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Application of the Breastfeeding Personal Efficacy Beliefs Inventory and Acknowledgment of Barriers for Improving Breastfeeding Initiation Rates in an Urban Population

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Abstract

Introduction: Breastfeeding (BF) is recognized as the preferred method of infant nutrition by American Academy of Pediatricians, American College of Obstetricians and Gynecologists, and the World Health Organization. Despite the benefits of BF, in 1998 only 69% of new mothers in the United States initiated BF and 29% continued to breastfeed at 6 months.

Objective: To assess perceived breastfeeding confidence (BFC) and determine barriers in regards to BF in an urban population.

Methods: The Breastfeeding Personal Efficacy Beliefs Inventory (BPEBI) was used to determine perceived BFC. The survey was distributed to 271 women during prenatal appointments at an urban Milwaukee medical center. BF initiation rate at discharge was determined by records review. A principal component factor analysis with varimax rotation was used to examine the structure of the BPEBI in this population.

Results: Survey response rate was 89%. Overall BFC was 74%. BF initiation rate at discharge was 62%, exclusively BF (EBF) at discharge (no bottle-feeding) was 55%. In multivariate models, EBF decreased with black race (p=0.02) and with residence in the low socioeconomic status zip codes of the central city of Milwaukee (p=0.01). BFC increased with prior exposure to BF (p=0.03), EBF (p=0.03) and length of BF (p=0.02). Factor analysis identified two constructs: BFC increased with prior exposure to BF (p=0.006) and EBF (p=0.001) within the motivation construct, and BFC increased with EBF (p=0.000) within the technique/environment construct.

Conclusions: The main barriers to increased BFC were lack of prior exposure to BF and nonexclusive breastfeeding practices. BF initiation rate at discharge was low compared to self-reported level of confidence. EBF decreased with black race and with closer proximity to the central city of Milwaukee. (*J Patient-Centered Res Rev.* 2014;1:77-84.)

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breastfeeding, lactation, infant food, maternal behavior, self-concept

Introduction

Breastfeeding (BF) is recognized as the preferred method of infant nutrition. The American Academy of Pediatricians recently reaffirmed its recommendation of exclusively breastfeeding (EBF) for 6 months, followed by continuation of breastfeeding until 1 year of age as complementary foods are introduced.[1] The World Health Organization[2] and the American College of Obstetricians and Gynecologists[3-6] concur with the recommendation. Breast milk provides immunity, is nutritionally balanced, easily digested and promotes healthy growth in infants.[2] BF is associated with lower rates of disease in the newborn including a decrease in sudden infant death syndrome; decreased respiratory, gastrointestinal and ear infections; and a reduction in children with allergies and asthma.[7] Proven benefits to the mother also have been noted, with a decrease in breast and ovarian cancer.[7]

Despite the benefits of BF, in 1998 only 69% of Americans initiated BF and 29% continued to breastfeed at 6 months. Therefore, BF was made a goal of Healthy People 2020, with an ideal initiation rate of 81.9%, 6-month rate of 60.6% and 1-year rate of 34.1%.[8] Overall BF rates continue to rise in the United States. In 2012 the Centers for Disease Control and Prevention estimated the national rate of initiation of BF

to be 76.9% and the rate of BF to be 47.2% and 25.5% at 6 and 12 months, respectively.[9] The rates reported for Wisconsin are similar, with BF initiation of 81.3% and continuation of 48.7% at 6 months and 21.9% at 12 months. In contrast, the urban population of Milwaukee, Wisconsin, has an initiation rate of 62.8%, BF rate at 6 months of 22.2%, and at 12 months of 10.4%.[10] These rates are significantly lower than the overall state rates and are far from the Healthy People 2020 goals.

