (OR (95% CI) = 0.34 (0.18, 0.67)), trouble understanding the provider (OR (95% CI) = 0.65 (0.43, 0.99)) and appointment reminders (OR (95% CI) = 2.37 (1.40, 4.02)) were most strongly associated with a PPV.

CONCLUSIONS

This work finds that women with unstable housing, transportation barriers, and difficulties communicating with providers are at risk for not receiving a PPV. This suggests that

access to postpartum health services in the Healthy Start communities studied may not be entirely equitable. Policies aimed at improving interconception care will need to address these barriers to accessing health services.

Keywords: Postpartum visit, compliance, health services

INTRODUCTION

To date, few studies have examined rates of utilization of the six-week postpartum medical visit. The American College of Obstetricians and Gynecologists and the American Academy of Pediatrics recommend routine medical follow up four to six weeks postpartum, at which time a general assessment of physical and mental well-being is performed, with particular emphasis upon screening for postpartum depression, evaluation of breastfeeding and issues related to family planning (1). Likewise, the World Health Organization suggests that contact with the health care system should occur at “six hours, six days, six weeks and six months” post-delivery in order to offer comprehensive puerperal care to mothers and newborns (2). The postpartum visit also provides an opportunity for an evaluation of maternal health status and allows for referrals for follow-up of chronic or pregnancy-related medical conditions. Compliance with the postpartum visit is likely related to a number of patient-, provider- and systems-level factors. Patients must perceive a need for and benefit from the visit, must be able to overcome any barriers to care (e.g. related to insurance, transportation, child care, safety) and must have access to a health care system equipped to provide appropriate care.

Andersen has described and revised a model of health services utilization that has proved to be a valuable evaluation tool in many settings. This behavioral model indicates that the use of health services is a function of individuals' predisposing characteristics (i.e. demographic and/or individual belief systems regarding health), enabling resources (i.e. home and medical community supports, income and insurance) and the need for health services. Andersen defines equitable access as “occurring when demographic and need variables account for most of the variance in utilization,”

and inequitable access as occurring when social structure, health beliefs and enabling resources predict use of medical care (3).

This study seeks to determine factors associated with compliance with a postpartum medical visit among low-income women in the population served by fourteen Healthy Start sites, using Andersen's model as a template. In particular, we expect to find that individual social factors, as well as enabling and inhibiting factors in the health care environment will play significant roles in predicting use of postpartum medical services.

METHODS

The Healthy Start Survey of Postpartum Women was designed to collect information on the prenatal and postpartum experiences of women in Healthy Start project areas. The objectives of the survey were three-fold; "to examine the experiences of the Healthy Start participants, including such factors as client satisfaction, barriers to and facilitators of receiving prenatal care, case management services received, other Healthy Start services received, and infant health care; to examine the experiences of women living in Healthy Start project areas who do not receive Healthy Start services; and to assess how the experiences of Healthy Start participants compare with those of nonparticipants." (4) Between December 1995 and April 1996, face-to-face interviews were conducted with 1,447 Healthy Start participants and 1,404 non-participants living in Healthy Start project areas nationwide. The fourteen areas included Baltimore, MD; Birmingham, AL; Boston, MA; Chicago, IL; Cleveland, OH; Detroit, MI; New Orleans, LA; New York, NY; Gary, IN; Oakland, CA; Pee Dee, SC; Philadelphia, PA, Pittsburgh, PA and Washington, DC. The interview questionnaire included six topic areas: 1) prenatal care, 2) labor, delivery and postpartum care, 3) Healthy Start services, 4) case management and home visits, 5) family planning, and 6) demographic characteristics

and other life factors. Because of the multi-stage stratified sampling of the Healthy Start study, data were analyzed using weighted means, proportions, regression coefficients and standard errors. Women interviewed less than six weeks postpartum were excluded from the study. Appropriate Institutional Review Board approval was obtained prior to the conduct of the current investigation.

Patient characteristics were assigned to categories consistent with Anderson's model, including predisposing factors (including demographic variables such as age, race/ethnicity and parity and social variables such as family size, maternal education and time spent doubled up in housing), enabling factors (such as income, receipt of AFDC (Aid to Families with Dependent Children), trouble understanding the provider and appointment reminders from the provider's office) and need factors (such as preterm delivery, the presence of a chronic health condition and domestic violence during the pregnancy). Bivariate analyses were conducted using χ^2 tests to establish relationships between patient characteristics and compliance with the postpartum visit. Compliance was defined as a self-report of a visit to a doctor or midwife since the birth of the baby amongst women whose deliveries were 6 weeks or more prior to the interview. Multiple logistic regression was then used to create a model to predict compliance with the postpartum visit. Variables that remained statistically significant predictors of compliance upon regression analysis, as well as several key demographic variables were retained in the final model.

