



Understanding Breastfeeding Barriers at an Urban Pediatric Practice

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Received: 30 November 2021 / Revised: 19 January 2022 / Accepted: 20 January 2022 / Published online: 31 January 2022
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Abstract

Breastfeeding is the optimal nutrition for infants given the numerous health benefits that are conferred on mothers, infants, and society in a dose-dependent manner. However, low breastfeeding rates and racial breastfeeding inequities persist for the African American (AA) community due to historic structural racism. The issue is especially salient at the Rainbow Center for Women and Children, an urban health center in Cleveland, Ohio where approximately 90% of their mothers are AA, WIC-eligible, and publicly insured. Our study aims to elucidate factors contributing to breastfeeding practices and identify supports that could be added for women served at RCWC. The study was conducted within 2 cohorts both of exclusively AA women. Wave 1 of the study included AA mothers who exclusively breastfed, did mixed feeding, or exclusively formula fed. Wave 2 included expectant women at least considering breastfeeding. Breastfeeding attitudes of those who had exclusively breastfed or practiced mixed feeding were not significantly different than those of expectant participants planning to breastfeed; mean attitude scores, however, were in the “neutral” range. Participants endorsed many sources of support for their feeding choices, including the infant’s father, their own parents, and family. However, the data show that even when women feel personally supported in their feeding choices by their partner and family, if additional breastfeeding help is needed, they will benefit from help accessing available resources. Thus, lactation support that helps women achieve their own breastfeeding goals is optimal; customized care ultimately can move the needle on racial inequities in breastfeeding for our society.

Keywords Breast feeding · Lactation · African Americans · Health resources

Background

Breastfeeding is the optimal nutrition for infants and has multiple health benefits for infants, mothers, and society [1–3]. Increased duration and exclusivity of breastfeeding confer dose-dependent and increased health benefits,

but well-documented persistent racial disparities undermine improvements in national breastfeeding rates [4–6, 6]. Notably, rates of breastfeeding for non-Hispanic African Americans (AA) have slowly improved [6], and the breastfeeding gap between AA and white infants has narrowed [7], but disparities remain. For example, the rate of exclusive breastfeeding at 3 months in the state of Ohio is 49.7% + 6.5, but the national rate for non-Hispanic African American (AA) women is meaningfully lower (39.1% ± 3.7) [6]. In our own practice, the Rainbow Center for Women and Children (RCWC), we serve a predominantly (90%) African American, low-income, publicly insured, and WIC eligible population; and our most recent (infants born in 2019) rates of exclusive breastfeeding (EBF) drop from the 3–5 day visit (38%), to the 2-week visit (22%), and to the 2-month visit (8%) (Source: Pediatric Practice Breastfeeding Database, IRB#11–16-07). These very low EBF rates are not acceptable and demand action.

The causes of disparities in EBF rates among non-Hispanic AA mothers as compared to other populations are multiple. Bias and racism appear to adversely influence rates and

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quality of lactation referrals for AA mothers [8]. Structural racism, both as assessed epidemiologically at the societal level and described qualitatively at the personal level, is a major factor contributing to inequities [9, 10]. Themes identified in focus groups included historic exploitation of AA women's breastfeeding as wet nurses, institutional advocacy for formula use, and failure of employer support for breastfeeding [10]. AA mothers also report a higher comfort level with feeding formula and lack of personal support for breastfeeding from family members and may not trust professionals' health information about breastfeeding [11–13]. The Special Supplemental Feeding Program for Women, Infants and Children (WIC) has an evidence-based peer counseling program, yet WIC-conducted focus groups revealed that AA mothers trusted family members' advice over that of professionals, and accepted misconceptions and incorrect breastfeeding information over mainstream medical advice [14]. Systematic reviews of interventions to promote breastfeeding among minority women have identified peer counselling, breastfeeding "teams" with a peer counselor and a health professional, group prenatal care, office appointments dedicated to breastfeeding, and hospital maternity practice changes, as effective [8, 15–17].

Major knowledge gaps exist in how best to meet the overall social, personal, and medical breastfeeding needs of AA women, with calls for an integrative approach [17]. Our study aims were (1) to gain a better understanding of maternal facilitators and barriers to continued exclusive breastfeeding among AA women served at RCWC, (2) to identify facilitators and barriers to uptake of local and practice (RCWC) resources for breastfeeding support and promotion for AA women, and (3) to solicit these mothers' ideas for preferred methods of supporting exclusive breastfeeding in the first 2–4 postnatal weeks following hospital discharge.

Methods

Study Design

This was a mixed-methods study using cross-sectional survey and structured interview.

Setting and Population

Setting The study was conducted at an urban health center, Rainbow Center for Women and Children (RCWC), part of a tertiary/quaternary care academic medical center in Cleveland Ohio. The city of Cleveland has a population just under 400,000, of whom 32.7% live in poverty, 48.8% self-describe as African-American (AA), and 59.1% are employed in the civilian labor force [17]. Of children served at RCWC, approximately 90% of their mothers are AA, WIC-eligible,

and publicly insured. A WIC office is on site, and Pediatrics and Obstetrical services are co-located.

Population Two cohorts of mothers were interviewed. Both cohorts purposely included only AA women, in order to address the study aims. Wave 1 included AA mothers ≥ 18 years of age who had delivered an infant at gestational age ≥ 34 weeks at the associated birthing hospital (University Hospitals MacDonald Women's Hospital) and did not receive neonatal intensive care, and who had at least one visit at RCWC prior to neonatal age one month. Feeding type had been previously recorded as part of an ongoing IRB-approved practice database (Pediatric Practice Breastfeeding Database), and consecutive eligible women were identified from the 2019 birth cohort. We aimed to include 10 mothers who had exclusively breastfed, 10 who had combined breast milk feeding and formula (mixed feeding), and 10 who had formula fed exclusively through 2 months (defined as the well care visit closest to 1.5–3 months post-natal age). Wave 2 included 30 expectant women ≥ 18 years of age currently receiving obstetrical care at the RCWC Women's Health Center. Mothers were eligible if they endorsed at least considering breastfeeding for the infant of their current pregnancy.

