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The Impact of Prenatal Discussion of Breastfeeding by Health Care Providers on Feeding Choice

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THE IMPACT OF PRENATAL DISCUSSION OF BREASTFEEDING BY HEALTH
CARE PROVIDERS ON FEEDING CHOICE

A Thesis Submitted to the
Yale University School of Medicine
in Partial Fulfillment of the Requirements for the
Degree of Doctor of Medicine

by

Karen Archabald

Class of 2007

THE IMPACT OF PRENATAL DISCUSSION OF BREASTFEEDING BY HEALTH CARE PROVIDERS ON FEEDING CHOICE. Karen Archabald, Jessica Illuzzi. Department of Obstetrics and Gynecology, Yale University, School of Medicine, New Haven, CT.

Breastfeeding initiation rates in the United States remain below the Healthy People 2010 goals. Research indicates patient interaction with health care providers may play an important role in women's ultimate feeding choice. This study sought to examine the impact of provider counseling regarding breastfeeding during the prenatal period on feeding outcome by evaluating: 1) if providers addressed women's concerns regarding breastfeeding; and 2) how providers responded to a woman's feeding choice. We also sought to examine whether the type of counseling provided by providers regarding infant feeding is influenced by patient socio-demographics and stated feeding plans. This study is cross-sectional with convenience sampling of all English or Spanish speaking women on the postpartum floor at Yale-New Haven Hospital. A total of 130 women participated. Overall, 95.4% of women identified a concern they had about breastfeeding during the prenatal period, and one quarter of patients had their concerns about breastfeeding addressed. The majority of patients (74.6%) were asked about their feeding plans, and 50.5% were encouraged to breastfeed. Unlike the majority of studies that indicate young, African American, poorly educated, unmarried and low income women are less likely to receive counseling from providers to breastfeed, providers in our study area focused their efforts on this population. In multivariate analysis, neither having concerns addressed nor being encouraged to breastfeed were associated with increased likelihood of breastfeeding. Addressing patients' concerns may be most relevant in the small subset of patients who make their feeding choice during pregnancy. Finally, women who were asked about their plans and had their concerns addressed ($p=.010$) or were encouraged to breastfeed ($p=.040$) were more likely to make their decision during pregnancy compared to before pregnancy than women whose providers did not discuss these issues. Likewise, mixed feeders were more likely to make their decision regarding infant feeding during rather than before pregnancy. This data suggests providers may be encouraging women to think more thoroughly about the possibility of breastfeeding, thus delaying their decision. In conclusion, many women are not being encouraged to breastfeed or having their concerns about breastfeeding addressed. All women would benefit from prenatal discussion of these topics; however, the effect may be most profound in women who make their decision regarding feeding during pregnancy.

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Introduction

Increasing breastfeeding initiation and duration is currently a priority of the public health and medical community in the United States. In its publication, *Healthy People 2010*, the US Public Health Service set goals of 75% breastfeeding initiation rate, 50% of

mothers continuing to breastfeed at 6 months, and 25% at one year by the year 2010. The most recent National Immunization Survey (NIS) reveals that national breastfeeding initiation rates remain below these goals, but have increased from 64% in 1998 to 72.9% in 2005. Initiation rates for African Americans, women younger than 20, with low incomes, less than a high school education, or enrolled in WIC, however, remain well below target [1].

As doctors for women from the pre-conceptional period through postpartum, obstetrician/gynecologists and midwives have a unique opportunity to promote breastfeeding throughout women's lives. Studies of the general population indicate that anywhere from 76% to 87% of women who intend to breastfeed make their decision before pregnancy [2-4]. However, a study of WIC eligible and therefore low income women at Yale-New Haven Hospital found that only 32.8% of women who ultimately decided to breast or mixed-feed had made this decision before pregnancy [5]. The remainder of this group, therefore, began their pregnancy either undecided about their plans or planning to formula-feed. Studies suggest that women who do not make their decision regarding feeding until pregnancy are more likely to formula or mixed-feed [2, 6, 7]. However, many women who decide to formula or mixed-feed consider breastfeeding at some point during their pregnancy. In a study of pregnant adolescents, 42% of mothers who ultimately chose formula-feeding had considered breastfeeding during their pregnancy. Within this group, 40% made their decision to bottle feed in mid-late stages of pregnancy, while 25% decided at delivery [6]. The prenatal period therefore is a critical time for education and intervention in a significant portion of the

WIC eligible population as well as a portion of the general population who are undecided or open to changing their feeding plans.

