

Prenatal Education, Significant Other Support and Demographic Determinants of Breastfeeding within a Rural Community

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Abstract

Introduction: Breastfeeding is the most natural and nutritious way to encourage a baby's optimal development and research over the past two decades clearly indicates multiple benefits to infants. Still, underprivileged, underserved, and minority women are not breastfeeding at rates that are comparable with national averages. National estimates indicate breastfeeding is initiated at much lower rates for minorities, adolescent mothers, socio-economically disadvantaged women and women who reside in rural areas.

Purpose: This study evaluated the impact of prenatal education, significant other support and demographics on breastfeeding initiation of women residing in a small rural community.

Methods: The study used a cross-sectional design that prospectively examined the breastfeeding intentions of the targeted population. A convenience sample of 41 post-partum women were recruited from a rural hospital within 48 hours of giving birth. Participants were administered a self-reporting 27-item questionnaire. Descriptive, Pearson's rho and chi-square analysis were conducted to determine associations.

Results: Approximately 65.9% of the women reported initiating breastfeeding. Prenatal education was not statistically significant associated using chi-square analysis at $p < 0.05$. Based on a Likert scale ranging from 1- least supportive to 3- very supportive, breastfeeding moms report a high level of support from healthcare providers and family members with mean scores ranging from 2.44 to 2.96. Older, more educated and women who had breastfed a previous baby were more likely to breastfeed at $p < 0.05$. Breastfeeding was initiated at higher rates in women whose extended family were breastfed.

Conclusion: Continued research aimed at increasing breastfeeding in rural communities will be useful in identifying best practices that will improve the health of mothers and infants.

Keywords: Breastfeeding, Healthcare, Rural community,

Prenatal Education, Significant Other Support and Demographic Determinants of Breastfeeding within a Rural Community

Extensive research conducted over the past two decades has shown multiple benefits of breastfeeding. Initiatives by the American Academy of Pediatrics (AAP), the U. S. Department of Health and Human Services (USDHHS), Centers for Disease Control and Prevention (CDC), Healthy People 2010, and The World Health Organization (WHO) have resulted in a gradual increase in breast-feeding rates in the United States. In 2005 the overall initiation rate was 71% (Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion, 2013). According to the CDC Division of Nutrition, Physical Activity, and Obesity National Immunization survey (2014), breastfeeding rates continue to rise, and in 2009 they increased from 74.6% to 76.9% representing the largest annual increase over the previous decade. Breastfeeding at 6 months increased from 44.3% to 47.2% and from 23.8%

to 25.5% at 12 months. In 2011, 79% of newborns were breastfed immediately after birth. Yet breastfeeding did not continue for as long as recommended. Of infants born in 2011, 49% were breastfeeding at 6 months and 27% at 12 months.

“Healthy People 2020: Maternal, Infant, and Child Health” published by the U. S. Department of Health & Human Services (USDHHS) 2011 objectives for breastfeeding are:

- Ever breastfeed 81.9 %
- At 6 months 60.6 %
- At 1 year 34.1 %
- Exclusive through 3 months 46.2 %
- Exclusive through 6 months 25.5 %

It is encouraging that the overall breastfeeding rate has increased in the United States. There are however significant disparities within these data as rates vary widely by ethnicity, age, marital status, education, and income. National estimates indicate while breastfeeding continues to increase across all racial/ethnic groups, breast feeding is initiated at much lower rates for non-Hispanic Black children compared to non-Hispanic White, or Hispanic children (Belanoff, McManus, Clark, McCormick, Subramanian, 2012). A retrospective population-based cohort study of all live births in 2006 and 2007 in the state of Ohio concluded adolescent mothers who have the least social support and are socio-economically disadvantaged are the least likely to breastfeed their newborns (Apostolakis-Kyrus, Valentine & DeFranco, 2013). Of the adolescent mothers, 44% initiated breastfeeding compared to 65% of older women. Another study showed women who participate in Women, Infants, and Children (WIC) program are almost 12% less likely to initiate breastfeeding than the general population and are less likely to continue for a year (Hedberg, 2013). A combined longitudinal cohort study of 1292 women paralleled with an

ethnographic study of 30 families in North Carolina concluded rural breastfeeding rates lag behind national averages (Cadigan, Flower, Perrin, Randolph & Willoughby, 2008).

On the Eastern Shore of Virginia, a low income, rural and medically underserved area, rates are much lower than national norms. Data collected from hospital records in 2007 indicated that 34% of mothers initiated breastfeeding. The current statistics are disappointing at 30% , significantly less than the Healthy People 2020 target objectives for breastfeeding.