Study Procedures and Data Collection

The study was approved by the UHMC Institutional Review Board and informed consent was obtained from each participant. Wave 1 mothers were recruited via an introductory letter followed by a phone interview. Data were collected during interview directly into a REDCap database [18]. Wave 2 mothers were identified through obstetrical schedules of both individual providers and CenteringPregnancy™ and were recruited in person following provider permission. The survey data were either collected directly into REDCap on an iPad or onto paper forms (when Wifi connectivity was lost) that were then entered into REDCap. All relevant institutional pandemic-related practices including masking and distancing were followed throughout for in-person interviews. Each participant received a \$25 local grocery chain gift card in appreciation.

Data Elements and Measures

Maternal AA race and feeding choice (Wave 1) or feeding intention (Wave 2) were confirmed verbally at the start of the interview. Questions were both open and closed: demographic descriptors were limited to age, number of living children, and prior breastfeeding experience; and 6 previously utilized questions about personal/social support, return to work/school plans or history, and public breastfeeding were included [19]. Additional probes focused on barriers to use of current resources and ideas for new resources. Both

Wave 1 and 2 interviews included the Iowa Infant Feeding Attitude Scale (IIFAS), a 17-item Likert scaled validated and reliable measure of maternal attitudes toward infant feeding and the choice of breastmilk compared to formula [20]. The IIFAS has been utilized in similar populations [19, 21]. The purpose of the IIFAS was to provide a comparison framework and context for maternal comments across feeding choices and differing interview timing.

The Integrated Model for explaining motivation and behavioral change, called the I-Change Model, was used to underpin survey development and content. This model is derived from the Attitude–Social influence–Self-Efficacy Model and integrates several other theories including Ajzen’s Theory of Planned Behavior and Bandura’s Social Cognitive Theory, and the Health Belief Model [22]. Briefly, this model begins with external factors, for example age, number of living children, and neighborhood, and then assumes three phases of behavioral change, including (1) motivation, which includes attitudes, support, and self-efficacy, (2) awareness, which includes relevant knowledge and skills, and finally (3) behavior change, i.e., breastfeeding initiation and continuation. Prior work has demonstrated the relevance of this model to breastfeeding [23]. We sought to understand how motivation and awareness were related to infant feeding decisions (behavior), and how these could function as facilitators or barriers to uptake of local resources and be related to ideas for future resources.

Behavior was recorded as either the mother’s feeding choice (Wave 1) or her feeding intention (Wave 2), assessed with the Infant Feeding Intention Scale, a validated 5-item Infant Feeding Intentions Scale (IFIS) which quantitates maternal breastfeeding intentions and has been validated in a low-income multi-ethnic population [24]. The IFIS score can range from 0 (very strong intention to not breastfeed at all) to 16 (very strong intention to breastfeed exclusively throughout the first 6 months) and has been shown to be significantly different between pre-admission feeding choice groups, strongly associated with planned duration of exclusive breastfeeding, and highly predictive of actual duration of exclusive breastfeeding (each $p < 0.0001$) [24]. In calculating the IFIS score, we assumed the response to statement no. 1 (“I am planning to only formula feed my baby”) was either “somewhat disagree” or “very much disagree” to align with the inclusion criteria for the study, while the responses to the four other statements were reported directly by mothers.

Main Outcomes

The main outcomes with respect to study aims were (1) mothers’ breastfeeding attitudes, social influences/supports, and reported breastfeeding self-efficacy, (2) mothers’ reported use of resources and barriers to uptake of current

breastfeeding programs at RCWC, and (3) mothers’ suggestions for ways to support exclusive breastfeeding following hospital discharge.

Data Analysis

Participant characteristics were described with percentages and frequencies. Differences between groups on continuous variables were assessed using one-way analysis of variance (ANOVA). Follow-up comparisons were made using independent t tests. All tests were two-tailed and p ’s < 0.05 were considered significant. No sample size calculation was conducted due to the exploratory nature of the work. We anticipated that thematic saturation could be reached with the planned total of up to 30 women per Wave.

Wave 1 participants responded to two open-ended questions regarding breastfeeding resources: “Please tell us of any [resource] you used and if it was helpful to you,” and “Was there anything else you wanted to let us know about resources or getting help with infant feeding?” Their responses (Table 4) were reviewed and examined for commonalities and themes by feeding group, and by response content and frequency, with results summarized. Wave 2 participants responded to closed choice questions (yes/no/not sure) about desired app features; these are summarized in Table 5. No specific statistical analyses were conducted due to the qualitative nature of the responses.

Results

Population Description

As per inclusion criteria, all women self-identified as AA. For Wave 1, of consecutive eligible women reached by phone following letter recruitment, 83% (10/12) of those exclusively breastfeeding, 60% (9/15) of those practicing mixed feeding, and 34% (10/29) of those exclusively formula feeding agreed to participate. For Wave 2, 34 consecutive eligible women were approached and 30 (88%) agreed to participate. All Wave 2 women were expectant and planned at least to try breastfeeding. Most women either had gone back to work or school after delivering their baby (Wave 1) or planned to do so (Wave 2), with 2 from each group returning or planning to return prior to 1-month postpartum. The study population is described in Table 1.

