

Intent to Breastfeed: A Population-Based Perspective

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Abstract

Background: Prenatal maternal intent to breastfeed can indicate postnatal breastfeeding practices and may serve to indicate potential barriers to breastfeeding. Breastfeeding rates in West Virginia, a primarily rural state, are among the lowest in the United States, and minimal research has been published to date on population-based prenatal intent to breastfeed among rural women.

Methods: Secondary data analysis of population-based data was conducted using two state-linked datasets. State data included all live singleton births from at least 20 weeks of gestation in West Virginia from 2004 to 2006, for a total of 52,899 births.

Results: Results from the logistic regression model for the population-based study indicate that variables predicting intent to breastfeed among pregnant women in West Virginia include insurance status, maternal education, maternal age, parity, marital status, timing of prenatal care initiation, and prenatal smoking status.

Conclusions: Prenatal identification of characteristics associated with lack of intent to breastfeed can serve to inform healthcare providers of women who are at risk for not breastfeeding for directed breastfeeding promotion and intervention, complementing education of healthy lifestyle choices such as breastfeeding promotion with smoking cessation.

Introduction

PRENATAL REPORT OF INTENT to breastfeed has been shown to suggest and predict breastfeeding practices in the postpartum period.¹ A British cohort study found that intent to breastfeed was the explanatory variable predicting breastfeeding initiation and 6-month duration.² Descriptive research has found that demographic factors such as higher socioeconomic status, higher level of education, parity, older maternal age, maternal smoking, ethnicity and culture, supportive environment, and receiving breastfeeding education influence maternal intent to breastfeed.³⁻⁷ Additional maternal health, attitudinal, and environmental factors as well as lactation factors associated with breastfeeding intention that influence breastfeeding practices include maternal obesity,⁸ multiparity,⁶ previous breastfeeding experience,³ increased breastfeeding self-efficacy,^{9,10} the hospital's approach to promote breastfeeding,¹¹ and environmental cultural norms regarding breastfeeding.⁵

The overall breastfeeding initiation rate in the United States is 73.9%, and the 6-month duration rate is 43.4%.¹² There are differences in breastfeeding rates in the nation based on region: The highest average regional breastfeeding rates are in

the western region (81.3% initiation rate and 42.5% 6-month duration rate), whereas the lowest average regional rate is in the southern region (65.1% initiation rate and 28.8% 6-month duration rate).¹³ West Virginia is among the seven states with the lowest breastfeeding initiation rates in the nation, under 60%.¹² Extensive reporting of sample and population-based breastfeeding rates has been published, while minimal research has been published on intent to breastfeed in a population-based approach. Furthermore, research has pointed to rural and Appalachian residential regions as factors negatively impacting breastfeeding rates.¹³⁻¹⁵ By examining maternal intent to breastfeed, barriers to breastfeeding may be identified, providing insight into strategies to promote positive breastfeeding attitudinal and behavioral changes for women living in rural areas.

Materials and Methods

Secondary data analysis was conducted using the SPSS statistical program version 17 (SPSS, Chicago, IL) to analyze the de-identified linked datasets of West Virginia birth certificates and West Virginia Birth Score. The study examined the demographic and infant birth factors associated with

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maternal report of intent to breastfeed using population-based data. West Virginia Birth Score is a tool used to identify infants at risk of mortality in the first year of life for referral to services. These data are captured on every newborn immediately following delivery and are matched with birth certificate data, serving as the basis for this study. The Birth Score tool, originally based on the Sheffield Birth Score,¹⁶ aimed at predicting increased risk for neonatal mortality, includes a question regarding maternal intent to breastfeed.