Research cites many barriers to successful breastfeeding including lack of knowledge, feelings of embarrassment, and a lack in their professional and social support (Beattie-Fairchild, 2013). The lack of staff to provide conventional in-home support has led some communities to explore telemedicine as an adjunct to assist women once they have been discharged (Macnab, Rojjanasrirat & Sanders, 2012). Rapid return to work following childbirth has also been cited as a significant barrier to breastfeeding (Rojjanasrirat & Sousa, 2010). Other barriers include maternal attitudes and inconsistent breastfeeding friendly hospital policies and procedures. Opportunities exist for implementing Baby Friendly Hospital Initiatives (BFHI) to improve breastfeeding rates in these disadvantaged women. This study evaluated the impact of breastfeeding education and significant other support on breastfeeding initiation in the population studied. Demographic factors were also assessed to determine breastfeeding initiation associations.

Review of the Literature

Breastfeeding is the most natural and nutritious way to encourage a baby's optimal development. The American Academy of Pediatrics (AAP) in its 2012 policy statement outlines many benefits of breastfeeding (American Academy of Pediatrics, 2012). The risk of hospitalization for lower respiratory tract infections during the first year of life has been reduced

by 72% in infants breastfed for 4 months exclusively. Otitis media has been shown to be reduced by 33% and four randomized clinical trials performed between 1983 and 2005 support the conclusion that premature infants that have been breastfed have a 58% reduction in the incidence of necrotizing enterocolitis. Breastfeeding for any length of time has been associated with a 64% reduction in nonspecific gastrointestinal tract infections. Other benefits include reduction in severity of a wide range of infectious diseases such as bacterial meningitis, urinary tract infections and sepsis in preterm infants (Pound & Unger, 2012). Breastfeeding helps the baby's immune system mature, protecting against viral, bacteria and parasitic infections. It also increases the effectiveness of immunizations thereby increasing protection against polio, tetanus, and diphtheria. The skin to skin contact encouraged in the first hour of birth increases breastfeeding rates and duration as well as enhances emotional security and maternal bonding (Phillips, 2013).

The benefits for the mother are not as well studied as the advantages to the child; however there is sufficient evidence of maternal benefits. Women who have breastfed for two years or more show a 37% lower risk of developing coronary heart disease. Longer duration of breastfeeding is also associated with reduced incidences of type II diabetes and lowered risks of ovarian, uterine, and breast cancer (Godfrey & Lawrence, 2010). Women who breastfeed for 24 months have a 25 percent lower risk of premenopausal breast cancer (Steinkraus, 2007). Breast milk is always fresh, perfectly clean, just the right temperature and is the healthy choice at the least expensive cost. Oxytocin produced after childbirth stimulates contractions, minimizing blood loss and encouraging rapid uterine toning. Because breastfed babies are generally healthier, their mothers miss less work and spend less time and money on pediatric care.

Breastfeeding women report psychological benefits such as increased self-confidence and a stronger sense of connection with their babies.

There are social and community implications of breastfeeding as well. One estimate suggests if 90 percent of US women breast-fed exclusively for 6 months, there could be a cost savings of \$13 billion due to the direct and indirect costs of otitis media, gastroenteritis, necrotizing enterocolitis, lower respiratory tract infections, atopic dermatitis, obesity, sudden infant death syndrome, childhood asthma, childhood leukemia, type 1 diabetes, and the cost of premature death (Bartick & Reinhold, 2010).

The American Academy of Pediatrics (2005) outlined specific strategies to improve breastfeeding initiation rates that include the following:

- Pediatricians and other health care providers should recommend breast feeding and provide complete, current information to all parents so that their decision is informed.
- Education and practices to optimize breastfeeding initiation and maintenance should include education both before and after delivery.
- Avoid procedures or medications that interfere with breastfeeding.
- Assess attitudes about infant feeding from healthcare providers, significant others and pregnant women.
- Healthy infants should be placed in skin to skin contact with the mother immediately after delivery and until the first breastfeeding is initiated.
- Newborns should remain with mothers 24 hours a day and breast feed at least 8 times a day.
- Supplements should not be given to breast fed infants unless ordered by a physician for medical reasons.

- Formal evaluation and documentation of breastfeeding should be undertaken by trained caregivers at least twice daily and include observation of position, latch, and milk transfer.
- The role of health care providers to support optimal breastfeeding includes making it the cultural norm, providing enthusiastic support, promoting hospital feedings that support breastfeeding such as no formula gift packs and adequate encouragement by all staff.
- Training for hospital staff should be in depth and provided for all staff.
- Breast pumps should be available to all patients (Gartner et al., 2005).