Regression modeling was also used to assess the relationship between county-level infant mortality rates and compliance with the postpartum visit. A coefficient of determination, R^2 , was determined for this model. All analyses were restricted to those

respondents interviewed at or beyond 6 weeks postpartum, and were performed using the STATA software package (Stata Corporation, College Station, TX).

RESULTS

Fifty-seven percent of the total sample (n = 1,637) were interviewed six or more weeks postpartum (Table 1). Mean interval between delivery and survey completion was 15 weeks (range 6-33 weeks). 75.7% of respondents self-identified as Black, 12.2% as White and 10.9% as Hispanic. Seventy-nine percent were less than 30 years old at the time of interview, while 1.5% were older than 40 years old. Sixty percent were multiparous at the time of the survey, and 65.2% had at least a high school education. Of the respondents, 40.6% had a chronic health problem, defined as heart disease, hypertension, diabetes, anemia, asthma or drug or alcohol abuse. 72% of pregnancies were reported as having been unintended. At the time of the interview, 45% of women reported that they were breastfeeding; only 8% of women in the total sample were exclusively breastfeeding.

Of this group, 1,415 (86.5%) reported having had a postpartum visit at the time of their interview. One hundred and twenty five women (7.6%) had either rescheduled an appointment or had an appointment scheduled for sometime in the future while 97 (5.9%) reported having no appointment scheduled at all.

Table 2 displays some relationships between variables of interest, categorized according to Andersen's model, and patient compliance with the postpartum visit. In these unadjusted analyses there were no differences in compliance with the postpartum visit by age, race/ethnicity, parity or maternal education. Women with incomes greater than \$15,000 per year had a 1.98 greater odds of being compliant with the visit (95% CI 1.02,

3.86). Women currently receiving AFDC, reporting two or more moves during their pregnancy and those reporting problems with transportation to their provider were less likely to comply with the visit. Alternatively, women who received an appointment reminder for the visit had a 2.24 times higher odds of having had a postpartum visit (95% CI 1.35, 3.72). Table 3 displays a multiple regression model for prediction of respondents' compliance with the postpartum visit. Age was input as a continuous variable for the purpose of the regression analysis. Women of Black and White race were compared with a referent group of women of Hispanic ethnicity, the racial/ethnic group with the highest proportion of women compliant with the postpartum visit (White 80.8%, Black 86.2%, Hispanic 91.1%). The presence of a chronic health condition is associated with a 2.49 times increased odds (95% CI 1.07, 5.80) of compliance with the visit, while having had two or more housing moves during the pregnancy, having trouble understanding the provider and having difficulty with transportation to visits remained negatively associated with postpartum visit compliance. Lastly, those respondents who had received a reminder regarding the postpartum appointment had an odds 2.37 times higher (95% CI 1.40, 4.02) for compliance with the visit. Of those predictors which remained significant in the regression model, a single one, presence of a chronic health condition, was a need variable in Andersen's model. The other significant predictors were all enabling (or inhibiting) factors.

We examined the proportion of respondents who had had a postpartum visit by Healthy Start project area, a predisposing factor. Compliance rates ranged from 74% to 100% by project area, with a *p*-value of 0.03. Significant differences in compliance by site persisted after adjustment for race/ethnicity, maternal age, income and Medicaid receipt. In a regression of postpartum visit frequency on county-level infant mortality rates for each site, having had a postpartum visit was associated with a site-specific infant

mortality rate which was 0.53 deaths per 1000 live births lower than not having had a postpartum visit ($p < 0.001$).

DISCUSSION

To date, there have been relatively few examinations of the health services usage patterns associated with the postpartum obstetrical visit, though there has been considerable attention paid to the adequacy of prenatal care. Amongst a cohort of 9,953 respondents of the 1988 National Maternal and Infant Health Survey, Lu and Prentice documented that low income, lower educational attainment and lack of prenatal care were risk factors for not receiving postpartum care within six months of delivery (5). The National Committee on Quality Assurance (NCQA) reports on rates of postpartum visits amongst health plan enrollees through the Health Plan Employer Data and Information Set (HEDIS). In 2003, the NCQA reported an 80.3% compliance rate for the postpartum visit amongst those enrolled in commercial plans, and a much lower 55.3% compliance rate amongst Medicaid enrollees, demonstrating a lower proportion of appropriate health services use among a low income population (6).