Providers can play a critical role in providing information, counseling and encouragement during the prenatal period. The American Academy of Pediatrics and the American College of Obstetricians and Gynecologists have both produced guidelines that recommend providers encourage breastfeeding [8, 9]. Observational studies indicate that encouragement by providers increases both breastfeeding initiation [6, 10-12] and duration [13-15]. Although there are few randomized controlled trials in this area, the results also indicate providers can potentially play an important role in feeding decisions. A randomized controlled trial of low income black women, which compared standard prenatal care at a midwifery clinic with either prenatal breastfeeding classes or an individual breastfeeding counseling session with a midwife, found 10% of controls, 26% of those in classes, and 48% who received individual counseling breast-fed despite prenatal plans to bottle-feed [16]. Another randomized controlled trial in France found patients who went to 2 week postpartum appointment with a primary care physician who was trained in breastfeeding counseling specifically for the study had significant increases in rates of exclusive breastfeeding as well as duration [17].

National as well as various local surveys of physicians indicate that between 75% and 90% of physicians report recommending breastfeeding to their patients and a similar percentage believe they play an important role in women's decisions regarding infant feeding [18-20]. A national survey of ACOG members found similar results, with 75.4% of ACOG members reporting that it is their responsibility to educate and encourage subjects to breastfeed [21]. In Connecticut, a survey conducted by the Connecticut

Breastfeeding Coalition and the Department of Public Health found 76% of obstetricians reported counseling their patients regarding breastfeeding [22].

Despite physician reports of high counseling rates and belief that they play an important role in women's decision making process, patients only report being advised to breastfeed by their provider between 40% and 60% of the time (estimates range from 23% to 73%) [10, 12, 23-25]. The difference in the perception of discussions regarding breastfeeding between providers and patients was clearly identified in a study of physician/patient dyads, which found only 16% of women whose obstetricians said they usually or always discussed breastfeeding duration during prenatal visits reported that it was discussed [26].

One possible explanation for the difference in perception of breastfeeding advice is the method of communication used by providers. A recent focus group of WIC eligible women reported that they often ignored the advice they received from providers because it "wasn't useful" or "didn't work" under their family's circumstances. Furthermore, mothers reported feeling their providers would not understand if they felt they could not follow recommendations, and therefore did not ask for assistance [27]. Another focus group of primiparas felt lactation consultants provided advice in a "powerful" way, without listening to mothers' concerns [28].

Communication centered on patients and their concerns has been shown to be more effective at increasing subjects' ability to synthesize information than biomedical conversations [29]. Results of a model breastfeeding education program in Ohio called "Best Start" support this idea. Before the intervention, all health professionals including physicians, nurses, and medical assistants were trained in breastfeeding educational

techniques. Throughout the intervention, patients were asked "What do you know about breastfeeding?" instead of "Are you going to breastfeed or bottle feed this baby?" Subsequent discussion focused on eliciting and acknowledging individual concerns and then educating women about the benefits of breastfeeding. This program increased breastfeeding initiation rates from 15% to 31% over the period of one year [30, 31]. In a recent randomized control trial in Singapore, women who were given a chance to ask questions about breastfeeding of a lactation counselor were more likely to practice exclusive breastfeeding at 3 and 6 months than those receiving standard care [32]. By discussing feeding choices and women's concerns, physicians and midwives could potentially be a powerful tool in promoting breastfeeding.

Despite clear recommendations from ACOG and APP, physicians report feeling uncomfortable providing information or advice regarding breastfeeding to those who have chosen to bottle feed. Only 51% of physicians surveyed in Missouri and 54% in Nebraska would recommend breastfeeding to subjects who had decided to bottle feed [18, 33]. ACOG members had similar opinions; only 57.1% felt it was their responsibility to investigate why a patient is not planning to breastfeed [21]. A study of adolescents in Texas found that although the majority of women planning to breastfeed reported receiving encouragement to breast-feed from their providers, less than half of bottle feeders reported receiving similar encouragement [6].

Other studies indicate that providers use socio-demographic factors to decide on the content of discussion regarding feeding choice. A review of survey results from the National Institute of Child Health and Human Development regarding whether women were advised to "consider breastfeeding" by a nurse or doctor during prenatal care,

suggests that black, unmarried, and poorly educated women are less likely to be advised to breastfeed than others [25]. Other large studies have shown similar results [27, 28, 34, 35]. A smaller, qualitative study found only one of eleven key informants in study of black, low income, WIC eligible women was encouraged to breastfeed by her physician [36]. However, there is also evidence to the contrary. One national study found that race, income and education did not influence encouragement [24], while a study of WIC eligible women found that black women were more likely to be encouraged to breastfeed by WIC employees, but providers were equally likely to encourage women independent of race [12].