Breastfeeding Attitudes

All women from both Waves completed the Iowa Infant Feeding Attitudes scale (IIFAS). Scores were first compared between the three infant feeding groups in Wave 1. Significant differences were found between the three groups,

Table 1 Population description—external factors

	Wave 1*			<i>p</i> value for difference EBF vs. formula	Wave 2* <i>N</i> = 30
	EBF <i>n</i> = 10	Mixed <i>n</i> = 9	Formula only <i>n</i> = 10		
Personal descriptors					
Age— <i>n</i> (%)				0.35	
< 20 years	0	0	1 (10%)		9 (30%)
20–30 years	8 (80%)	4 (44%)	5 (50%)		18 (60%)
> 30 years	2 (20%)	5 (56%)	4 (40%)		3 (10%)
Number of children**					
1	3 (30%)	3 (33%)	4 (40%)	0.22	16 (55%)
2	4 (40%)	2 (22%)	0		9 (31%)
3 or more	3 (30%)	4 (44%)	6 (60%)		4 (13%)
Work and school					
Back to work/school (<i>n</i> , % yes)***	8 (80%)	6 (67%)	7 (70%)	1.0	24 (80%)
< 1 month-postpartum (<i>n</i>)	1	1	0	.41	2
1–3-month postpartum (<i>n</i>)	4	0	6		14
> 3-month postpartum (<i>n</i>)	3	5	1		8

*Wave 1 participants delivered in 2019; Wave 2 participants were expectant and considering breastfeeding

**Includes current pregnancy for Wave 2

***As accomplished for Wave 1, and as planned for Wave 2

$p = 0.014$. Mean scores in the exclusive breastfeeding group (65.3 ± 5.8 (range: 57–78)) did not differ significantly from those in the mixed feeding group (62.6 ± 6.8 (range: 57–78)), $p = 0.360$, but were significantly higher than those in the formula only group (56.9 ± 5.6 (range: 48–67)), $p = 0.004$. Mean scores in the mixed feeding group did not differ significantly from those in the formula only group, $p = 0.062$. Among women in Wave 2, each of whom intended to breastfeed, 5/30 (17%) scored between 70 and 85, which is interpreted on the IIFAS as “positive” (70–80) or “very positive” (80–85) toward breastfeeding; average scores for the Wave 2 group were 59.9 ± 8.0 (range: 50–79).

Comparing Wave 1 and Wave 2, those who were in either the (Wave 1) exclusive breastfeeding or mixed feeding groups did not have significantly different scores (64.0 ± 6.3 [range: 57–78]) than those in the Wave 2 group, $p = 0.133$. Also compared to Wave 2, those in the (Wave 1) exclusive breastfeeding group did not differ significantly, $p = 0.101$, nor did those in the mixed feeding group, $p = 0.526$, or the formula only group, $p = 0.176$.

Women in Wave 2 also completed the Infant Feeding Intention (IFI) scale: their mean score was 12.7, which indicates moderate to high intention to breastfeed, and corresponded to a planned exclusive breastfeeding duration of 3–6 months in the initial validation study for the IFI.

When comparing the mean IIFAS scores between those who said “very much agree” to feeding their baby at 1 month with breastmilk only (exclusive breastfeeding) versus all others, scores were significantly different, $p = 0.002$. “Very

much agree” participants had average scores of 64.6 ± 8.7 (range: 50–79) on the IIFAS, while all others had average scores of 56.3 ± 4.1 (range: 51–64). When comparing the mean IIFAS scores between those who said “very much agree” to feeding their baby at 3 months with breastmilk only versus all others, scores were significantly different, $p = 0.034$. “Very much agree” participants had average scores of 63.9 ± 8.8 (range: 50–79), while all others had average scores of 57.5 ± 6.3 (range: 51–75). These results are further described in Table 2.

Social Influences and Support

Women in both Waves 1 and 2 endorsed multiple sources of personal support for their feeding choices (Table 2). In each Wave 1 feeding group and in Wave 2, 50% or more reported “everyone supported me;” within each group, 70% or more felt supported by the father of their child (described as father, partner, husband, or boyfriend), and 60% or more felt supported by their own parents. Family members, friends, and the WIC peer breastfeeding counselor were other sources of support for infant feeding choice. When comparing those who had 4+ categories of support versus those who say, “everyone supports me,” no significant differences were found, $p = 0.061$. When asked to describe (free text) the “top 3 people whose support you value most, not just for infant feeding,” the father of their baby, their own parents, and family members were again most often cited.

Table 2 Breastfeeding attitudes, social influences, and self-efficacy

	Wave 1*			<i>p</i> value for difference EBF vs. formula <input type="checkbox"/>	Wave 2*
	EBF	Mixed	Formula only		
Attitude toward breastfeeding					
IIFAS score (mean ± SD)**	65.3 ± 5.8	62.6 ± 6.8	56.9 ± 5.6	0.004	60.7 ± 8.0
IFI score (mean ± SD)***	NA	NA	NA		12.45
Social influences and support					
Support for my feeding choice					
“Everyone supported me”	7 (70%)	7 (78%)	5 (50%)		17 (57%)
Partner/FOB/husband/boyfriend	9 (90%)	7 (78%)	7 (70%)		24 (80%)
Mom’s own mother and father	8 (80%)	6 (67%)	6 (60%)		19 (63%)
Other family members	9 (90%)	6 (67%)	3 (30%)		13 (43%)
Friends	6 (60%)	4 (44%)	2 (20%)		10 (33%)
WIC peer counsellor	6 (60%)	2 (22%)	5 (50%)		4 (13%)
Other	5 (50%)	4 (44%)	4 (40%)		1 (3%)
The top 3 people whose support you value most (in general, not specific to infant feeding)					
Partner/FOB/husband/boyfriend	6	7	5		19
Mom’s own mother and father	6	5	8		20
Other family members	9	8	9		15
Friends	5	1	2		7
WIC peer counsellor	0	1	0		1
Other	0	3	2		3
Self-efficacy					
Mastery experiences (personal hx)					
Number with other children	7	7	6		15
If other children, BF them (<i>n</i> , % yes)	7 (100%)	5 (71%)	2 (33%)	0.021	10 (67%)
If other children, BF in public (<i>n</i> , % few times per week or so many times I cannot remember)	6 (60%)	2 (22%)	NA		NA
Feeding after back to work/school plan (<i>n</i> of those returning)	8	6	7		24
BF only (includes pumping)	6 (75%)	2 (33%)	0		10 (42%)
BF and formula	1 (12%)	2 (33%)	0		8 (33%)
Formula only	1 (12%)	2 (33%)	7 (100%)		6 (25%)
Achieved plan for feeding after back to work/school					
Yes	6 (75%)	5 (83%)	7 (100%)		NA
No	1 (12%)	0	0		NA
Partly	1 (12%)	1 (17%)	0		NA
Achieved own BF duration goal (<i>n</i> , % yes)	7 (70%)	4 (44%)	NA		NA
Vicarious experiences (someone I know BF)					
Know someone who BF (<i>n</i> , % yes)	9 (90%)	5 (56%)	7 (70%)	0.58	17 (57%)
Emotional and physical state					
Perceive medical problem impacts BF (<i>n</i> , % no versus yes/maybe/not sure)	7 (70%)	7 (78%)	9 (90%)		16 (53%)

