WIC Mothers' Social Environment and Postpartum Health on Breastfeeding Initiation and Duration

Sandra Asantewaa Darfour-Oduro¹ and Juhee Kim²

Abstract

A low breastfeeding rate has been a consistent maternal and child health problem in the United States, especially for low-income families. Understanding mothers' social environment and overall well-being is important in determining how mothers will take care of themselves and their infants during the postnatal period in relation to the breastfeeding rate among low-income mothers. In this study, we examined the effects of the social environment of mothers enrolled in a Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) program in eastern Illinois and their postpartum health on breastfeeding initiation ($n=103$) and maintaining breastfeeding for at least 3 months ($n=73$). Using logistic regression models, a significant positive association (adjusted odds ratio [AOR]=3.47; 95% confidence interval [CI], 1.15–10.47; $p=0.03$) between marital status and breastfeeding initiation and a significant negative association (AOR=0.23; 95% CI, 0.06–0.88) between receiving food stamps and breastfeeding initiation were found. WIC mothers who were married were 4.1 times as likely to maintain any breastfeeding for at least 3 months than single mothers, and the association was significant (AOR=4.08; 95% CI, 1.36–12.27; $p=0.01$). The breastfeeding initiation rate was 77.7%, however, the mean $\pm$ standard deviation age of the child when breastfeeding stopped was 2.2 ± 1.4 months. There was a nonsignificant association between postpartum depression and breastfeeding initiation and maintaining any breastfeeding for 3 months. This study has shown that the familial environment of mothers plays a very important role in improving breastfeeding rates among WIC mothers. In addition, there is a negative relationship between using a food assistance program and breastfeeding among low-income women.

Introduction

THE SHORT- AND LONG-TERM health benefits of breastfeeding are well documented and universally accepted.^{1–4} The American Academy of Pediatrics⁵ recommends exclusive breastfeeding for about 6 months, followed by continued breastfeeding as complementary foods are introduced. They contend that breastfeeding should continue for 1 year after birth or longer, as mutually desired by the mother and infant. The National Immunization survey report showed that breastfeeding rates in the United States have increased over the last 10 years but still fall short of the recommendations. The report showed that the rate of breastfeeding initiation was 77% and that the rate for continued breastfeeding at 6 months was 49% in 2010.⁶ The Healthy People 2020 objective is to increase breastfeeding initiation to 81.9%, exclusive breastfeeding through 3 months to 46.2%, and to 60.6% for continuation of breastfeeding at 6 months.⁷

The study of Li et al.⁸ found that mothers with higher socioeconomic status had consistently higher breastfeeding

rates than mothers with low socioeconomic status. Mothers of children receiving Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) benefits during the first year of life were less likely to initiate or maintain breastfeeding than mothers whose children were not in WIC.⁸ WIC is a national program that provides nutrition education, growth monitoring, breastfeeding promotion and support, and food to low-income pregnant or postpartum women, infants, and children <5 years of age. The National Immunization survey reported that 68% of WIC mothers initiated breastfeeding, 26% breastfed exclusively for 3 months,⁹ and 34% continued breastfeeding for 6 months.¹⁰

Mothers' social environment and postpartum health are important factors needed to understand breastfeeding practices. The study of Meyerink and Marquis¹¹ found that mothers who were married or lived with a partner were significantly more likely to initiate breastfeeding. The National Immunization survey also reported that 82% of married mothers initiated breastfeeding, whereas 61% of single mothers did.¹⁰ Of those who breastfed exclusively for 3

¹Department of Kinesiology and Community Health, University of Illinois at Urbana-Champaign, Urbana, Illinois.

²Center for Health Disparities, Department of Public Health, East Carolina University, Greenville, North Carolina.

months, 39% were married, and 21% were unmarried.⁹ Family structure seems to be an important social factor in breastfeeding decisions.