The Baby-Friendly Hospital Initiative (BFHI), a global program launched by the World Health Organization and the United Nations Children's Fund similarly has outlined Ten Steps to Successful Breastfeeding (Pound & Unger, 2012). The guidelines (Table 1) were developed by a team of global experts and consist of evidence based practices that have been shown to increase breastfeeding initiation and duration.

Evidence based research has supported the role the Ten Step initiative has played in increasing breastfeeding initiation rates as well as sustainable breastfeeding up to 12 months, both exclusive breastfeeding and breastfeeding with supplemental fluids. A practice development initiative by Barnes, Cox, Doyle and Reed (2010) demonstrated significant changes in breastfeeding results after implementing Ten Step recommendations. An analysis of 317 retrospective chart reviews before the program and 273 prospective reviews post program revealed a 9% increase in exclusive breastfeeding at discharge and a 20% increase during the following 18 months. In the same study, a pre and post program survey was conducted to determine client knowledge and satisfaction.

Table 1

Ten Steps to Successful Breastfeeding

Step	Content
1	A written breastfeeding policy that is routinely communicated to all health care staff.
2	Train health care staff in skills necessary to implement the breastfeeding policy.
3	Inform all pregnant women about the benefits and management of breastfeeding.
4	Help mothers initiate breastfeeding within a half hour of birth.
	Show mothers how to breastfeed and maintain lactation, even when they are separated
5	from their infants.
6	Give newborns no food or drink other than breast milk, unless medically indicated.
7	Practice rooming-in, allow mothers and infants to remain together 24 hours a day.
8	Encourage breastfeeding on demand.
9	Give no artificial treats or pacifiers to breastfeeding infants
	Foster the establishment of breastfeeding support groups and refer mothers to them at
10	discharge from the hospital or clinic.

The convenience sample of 223 preprogram surveys and 161 post program surveys revealed significant differences ($t(378) = -4.976, p = .000$) in their responses related to breastfeeding preparation. With a maximum total score of 45 on a Likert scale, the preprogram participants had a mean score of 29.27, standard deviation of 10.74 while the post program participants had a mean of 34.05, standard deviation of 7.9. The postnatal satisfaction was similarly higher in the post program participants with a mean score of 36.19, standard deviation versus a mean score of

33.90, standard deviation of 5.182 in the preprogram group with a significant difference between the two groups ($t(378) = -4.375, p = .000$).

Similar results were found in a study by Kornides and Kitsantas (2013). Descriptive statistics and chi-square analyses were conducted to determine the association between prenatal variables and breastfeeding initiation and postpartum continuation at two months. An analysis of 3033 mother baby couplets at birth and another 2546 at two months postpartum revealed a significant relationship between maternal knowledge and breastfeeding initiation and continuation. An additional study by Pound and Unger (2012) showed 68% of mothers who experienced a minimum of five of the ten steps were still exclusively breastfeeding at 16 weeks as compared to those who had no exposure breastfeeding with rates of 53%.

Methods

Rural Setting

The study was conducted at the only local hospital on the Eastern Shore of Virginia. Riverside Shore Memorial is a 125 bed rural, community hospital with no other hospitals within a 45-60 mile radius. There is a level I nursery with an annual delivery rate of approximately 450. According to the US Census Bureau rural areas encompass all housing and territories not included within an urban area. The population is greater than 2500 without substantial commuting (Hart, Larson, & Lishner, 2005). The Eastern Shore is located on the east coast as part of the Delmarva Peninsula, a 70 mile stretch of rural land bordered on the east by the Atlantic Ocean, on the west by the Chesapeake Bay and on the north by the Eastern Shore of Maryland. The rural community is unique in that it is not connected by land to the rest of Virginia. Each of the two counties has been designated as medically underserved areas,

medically underserved populations, and health professional shortage areas by the Health Resources and Services Administration (2014).

The economy is heavily dependent on agriculture and seafood industries both of which are in decline, and there is limited manufacturing and industry. According to the latest community assessment (Kiger, 2011), an estimated 20% of the population lives in poverty, compared to a 10% rate for all of Virginia. Household income is about 57% the state average and can be traced to lower levels of educational attainment, fewer job options, and a chronic history of poverty and unemployment. Approximately 22% of the population lacks a high school diploma as compared to a state rate of 12.5%. The percentage of college graduates in the community is half the state average. The small peninsula is cultural diverse with 31.5% African American, white 59.7%, Hispanic 8.4%. The number of births to teenage mothers is double the state average. Only 47.3% of women who deliver live infants receive the recommended number of prenatal visits. 11.15% of the 556 babies born in 2009 were born with low weight ranking the Shore in the bottom quartile. The total infant death rate is 9 per 1000 while the state reference rate is 7.