*Wave 1 participants delivered in 2019; Wave 2 participants were expectant and considering breastfeeding

**Iowa Infant Feeding Attitudes Score (de la Mora, A., Russell, D.W., Dungy, C.I., Losch, M., & Dusdieker, L. (1999). The Iowa infant feeding attitude scale: analysis of reliability and validity. *Journal of Applied Social Psychology*, 29 (11) 2362–2380)

*** Infant Feeding Intention Scale (Nommsen-Rivers LA and Dewey KG. Development and validation of the Infant Feeding Intentions scale. *Matern Child Health J.* 2009; 13 (3): 334–42 10.1007/s10995-008–0356-y)

Value for *p* provided where relevant

Total number of participants identifying this person as a support to her; free text responses so no percentage of sample calculated

Table 3 Breastfeeding resource use (breastfeeding abbreviated as BF throughout)

	Wave 1			Wave 2
	EBF	Mixed	Formula only	
Resources you knew (or know) about**				
Breastfeeding group at RCWC	5 (50%)	5 (56%)	9 (90%)	9 (30%)
Lactation appointment at RCWC	8 (80%)	4 (44%)	8 (80%)	4 (13%)
WIC peer helper	7 (70%)	5 (56%)	10 (100%)	10 (33%)
Lactation phone help	6 (60%)	2 (22%)	7 (70%)	5 (17%)
My doctor or nurse	9 (90%)	7 (78%)	10 (100%)	7 (23%)
Did not know about any	0	0	0	10 (33%)
Resources you used (or plan to use)**				
Breastfeeding group at RCWC	1 (10%)	1 (11%)	1 (10%)	18 (60%)
Lactation appointment at RCWC	4 (40%)	2 (22%)	1 (10%)	10 (33%)
WIC peer helper	5 (50%)	4 (44%)	4 (40%)	13 (43%)
Lactation phone help	0	0	0	7 (23%)
My doctor or nurse	5 (50%)	3 (33%)	2 (20%)	11 (37%)
None	0	2 (22%)	4 (40%)	5 (17%)
Reasons not used or would not use**				
Did not know how to schedule	4 (40%)	5 (56%)	NA	NA
Transportation problem	0	0	NA	NA
Hard to use due to other kids	1 (10%)	0	NA	NA
No time	0	0	NA	NA
Felt uncomfortable about getting BF help	0	0	NA	NA
Did not need help	0	0	NA	NA
Worried someone would be too pushy	7 (70%)	3 (33%)	NA	NA
Other	0	0	NA	NA
Suggestions for feeding resources				
Hotline available 24/7	1 (10%)	1 (11%)	0	19 (63%)
Telehealth with ability to see lactation counselor	0	1 (11%)	0	6 (20%)
An app for my phone with BF information	0	1 (11%)	0	14 (47%)
Adding a BF appointment to my baby's checkup or my obstetrical appointment	0	1 (11%)	0	12 (40%)
Home visiting	0	2 (22%)	0	13 (43%)
Other/support group	3 (30%)	0	0	14 (47%)

**Resources used/not used for Wave 1, and plan to use/would not use for Wave 2

Reported Self-efficacy

Among women in Wave 1 who had other children, rates of breastfeeding previous children were 100%, 70%, and 33%, among those who had exclusively breastfed, practiced mixed feeding, and formula fed only, respectively. In Wave 2, 15/30 women had prior children, and of these 10 (67%) had breastfed these children. Plans for infant feeding among those returning to work/school are described (Table 2): the majority of women said they had achieved their plan. With respect to breastfeeding duration goals, 7 (70%) of those who exclusively breastfed and 4 (44%) of those who had practiced mixed feeding said they had met their own goal. Regarding the vicarious experience of knowing someone who had breastfed, there were no significant differences

between the feeding groups in Wave 1 ($p = 0.58$). Most women (70–90%) in Wave 1 did not believe that medical problems such as depression and hypertension had impacted their infant feeding, while a smaller proportion (57%) in Wave 2 felt this way.

Use of Resources and Barriers to Uptake

Breastfeeding resources available at RCWC-RPP include (1) a lactation specialist (IBCLC—International Board Certified Lactation Consultant) on site half time with CLC (Certified Lactation Counselor) back up most days, (2) a breastfeeding support group (virtual during the pandemic but in person during the Wave 1 mothers' period of lactation), (3) WIC (Supplemental Feeding Program for Women, Infants

Table 4 Wave 2: desired app features

Tracking	
Track baby feedings, naps, diapers, weights, appointments	30
Track mom's sleeping, drinking or eating, appointments	28
Personalization	
Can post my own pictures or videos	25
Has emojis or pictures of African Americans	23
Peer support	
Able to share with family, partner	22
Connect to my own social media	15
Education—short video/tiny url on:	
Breastpump use	29
Breastfeeding positions	29
Milk expression and storage	28
Good latch	27
Managing engorgement	26
Going back to work	24
Professional support	
Link to check if medication is OK for breastfeeding	28
Link to legal rights for back to work and public breastfeeding	28
Link to make an appointment with the doctor/provider	27
Phone numbers for lactation, warmth, and hotlines	26

and Children) Breastfeeding Peer Helpers, (4) lactation help by phone call from the main hospital IBCLCs, and (5) the mother's own health provider (physician, midwife, nurse practitioner). Participants in Wave 1 from all feeding groups largely endorsed being aware of each of the resources, while one-third or fewer of expectant participants (Wave 2) were yet aware of resources (Table 3). The two most frequently used resources by Wave 1 participants were a WIC Peer Helper and the participant's own doctor or nurse. The two most frequently cited barriers were not knowing how to schedule an appointment and worrying someone would be "too pushy" about breastfeeding; transportation problems, lack of time, feeling uncomfortable about getting help, and not needing help were not endorsed by any participant as the reason they did not access resources.