A large proportion of low-income women in the United States have their deliveries and postpartum care financed by Medicaid: while expansions of eligibility requirements for publicly-funded prenatal care have been in effect since the 1980s, these expansions do not continue beyond 60 days postpartum in most states. Paradoxically, low-income and minority women are often most at-risk for conditions which would benefit from ongoing care in the postpartum and interconception periods. Lack of a postpartum visit may represent a missed opportunity to address and make appropriate referrals for such chronic medical conditions as hypertension, diabetes and obesity. Lost, too, is the opportunity to ensure adequate consideration to family planning. In non-breastfeeding

women, the average length of time between delivery and first ovulation is forty-five days, with a significant number of women ovulating before the sixth postpartum week (7). This group of women is thus at high risk for repeat pregnancy during this period if contraceptive options are not made available. According to the Institute of Medicine Report, "The Best Intentions," over half of all pregnancies, and just under half of all births in the United States are unintended (8). Women with unintended pregnancies are more likely to seek prenatal care late or not at all, and are more likely to suffer poor pregnancy outcomes, such as low birth weight (8). In addition, a short inter-pregnancy interval (less than 6 months) is known to be one factor that contributes to increased risk of preterm birth and low birth weight, the two largest contributors to infant mortality risk (9). It is thus clear that the postpartum visit represents an opportunity not only for improvement of general maternal health, but also may have an impact on subsequent pregnancy outcomes. Quality obstetrical and primary care should include an assessment of maternal well being in the postpartum period, particularly for those women at highest risk for chronic health conditions, intimate partner violence, short inter-pregnancy interval and other stressors associated with poor health and poor subsequent pregnancy outcome.

This study demonstrates that, while traditional medical/need factors such as the presence of a maternal chronic health problem do predict the use of postpartum health services, so too do enabling factors. In multivariate regression modeling, the presence of a maternal chronic health condition became a significant predictor, while the number of moves during pregnancy, difficulty understanding the provider, travel problems and appointment reminders remained significantly associated with compliance.

Residence in particular Healthy Start project areas was also correlated with use of health services postpartum, even after controlling for such site-related factors such as language used by provider and use of appointment reminders. Sites with the highest county-level infant mortality rates had lower proportions of respondents reporting compliance with the 6-week visit, a finding that did not completely explain the differences seen by Healthy Start site. Not surprisingly, this finding indicates that under-use of health services in the interpregnancy interval, and not just under-use of *prenatal* care, tracks with more traditional measures of maternal and child health, such as the infant mortality rate. Our findings suggest that practical considerations such as sending reminder letters may help improve utilization of this important health service. In addition, it highlights the need for providers, administrators and policymakers to appreciate the role played by such “non-medical” factors as transportation and language proficiency in the decision or ability to seek postpartum care. Policies aimed at reducing transportation barriers and improving patient-provider communication via language concordance and availability of trained medical interpreters may help to improve compliance rates.

One limitation of this study is that the data were collected over a decade ago. In addition, we were limited by the self-reported nature of measurement of the outcome of interest, which may have been subject to reporting bias. Another study design might use more objective methods such as medical record or claims data review. Too, subjects may have mistaken other encounters with the health care system (such as a visit to a primary care provider or an urgent care visit) for “a postpartum visit.” One might argue, however, that as compared with no visits at all, any meaningful contact in the postpartum visit with a medical provider capable of identifying and treating health problems and delivering health education messaging might lead to improved health outcomes.

Andersen's behavioral model suggests that access to health services is equitable when patients' demographic and need factors explain health services use, and is inequitable when enabling variables drive patterns of usage. This work suggests that access to postpartum health services, similar to access to other types of health services, is not entirely equitable, with a number of enabling factors predicting use of the postpartum visit. With the goal of equity in health care and health outcomes looming large in the consciousness of patients, providers, insurers and policy-makers, models such as Andersen's may help to more clearly elucidate barriers to achieving this goal.

Though national, state-level and local policies aimed at the improvement of adverse pregnancy outcomes have traditionally focused on ensuring adequate prenatal care, such initiatives have not been shown to significantly impact rates of preterm birth or low birth weight (10). Slowly, emphasis has begun to shift toward considering adequate interconception care as a means of improving reproductive and overall health outcomes. A number of Healthy Start Initiatives throughout the country have adopted models of promoting interconception health as a supplement to their endeavors aimed at ensuring adequacy of antenatal care. The postpartum visit can be considered a first step towards appropriate health care between pregnancies. Further work could evaluate the impact of compliance with and quality of the postpartum visit upon subsequent health care. As maternal and child health policy trends increasingly toward a focus on access to and quality of health care prior to and between pregnancies, work such as that presented here should aid an understanding of potential obstacles to this streamlining of reproductive and basic health care.