Studies have reported that postpartum weight retention and depressive symptoms are two leading health conditions that are important for community healthcare agencies to address among low-income women.^{12,13} The study of Petterson and Albers¹⁴ found that having limited socioeconomic resources is associated with greater risk of symptoms of depression. Postpartum depression has been associated with more reports of feeding difficulties and lesser satisfaction with breastfeeding.¹⁵⁻¹⁷

Previous research has examined mothers' own health and social environments that do not include potential benefits of government assistance programs on breastfeeding. To date, few have examined the impact of broad social environments including use of government assistance programs and postpartum health conditions on breastfeeding initiation and duration at the same time, especially among women enrolled in a WIC program.^{8,11,13,18}

A mother's decision to initiate breastfeeding is marked by complex factors such as attitudes and concerns surrounding inconvenience, difficulty, and embarrassment.^{19,20} There are also both physical and psychological factors that affect breastfeeding duration among mothers who wish to breastfeed.²¹

In this study, we aimed to evaluate the factors associated with breastfeeding initiation and duration in order to better understand why breastfeeding rates are much lower among low-income mothers. This study hypothesizes that WIC mothers who have favorable social environments, including the use of government assistance programs, and are in good health postpartum would be more likely to initiate breastfeeding and maintain exclusive or any breastfeeding for 3 months.

Materials and Methods

Participant recruitment

We conducted a cross-sectional survey study, which recruited mother-infant dyads enrolled in a local WIC program in eastern Illinois, to examine the effects of WIC mothers' social environment and postpartum health on breastfeeding initiation and duration. We excluded infants who were younger than 3 months when we evaluated any and exclusive breastfeeding for 3 months ($n=73$) to avoid a misclassification error. For other analyses, we included all samples ($n=103$). Study participants were recruited in the waiting room at a WIC program office in Illinois. Although 278 mothers were contacted to take part in the study, 107 mothers (38.5%) completed the study from October 2009 to August 2011. At the end of the study, two infants were excluded because they were not enrolled in WIC but had visited the Public Health Department for other reasons, and data from an additional two participants were also excluded because they were not the biological mothers of the infants. The total analytic sample for this study was 103 biological mothers.

Survey measures

The independent variables used in this study were survey questions about WIC mothers' social environment and postpartum health. The social environment variables collected were marital status (married/single), employment (yes/no),

use of government assistance programs such as welfare/cash assistance (yes/no), and food stamps (yes/no). To examine mothers' postpartum health, the questions asked were as follows: "Have you ever been diagnosed with postpartum depression (yes/no)," and "Do you feel like you have had postpartum depression without a doctor diagnosing you (yes/no)?" For mothers' current weight, the question asked was as follows: "How would you classify your current weight (overweight/not overweight)?" The dependent variables were breastfeeding initiation (yes/no), maintaining any breastfeeding for at least 3 months (yes/no), and maintaining exclusive breastfeeding for at least 3 months (yes/no). The covariates used were child's age, sex and race. Lastly, we modified the corresponding breastfeeding cessation question from the Pregnancy Risk Assessment Monitoring System²²: "If you stopped breastfeeding, please tell us the reasons why you stopped. (check all that apply)":

- I was worried he/she was not getting enough (yes/no).
- His/her grandmother was worried he/she was not getting enough (yes/no).
- He/she was not growing fast enough (yes/no).
- He/she always seemed hungry (yes/no).
- I could not make enough milk to satisfy him/her (yes/no).
- My doctor told me I should stop because he/she had medical reasons (yes/no).
- My doctor told me I should stop because he/she was not growing (yes/no).
- I had to go back to work or school (yes/no).
- He/she started childcare (yes/no).
- It became painful (yes/no).