The primary aim of this study was to investigate the apparent gap in communication about breastfeeding between providers and patients. First, we sought to examine women's concerns about breastfeeding, whether these are being addressed during prenatal care, and if addressing these concerns ultimately has an impact on feeding practice. Second, we sought to examine whether a neutral or positive response to a woman's feeding choice versus directed encouragement of breastfeeding and education ultimately has an impact on feeding practices.

The secondary aim of this study was to investigate whether the type of counseling provided by providers regarding infant feeding is influenced by patient socio-demographics and stated feeding plans. We sought to evaluate the impact of socio-demographics and stated feeding plans on 1) providers' response to the patient's stated feeding plans, 2) whether patients were asked about possible concerns regarding breastfeeding, and 3) whether these concerns were addressed.

Methods

Sample

We conducted a cross-sectional study with convenience sampling of all English or Spanish speaking women on the postpartum floor at Yale-New Haven Hospital between October 20, 2006 and January 9, 2007. After checking with the nursing staff regarding patient availability and exclusion criteria, the author approached as many eligible women as possible during each session. Exclusion criteria included women with infants unable to suckle secondary to congenital anomalies or with medical conditions precluding them from breastfeeding.

If the patient met inclusion criteria and consented to participate, the author administered the questionnaire in the patient's room (see Appendix 1). The interview took approximately 20 minutes and consisted of 51 open and closed ended questions. The questionnaire was designed to obtain information about the subjects' decision making process regarding feeding practices, subjects' concerns about breastfeeding, and the content of prenatal discussion of these topics. The questions are not based on any prior survey instrument, as a validated instrument addressing these questions does not exist.

Demographics including age, socioeconomic status, ethnicity/race, education, parity, maternity leave, mode of delivery, country of origin, social support and previous experience were obtained as these have been shown in other studies to be potential confounders of feeding choice [37-46]. We also asked whether women had seen a midwife, doctor, or both during their prenatal care and if they were seen in a private or university clinic as we suspected that differences in both patient population and approach to prenatal care could impact feeding choice.

The Yale-New Haven Hospital and Yale School of Medicine Investigational Review Board approved this protocol. The student author designed the study and questionnaire, and conducted all interviews herself.

Study Variables

Feeding

Feeding choice is the primary outcome variable. Breastfeeding was defined as the intention to solely feed breast milk for any period of time. Formula-feeding was defined as the intention to solely feed formula without any supplementation with breast milk. Mixed was defined as the intention to use both breast milk and formula from birth. Although some studies combine mixed-feeding with exclusive breastfeeding, the evidence that women planning to mixed-feed are less likely to achieve their breastfeeding goals than women planning to exclusively breastfeed is compelling and further separates the two categories [47].

Concerns

Subjects were asked, “While making your decision about how to feed your baby, what concerns did you have about possibly breastfeeding?” Responses fell into 15 groups, which were further consolidated into the following 5 categories: lifestyle (difficult to share responsibility for feeding, maintaining diet, not enough time, difficulty sleeping, frequent feeding, nipple confusion, inability to wean, social isolation, body image), pain (same), confidence (not producing enough milk, baby not getting enough milk, baby not latching on), work (difficult to go back to work), and medications (perceived medicine interactions with breastfeeding). Patients were then asked if these concerns were addressed by their provider at any point during their prenatal care.

Women were also directly asked if they shared any of eight concerns about breastfeeding commonly mentioned in other studies, regardless of their chosen method of feeding and whether these were addressed by their provider at any point during their prenatal care. The list of common concerns that women were asked about was identified from previous studies and included fear of inadequate milk production, dietary and other maternal health problems, pain, difficulty returning to work, restriction of social life, embarrassment, physical changes, and difficulty sharing responsibility [27, 28, 34, 48].

Provider response to feeding choice

Women were asked if their provider asked them about their feeding plans at any point during their prenatal care. The subjects who were asked about feeding plans were subsequently asked “What did she/he say when you said you were planning to breast/formula/both feed?” Responses were categorized as “neutral” if the provider responded with a neutral comment such as “okay”, or continued on with further questions without perceived feedback. Responses were categorized as “positive” if the provider responded with a positive comment such as “great” or “good for you!” and moved on to another topic. Responses were categorized as “encouraged breastfeeding” if the provider responded with further information about breastfeeding or advised them to consider breastfeeding if they were considering formula or both. Women whose providers did not ask them about their plans were categorized as no response/did not ask. Subjects were also asked whether their provider had reviewed the benefits of breastfeeding at any point during prenatal care.