Interventions to increase BF rates, particularly initiation rates, are needed in populations with inherently low rates of BF initiation. Evaluation and understanding of such population's self-efficacy about BF is important to guide meaningful community interventions to increase initiation and duration of BF. The theory of self-efficacy has as its premise the belief in one's own capabilities to accomplish a task to reach a given outcome. Using personal efficacy beliefs, one can measure individuals' confidence levels in managing their introspection, response and environment to produce the desired effects, which helps predict that individual's behavior. This then serves as a guide to the development of interventions to modify the self-efficacy beliefs.[11,12]

The Breastfeeding Personal Efficacy Beliefs Inventory (BPEBI) addresses the perceived self-efficacy of women prior to initiation of BF and is a logical choice to explore these issues. This survey was chosen as it had been previously validated to find confidence levels and barriers to breastfeeding initiation. Survey validation occurred in a predominantly white, younger aged, university student population.[13]

The primary objective of this project was to assess perceived breastfeeding confidence (BFC) and determine barriers related to BF at an urban hospital with a low BF initiation rate. In addition, we sought to determine the structure of the BPEBI as an instrument in this population. This information will aid in developing the appropriate interventions for improving BF initiation rates and, ultimately, increasing the percentage of women who practice EBF for 6 months.

Methods

Data collection was attained through a previously validated survey: the BPEBI.[13] The BPEBI survey was distributed to 271 pregnant women attending prenatal appointments at an academic clinic in downtown Milwaukee. The clinic serves primarily low-income, inner-city women who participate in a state-administered insurance plan that covers pregnant women and their families with income up to 300% of the federal poverty level. There were approximately 4,200 nonunique clinic patient visits in 2012, of which 60% (2,533) were black, 75% (3,169) were between the ages of 20-44, and 55% were on Medicaid.

The survey was distributed at clinic visits to all women who were currently pregnant. Over a period of 2 months, all eligible patients were approached and recruited to voluntarily participate by the project coordinator. In the examination room, directions were explained by the project coordinator to willing patients, and one example question was practiced with the patient prior to allowing her to confidentially complete the survey. The survey was then placed into an envelope and returned anonymously to the staff at the end of the appointment.

This survey was used to measure women's confidence in all aspects of breastfeeding. The survey included 24 questions using a visual analogue scale measurement instrument, followed by 12 demographic questions. The visual analogue scale is used to measure attitudes that are otherwise difficult to measure. The instrument allows participants to mark anywhere along a horizontal line to represent their level of confidence from 0 (cannot do) to 50% (might do) to 100% (certain can do), with 0% being no confidence and 100% being complete confidence. The point at which the line was marked was measured via ruler and converted to a percentage.

A principal component factor analysis with varimax rotation was used to examine the structure of the BPEBI. The goal of principal component factor analysis is to reflect the magnitude of the stable common and specific variance. Reliabilities are used when the objective is to study the nature of the theoretical factors that best account for the stable variance of the variables.[14] Varimax rotation is considered uncorrelated and is used to simplify the structure and interpretation of the eigenvectors; it focuses on creating as many values in each column of the factor-loading coefficients table to be as close to zero as possible.[14] The criterion for the determination of the number of factors was an eigenvalue of greater than 1 and a loading factor of 0.3. Four items did not meet the factor-loading criteria: "breastfeeding my baby for one year," "getting the information I need about BF," "eating mostly as I please while BF," and "taking most medications I need."

An inventory score was determined for each of the 24 items on the survey by calculating the mean score. An overall inventory score was calculated by taking the mean score of the individual inventory scores. Additionally, an inventory score was calculated separately for the two constructs that ultimately resulted from the factor analysis, based on the items that made up the constructs.

Quantitative data were analyzed utilizing Minitab® software (Minitab Inc., State College, PA). Demographic data were summarized using descriptive statistics. Categorical data were analyzed using chi-square tests (with Yates correction for 2 × 2 tables). Groups of score variables were compared with the Mann-Whitney test. Univariate regression was used to determine association of predictor variables with individual inventory score, and multivariate models were constructed with the significant variables. Statistical significance was determined at $P<0.05$, with a 95% confidence interval.

Aggregate BF initiation rate at discharge, marital status, insurance provider, and permanent address by zip code were determined by medical chart review from a list of all patients approached to participate in the project. The project was submitted to the local Institution Review Board and deemed not to be human subject research.

Results

Of 271 patients asked to participate, 240 returned the survey for a response rate of 89%. The mean age was 25.3 ± 5.7 years, and median age was 24 years (range: 26 years). The project population was 58% (n=158) black, 83% (n=226) single/not married, 83% (n=225) on Medicaid, and 67% from low socioeconomic status (SES) zip codes of the central city of Milwaukee.[15] Based on demographic information from this clinic, this project population was a representative sample of the clinic population.