Table 1. Characteristics of the study cohort

<i>Characteristic</i>	<i>% of Respondents</i>
Age <30	79.5
Primiparous	40.5
Race/Ethnicity	
White	12.7
Black	71.6
Hispanic	15.7
Education	
Less than high school	34.5
High school	38.6
More than high school	26.8
Healthy Start Participation	21.4
Insurance type	
Medicaid	67.7
Other	32.3
Annual household income <\$15,000	79.4
Current Aid to Families with Dependent Children (AFDC) receipt	54.4
Number of moves in past year	
0	69.2
1	22.7
≥2	8.1
Intended pregnancy	28.1
Exclusively breastfeeding	7.8
Preterm delivery (<37 weeks gestation)	80.2

Low birth weight infant (<2500g)	12.5
Maternal chronic health problem	37.0
Postpartum visit completed	86.5

Table 2. Factors associated with compliance with the postpartum visit

Factor	Compliance with PPV (%)	OR (95% CI)	p-value
<i>Predisposing factors</i>			
Age			
<30*	85.7		
≥ 30	89.1	1.37 (0.77, 2.41)	0.278
Race/Ethnicity			
Hispanic*	91.1		
White	80.8	0.47 (0.17, 1.30)	0.150
Black	86.2	0.61 (0.24, 1.51)	0.307
Parity			
Primiparous*	87.3		
Multiparous	85.9	0.89 (0.55, 1.44)	0.637
Total Household Size			
2 persons*	76.5		
2-5 persons	87.6	2.18 (0.79, 5.98)	0.130
6-8 persons	89.1	2.50 (0.81, 7.20)	0.089
>9 persons	73.0	0.83 (0.25, 2.73)	0.761
Education			
Less than high school*	83.9		
High school or higher	87.8	1.38 (0.87, 2.19)	0.166
Any time spent doubled up in housing or living with friend/relative			
Yes	82.7	0.64 (0.40, 1.02)	0.061
No*	88.1		

Regular church attendance			
Yes	88.8	1.05 (1.00, 1.10)	0.043
No*	83.2		
Enabling factors			
Annual household Income			
<\$15,000*	85.0		
≥\$15,000	91.9	1.98 (1.02, 3.86)	0.039
Current AFDC receipt			
Yes	83.3	0.61 (0.39, 0.97)	0.008
No*	90.3		
Number of moves in past year			
< 2*	87.3		
≥ 2	76.4	0.47 (0.25, 0.89)	0.019
Language used by provider			
English	86.8	0.94 (0.91, 0.98)	0.001
All others*	89.7		
Trouble understanding the provider			
Yes	84.3	0.65 (0.44, 0.97)	0.036
No*	87.2		
Received complete teaching on antenatal topics during prenatal visits			
Yes	85.9	0.85 (0.54, 1.36)	0.514
No*	87.7		
Continuity relationship with provider at delivery			

Yes	88.0		
No	85.0	0.94 (0.63, 1.42)	0.031
Reminder sent from provider's office			
Yes	91.1	2.24 (1.35, 3.72)	<0.001
No	80.9		
Healthy Start Participation			
Yes	82.6	0.68 (0.44, 1.04)	0.075
No	87.5		
Type of insurance			
Medicaid	84.9		
Other	89.3	1.42 (0.95, 2.12)	0.098
Problems traveling to provider's office			
Yes	81.0	0.59 (0.39, 0.90)	0.014
No	87.5		
Need factors			
Gestational age at delivery			
< 34 weeks	85.8		
35-37 weeks	84.7	0.91 (0.38, 2.20)	0.841
> 38 weeks	86.9	1.10 (0.52, 2.33)	0.810
Treated badly in pregnancy by family, friends or baby's father			
Yes	80.9	0.60 (0.34, 1.02)	0.061
No	87.8		
Maternal chronic health problem			
Yes	91.7	1.84 (0.93, 3.64)	0.074

No	85.7		
Exclusively breastfeeding			
Yes	93.5	2.31 (0.73, 7.33)	0.142
No	86.2		

Table 3. Multiple regression model for compliance with postpartum visit

<i>Factor</i>	<i>Adjusted OR*</i>	<i>95% CI</i>	<i>p-value</i>
Chronic health condition	2.49	(1.07, 5.80)	0.034
≥2 moves in pregnancy	0.35	(0.18, 0.67)	0.002
Trouble understanding provider's language	0.65	(0.43, 0.99)	0.048
Problem traveling to provider	0.59	(0.04, 0.89)	0.013
Received reminder from provider	2.37	(1.40, 4.02)	0.001

*Model adjusted for maternal age, race, parity and insurance status. Reference group includes women without a chronic health condition, fewer than two moves in pregnancy, no trouble understanding or traveling to the provider and whom did not receive an appointment reminder.

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