Statistical analysis

A descriptive analysis was done to determine the characteristics of the study participants' social environment and postpartum health (Table 1). A bivariate analysis was done on mothers' social environment variables and postpartum health by breastfeeding practices. The continuity-adjusted chi-squared test value was used to determine significance of unadjusted associations between mothers' social environment variables and postpartum health variables on breastfeeding initiation and maintaining exclusive breastfeeding for at least 3 months and maintaining any breastfeeding for at least 3 months. In cases where the chi-squared test assumptions were not satisfied, the p value from Fisher's exact test was used. As the statistical significance of the test, a two-sided alpha of 0.05 was used. Using the logistic regression model, each mother's social environment variables and postpartum health variables were used to predict breastfeeding initiation and maintaining exclusive and any breastfeeding for at least 3 months while controlling for the child's age, sex, and race. We used the Hosmer-Lemeshow goodness-of-fit statistics test to evaluate the model fit of all logistic models. The survey data were analyzed using SPSS version 20 software (SPSS, Inc., Chicago, IL) and SAS software (SAS Institute, Cary, NC).

Results

The breastfeeding initiation rate was 77.7%, and 89% of mothers did not breastfeed exclusively for at least 3 months

TABLE 1. DESCRIPTIVE STATISTICS OF THE SOCIAL ENVIRONMENT, POSTPARTUM DEPRESSION, AND BREASTFEEDING INITIATION ($N=103$)

Factor	n (%)
Social environment	
Marital status	
Married	44 (42.7)
Single	59 (57.3)
Employment status	
Employed	46 (44.7)
Unemployed	57 (55.3)
Maternity leave	
Received paid maternity leave	10 (11.5)
Did not receive paid maternity leave	77 (88.5)
Child care assistance from government source	
Received child care assistance	34 (33.7)
Did not received child care assistance	67 (66.3)
Postpartum health	
Postpartum depression	
Mothers who were diagnosed with postpartum depression	17 (17)
Mothers who were not diagnosed with postpartum depression	83 (83)
Mother's weight	
Overweight	46 (44.7)
Not overweight	56 (54.4)
Breastfeeding	
Breastfeeding initiation	
Children who were breastfed	80 (77.7)
Children who were never breastfed	23 (22.3)
Exclusive breastfeeding at least 3 months ^a	
Children who were exclusively breastfed at least 3 months	8 (11.0)
Children who were not exclusively breastfed for at least 3 months	65 (89.0)
Any breastfeeding at least 3 months ^a	
Children who were breastfed for at least 3 months	23 (31.5)
Children who were not breastfed for at least 3 months	50 (68.5)

^aBased on the children who were older than 3 months ($n=73$).

(Table 1). The mean age of the child when breastfeeding was stopped was 2.2 ± 1.4 (standard deviation) months. The main reasons mothers stopped breastfeeding were that they could not make enough milk to satisfy their babies ($n=27$, 61.4%), they were worried their children were not getting enough ($n=21$, 50%), and their babies always seemed hungry ($n=16$, 38.1%).

Bivariate analyses indicated a wide variation in breastfeeding practices. Among mothers who were married, 88.6% did initiate breastfeeding, whereas 69.5% of single mothers initiated breastfeeding. Among mothers who did not receive food stamps, 90.9% initiated breastfeeding, whereas 71.4% of those who received food stamps initiated breastfeeding (Table 2). Only 76.5% of mothers diagnosed with postpartum depression initiated breastfeeding, and 92.3% of those who initiated breastfeeding had stopped exclusive breastfeeding before 3 months (Table 2). There was a significant association between marital status and breastfeeding initiation ($p=0.02$) and maintaining any breastfeeding for at least 3 months ($p=0.01$). A significant association was also found

between access to food stamps and breastfeeding initiation ($p=0.03$) (Table 2).