Participants in Wave 1 were asked, "Please tell us of any [resource] you used and if it was helpful to you," and "Was there anything else you wanted to let us know about resources or getting help?" (Table 5). The WIC breastfeeding peer helper received the most mentions as a helpful resource among each feeding group (exclusively breastfed—4; mixed feeding—3; and exclusively formula feeding—3). Participants who had exclusively breastfed spoke about the need for more education, for dispelling myths about breastfeeding, and for more support and mentoring. Those who had practiced mixed feeding offered a

greater variety of comments about resource use: three wanted additional information and specifically help with latch (including a wish for "numbing cream with first kid"), one participant said, "[I] wouldn't change much but saying listen more, some people were more attentive than others but others were in a rush, not taking what [I] was saying seriously..." and one mother reported that her depression was her main obstacle ("all the resources were there...[I was] in a grey area, didn't go out much... just would go to appointments then back in bed... because I was depressed."). Among those who formula fed exclusively, comments included two participants who had wanted more information about latch and milk production ("was producing the milk but it wouldn't come out"), two wanted specific information about formula mixing and having enough formula for the month, and two had very positive comments about hospital-based support (including, "they go along with your choice... they don't try to force anything on you... they don't frown on you if you choose not to breastfeed or if you choose to breastfeed.").

Suggestions for Future Support of Breastfeeding

All participants were asked, "If you could design your own resources to support baby feeding, what do you think would be helpful to you? In Wave 1, few mothers endorsed any of the offered options (Table 3). In Wave 2, mothers endorsed the following: Hotline available 24/7 (19, 63.3%), an app for my phone with information (14, 46.7%), home visiting (13, 43.3%), a support group for mothers who are giving breastmilk (13, 43.3%), adding an additional appointment to my baby's checkup or to my OB postpartum visit (12, 40.0%), telehealth with ability to see the health provider (6, 20.0%), support group (13 (43%), and other not stated (1, 3.3%).

With respect to a phone app, Wave 2 mothers responded to their interest in specific functionalities, which were categorized into the domains of professional support, peer support, tracking, resources and education, and personalization (Table 4). When asked if they would want to receive motivational text messaging from a breastfeeding app, 19 (65.5%) said "yes," with 7 (24.1%) responding "maybe," 1 responding "no," and 2 "unsure." Of 28 responding regarding messaging frequency, 17 (60.7%) would choose weekly messaging, 8 (28.6%) would choose daily messages, and the remainder were unsure. Regarding potential cost of an app, 24 (80%) said it would need to be free and 6 (20%) said less than \$3.00 would be acceptable; no one accepted a higher cost.

Table 5 Comments by feeding method of delivered participants (Wave 1)

	Please tell us of any [resource] you used and if it was helpful to you	Was there anything else you wanted to let us know about resources or getting help with infant feeding?
EBF		
1	Lactation appointment helpful when wouldn't latch in the beginning; also, UH had baby group where they talked about breastfeeding	Just more information about breastfeeding, had to look up everything
2	Yes, they were helpful	Helping with eating choices, meal plan directed towards mothers who are breastfeeding—need to make sure you eat properly and breastfeed
3	WIC peer counselor help wasn't not helpful, hadn't had a problem or needing milk or anything	Black community needs to talk more about breastfeeding and more knowledge
4	Doctor/nurse referred to lactation coach; A lady at UH taught me the football method which helped with latching; making sure I ate more to feed my (baby) and myself (mother)	More research on how important it is to drink water during pregnancy, don't freak out if milk doesn't come in the beginning; it is going to be painful how to massage lumps out; the different types of pumps for when you get back to work; the different positions on how to breastfeed
5	WIC peer was for the last child, but not for the previous three children because they couldn't figure out why milk supply wasn't as good	Figuring out a better routine for feeding for pumping, took until fourth child to figure that out
6	Went just for WIC appointment, had seen lactation consultant just in the hospital; saw my midwife—can't say it was helpful for the breastfeeding because I had breastfed other daughter and was familiar with it	Taking away the myth of breastfeeding; they think they aren't making enough milk, or the sexual connotation that comes with breastfeeding—improve education; people use that as excuse for not breastfeeding; need to talk about cost benefits and health benefits
7	Had done centering when pregnant and continued when had had my son	Mentoring and help before the son was born, not blaming yourself
8	[Blank]	More motivation with pumping
9	Yes, WIC peer counselor	Extra support from others is always good
10	Yes	Teaching people the fastest way to get milk to stop once you want to stop breastfeeding (fed up to a year but milk was still coming and leaking through shirts even though no longer feeding)
Mixed		
1	[Used none]	Numbering cream would have helped with first kid, how to physically latch the kid on the correct way
2	WIC peer counselor was really helpful	Initial appointment when pregnant if she could have given all of the information, handbook or pamphlet, or resources that would have really helped, especially as a first-time mom
3	Third kid at this point, support for other girls in the class, only went a few times, reached out to lactation specialist a few times with questions about latch	Everything they had helped, wouldn't change much but saying listen more, some people were more attentive than others but others were in a rush, not taking what she was saying seriously—the program the way it is set up currently works great if everyone is listening to you
4	WIC counselor told to continue to breastfeeding because better for her; seeing doctor or nurse was helpful	Didn't need any more resources, good
5	Did see someone about how to produce more breastmilk, just don't remember who	Never thought to look into resources
6	[Used none]	The lactation support, help with getting baby the latch, help with different things for the production of the breastmilk
7	Wants to know more about breastfeeding group; WIC wasn't at the rainbow center but they connected her with the people she was using; Yes, it was helpful	I don't even know how to think about that, all of the above would have helped me