There were a total of 54,391 live births in West Virginia during 2004–2006. For analysis purposes, the data were limited to singleton births that had achieved at least 20 weeks of gestation. The outcome variable was defined as maternal report of intent to breastfeed. One infant record was missing the inclusion criterion of containing data of the primary outcome variable of maternal intent to breastfeed and therefore was excluded from the analysis, yielding 52,899 live births during the 3-year period. Comparisons were made between the infant records of those whose mothers reported intent to breastfeed and those who reported intent to use formula. The maternal prenatal independent variables (and their operational definition) included in the analysis were parity (primiparous or multiparous), insurance status (Medicaid or private insurance), marital status (married or not married), prenatal smoking status (smoker or non-smoker), preterm delivery (<37 weeks of gestation as preterm or ≥37 weeks of gestation as term), maternal level of education (post-high school education or no post-high school education), and initiation of early prenatal care (first trimester or after first trimester), and the remaining variables of the number of prenatal visits, the month in which prenatal care was initiated, age in years, and years of education were defined as continuous variables. Transfer of an infant to the neonatal intensive care unit is often not known prior to delivery and was therefore excluded from the analysis. The number of women who reported drinking alcohol during pregnancy was less than 1%, and this variable was therefore excluded from the analysis. The descriptive analysis identified prenatal characteristics associated with intent to breastfeed among women in West Virginia. The West Virginia University Institutional Review Board has given this study exempt status.

Results

The linked population-based datasets for all live singleton births from at least 20 weeks of gestation in West Virginia during the 3-year period yielded a total of 52,899 records. Sociodemographic characteristics of the pregnant women include an average age of 25.9 years (range, 12–52 years) and 12.3 years of education (range, 0–17 years), 61.9% were mar-

ried, and 42.1% ($n = 22,288$) were primiparous. Regarding insurance status, 58.2% ($n = 28,761$) of the women were recipients of Medicaid during their pregnancy, 39.7% ($n = 19,637$) had private insurance, and 2.1% ($n = 1,035$) used other means for healthcare payment. According to the self-report data, 48.2% ($n = 25,507$) of the women intended to breastfeed, and 51.8% ($n = 27,392$) of the women reported that they did not intend to breastfeed. During the period 2004–2006, the maternal report of intent to breastfeed remained constant (48%, 49%, and 48%, respectively).

Bivariate analysis results indicate significant associations between nearly all of the identified sociodemographic independent variables and the dependent variable of intent to breastfeed. Gestational age at delivery was clinically similar between the groups, at 38 weeks of gestation, and maternal intent to breastfeed did not differ according to infant gender. The characteristics significantly associated with maternal report of intent to breastfeed include higher average number of prenatal visits, earlier initiation of prenatal care, older maternal age, and higher average number of maternal education years (Table 1). Additionally, characteristics defined using dichotomous variables demonstrating a significantly higher likelihood for women to report intent to breastfeed included primiparity (54.7%, $n = 12,197$) compared to multiparity (43.5%, $n = 13,307$) ($p < 0.001$), married (55.6%, $n = 18,221$) compared to not married (36.1%, $n = 7,272$) ($p < 0.001$), non-smoker (55.4%, $n = 20,849$) compared to smoker (30.4%, $n = 4,574$) ($p < 0.001$), private pay insurance carrier (63.1%, $n = 12,386$) compared to Medicaid recipient (37.9%, $n = 10,910$) ($p < 0.001$), initiating prenatal care in the first trimester (51.0%, $n = 22,114$) compared to those who initiated later prenatal care (37.1%, $n = 2,970$) ($p < 0.001$), and women who had at least some post-high school education (64.3%, $n = 14,012$) compared to those who did not (36.9%, $n = 11,297$) ($p < 0.001$).

In a logistic regression analysis, the variables that were significantly associated with intent to breastfeed in the bivariate analyses were entered into the final model. Variables in the model with a statistically significant positive association with maternal intent to breastfeed included maternal characteristics of married, private healthcare insurance carrier, higher average age, post-high school education, first trimester initiation of prenatal care, primiparity, and non-smoker (Table 2). The odds of intending to breastfeed were 94% higher for women who had any education beyond high school compared to those who did not (95% confidence interval [CI] 1.855, 2.029), 25% higher for those who initiated prenatal care in the first trimester compared to those who did not (95% CI 1.184, 1.324), 43.2% higher for married women compared to non-married women (95% CI 1.366, 1.501), 40.4%

TABLE 1. MEAN DIFFERENCES OF CHARACTERISTICS OF PREGNANT WOMEN IN WEST VIRGINIA WHO REPORTED INTENT TO BREASTFEED COMPARED TO THOSE WHO DID NOT ($N = 52,899$)

Characteristic	Breastfeeding intent	No intent	P	CI
Frequency of prenatal visits	12.2 ± 3.6	11.5 ± 4.2	< 0.001	-0.7, -0.6
Month initiated prenatal care	2.4 ± 1.1	2.7 ± 1.4	< 0.001	0.2, 0.3
Age (years)	26.7 ± 5.7	25.1 ± 5.5	< 0.001	-1.7, -1.5
Education (years)	13.5 ± 2.3	12.2 ± 2.0	< 0.001	-1.4, -1.3

Data are mean ± SD values.
CI, confidence interval.