Decision

Subjects were asked the following open-ended question “What helped you make your decision about how to feed your baby?” Responses fell into 15 groups, which were further consolidated into the following 5 categories: convenience (convenience, not enough time, economics), health benefits (health of baby, health of mother, bonding, "natural"), influence of others (family, friends, physicians/nurses), prior bad experience (same), social/cultural (feeding in public, sexual identity, discomfort with idea of breastfeeding).

Statistical Analysis

Data analysis was done using SAS 9.1 (SAS Institute Inc., Cary NC) statistical analysis software package. The primary outcome variable was feeding choice. The two primary exposures of interest were provider response to feeding choice and provider/patient discussion regarding breastfeeding concerns. Potential confounders and demographic variables were compared for each level of the exposure variables using analysis of variance, chi squared tests or Fischer’s exact test. Multinomial logistic regression was used to calculate unadjusted and adjusted odds ratios for breast or mixed-feeding compared to formula-feeding. Multivariable analysis was performed to examine the independent effect of provider response to feeding choice and provider/patient discussion regarding breastfeeding concerns on feeding choice. In the regression model, we adjusted for variables shown to most strongly confound the relationship between the two exposures of interest and ultimate feeding choice.

Results

During the study period, 146 subjects were approached during their postpartum course, which ranged from postpartum day 1 through 4. No women meeting exclusion criteria were encountered in the convenience sample. 4 subjects refused participation. Another 12 requested that the author return at a different time but were not subsequently interviewed secondary to limited time for interviews per daily session. A total of 130 subjects completed the study, yielding a participation rate of 89%. Due to the sampling methodology, the sample contains a higher proportion of women with cesarean sections as they spend more days in the hospital than women with normal spontaneous vaginal deliveries.

Of women in the study, 60% chose to breastfeed exclusively, 20% chose to formula-feed, and 20% chose to mixed-feed. The mean age was 29.5. The majority were Caucasian (55.4%), with significant minorities of African American (17.7%) and Hispanic (16.9%) women. Most (65.4%) women had a household income of >\$24,000 per year, and just over half (52.4%) had graduated from college or had a post graduate degree. Private providers provided care to 69.2% of the women, while the Yale University Obstetrics and Gynecology faculty, residents and midwifery students provided care to the remainder.

Table 1 displays feeding choice by selected maternal characteristics using univariate analyses. Race/ethnicity was significantly associated with feeding choice ($p < .001$). The majority (79.1%) of Caucasians chose to breastfeed, while African Americans most frequently chose formula (47.8%) and Hispanics mixed-feeding (59.1%). Although the majority of women born both in the US and elsewhere chose to

Table 1 - Feeding choice by selected maternal characteristics

Maternal Characteristics		n	Breastfeeding	Formula-feeding	Mixed-feeding	p value
			%	%	%	
Age (mean)			31.1 +/- 5.4 * †	27.6 +/- 6.9 *	26.3 +/- 6.9 †	
Race/Ethnicity						< .001
	Caucasian	72	79.1	12.0	4.2	
	African American	23	17.4	47.8	34.8	
	Hispanic	22	31.8	9.1	59.1	
	Asian	7	71.4	0.0	28.6	
	Other	6	83.3	16.7	0.0	
Country of Birth						0.001
	USA	101	61.4	24.8	13.9	
	Other	29	55.2	3.4	41.4	
Multiparity		67	50.8	26.9	22.4	0.060
Breastfeeding Experience						0.398
	Yes	50	64.0	14.0	22.0	
Last infant Breastfed						< .001
	Yes	40	80.0	5.0	15.0	
Delivery						0.618
	Vaginal	74	58.1	18.9	23.0	
	Cesarean	56	62.5	21.4	16.1	
Prenatal Care						< .001
	Private	90	75.6	17.8	6.7	
	University Clinic	40	25.0	25.0	50.0	
Provider						< .001
	Physician	47	63.8	17.0	19.2	
	Midwife	21	33.3	14.3	52.4	
	Both	62	66.1	24.2	9.7	
Education						< .001
	High school or less	37	35.2	27.0	37.8	
	Some College	25	20.0	44.0	36.0	
	College Graduate	35	88.6	8.6	2.8	
	Post Graduate	33	87.8	6.1	6.1	
Working/Attending School Prior to Pregnancy						0.602
	Yes	99	60.6	21.2	18.2	
Returning to Work/School						0.296
	Yes	104	56.7	21.2	22.1	
Paid Maternity Leave						0.029
	Yes	50	56.7	16.0	14.0	
Time off						< .001
	<= 6 weeks	37	43.2	32.4	24.3	
	6 - 12 weeks	50	58.0	16.0	26.0	
	> 12 weeks	17	82.4	11.8	5.9	
Medications						0.023
	Yes	12	33.3	50.0	16.7	
Smoking (current or directly prior to pregnancy)						0.005
	Yes	11	27.3	45.5	27.3	
Married						< .001
	Yes	88	75.0	11.4	13.6	
Lives with						< .001
	Family	29	20.7	37.9	41.4	
	Significant Other	100	71.0	15.0	14.0	
	Alone	1	100.0	0.0	0.0	
Income						< .001
	<\$10,000	29	17.2	27.6	55.2	
	\$10,000-\$24,000	16	43.8	25.0	31.2	
	>\$24,000	85	77.7	16.5	5.9	
Timing of Decision						<.001
	Before Pregnancy	96	71.9	17.7	10.4	
	Beginning of Pregnancy	13	38.5	15.4	46.2	
	End of Pregnancy	15	6.7	40.0	53.3	
	Postpartum	6	50.0	16.7	33.3	