Design

The study used was a cross-sectional, correlation design examining the relationship among breastfeeding initiation and prenatal education, significant other support and demographic factors-age, education, race, parity, and socio-economic status. Government funding included Medicaid, food stamps, WIC and Temporary Assistance for Needy Families (TANF). Breastfeeding initiation was defined as any breastfeeding during the hospital stay regardless to duration, continuation or supplementation with other fluids. The Health Belief Model was used as the framework for conducting the study. The model contains the following components: perceived threat, perceived benefits, perceived barriers, cues to action, other modifying variables,

and self-efficacy. The components work together to influence an individual's choice to take action or not (Boslaugh, 2014). It suggests certain cues to action such as prenatal education will encourage pregnant women to breastfeed. Families, peers and health care professionals exert influences that may either support or dissuade the decision. The model further purports certain demographic variables will have an impact on this decision; for instance the higher the educational level, the greater the likelihood that the woman will breastfeed or that minorities are less likely to initiate breastfeeding.

Instrument

The survey method was used to obtain data. Participants completed a 27 item self-reporting questionnaire. The instrument was developed by the primary investigator, a maternal child health nurse of 30 years. Validity was obtained by face value via expert evaluation, including PhD faculty, breastfeeding moms, and maternal child healthcare providers. The survey obtained pertinent demographic information, breastfeeding history and perceptions about significant other support. This was a pilot study. Additional instrument reliability and validity could be established in future research using multiple sites and participants.

Protection of Human Subjects

IRB approval as an exempt study was obtained as it met all of the criteria according to the Code of Federal Regulations (CFR), Title 45, Part 46.101(b) as "Exempt." Anonymity was addressed by the use of numerical codes with no identifiable data included.

Sample and Procedure

A convenience sample of 41 women was recruited during their initial 48 hours post-partum period. Exclusions were any pregnancy or neonatal complications that would delay initiation or continuation of infant feeding. Prospective participants were provided a cover letter to include

the nature of the study and that their anonymity would be protected. A \$10 Walmart gift card or gift of equal value was used to incentivize their participation. Completed questionnaires were identified by a numerical code and contained no identifiable patient related information. They were secured by lock and retrievable by the primary investigator only. Once the data was retrieved, it was entered into a password protected database accessible by the primary researcher exclusively.

Analysis and Findings

Descriptive statistics, Pearson’s rho and chi-square analysis were conducted to identify any associations between the independent variables and breastfeeding initiation. Using a Likert scale format, participants used a 3 point scale indicating their perceptions regarding significant other’s degree of support defined as 1) not supportive of the decision to breastfeed, 2) somewhat supportive and 3) very supportive. The mean scores for each of the variables determined the perception of significant other support in those women who initiated breastfeeding.

Table 2 represents descriptive statistics. The majority of the women (65.9%) reported initiating breastfeeding. 63.4% of the respondents reported receiving prenatal education while 36.6% did not. Of those that received prenatal education, 69.2% reported breastfeeding initiation compared to 60.0% who breastfed without the education.

Table 2

Demographics

Demographics	Study Group (N = 41)	Percentage (%)
Breastfeeding		
Yes	27	65.9 %
No	14	34.1 %
Breastfed previous child		
Yes	22	64.7 %
No	12	35.3 %

Extended family breastfed		
Yes	17	41.5 %
No	14	34.1 %
Unknown	10	24.4 %
Age		
20 & under	2	4.8 %
21-30	28	68.3 %
31-40	8	19.7 %
41-50	2	4.8 %
Unknown	1	2.4 %
Parity		
1	8	19.5 %
2	13	31.7 %
3	13	31.7 %
4	2	4.9 %
5	2	4.9 %
6	1	2.4 %
7	1	2.4 %
Ethnicity		
White	16	39.0 %
African American	19	46.3 %
Hispanics	5	12.2 %
Other	1	2.4 %
Marital Status		
Married	18	43.9 %
Divorced	1	2.4 %
Single	19	46.9 %
Separated	3	2.4 %
Educational Level		
Elementary school	1	2.4 %
High school	15	36.6 %
Some college	13	31.7 %
Associates degree	4	9.8 %
Bachelor's degree	6	14.6 %
Graduate degree	2	4.9 %
Household Income		
Less than \$20K	21	51.2 %
\$20K-\$50K	16	39.0 %
\$50K & over	4	9.8 %
Government funding received		
Yes	28	68.3 %
No	12	29.3 %
Unknown	1	2.4 %
Prenatal Education received		
Yes	26	63.4 %
No	15	36.6 %