The project population's level of education varied, with 64% (n=121) of individuals with a high school diploma/GED, 13% (n=25) with less than a high school education, 13% (n=24) with an associate's degree/junior college education, 6% (n=12) with a bachelor's degree, and 3% (n=6) with a graduate degree. Nearly half of spouses/partners had occupations in the governmental job categories of Operative (20%, n=28), Service Worker (15%, n=22) or Craft Worker (12%, n=17); 14% (n=20) of the patients reported that their spouse or partner was unemployed. Table 1 provides demographic description of the project population.

The project population consisted of 33% (n=77) of patients reporting first pregnancy; in the 67% (n=156) who reported this was not their first pregnancy, the median number of children was one. In women who reported a prior pregnancy, 39% (n=91) reported BF in the past, for an average length of 5.5 months (± 6.16). In women who reported BF in the past, 52% (n=47) were very satisfied, 37% (n=34) were somewhat satisfied and 11% (n=10) were a little satisfied. Among these same women, 46% (n=42) provided all, 23% (n=21) provided most, 17% (n=15) provided some, 11% (n=10) provided a little, and two provided none of their baby's diet during the early weeks of BF. In the overall project population, 58% (n=137) of women reported they had a sister or close friend who had breastfed in the past, of which 57% (n=78) reported that she was very satisfied with BF. Table 2 provides a summary of the participants' BF and pregnancy experience.

Table 1. *Population demographics*

Variable	Frequency	Percentage
Race (n=271)		
Unknown	15	5.5
White	45	16.6
Black	158	58.3
Hispanic	38	14.0
Asian	9	3.3
Mixed/Other	6	2.2
Marital status (n=271)		
Unknown/not applicable	1	0.4
Single/not married	226	83.4
Married	39	14.4
Divorced	4	1.5
Widowed	1	0.4
Insurance (n=271)		
None	32	11.8
Medicaid	225	83.0
Commercial	14	5.2
Education level (n=188)		
Less than high school	25	13.3
High school diploma/GED	121	64.4
Associate's degree/junior college	24	12.8
Bachelor's degree	12	6.4
Graduate degree	6	3.2
Occupation (n=143)		
Unemployed	20	14.0
Professional	10	7.0
Official/manager	5	3.5
Technician	2	1.4
Sales worker	11	7.7
Administrative support	6	4.2
Craft worker	17	11.9
Operative	28	19.6
Laborer/helper	11	7.7
Service worker	22	15.4
Student	11	7.7

BFC was based on the calculated overall inventory score. The overall inventory score was 74.8. EBF (no bottle-feeding) initiation rate at hospital discharge was 50%; the overall BF initiation rate (meaning the mother put the baby to the breast at least once) was 56%, and 34% of mothers were only bottle-feeding at discharge, based on records review.

Two factors resulted from factor analysis based on the predetermined criteria. Varimax rotation was used because items were believed to be heterogeneous. A loading factor

Table 2. *Summary of participants' breastfeeding (BF) and pregnancy experience*

Variable	Frequency	Percentage
Exclusively BF at hospital discharge (n=271)	136	50.2
Bottle-feeding at discharge (no BF)	92	33.9
BF and bottle-feeding at discharge	17	6.3
BF initiation unknown	26	9.6
Overall BF at hospital discharge (BF and bottle-feeding)	153	56.5
Breastfed as baby (n=233)		
No	99	42.5
Yes	75	32.2
Do not know	59	25.3
First pregnancy (n=233)		
No	156	67.0
Yes	77	33.1
Sister/close friend breastfed (n=235)		
No	97	41.3
Yes	137	58.3
Number of children (n=234, mean=1.53, SD=1.65, median=1)		
None	79	33.8
One	62	26.5
Two	33	14.1
Three	32	13.7
Four	19	8.1
Five	3	1.3
Six	3	1.3
Seven	1	0.4
Nine	2	0.9
Sister/close friend satisfaction (n=137)		
Little	7	5.1
Some	46	33.6
A lot	78	56.9
Prior BF** (n=234, mean length=5.5, SD=6.16, median=3.5)*		
No	142	60.7
Yes	91	38.9
Diet supplied (n=91)		
None	2	2.2
Little	10	11.0
Some	15	16.5
Most	21	23.1
All	42	46.2
Satisfaction with prior BF (n=91)		
Little	10	11.0
Some	34	37.4
A lot	47	51.6