Table 5 (continued)

	Please tell us of any [resource] you used and if it was helpful to you	Was there anything else you wanted to let us know about resources or getting help with infant feeding?
8	Saw her [IBCLC] to help with latch; it was a little bit helpful	Someone coming out to the house and being hands-on when I am doing it at home
9	Received help when in the hospital about lactation and breastfeeding	Alert on my phone to go to the hospital, don't forget, all the resources were there and I can't think of anything help; states, "[I was] in a grey area, didn't go out much.... just would go to appointments then back in bed... because I was depressed."
Formula		
1	[Used none]	Knowing what makes the baby latch on
2	[Used none]	Maybe reading a book; groups are really good with helping to get more information from people who already experienced it
3	Had participated in centering and thought it was nice	24/7 line was nice if you called and a nurse would call back, that was good enough
4	[Used none]	Rainbow supported me very much and WIC and food stamp program; I was very well taken care of; I love my hospital
5	Breastfeeding specialist at WIC was really supportive	Was producing the milk but it wouldn't come out; the nipples were scabbing over and she [mom] would bleed
6	I don't know because she just wouldn't latch, just need a better understanding on how to latch the baby on with littler nipples	Was about to go to the breastfeeding group, but wasn't latching; Help me grow; found resources helpful, some of them
7	[Used none]	Not sure
8	[Used none]	Information on how to make baby bottles; some people make too much or too little; skeptical about proportions; used distilled water and using Gerber and Similac
9	Very much so [WIC peer]	Just making sure that the particular child has enough formula to feed them throughout the month because WIC gives it every month
10	Used WIC but not for breastfeeding, found it helpful	Everything at UH, no matter what your choice is they go along with your choice they don't try to force anything on you; they don't frown on you if you choose not to breastfeed or if you choose to breastfeed

Discussion

We examined breastfeeding attitudes, social supports, and breastfeeding self-efficacy among delivered (Wave 1) and expectant (Wave 2) AA women in order to understand current uses of resources, barriers to use, and suggestions for improvement. Breastfeeding attitudes of those who had exclusively breastfed or practiced mixed feeding were not significantly different than those of expectant participants planning to breastfeed; mean attitude scores, however, were in the “neutral” range, that is, neither positive toward breastfeeding nor formula feeding. Participants endorsed many sources of support for their feeding choices, and for themselves personally, with the infant’s father, their own parents, and family, the most frequently mentioned, in that order. Measures of self-efficacy, including prior and vicarious breastfeeding experiences, were generally positive among both delivered and expectant women. More (delivered) participants knew about available RCWC breastfeeding resources than had used them, with the main cited obstacles, “did not know how to schedule” and “worried someone would be too pushy;” WIC peer helpers were most frequently mentioned as a helpful resource. In comparison, 1/3 or less of expectant participants knew about each current RCWC resource. Few (delivered) participants had additional suggestions for resources, while expectant participants endorsed a 24/7 breastfeeding hotline (63%), “a breastfeeding app for my phone” (47%), a support group (47%), home visiting (43%), and “adding a breastfeeding appointment to my baby’s check-up” (40%).

In summary, these data suggest that even when women feel personally supported in their feeding choices by their partner and family, if additional breastfeeding help is needed, they may require navigation assistance for scheduling, or they may be reluctant to access resources (or even navigation) due to concerns about coercion. This aligns with the finding that among those who did breastfeed, or intended to breastfeed, mean infant feeding attitude scores were actually neutral rather than positive toward breastfeeding. The variety of comments, with requests for more information and motivation side by side with apparent satisfaction with resources, suggests that women have highly individual needs and a “one size fits all” approach is unlikely to succeed (Table 5). The expressed desires for “mentoring,” “being attentive,” and “not rushing,” reinforce the need for care and resources than can be individualized, and the importance of avoiding excessive persuasion.

These data largely align with the literature on support for breastfeeding among AA women. To provide context, current lower rates of breastfeeding initiation, continuation, and exclusivity among AA women are increasingly recognized as occurring with a historical framework characterized

by racism and survival needs [25]. Enforced wet nursing of owner’s children during slavery leading to generational trauma has been followed by centuries of adverse socioeconomic conditions in which supplementation with milk substitutes (formula) given by family members was an economic necessity for many AA mothers. In a small interview study of AA mothers enrolled in WIC, formula feeding was described as the cultural norm, with stigma associated with breastfeeding, including social isolation and unwanted sexualization of breasts by others, despite good knowledge of breastfeeding benefits; a systematic review confirms this result [19, 26]. A recent scoping review concluded that unintended consequences of these historical and current realities were that health providers held racially biased assumptions that AA women would not want to breastfeed, and so when help was needed, they offered fewer lactation consultations and less breastfeeding assistance, while actually more assistance may be needed, since the mother’s usual source of support, i.e., her own mother, may not have breastfeeding experience of her own to share [27, 28]. Johnson et al. echoed these themes in their systematic review, noting that cultural attitudes may shape decision making about breastfeeding, and that experiences with discrimination in the health care setting increase stress, leading to poorer health outcomes [16]. Although participants in our study endorsed having personal support, they reported difficulty knowing how to access resources, and also reluctance to do so due to concerns that care might not align with their own breastfeeding goals (“too pushy”).

In terms of resources that participants endorsed, a Cochrane review concluded that a characteristic of effective support for breastfeeding mothers of healthy term infants is that it is “...tailored to the setting and the needs of the population...” [29]. The importance of flexible, respectful, and supportive lactation care, with “active learning” about the mother’s needs and ideas, is critical, and was emphasized by participants in this study [19, 28]. Expectant participants chose from a menu of options and endorsed wanting on demand self-initiated care, i.e., the 24/7 hotline. This is available in certain states, including ours. Participants endorsed wanting access to a phone app, and others have spoken about the need for smartphone applications for breastfeeding; although few are available specifically for AAs, social media shows promise for reaching and engaging this population [30–32]. Home visiting, support groups, and lactation-specific appointments were endorsed by participants, and are part of the larger tapestry of evidence-based effective interventions to support breastfeeding among AAs [15, 16, 33]. Reviews emphasize the need for an integrative approach that is ideally seamless across multiple levels, including from national to state to local hospital policy, across the community from medical facilities to community hubs including faith-based organizations, and across

all levels of care and support including medical providers, lactation support providers, and family; no one intervention alone will solve this support gap [15, 16, 33, 34].