* p =.05, † p=.05

breastfeed, women born in the U.S. were significantly more likely to formula-feed (24.8%) than those born outside the U.S. (3.4%) ($p=.001$). Women who breastfed their last infant were more likely to breastfeed this infant (80%) than women who either mixed (15%) or formula (5%) fed their last infant ($p<.001$). Women seen in private practices for prenatal care were predominantly breastfeeders (75.6%), while women seen at the university clinic were predominantly mixed-feeders (50%) ($p<.001$). Women in physician-only (63.8%) and mixed physician/midwife practices (66.1%) were predominantly breastfeeders, while those in midwife-only practices were predominantly mixed-feeders (52.4%) ($p<.001$). The majority of private practices have a mix of physicians and midwives, with a small number of physician only practices whereas the majority of patients who see midwives only are seen at the university clinic. Women who had less than a college education chose breast, formula, and mixed-feeding in similar proportions while women with a college degree or more chose to breastfeed significantly more often ($p<.001$). Women with paid maternity leave and more than 6 weeks off were more likely to breastfeed than women without paid maternity leave ($p=.029$) and less time off ($p<.001$). Women who took medications and those who smoked were more likely to choose to formula-feed than women who were not taking medications ($p=.023$) or smoking ($p=.005$), respectively. Women who were married or lived with a significant other were more likely to breastfeed than those who lived with their families ($p<.001$). Finally, women who earned less than \$10,000 in annual income were most likely to mixed-feed (55.2%), while women earning between \$10,000 and \$24,000 (43.8%) or more than \$24,000 (77.7%) were more likely to breastfeed ($p<.001$). Parity, previous breastfeeding experience, mode of delivery, working status,

Table 2 - Primary Concern regarding breastfeeding by feeding choice

		Total n=130	Breastfeeding n=78 number, %	Formula- feeding n=26 number, %	Mixed feeding n=26 number, %	p value
Any concern identified						
	Yes	106 (81.54)	63 (80.8)	22 (84.6)	21 (80.8)	0.903
Primary Concern						
						0.138
	Confidence	47 (36.2)	35 (44.9)	6 (23.1)	6 (23.1)	
	Lifestyle/Social	21 (16.2)	9 (11.5)	8 (30.8)	4 (15.4)	
	Pain	17 (13.1)	9 (11.5)	3 (11.5)	5 (19.2)	
	Work	17 (13.1)	8 (10.3)	3 (11.5)	6 (23.1)	
	Meds	4 (3.1)	2 (2.6)	2 (7.7)	0 (0.0)	
	None Identified	24 (18.5)	15 (19.2)	4 (15.4)	5 (19.2)	
Primary Concern Addressed						
	Yes	33 (25.4)	17 (21.8)	8 (30.8)	8 (30.8)	0.512

and support from family and father of the baby did not have a significant impact on feeding outcome.

When asked during the interview what concerns, if any, a woman had about breastfeeding while she was making her feeding choice, the majority of women (81.5%) identified at least one concern (see Table 2). The percentage of women who identified a concern about breastfeeding did not vary by ultimate feeding choice ($p=.903$).

Breastfeeders most commonly identified their primary concern as confidence (44.9%), formula-feeders were most concerned about social/lifestyle issues (30.8%) and mixed-feeders were equally concerned with confidence and work (23.1% each), although these differences were not statistically significant ($p=.138$).