SD, standard deviation.
**Mean and median length of breastfeeding was calculated from previous pregnancies in number of months.*
***Timing of prior exposure was not known.*

of 0.3 was used to determine the two-factor solution. If each factor had a loading factor >0.3, the higher value was used to determine which construct the item belonged. Factor 1 measured women's BF confidence about the beneficial aspects of BF (all items had a factor loading score >0.3) and was designated Confidence to Manage Motivation. This construct included survey items such as "improves my baby's intelligence by BF," "make safe milk," and "have a pleasant experience while BF." Factor 2 reflected confidence about technical and environmental aspects (all items had a factor loading score >0.3). This was designated Confidence to Manage Technique and Environment. This construct included items such as "provide all food," "breast size doesn't matter," and "BF while immediate family present." The two-factor solution explained 46% of variance. Before testing, five factors had been hypothesized based on a previous study conducted by Cleveland et al.;[13] however, no items met the factor-loading criteria in the other factors. Table 3 provides the factor loadings for the two factors. Table 4 provides the factor loadings for all 24 items.

Inventory scores were calculated for the Motivation Construct and the Technique and Environment Construct, and were 81 and 70, respectively. The items with the highest individual inventory scores show that patients were confident in their ability to get information about BF (92), BF during the nighttime (87.2) and BF right after birth (87). The items with the lowest individual inventory score demonstrated patients lacked the confidence to "take most medications I need while BF" (44.1), "eat mostly as I please" (54.6), and "ease my return to work by BF" (60.7). Table 5 provides a summary of individual inventory scores for each of the 24 items on the survey.

Univariate regression was performed to measure the effect of age, prior exposure to BF, first pregnancy, EBF during the early weeks (100% of diet was supplied) and length of BF compared to the individual inventory score (BFC). All variables were statistically significant, with P-values of 0.009, 0.001, 0.03, 0.01 and 0.04, respectively. Overall, when taken together, the variables explained 19% of the variance in BFC. Multivariate models were constructed from these variables and revealed that BFC increased with prior exposure to BF (P=0.03), EBF (P=0.03) and length of BF (P=0.02).

When the individual inventory score was analyzed separately by construct, there was significant difference in the Motivation Construct, noting statistical significance in patients with a history of prior exposure to BF (P<0.001) and EBF during the early weeks (P=0.001). These two variables

Table 3. *Factor analysis of BPEBI by construct*

Confidence to:	Factor 1	Factor 2
Manage motivation		
Have a pleasant time while breastfeeding	0.61	0.27
Improves my baby's intelligence by breastfeeding	0.68	----
Ease my return to work by breastfeeding	0.30	0.19
Improves baby's health by breastfeeding	0.69	0.10
Make safe milk for my baby	0.59	0.13
Save money by breastfeeding	0.72	0.22
Bond easily with my baby by breastfeeding	0.59	0.36
Expect support from spouse/ partner	0.54	0.18
Get help with my baby by breastfeeding	0.33	0.17
Breastfeed my baby during the nighttime	0.65	0.41
Breastfeed my baby right after birth	0.62	0.32
Manage technique and environments		
Breastfeed with my immediate family present	0.22	0.73
Breastfeed at the mall	0.14	0.60
Pump at work to save milk for my baby	0.05	0.53
Doing most activities with breastfeeding	0.23	0.32
Breastfeed no matter the size of my breasts	0.26	0.57
Learn to get my baby on and off the breast	0.38	0.39
Breastfeed my baby for three months	0.45	0.57
Breastfeed my baby for six months	0.26	0.37
Provide all food for several months	0.35	0.56
Eigenvalues	9.2	1.8
% of variance	38.3	7.7
		Total = 46%

BPEBI, Breastfeeding Personal Efficacy Beliefs Inventory.
Factor loading >0.3; eigenvalue >1.
Note: The item-loading statistic that is underlined indicates the subscale to which each item was assigned.