Logistic regression models were used to predict breastfeeding initiation and maintaining 3 months of any and exclusive breastfeeding from each of the mothers' social environment and postpartum health variables individually while adjusting for the child's age, sex and race. WIC mothers who were married were 3.47 times as likely to initiate breastfeeding (adjusted odds ratio [AOR]=3.47; 95% confidence interval [CI], 1.15–10.47; $p=0.03$). There was a statistically significant negative association (AOR=0.23; 95% CI, 0.06–0.88; $p=0.03$) between access to food stamps and breastfeeding initiation. There was also a significant association between marital status and maintaining any breastfeeding at least 3 months (AOR=4.08; 95% CI, 1.36–12.27; $p=0.01$). None of the other variables for social environment and postpartum health was statistically significant with breastfeeding initiation, maintaining exclusive breastfeeding, and any breastfeeding for at least 3 months (Table 3). All logistic models showed no evidence of lack of fit by the Hosmer–Lemeshow goodness-of-fit statistics test.

Discussion

A significant finding from this study is that marriage and not receiving food stamps enhances breastfeeding initiation and maintaining any breastfeeding for at least 3 months. Mothers who were married were 3.47 times as likely to initiate breastfeeding and 4.08 times as likely to maintain any breastfeeding for more than 3 months compared with mothers who were single. Also, breastfeeding mothers were mothers who did not receive food stamps. The unadjusted associations were significant for marriage and breastfeeding initiation, not receiving food stamps and breastfeeding initiation, and, lastly, marriage and maintaining any breastfeeding for 3 months. After adjusting for the child's age, sex, and race, the associations were still significant. This could mean that marriage and not receiving food stamps have an effect on breastfeeding initiation and duration. The findings of this study is consistent with the findings of the study of Meyerink and Marquis,¹¹ who found that mothers who were married or had a partner were significantly more likely to initiate breastfeeding. These authors also found that breastfeeding mothers were mothers who were less likely to receive food stamps.

The breastfeeding initiation rate reported in our study was 77.7%. Among those who initiated breastfeeding, 11% maintained exclusive breastfeeding for at least 3 months, and 31.5% also maintained any breastfeeding for at least 3 months. The findings of this study were consistent with the findings from the study of Li et al.,⁸ which found that mothers with lower socioeconomic status had consistently lower breastfeeding rates. Furthermore, the rates of breastfeeding reported in our study were consistently lower than those of Healthy People 2020, which is 81.9% for breastfeeding initiation, 25.5% for exclusive breastfeeding and 60.6% for any breastfeeding for 6 months.⁷

This study examined mothers' postpartum health. The results showed that mothers who were diagnosed with postpartum depression had consistently lower breastfeeding rates than mothers who were not diagnosed with postpartum depression (76.5% versus 78.3% for breastfeeding initiation,