Overall, 25.4% of women had their primary concern addressed by their provider (see Table2). There was no statistical difference between the number of women who had their concern addressed in the mixed and formula-feeding groups (30.8% each) and the breastfeeding group (21.8%) ($p=.512$).

Table 3 displays the prevalence of common concerns regarding breastfeeding as well as whether these concerns were addressed by the provider during prenatal care. Women were asked specifically whether they shared any of eight common concerns about breastfeeding. Overall, the most common concern was that breastfeeding would impact the mother's ability to go back to work or school (46.9%). This concern was more common among mixed (61.5%) and formula-feeders (61.5%) than breastfeeders (37.2%) ($p=.024$). Regardless of feeding choice, only between 18% and 25% of women concerned about going back to work or school had the concern addressed by their provider ($p=.905$). Inadequate milk supply was the second most common concern (43.9%) and was equally prevalent across groups ($p=.321$). Milk supply was addressed in only 21.1% of women. Pain was a concern for 42.3% of women, with similar frequency in all three groups ($p=.657$). Providers addressed the concern more often in women who ultimately chose to breast or mixed-feed ($p=.033$). A higher percentage of women who chose to formula-feed were concerned about sharing feeding responsibility (53.9%), compared to mixed (34.2%) or breastfeeders (28.2%) ($p=.059$). Providers addressed sharing feeding responsibility more often in women who chose to mixed-feed ($p=.009$). A significantly larger number of women (35.9%) who chose to breastfeed reported anxiety or embarrassment about feeding in public places than women who chose to mixed or formula-feed ($p=.007$), but this concern was uniformly not addressed during prenatal care. Women who chose to formula-feed were more likely to be worried about maintaining their own health while breastfeeding ($p=.006$), but equally likely to have the concern addressed as women in other groups ($p=.452$). Restriction of social life and body

Table 3 - Prevalence and discussion of common concerns regarding breastfeeding by feeding choice

Concern	Total n=130 number, %	Breastfeeding n=78 number, %	Formula- feeding n=26 number, %	Mixed feeding n=26 number, %	p value
Ability to work/attend school	61 (46.9)	29 (37.2)	16 (61.5)	16 (61.5)	0.024
Addressed by clinician	13 (21.3)	6 (20.7)	3 (18.8)	4 (25.0)	0.905
Inadequate milk supply	57 (43.9)	37 (47.4)	8 (30.8)	12 (46.2)	0.321
Addressed by clinician	12 (21.1)	7 (18.9)	2 (25.0)	3 (25.0)	0.866
Pain	55 (42.3)	31 (39.7)	11 (42.3)	13 (50.0)	0.657
Addressed by clinician	15 (27.3)	7 (22.6)	1 (9.1)	7 (53.9)	0.033
Difficulty sharing feeding responsibility	45 (34.6)	22 (28.2)	14 (53.9)	9 (34.2)	0.059
Addressed by clinician	6 (13.3)	1 (4.6)	1 (7.1)	4 (44.4)	0.009
Anxiety/Embarrassment	42 (32.3)	28 (35.9)	12 (46.2)	2 (7.7)	0.007
Addressed by clinician	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	n/a
Difficulty maintaining mother's diet/health	31 (23.9)	12 (15.4)	12 (46.2)	7 (26.9)	0.006
Addressed by clinician	8 (25.8)	3 (25.0)	2 (16.7)	3 (42.9)	0.452
Restriction of Social Life	19 (14.6)	9 (11.5)	6 (23.1)	4 (15.4)	0.351
Addressed by clinician	1 (5.3)	0 (0.0)	0 (0.0)	1 (25.0)	0.138
Body Image	18 (13.9)	12 (15.4)	4 (15.4)	2 (7.7)	0.597
Addressed by clinician	2 (11.1)	1 (8.3)	0 (0.0)	1 (50.0)	0.161

image were less commonly listed as concerns, and did not vary either among the different feeding groups or by how often they were addressed during prenatal care.