Table 4. *Factor loadings for all 24 items on the BPEBI*

Item Name	Motivation	Technique/ Environment
Improves my baby's intelligence by breastfeeding	0.679	----
During the nighttime	0.646	0.405
Bond with baby	0.591	0.358
Right after birth	0.623	0.320
Have a pleasant experience	0.605	0.267
Save money	0.720	0.216
Ease return to work	0.304	0.191
Expect support from spouse/ partner	0.540	0.184
Get help with baby	0.330	0.169
Make safe milk	0.594	0.128
Increase baby's health	0.693	0.095
Immediate family present	0.219	0.733
At the mall	0.135	0.600
Three months	0.454	0.573
Breast size doesn't matter	0.262	0.567
Provide all food	0.348	0.557
Pump at work	0.047	0.525
Learn on and off	0.379	0.392
Six months	0.263	0.368
Do most activities	0.230	0.322
*Eat as I please	0.193	----
*Take most medications I need	0.063	0.227
*Get information	0.118	0.133
*One year	0.136	0.066
Eigenvalues	9.2	1.8
Overall inventory score	81.0	70.0

BPEBI, Breastfeeding Personal Efficacy Beliefs Inventory.
Factor loading >0.3; eigenvalue >1.
Overall inventory score = the mean score of the individual inventory scores.
Note: The item-loading statistic that is underlined indicates the subscale to which each item was assigned.
**Indicates the four items that did not meet the factor-loading criteria of >0.3.*

accounted for 10% of variance in BFC within the Motivation Construct. Within the Technique and Environment Construct, age (P=0.008), prior exposure to BF (P=0.006), first pregnancy (P=0.04) and EBF during the early weeks (P<0.001) were all statistically significant. These four variables accounted for 18% of the variance (11% from the exclusively breastfed) in BFC within the Technique and Environment Construct. Multivariate models were created for each construct. Within the Motivation Construct, BFC increased with prior exposure to BF (P=0.006) and EBF (P=0.001). BFC increased with EBF (P<0.001) within the Technique and Environment Construct.

Table 5. *Individual inventory score for each item on the BPEBI*

Confidence about the ability to:	Mean	SD	N
Improve my baby's health	86.5	19.7	238
Get information about breastfeeding	92.0	14.7	237
Breastfeed at the mall	61.9	34.2	238
Breastfeed with immediate family present	76.6	30.6	238
Pump at work and save my milk for baby	57.3	36.1	236
Make enough milk no matter breast size	68.2	30.3	232
Learn to get baby on and off the breast	77.6	24.8	238
Make milk that is safe for my baby	85.3	23.0	237
Eat mostly as I please	54.6	31.9	233
Get help with the baby while breastfeeding	75.7	27.7	232
Expect support from my spouse/partner	80.6	28.0	233
Improve my baby's intelligence	83.7	22.3	234
Have a pleasant time while breastfeeding	75.6	27.6	230
Breastfeed during the nighttime	87.2	20.0	236
Save money by breastfeeding	89.2	20.1	236
Take most medications I need while breastfeeding	44.1	30.6	231
Bond easily with my baby	88.0	18.8	235
Ease my return to work by breastfeeding	60.7	29.8	229
Do most activities that I want	61.0	33.0	235
Provide all my baby's food for several months	71.5	28.9	230
Breastfeed right after birth	87.0	21.5	235
Breastfeed for three months	85.0	23.9	235
Breastfeed for six months	78.9	28.9	234
Breastfeed for one year	64.6	36.0	235
Overall confidence inventory score	74.8		
Overall Motivation Construct inventory score	81.0		
Overall Technique Construct inventory score	70.0		

BPEBI, Breastfeeding Personal Efficacy Beliefs Inventory; SD, standard deviation.
Overall confidence inventory score = the mean score of the individual inventory scores.
Construct inventory scores were calculated separately for the two constructs from the items that made up the individual constructs.