TABLE 2. LOGISTIC REGRESSION RESULTS OF THE FACTORS ASSOCIATED WITH MATERNAL INTENT TO BREASTFEED (N = 46,474)

Variable	Odds ratio	CI	P
Maternal age (years)	1.019	1.015, 1.023	< 0.001
Maternal education ^a	1.940	1.855, 2.029	< 0.001
Timing of prenatal care ^a	1.252	1.184, 1.324	< 0.001
Marital status ^a	1.432	1.366, 1.501	< 0.001
Insurance status ^a	1.404	1.337, 1.474	< 0.001
Parity ^a	0.543	0.520, 0.567	< 0.001
Smoking status ^a	0.571	0.545, 0.599	< 0.001

^aReference categories for these dichotomous variables are lacking post-high school education, lacking first trimester prenatal care, not married, Medicaid insurance recipient, primiparity, and non-smoker, respectively.

higher for women with private insurance compared to those without (95% CI 1.337, 1.474), 45.7% lower for multiparas compared to primiparas (95% CI 0.520, 0.567), and 42.9% lower for smokers compared to non-smokers (95% CI 0.545, 0.599). Also, each additional year in maternal age corresponded to a 1.9% (95% CI 1.015, 1.023) increase in the odds of intending to breastfeed.

Discussion

Information from maternal report of intent to breastfeed can be used to identify women at risk of not breastfeeding in an effort to address their needs, to minimize obstacles, and to promote breastfeeding. Previous research has found that women who are at risk of not intending to breastfeed can be targeted for interventions such as providing lactation education, confidence, support, and overcoming barriers to breastfeeding.¹⁷ While the *Healthy People 2010* goal for breastfeeding initiation rate is set at 75%,¹⁸ only 58.8% of women in West Virginia initiated breastfeeding according to the Centers for Disease Control and Prevention (CDC), indicating the need for improvement in breastfeeding support, promotion, and outcomes.¹²

Use of the linked datasets of state birth certificates and Birth Score assessments enriched the data for examining the factors associated with maternal report of intent to breastfeed. Lack of intent to breastfeed is a component of the Birth Score assessment tool that is significantly associated with mortality in the first year of life. The study findings related to lack of intent to breastfeed supports the importance of breastfeeding encouragement in this population as breastfeeding is health promotional and can help decrease the risk for infant morbidity and mortality.¹⁹ Considering the many factors contributing to the lack of intent to breastfeed that pertain to much of the pregnant population in West Virginia, the importance of increased efforts in breastfeeding promotion in this population is reinforced. By identifying pregnant women who do not intend to breastfeed, healthcare providers may initiate anticipatory and early education and promotion of breastfeeding. Prenatal variables associated with maternal intent to breastfeed included variables that indicate a more intense level of prenatal care, specifically, higher average number of prenatal visits and earlier initiation of prenatal care, although considering the large dataset, the finding may

not be clinically significant as the average difference in timing of prenatal care was but a couple weeks. The findings that primiparity was associated with a higher rate of intent to breastfeed may reflect a more recent increase in breastfeeding promotion messages by healthcare providers, by the general culture, as there have been national efforts to increase breastfeeding rates,¹⁸ and by the West Virginia Women, Infants and Children (WIC) program in the state that has been increasing its efforts to promote and teach pregnant and postpartum women about the benefits and techniques of breastfeeding. Considering that more than half of the pregnant women of West Virginia qualify for Medicaid, the potential perinatal participation in WIC is approximately similar. Demographic factors such as low socioeconomic status and lack of insurance status are likely to influence breastfeeding practices in West Virginia, as the state is primarily rural and the rates of prenatal Medicaid recipient status and WIC participation are high. Regarding having private health insurance (in contrast to Medicaid recipients), factors supported by previous research that found that women who participated in the WIC program were less likely to breastfeed.²⁰ Two of the significant variables in the logistic regression model—those of increased maternal education and older maternal age—may indicate women who choose to delay having their first child until having attained a higher level of education. The findings of the current study point to higher rates of intent to breastfeed among women who have at least some post-high school education, which is consistent with findings in previous research that has shown higher education associated with an increased awareness of breastfeeding recommendations and consequently with an increased likelihood of reporting intention to exclusively breastfeed.²¹ In West Virginia, lack of higher education may contribute to health disparities as the state's college education rate is 14.8% lower than the overall U.S. rate of 24.4% and the state's high school graduation rate is 75.2%, lower than the national rate of 80.4%.²²