Study limitations include a small sample of both delivered and expectant mothers, leading to reduced ability to demonstrate statistical significance. Another limitation is that the survey interview was investigator designed; however, validated survey tools were embedded and questions were derived from prior tools. By combining multiple choice and open-response questions, we were uniquely able to tap into mothers' thinking on this topic. Additional strengths of this study included the focus on an underserved minority population, inclusion of both delivered and expectant participants, and inclusion of those with differing feeding choices.

The clinical significance of these results for our RCWC setting is clear and is likely generalizable to other similar settings. Lactation support resource availability is important. Among the AA mothers participating in this study, endorsed resources included those that either (1) are continuously accessible on demand and on the go, such as a hotline and a phone app, or (2) bring one-on-one help to the mother, such as home visiting and lactation appointments. Since individual AA women have differing breastfeeding opinions and goals, and hold culturally based attitudes toward breastfeeding, a key feature of lactation support for AA women must be respect, flexibility, and active listening that implicitly acknowledge the role of generational racial trauma with respect to breastfeeding. Lactation support that helps women achieve their own breastfeeding goals, is optimal; and these nuances may allow lactation support providers to customize care and ultimately move the needle on racial inequities in breastfeeding for our society.

Acknowledgements We thank the women who participated, the obstetrical providers and CenteringPregnancy™ nurses for their support, and Monica Chavan MS2 for work on the Pediatric Practice Breastfeeding Database.

Author Contribution Dr. Furman designed the study, was responsible for study oversight and data integrity, and drafted and revised the manuscript. Ms. Feinstein interviewed all participants, aided in data interpretation, and revised and reviewed the manuscript. Dr. DeLozier conducted the statistical analysis and revised and reviewed the manuscript. All authors read and approved the final manuscript.

Funding The work was supported by a Rainbow Babies and Children's Hospital Faculty Fund Pilot award to Dr. Furman.

Declarations

Ethics Approval The University Hospitals Cleveland Medical Center Institutional Review Board approved this research. The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and the Belmont Report.

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Consent for Publication Protected health information and identifiable data were not collected.

Competing Interests The authors declare no competing interests.

References

1. American Academy of Pediatrics Section on Breastfeeding. Breastfeeding and the use of human milk [Policy Statement]. *Pediatr*. 2012;129:e827–41. <https://doi.org/10.1542/peds.2011-3552>.
2. American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 756: optimizing support for breastfeeding as part of obstetric practice. *Obstetr Gynecol*. 2018;132:e187–96. <https://doi.org/10.1097/AOG.0000000000002890>.
3. World Health Organization. Nutrition, breastfeeding. Updated 2019. <https://www.who.int/nutrition/topics/exclusive_breastfeeding/en/> Accessed 8/21/2019.
4. Sankar MJ, Sinha B, Chowdhury R, Bhandari N, Taneja S, Martines J, Bahl R. Optimal breastfeeding practices and infant and child mortality: a systematic review and meta-analysis. *Acta Paediatr Suppl*. 2015;104:3–13.
5. Chowdhury R, Sinha B, Sankar MJ, Taneja S, Bhandari N, Rollins N, Bahl R, Martines J. Breastfeeding and maternal health outcomes: a systematic review and meta-analysis. *Acta Paediatr Suppl*. 2015;104:96–113.
6. Breastfeeding, data and statistics, breastfeeding rates. Division of physical activity, nutrition and obesity, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. <https://www.cdc.gov/breastfeeding/data/nis_data/results.html> Accessed February 12, 2020.
7. Centers for Disease Control and Prevention. Racial disparities remain in breastfeeding rates. *JAMA*. 2017;318(8):691. <https://doi.org/10.1001/jama.2017.10454>.
8. Beauregard JL, Hamner HC, Chen J, Avila-Rodriguez W, Elam-Evans LD, Perrine CG. Racial disparities in breastfeeding initiation and duration among U.S. infants born in 2015. *MMWR Morb Mortal Wkly Rep*. 2019;3068(34):745–8. <https://doi.org/10.15585/mmwr.mm6834a3>.
9. Robinson K, Fial A. Lisa Hanson Racism, bias, and discrimination as modifiable barriers to breastfeeding for African American women: a scoping review of the literature. *J Midwifery Womens Health*. 2019;64:734–42. <https://doi.org/10.1111/jmwh.13058>.
10. Morrow AL, McClain J, Conroy SC, Niu L, Kinzer A, Cline AR, Piasecki AM, DeFranco E, Ward L, Ware J, Payne DC, Staat MA, Nommsen-Rivers LA. Breastfeeding disparities and their mediators in an urban birth cohort of Black and White mothers. *Breastfeed Med*. 2021;16(6):452–62. <https://doi.org/10.1089/bfm.2020.0327>. PMID:33733869;PMCID:PMC8418439.
11. Davis C, Villalobos AVK, Turner MM, Long S, Lapinski MK. Racism and resistance: a qualitative study of bias as a barrier to breastfeeding. *Breastfeed Med*. 2021;16(6):471–80. <https://doi.org/10.1089/bfm.2020.0307>. PMID:33784475;PMCID:PMC8215417.
12. Kaufman L, Deenadayalan S, Karpati A. Breastfeeding ambivalence among low-income African American and Puerto Rican women in north and central Brooklyn. *Matern Child Health J*. 2010;14:696–704. <https://doi.org/10.1007/s10995-009-0499-5>.
13. Cricco-Lizza R. The milk of human kindness: environmental and human interactions in a WIC clinic that influence infant-feeding