The percent of women who report being asked about their concerns by selected maternal characteristics is presented in Table 4. Compared to women who were asked about their feeding plans, women who were not asked were more likely to be seen in a private (81.8%), physician-only practice (57.6%). These women were also more likely to be older, multiparous (66.7%), married (87.9%), Caucasian (66.7%), with prior breastfeeding experience (57.6%) and a college or higher degree (63.7%), earning more

Table 4 - Percent of mothers who were asked about feeding plans and/or concerns about breastfeeding by selected maternal characteristics

Maternal Characteristic	Not asked about feeding plans	Asked about feeding plans, not concerns	Asked about feeding plans, addressed concerns	p value
	n =33 number, %	n=54 number, %	n=43 number, %	
Age (mean)	32.6 +/- 4.8 *	30.1 +/-5.8 †	26.3 +/- 6.6* †	
Race/Ethnicity				0.004
Caucasian	22 (66.7)	35 (64.8)	15 (34.9)	
African American	1 (3.0)	7 (13.0)	15 (34.9)	
Hispanic	6 (18.2)	9 (16.7)	7 (16.3)	
Asian	4 (12.1)	1 (1.9)	2 (4.7)	
Other	0 (0.0)	2 (3.7)	4 (9.3)	
Country of Birth				0.078
USA	21 (63.6)	44 (81.5)	36 (83.7)	
Other	12 (36.4)	10 (18.5)	7 (16.3)	
Multiparity	22 (66.7)	28 (51.9)	17 (39.5)	0.064
Prior Breastfeeding experience				0.005
Yes	19 (57.6)	22 (40.7)	9 (20.9)	
Last infant Breastfed (n=67)				0.004
Yes	18 (81.8)	16 (57.1)	5 (29.4)	
Delivery				0.327
Vaginal	19 (57.6)	27 (50.0)	28 (65.1)	
Cesarean	14 (42.4)	27 (50.0)	15 (34.9)	
Prenatal Care				0.006
Private	27 (81.8)	41 (75.9)	22 (51.2)	
University Clinic	6 (18.2)	13 (24.1)	21 (48.8)	
Provider				0.003
Physician	19 (57.6)	12 (22.2)	16 (37.2)	
Midwife	2 (6.1)	8 (14.8)	11 (25.6)	
Both	12 (36.4)	34 (63.0)	16 (37.2)	
Education				0.005
High school or less	8 (24.2)	8 (14.8)	21 (48.8)	
Some College	4 (12.1)	13 (24.1)	8 (18.6)	
College Graduate	9 (27.3)	20 (37.0)	6 (14.0)	
Post Graduate	12 (36.4)	13 (24.1)	8 (18.6)	
Working/Attending School Prior to Pregnancy				0.326
Yes	23 (69.7)	40 (74.1)	36 (83.7)	
Returning to Work/School				0.005
Yes	22 (66.7)	41 (75.9)	41 (95.4)	
Paid Maternity Leave				0.234
Yes	14 (63.6)	17 (41.5)	19 (46.3)	
Amount of Time off				0.406
<= 6 weeks	6 (27.3)	14 (34.2)	17 (41.5)	
6 - 12 weeks	11 (50.0)	23 (56.1)	16 (39.0)	
> 12 weeks	5 (22.7)	4 (9.8)	8 (19.5)	
Medications				0.807
Yes	3 (9.1)	4 (7.4)	5 (11.6)	
Smoking (current or directly prior to pregnancy)				0.002
Yes	0 (0.0)	2 (3.7)	9 (20.9)	
Married				0.001
Yes	29 (87.9)	38 (70.4)	21 (48.8)	
Lives with				0.040
Family	4 (12.1)	10 (18.5)	15 (34.9)	
Significant Other	29 (87.9)	44 (81.5)	27 (62.8)	
Alone	0 (0.0)	0 (0.0)	1 (2.3)	
Income				< .001
<\$10,000	6 (18.2)	11 (20.4)	12 (27.9)	
\$10,000-\$24,000	0 (0.0)	3 (5.6)	13 (30.2)	
>\$24,000	27 (81.8)	40 (74.1)	18 (41.9)	
Timing of Decision				0.010
Before Pregnancy	27 (81.8)	45 (83.3)	24 (55.8)	
Beginning of Pregnancy	5 (15.2)	2 (3.7)	6 (14.0)	
End of Pregnancy	1 (3.0)	5 (9.3)	9 (20.9)	
Postpartum	0 (0.0)	2 (3.7)	4 (9.3)	

* p =.05, † p=.05

than \$24,000 (81.8%). The majority of women who were not asked had decided on their feeding method before they became pregnant (81.8%).

More women who were asked about their feeding plans and also had their concerns addressed were seen at the university clinic ($p=.006$) and by midwives ($p=.003$) than women who were either not asked about their plans, or were asked about plans but did not have their concerns addressed. Compared to these other two groups, women who had their concerns addressed tended to be younger, nulliparous (60.5%), Caucasian or African American (34.9% each), with a high school degree or less (48.8%), earning less than \$24,000 (58.1%). These women were more likely to make their decision during pregnancy (44.2%) than the other groups ($p=.010$). Although race and ethnicity had a significant association with whether women were asked about their plans ($p=.004$), Hispanic women were similarly distributed between the three groups.