Researchers have demonstrated that breastfeeding rates are associated with geographic region in addition to other sociodemographic factors,^{13,19,23} placing West Virginia women at increased risk for low breastfeeding rates related to region. Cultural norms specific to geographic area may play an important role, negatively influencing intent to breastfeed among women in West Virginia. The potential role of the culture in breastfeeding in the state is evidenced by the recent state legislation minimally supporting breastfeeding,²⁴ the CDC's report of relatively low rates of breastfeeding in the state, and the current findings pointing to a correspondingly low rate of prenatal intention to breastfeed. Low breastfeeding rates have been noted in a previous study of 52 women living in rural Appalachia¹⁴ as well as in a combined qualitative and quantitative study of rural women,¹⁵ although both of these studies sought maternal responses to breastfeeding questions during the postpartum period. Likewise, a study of maternal breastfeeding intent among rural Midwest women was conducted following delivery.¹⁰ As such the current study of maternal intent to breastfeed among rural U.S. women using population-based data is a novel approach to identifying breastfeeding predictors prior to delivery.

Among the variables in the study that indicated lack of intent to breastfeed, the most modifiable risk factor is that of prenatal smoking. Prenatal smoking has been associated with lower breastfeeding rates in other studies.²⁵ According to the

CDC's Pregnancy Risk Assessment Monitoring System surveillance of 26 states, West Virginia has had an increase in prenatal smoking from 24.5% in 2000 to 31.9% in 2005, in contrast to the overall Pregnancy Risk Assessment Monitoring System prenatal smoking rate that was 15.2% in 2000 and decreased to 13.8% in 2005.²⁶ The state has recognized the need for reversal of the increasing prenatal smoking trends in West Virginia and has developed and implemented a Tobacco Free Pregnancy Initiative providing education, support, and cessation information.²⁷ These various perinatal health issues involving lifestyle choices impact maternal-infant health and should be addressed in prenatal and postpartum maternal and infant care. Providing a comprehensive health education combining topics such as breastfeeding promotion and smoking cessation throughout the prenatal period and following up through the postpartum period will give a consistent and constant message regarding modifiable health behaviors. Furthermore, it behooves healthcare providers to become knowledgeable about specific factors influencing health outcomes in the state, resources available, and effective approaches to providing care. By using the prenatal period for persistent and regular health education, healthcare providers can effectively target women who may not have had consistent access to health care, especially those who are covered by Medicaid during pregnancy and may lack health insurance outside of pregnancy.

A primary limitation of the study is the lack of expanded options in maternal reporting of intention to breastfeed on the state's Birth Score form. Additionally, maternal previous experience with breastfeeding and perception of the importance of breastfeeding were not included in the data collection. This information could give more insight into reasons for the maternal choice of intent to breastfeed, to further help inform healthcare providers as to factors that may facilitate or hinder intent to breastfeed. Further prospective research should examine more detailed maternal perception of breastfeeding along with local cultural perspectives on breastfeeding to develop greater insight into prenatal factors that may inhibit breastfeeding.

Conclusions

The findings of the current population-based study regarding maternal prenatal intent to breastfeed closely correspond to the CDC's findings of breastfeeding initiation rates in West Virginia. Multivariate analysis identified prenatal characteristics that predict maternal intent to breastfeed. These predictors can be used to inform healthcare providers of women at risk for not breastfeeding and to guide breastfeeding promotion and intervention efforts in this population. Associated factors for lack of intent to breastfeed, specifically, that of maternal smoking, may be simultaneously targeted in prenatal and postpartum education of health promotional activities. Findings of this study alert healthcare providers to the need for comprehensive education and promotion of healthy lifestyle choices, specifically infant feeding and maternal smoking, for pregnant and postpartum women throughout the state.

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Disclosure Statement

No competing financial interests exist.

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