- decisions of Black women. *Qual Health Res.* 2005;15:525–38. <https://doi.org/10.1177/1049732304273030>.
14. Nommsen-Rivers LA, Chantry CJ, Cohen RJ, Dewey KG. Comfort with the idea of formula feeding helps explain ethnic disparity in breastfeeding intentions among expectant first-time mothers. *Breastfeed Med.* 2010;5:25–33. <https://doi.org/10.1089/bfm.2009.0052>.
 15. RAMA Consulting Group, Inc. WIC African American Breastfeeding Focus Groups Final Report. Ohio Department of Health African American Breastfeeding Focus Group Project. 2011. <https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/women-infants-children/media/wic-african-americanbreastfeeding-focus-group-report> (Accessed 1/30/22).
 16. Chapman DJ, Pérez-Escamilla R. Breastfeeding among minority women: moving from risk factors to interventions. *Adv Nutr.* 2012;3(1):95–104. <https://doi.org/10.3945/an.111.001016>.
 17. Jones KM, Power ML, Queenan JT, Schulkin J. Racial and ethnic disparities in breastfeeding. *Breastfeed Med.* 2015;10(4):186–96. <https://doi.org/10.1089/bfm.2014.0152>.
 18. Johnson A, Kirk R, Rosenblum KL, Muzik M. Enhancing breastfeeding rates among African American women: a systematic review of current psychosocial interventions. *Breastfeed Med.* 2015;10:45–62. <https://doi.org/10.1089/bfm.2014.0023>.
 19. Quick Facts, Cleveland OH. United States Census Bureau. United States Department of Commerce. <https://www.census.gov/quickfacts/clevelandcityohio> Accessed 11/24/2021.
 20. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, JG. Conde, Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009;42(2):377–81.
 21. Kim JH, Fiese BH, Donovan SM. Breastfeeding is natural but not the cultural norm: a mixed-methods study of first-time breastfeeding, African American mothers participating in WIC. *J Nutr Educ Behav.* 2017;49(7 Suppl 2):S151–1611. <https://doi.org/10.1016/j.jneb.2017.04.003>.
 22. de la Mora A, Russell DW, Dungy CI, Losch M, Dusdieker L. The Iowa infant feeding attitude scale: analysis of reliability and validity. *J App Soc Psychol.* 1999;29(11):2362–80.
 23. Mitchell-Box K, Braun KL, Hurwitz EL, Hayes DK. Breastfeeding attitudes: association between maternal and male partner attitudes and breastfeeding intent. *Breastfeed Med.* 2013;8(4):368–73. <https://doi.org/10.1089/bfm.2012.0135>.
 24. Hein DV. An integrated approach for understanding health behavior; the I-change model as an example. *Psychol Behav Sci Int J.* 2017;2(2):555585. <https://doi.org/10.19080/PBSIJ.2017.02.555585>.
 25. Gijbbers B, Mesters I, Knottnerus JA, Van Schayck CP. Factors associated with the initiation of breastfeeding in asthmatic families: the attitude-social influence-self-efficacy model. *Breastfeed Med.* 2006;1(4):236–46. <https://doi.org/10.1089/bfm.2006.1.236> (PMID: 17661604).
 26. Nommsen-Rivers LA, Dewey KG. Development and validation of the infant feeding intentions scale. *Matern Child Health J.* 2009;13(3):334–42. <https://doi.org/10.1007/s10995-008-0356-y>.
 27. Louis-Jacques AF, Marhefka SL, Brumley J, Schafer EJ, Taylor TI, Brown AJ, Livingston TA, Spatz DL, Miller EM. Historical antecedents of breastfeeding for African American women: from the pre-colonial period to the mid-twentieth century. *J Racial Ethn Health Disparities.* 2020;7(5):1003–12. <https://doi.org/10.1007/s40615-020-00727-5> (Epub 2020 Mar 2 PMID: 32124420).
 28. Gyamfi A, O'Neill B, Henderson WA, Lucas R. Black/African American breastfeeding experience: cultural, sociological, and health dimensions through an equity lens. *Breastfeed Med.* 2021;16(2):103–11. <https://doi.org/10.1089/bfm.2020.0312>. PMID:33591226;PMCID:PMC7891224.
 29. Robinson K, Fial A, Hanson L. Racism, bias, and discrimination as modifiable barriers to breastfeeding for African American women: a scoping review of the literature. *J Midwifery Womens Health.* 2019;64(6):734–42. <https://doi.org/10.1111/jmwh.13058> (Epub 2019 Nov 11 PMID: 31710173).
 30. Woods Barr AL, Miller E, Smith JL, Cummings SM, Schafer EJ. #EveryGenerationMatters: intergenerational perceptions of infant feeding information and communication among African American women. *Breastfeed Med.* 2021;16(2):131–9. <https://doi.org/10.1089/bfm.2020.0308> (PMID: 33591228).
 31. Trivedi D. Cochrane Review Summary: support for healthy breastfeeding mothers with healthy term babies. *Prim Health Care Res Dev.* 2018;19(6):529–30. <https://doi.org/10.1017/S1463423618000130>.
 32. Coughlin SS. The need for research-tested smartphone applications for promoting breastfeeding. *Mhealth.* 2016 May;2(5):18. <https://doi.org/10.21037/mhealth.2016.04.03>.
 33. Mieso B, Neudecker M, Furman L. Mobile phone applications to support breastfeeding among African-American women: a scoping review. *J Racial Ethn Health Disparities.* 2020 Nov 20. <https://doi.org/10.1007/s40615-020-00927-z>.
 34. Dauphin C, Clark N, Cadzow R, Saad-Harfouche F, Rodriguez E, Glaser K, Kiviniemi M, Keller M, Erwin D. #BlackBreastsMatter: process evaluation of recruitment and engagement of pregnant African American women for a social media intervention study to increase breastfeeding. *J Med Internet Res.* 2020;22(8): e16239. <https://doi.org/10.2196/16239>. PMID:32773377;PMCID:PMC7445612.
 35. Breastfeeding in the community: program implementation guide. NACCHO 2018. National Association of County and City Health Officials.

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