Univariate regression was performed to determine the effect of race (black vs. non-black), marital status (married vs. not married), and insurance (Medicaid vs. self-pay) on EBF at hospital discharge. Race and marital status were statistically significant with P-values of 0.003 and 0.004, respectively, with non-black race and being married positively associated with EBF. Having Medicaid insurance (vs. other insurance types) was negatively associated with EBF, with borderline statistical significance (P=0.06). Multiple regression revealed that the two main predictors of EBF at discharge were: EBF mothers were less common among those of black race (P=0.02) and those living within lower SES zip codes of the central city of Milwaukee (P=0.01).

Discussion

Based on these findings, using the BPEBI as a tool to assess BF in this predominantly urban, low SES population suggests that, based on self-reported BFC levels, we would expect these patients to have a substantially high BF initiation rate. Research that has measured the concept of self-efficacy in BF found that participants with high self-efficacy scores breastfed for longer periods and have a higher initiation rate.[16] This was not the case in this population, with only 56% of women initiating BF at hospital discharge; there are presumably other factors influencing BF initiation.

Many factors influence infant feeding decisions. These include social influences of the mother's peer group, expectations from society, the partner's attitude about BF, family expectations, mother's level of education about BF and exposure to BF.[16] Specifically, in black women there is disproportionately inadequate support for BF. This lack of support extends from the home, workplace, peers and health care providers.[17,18] Barriers to BF in the Women, Infants, and Children (WIC) population have been sorted into five categories: lack of support inside/outside the hospital, returning to work, practical issues, WIC-related issues, and social/cultural barriers. This is a complex population that has many factors influencing BF. Clinical recommendations have included peer-counseling programs, prenatal/postpartum education, in-hospital BF support, and changing the focus of WIC from formula-promoting to BF-promoting, all of which have shown to increase EBF in this population.[19]

Those factors most associated with BFC were black race, age, prior exposure to BF, whether or not this was the first pregnancy, and EBF during the early weeks. The most significant variables associated with the low BF initiation rates in this population were absence of exposure to BF, failure to breastfeed exclusively immediately postpartum, black race, and living in low SES zip codes of the central city of Milwaukee.[15] These findings are similar to recent interviews of black women in this area (which comprise 58% of the same population as this project) about influences on BF.[20] It is imperative to direct patient education toward increased exposure to BF in the antenatal period. Improving health behaviors using the behavior change approach based on individual psychology, behaviorism and community-based participatory approach have been successfully utilized in numerous World Health Organization BF programs. Specific strategies include baby-friendly hospital initiatives, in-service staff training, supportive supervision during antepartum care, education using electronic, print and social media (i.e. BF videos in the waiting area, posters of role models supporting

BF), prenatal lactation classes, centering groups, community advocacy, peer counseling, and networking with mother support groups such as the La Leche League.[21]

Prenatal BF workshops provided to patients have shown increased initiation and duration rates.[22] BF classes are often available; however, this service may require a fee that could prevent patients from participating. These workshops are in a lecture format and may not be enticing for young women to participate in due to lack of interaction. An interactive model that promotes exposure and support through peer groups is CenteringPregnancy© (Centering Healthcare Institute, Boston, MA). This model has great potential in low SES black populations and has already been shown to increase the number of prenatal care appointments attended, decrease preterm labor and increase BF initiation rates.[23] Our medical center has initiated group prenatal care, and we are hopeful that this will impact the initiation rate of BF.

Initiation is the first step; continuation of BF will need continued support for mothers and an environment that promotes successful BF. Multiple interventions have been previously studied, with validated surveys available to identify possible issues in women who have chosen to breastfeed. Britton et al., in a systematic review and meta-analysis of 34 randomized trials, showed a significant beneficial effect of lay and professional BF support, particularly on EBF.[24]

Lactation consultants have been shown to increase BF initiation rates at hospital discharge through promotion and education of the mother, spouses/partners and immediate family members. Past research by Oza-Frank et al. demonstrated that a mother receiving the services of both a lactation consultant and peer counselor was 34% more likely to provide any breast milk to their infant in the NICU, compared to only lactation consultants (11%) or only peer counselors (14%).[25] Our institution has lactation consultants available 7 days a week for all mothers; an additional service to add would be a peer counselor.