Breastfeeding mothers report a high level of support from healthcare providers and family members. Mean scores ranged from 2.44 to 2.96 with the in-laws providing the least support and the nurses providing the highest level of support, followed by pediatrician with a mean score of 2.93. Using chi-square analysis, Table 3 shows demographic associations with breastfeeding initiation. Prenatal education is positively associated with a woman's decision to breastfeed. It is not statistically significant using Pearson's chi-square analysis at $p < .05$. Race, marital status, annual salary, the number of children and government funding were also positively associated though not statistically significant. The age and educational level of women were significantly associated with the decision to initiate breastfeeding at $p < .05$. Women who had previously breastfed were statistically significantly more likely to breastfeed subsequent children at $p < .05$. Of approximately 64.7% of the women who reported breastfeeding other children, the majority (77.3%) breastfed this child also. Only 25% of those who had not breastfed a previous child reported breastfeeding the current child. Women who reported breastfeeding practices among extended family members were more likely to breastfeed their own children at a statistically significant level of $p < .05$. Overall there were 41.5% of the respondents that reported breastfeeding in extended family members. The majority (82.4%) of these women also breastfed while 35.7% breastfed when their extended family did not.

Table 3

Demographic Associations with Breastfeeding Initiation

	Chi-Square	Asymp. Sig. (2-sided)
Prenatal Education	.360	.548
Race	3.759	.289
Marital Status	1.379	.710
Age	27.692	.049*
Education Level	14.728	.012*
Annual Salary	.354	.838

Government Funding	754.000	.385
Number of children	9.400	.152
Previous child breastfed	8.759	.003*
Extended family breastfed	8.604	.014*

* *Statistically significant at p < .05*

Other Significant Findings:

In Table 4 Pearson's analysis showed a statistically significant association at $p < .05$ between the education level of women and family support of their decision to breastfeed.

Table 4

Correlations

Pearson's Correlation	<i>Education level</i>	<i>Family support</i>
Education level	1	.400*
Sig. (2-tailed)		.031
Family support	.400*	1
Sig. (2-tailed)	.031	

Discussion

There are several factors that influence a woman's decision to breastfeed in rural communities. This study indicates specific demographic variables such as age and educational level as well as support from family and healthcare professionals impact breastfeeding outcomes. A woman's decision to breastfeed is linked to breastfeeding a previous child and having extended family that have also been breastfed.

A limitation of the study is its small sample size and therefore it is not generalizable. Studies have demonstrated statistical significant associations between prenatal education and breastfeeding. A detailed exploration of the course curricula referenced in this study may lend more credibility to the results. Due to the uniqueness of the targeted population, a community assessment and consideration of a qualitative study with a broader focus evaluating attitudes of

the workplace environment, local policy makers, healthcare providers and the overall community may be warranted in efforts to increase breastfeeding to Healthy People objectives.

Implications

While extensive research has validated the benefits of breastfeeding, disparities still exist in vulnerable populations. Underprivileged, underserved and minority women are not breastfeeding at rates that are comparable with national averages. This research study was designed to evaluate factors that were associated with breastfeeding initiation within rural communities. There were several associations identified that are reflective of previous research. Other associations though positively associated were not statistically significant. Future research is needed to analyze barriers to breastfeeding through the conduct of an overall community assessment. Funding through rural health grants may provide an avenue for subsidizing research geared toward promoting breastfeeding. Conducting an in-depth study regarding attitudes toward breastfeeding, workplace support of breastfeeding and the existence or nonexistence of policies that are reflective of successful breastfeeding will produce valuable information. The research findings will be useful in identifying best practices with subsequent revision of policies, procedures and guidelines to meet Healthy People objectives.

Lack of access to care and services creates a major challenge to breastfeeding women living in rural isolated communities. Resources such as lactation consultants and peer support are necessary for making exclusive breastfeeding the cultural norm. Telehealth through the use of social media to enhance breastfeeding support should be investigated as a cost-effective approach to address such barriers. Specific to targeted rural populations and other underserved areas, standardized prenatal education curricula and lactation services could be provided through the use of social media or other telehealth modalities.

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