TABLE 2. EFFECTS OF SOCIAL ENVIRONMENT AND MOTHER'S HEALTH FACTORS ON BREASTFEEDING PRACTICES

<i>Factor</i>	<i>Breastfeeding initiation (n = 103)</i>			<i>Maintaining exclusive breastfeeding at least 3 months (n = 73)</i>			<i>Maintaining any breastfeeding at least 3 months (n = 73)</i>		
	<i>Yes</i>	<i>No</i>	χ^2 test (p value)	<i>Yes</i>	<i>No</i>	χ^2 test (p value)	<i>Yes</i>	<i>No</i>	χ^2 test (p value)
Social environment									
Marital status			0.02 ^a			NS			0.01 ^a
Married	39 (88.6)	5 (11.4)		5 (17.2)	24 (82.8)		14 (48.3)	15 (51.7)	
Single	41 (69.5)	18 (30.5)		^b (6.8)	41 (93.2)		9 (20.5)	35 (79.5)	
Employment status			NS			NS			NS
Employed	38 (82.6)	8 (17.4)		^b (6.3)	30 (93.8)		7 (21.9)	25 (78.1)	
Unemployed	42 (73.7)	15 (26.3)		6 (14.6)	35 (85.4)		16 (39.0)	25 (61.0)	
Government child care assistance			NS			NS			NS
Received child care assistance	26 (76.5)	8 (23.5)		^b (7.4)	25 (92.6)		7 (25.9)	20 (74.1)	
Did not receive child care assistance	52 (77.6)	15 (22.4)		6 (13.3)	39 (86.7)		16 (35.6)	29 (64.4)	
Welfare/cash assistance			NS			NS			NS
Received welfare/cash assistance	13 (76.5)	^b (23.5)		^b (7.7)	12 (92.3)		^b (23.1)	10 (76.9)	
Did not receive welfare/cash assistance	66 (78.6)	18 (21.4)		7 (12.1)	51 (87.9)		20 (34.5)	38 (65.5)	
Food stamps			0.03 ^a			NS			NS
Received food stamps	50 (71.4)	20 (28.6)		5 (9.4)	48 (90.6)		17 (32.1)	36 (67.9)	
Did not receive food stamps	30 (90.9)	^b (9.1)		^b (15.0)	17 (85.0)		6 (30.0)	14 (70.0)	
Borrowing money			NS			NS			NS
Has someone to borrow money from	62 (76.5)	19 (23.5)		7 (12.1)	51 (87.9)		19 (32.8)	39 (67.2)	
Has no one to borrow money from	18 (81.8)	^b (18.2)		^b (6.7)	14 (93.3)		^b (26.7)	11 (73.3)	
Postpartum health									
Postpartum depression			NS			NS			NS
Diagnosed	13 (76.5)	^b (23.5)		^b (7.7)	12 (92.3)		^b (23.1)	10 (76.9)	
Not diagnosed	65 (78.3)	18 (21.7)		7 (11.9)	52 (88.1)		20 (33.9)	39 (66.1)	
Self-perceived depression			NS			NS			NS
Felt depressed but was not diagnosed	14 (66.7)	7 (33.3)		^b (5.6)	17 (94.4)		^b (22.2)	14 (77.8)	
Did not feel depressed	65 (78.3)	18 (21.7)		7 (13.2)	46 (86.8)		19 (35.8)	34 (64.2)	
Weight status			NS			NS			NS
Overweight	36 (78.3)	10 (21.7)		^b (10.8)	33 (89.2)		12 (32.4)	25 (67.6)	
Not overweight	44 (78.6)	12 (21.4)		^b (11.4)	31 (88.6)		11 (31.4)	24 (68.6)	

Data are number (%).

^aSignificant difference^bFewer than five cases.NS, not significant ($p = 0.05$).

TABLE 3. LOGISTIC REGRESSION MODEL: ODDS RATIOS AND CONFIDENCE INTERVALS OF EFFECTS OF MOTHERS' SOCIAL ENVIRONMENT AND POSTPARTUM HEALTH ON BREASTFEEDING INITIATION, EXCLUSIVE BREASTFEEDING FOR AT LEAST 3 MONTHS, AND ANY BREASTFEEDING FOR AT LEAST 3 MONTHS

Factor	Breastfeeding initiation (n = 103)		Maintaining exclusive breastfeeding at least 3 months (n = 73)		Maintaining any breastfeeding at least 3 months (n = 73)	
	Odds ratio (95% CI)	p value	Odds ratio (95% CI)	p value	Odds ratio (95% CI)	p value
Social environment						
Marital status	3.47 (1.15–10.47) ^a	0.03 ^a	2.83 (0.5–14.45)	NS	4.08 (1.36–12.27) ^a	0.01 ^a
Employment	1.72 (0.65–4.54)	NS	0.35 (0.06–2.13)	NS	0.44 (0.15–1.26)	NS
Child care assistance from government	0.97 (0.36–2.67)	NS	0.76 (0.13–4.51)	NS	0.59 (0.2–1.73)	NS
Welfare/cash assistance	0.84 (0.23–3.06)	NS	1.62 (0.14–18.60)	NS	0.5 (0.12–2.16)	NS
Food stamps	0.23 (0.06–0.88) ^a	0.03 ^a	1.16 (0.21–6.35)	NS	0.99 (0.31–3.18)	NS
Borrowing money	0.69 (0.21–2.32)	NS	1.66 (0.17–15.74)	NS	1.31 (0.36–4.78)	NS
Postpartum health						
Postpartum depression diagnosis	0.88 (0.25–3.13)	NS	1.68 (1.14–19.94)	NS	0.52 (0.12–2.23)	NS
Self-perceived depression	0.43 (0.14–1.32)	NS	0.49 (0.05–4.74)	NS	0.47 (0.13–1.7)	NS
Current weight	1.00 (0.38–2.63)	NS	1.13 (0.24–5.42)	NS	0.97 (0.35–2.68)	NS

The model was controlled for the child's age, sex, and race. All Hosmer–Lemeshow goodness-of-fit statistics tests were at $p > 0.05$.