The contradictory view of the WIC program as supporting BF on one hand but also promoting formula on the other delivers mixed messages to the population that it serves.[18] WIC provides free supplemental formula to mothers and does not endorse EBF as an important health goal. Participation in the WIC program during the first trimester is associated with reduced duration of BF, participation during any trimester is related to increased formula feeding, and participation at 2-4 months is associated with increased risk of BF discontinuation by 50%. The more formula that is consumed creates additional funding, which enables the WIC program to reach more families. However, if the program is reaching families with the wrong or confusing messages, broader coverage might not be beneficial. In the New York City WIC office, a shift has been made from WIC being the "formula people" to the "BF people;" removing all formula from its office has helped to promote BF within the population.[18]

In regards to continuous support after delivery, it has been noted that mothers who give birth at Baby-Friendly-accredited hospitals are more likely to initiate EBF and more likely to sustain it at 6 months and 1 year of age.[26] To attain Baby-Friendly status, adherence to the Ten Steps to Successful Breastfeeding is advised as well as using the 4-D pathway to designation.[27] Using this method creates an environment that is supportive of best practices in maternity care and of optimal infant feeding. This, along with addition of a peer counselor and steps to recreate WIC as a BF-promoting rather than formula-promoting program, would be new initiatives for our institution and would help support the community in promoting BF. Also important to our institution would be to offer vouchers to women who are unable to pay for BF information classes.

In addition to the aforementioned possible explanations, an alternative explanation for some of the mismatch between calculated BFC and BF initiation rates may be the performance of the BPEBI instrument in this patient population, particularly given that the two identified factors explained less than 50% of the variance. This may relate to the fact that the BPEBI was validated in a different racial and socioeconomic demographic than the project population. Further investigation could attempt to construct questions that would more accurately query those issues which encourage or discourage BF initiation rates in this setting.

Limitations of this project include its moderate sample size from a single institution, the anonymity of the survey, which did not allow correlation of confidence score with actual BF initiation rate, that the timing of prior BF exposure was unknown, and the fact that the BPEBI has not been specifically validated in the project population. The validity of the BPEBI in this population will need more exploration to determine if this tool can be used in the future to reliably predict BF initiation rates. Strengths of this project include high survey response rate (perhaps aided by anonymity of the survey) and the use of a previously validated survey instrument in an unexplored urban population.

Conclusions

Women in this urban population need more exposure to breastfeeding during the antenatal period and continued support after initiation to increase the rate of BF and reach the goals of Health People 2020. Despite the complexity of individuals in this population, this survey demonstrated they have the self-reported confidence to breastfeed. The low BF rates among this population may be the result of lack of support from health care providers or programs inside/outside the hospital as well as sociocultural and economic barriers that emerge at the time of BF decisions. Racial and demographic barriers cannot be changed, but interventions can be designed to address them in a culturally sensitive manner. With this information we can now direct patient-centered tools (peer counselors, BF class vouchers, decreased formula use in the hospital, etc.) for improvement in BF at our institution, as can similar urban facilities. Future assessment of success of any proposed interventions can be measured by BF initiation and continuation rates.