^aSignificant at $p < 0.05$.

CI, confidence interval; NS, not significant.

7.7% versus 11.9% for exclusive breastfeeding for at least 3 months, and 23.1% versus 33.9% for any breastfeeding for at least 3 months). A similar trend was also seen among mothers who felt depressed but were not diagnosed (66.7% versus 78.3% for breastfeeding initiation, 5.6% versus 13.2% for exclusive breastfeeding for at least 3 months, and 22.2% versus 35.8% for any breastfeeding). Our findings were consistent with the findings of Hatton et al.,²³ who also reported that at 6 weeks of postpartum, breastfeeding mothers had fewer depressive symptoms, and the association was statistically significant. However, in our study, despite the consistently lower rates of postpartum depression and breastfeeding, the associations were not statistically significant. Walker et al.¹³ also reported that the prevalence of elevated depressive symptoms at 6 weeks postpartum was 60% in low-income women.

Strength of the study

This study is among the few to explore the impact of social environment, including government assistance program and postpartum health, on breastfeeding initiation and duration among women enrolled in the WIC program. The results from this study indicate that breastfeeding education and promotion among WIC mothers need to be developed based on the mother's marital status. In addition, it is noted that the current benefits of this government assistance program do not yield any favorable breastfeeding rates. Thus, the development of breastfeeding promotion strategies among government assistance programs would be warranted. For example, food stamps may have additional benefit for breastfeeding mothers. The effort to understand facilitators and barriers of unmarried women and how to incorporate them in the WIC breastfeeding program are greatly needed among low-income women. Lastly, tracing the importance of poverty, social support, postpartum health, and overweight/obesity percep-

tions in determining breastfeeding practices can inform interventions to improve breastfeeding practices and adherence to breastfeeding recommendations.

Limitations of the study

Most of the associations between WIC mothers' social environment and postpartum health on breastfeeding initiation and duration were not statistically significant. This could be due to the small sample size used in this study. In addition, there were no differences between the crude and adjusted estimates in this study. These results could suggest that covariates of age, sex, and race of children may not be important indicators to explain the maternal decision to breastfeeding. Again, this indirectly supports the study findings about the importance of the maternal familial and financial situation rather than the child's characteristics in breastfeeding promotion. Also, because of the young children enrolled in our study, we only used 3 months of breastfeeding rates as the breastfeeding outcome variable instead of using the recommended 6 months. However, given that the 3-month rates were still much lower compared with those of other studies, this study presents additional importance in the breastfeeding promotion program among WIC mothers, and the rates were still much lower compared with the recommended rates at 6 months.

Conclusions

This study has shown that marriage and not receiving food stamps play very important roles in promoting breastfeeding initiation and maintaining any breastfeeding for 3 months among WIC mothers. The main barrier to breastfeeding was not making enough milk to satisfy the baby. Finally, the study was conducted using a convenient sample of WIC mothers from an eastern Illinois region of the United States, and thus the results may not be generalizable to other geographic

regions in the nation. The study's limitations warrant caution in interpreting the findings.

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Disclosure Statement

No competing financial interests exist.

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Address correspondence to:
 Juhee Kim, MS, ScD
 Center for Health Disparities
 Department of Public Health
 East Carolina University
 1800 West 5th Street
 Medical Pavilion Suite 9, MS-643
 Greenville, NC 27834

E-mail: kimju@ecu.edu