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Conflicts of Interest

None

References

1. Section on Breastfeeding, Johnston M, Landers S, Noble L, Szucs K, Viehmann L. Breastfeeding and the use of human milk. *Pediatrics.* 2012;129:3:e827-41.
2. World Health Organization. *Report of the Expert Consultation on the Optimal Duration of Exclusive Breastfeeding.* Geneva, Switzerland: World Health Organization, 2001;1-6.
3. Committee on Health Care for Underserved Women, American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 361: Breastfeeding: maternal and infant aspects. *Obstet Gynecol.* 2007;109:479-80.
4. Gartner LM, Morton J, Lawrence RA, et al. Breastfeeding and the use of human milk. *Pediatrics.* 2005;115:496-506.
5. Boland M. Exclusive breastfeeding should continue to six months. *Paediatr Child Health.* 2005;10:148.
6. Royal College of Paediatrics and Child Health. England, Whales, and Scotland: The College 2007-2010. Police Statement-Child Health. Available at: www.rcpch.ac.uk/child-health/ standards-care/position-statements/position-statements. Accessed Dec. 26, 2012.
7. Ip S, Chung M, Raman G, et al. Breastfeeding and maternal and infant health outcomes in developed countries. *Evid Rep Technol Assess (Full Rep).* 2007;(153):1-186.
8. Healthy People 2020. Maternal, infant, and child health. Available at: http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=26. Accessed Aug. 28, 2013.
9. Center for Disease Control and Prevention. Breastfeeding report card – United States, 2012. Available at: www.cdc.gov/breastfeeding/pdf/2012BreastfeedingReportCard.pdf. Accessed Dec. 26, 2012.
10. Center for Disease Control and Prevention. Pediatric nutrition surveillance system (PedNSS)-WIC data. Available at: www.dhs.wisconsin.gov/wic/WICPRO/data/PedNSS/10metro.pdf. Accessed Dec. 26, 2012.
11. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev.* 1977;84:191-215.
12. Bandura A. *Self-Efficacy: The Exercise of Control.* New York: W.H. Freeman and Company, 1997.
13. Cleveland AP, McCrone S. Development of the Breastfeeding Personal Efficacy Beliefs Inventory: a measure of women's confidence about breastfeeding. *J Nurs Meas.* 2005;13:115-27.
14. Grimm LG, Yarnold PR. *Reading and Understanding Multivariate Statistics.* Washington, D.C.: American Psychological Association, 2004.
15. Chen HY, Baumgardner DJ, Frazer DA, Kessler CL, Swain GR, Cisler RA. *Milwaukee Health Report 2012: Health Disparities in Milwaukee by Socioeconomic Status.* Milwaukee: Center for Urban Population Health, 2012.
16. Wells KJ, Thompson NJ, Kloeblen-Tarver AS. Development and psychometric testing of the prenatal breast-feeding self-efficacy scale. *Am J Health Behav.* 2006;30:177-87.
17. Street DJ, Lewallen L. The influence of culture on breast-feeding decisions by African American and white women. *J Perinat Neonatal Nurs.* 2013:27:43-51.
18. Kelka TR, Jensen E, McLaurin S, et al. Community based participatory research of breastfeeding disparities in African American women. *Infant Child Adolesc Nutr.* 2011;3:233-9.
19. Hedberg IC. Barriers to breastfeeding in the WIC population. *MCN Am J Matern Child Nurs.* 2013;38:244-9.
20. Robinson KM, VandeVusse L. African American women's infant feeding choices: prenatal breast-feeding self-efficacy and narratives from a black feminist perspective. *J Perinat Neonat Nurs.* 2011:25:320-8.
21. Morrow A. *Community Based Strategies for Breastfeeding Promotion and Support in Developing Countries.* Geneva, Switzerland: World Health Organization. Available at: http://whqlibdoc.who.int/publications/2003/9241591218.pdf. Accessed Dec. 26, 2012.
22. Noel-Weiss J, Rupp A, Cragg B, Bassett V, Woodend AK. Randomized controlled trial to determine effects of prenatal breastfeeding workshop on maternal breastfeeding self-efficacy and breastfeeding duration. *J Obstet Gynecol Neonatal Nurs.* 2006;35:616-24.
23. Ickovics JR, Kershaw TS, Westdahl C, et al. Group prenatal care and perinatal outcomes: a randomized controlled trial. *Obstet Gynecol.* 2007;110:330-9.
24. Britton C, McCormick FM, Renfrew MJ, Wade A, King SE. Support for breastfeeding mothers. *Cochrane Database Syst Rev.* 2007;(1):CD001141.
25. Oza-Frank R, Bhatia A, Smith C. Combined peer counselor and lactation consultant support increases breastfeeding in the NICU. *Breastfeed Med.* 2013;8:509-10.
26. Merewood A, Mehta SD, Chamberlain LB, Philipp BL, Bauchner H. Breastfeeding rates in US Baby-Friendly hospitals: results of a national survey. *Pediatrics.* 2005;116:628-34.
27. Baby-Friendly USA. Guidelines and Criteria. Available at: http://www.babyfriendlyusa.org. Accessed Dec. 26, 2012.