Table 5 displays the decision making process and provider/patient interaction by feeding choice. The majority of patients in all groups (74.6%) were asked about their feeding plans ($p=.142$). Providers were most likely to encourage patients who stated they planned to mixed (70.0%) or formula-feed (60.9%), compared with breastfeeders (38.9%) ($p=.016$). Patients who chose to formula-feed were the most likely to receive a neutral response from their provider (30.4%). Of mixed-feeders, 61.5% made their decision during pregnancy, compared to 34.7% of formula-feeders and 11.6% of breastfeeders ($p<.001$). The most important factor identified by patients as influencing their decision was health reasons for breastfeeders and convenience for formula-feeders. Mixed-feeders were influenced by both health benefits and convenience ($p<.001$). Overall, the

Table 5 - Clinician/Patient Interaction by feeding choice

	Total n=130 number, %	Breast feeding n=78 number, %	Formula- feeding n=26 number, %	Mixed- feeding n=26 number, %	p value
Timing of decision about feeding plans					<.001
Before Pregnancy	96 (73.9)	69 (88.5)	17 (65.4)	10 (38.5)	
Beginning of Pregnancy	13 (10.0)	5 (6.4)	2 (7.7)	6 (23.1)	
End of Pregnancy	15 (11.5)	1 (1.3)	6 (23.1)	8 (30.8)	
Postpartum	6 (4.6)	3 (3.9)	1 (3.9)	2 (7.7)	
Main factor influencing decision					<.001
Convenience	26 (20.0)	7 (9.0)	12(46.2)	7 (26.9)	
Health Benefits	78 (60.0)	62 (79.5)	2 (7.7)	14 (53.9)	
Influence of Others	14 (10.8)	9 (11.5)	2 (7.7)	3 (11.5)	
Prior bad experience	3 (2.3)	0 (0.0)	3 (11.5)	0 (0.0)	
Social/Cultural	5 (3.9)	0 (0.0)	5 (19.2)	0 (0.0)	
No factor Identified	4 (3.1)	0 (0.0)	2 (7.7)	2 (7.7)	
Patient asked about feeding plans					0.142
Yes	97 (74.6)	54 (69.2)	23 (88.5)	20 (76.9)	
Provider reaction to plans (n=97)					0.016
Neutral	21 (21.7)	11 (20.4)	7 (30.4)	3 (15.0)	
Positive	27 (27.8)	22 (40.7)	2 (8.7)	3 (15.0)	
Encouraged Breastfeeding	49 (50.5)	21 (38.9)	14 (60.9)	14 (70.0)	

influence of others, including health care providers, was 10.8 %, and was similar among the three groups.

Women’s report of provider response to intended feeding choice by selected maternal characteristics is presented in Table 6. Location of prenatal care did not have an impact on provider response to feeding choice (p=.100). However, compared to other groups, a high percentage of women who were encouraged to breastfeed were seen by midwives (22.5%) (p=.029). A significantly larger proportion of women who were encouraged to breastfeed made their decision regarding feeding choice during pregnancy (40.9%) compared to those who received either a positive (18.5%) or neutral (14.3%) response (p=.040). Women who were encouraged to breastfeed were significantly younger than women who were not asked about their feeding plans (p=.05). They were

Table 6 - Clinician Response to feeding choice by selected maternal characteristics

Maternal Characteristics	No Response/ Did not ask n=33 number, %	Neutral n = 21 number, %	Positive n=27 number, %	Encouraged Breastfeeding n=49 number, %	p value
Age (mean)	32.6 +/- 4.8 *	29.9 +/- 4.2	30.3 +/- 6.7	26.7 +/- 6.7 *	
Race/Ethnicity					0.026
Caucasian	22 (66.7)	12 (57.1)	17 (63.0)	21 (42.9)	
African American	1 (3.0)	4 (19.1)	2 (7.4)	16 (32.7)	
Hispanic	6 (18.2)	2 (9.5)	7 (25.9)	7 (14.3)	
Asian	4 (12.1)	1 (4.8)	0 (0.0)	2 (4.1)	
Other	0 (0.0)	2 (9.5)	1 (3.7)	3 (6.1)	
Country of Birth					0.120
USA	21 (63.6)	16 (76.2)	22 (81.5)	42 (85.7)	
Other	12 (36.4)	5 (23.8)	5 (18.5)	7 (14.3)	
Multiparity	22 (66.7)	13 (61.9)	14 (51.9)	18 (36.7)	0.042
Prior Breastfeeding experience					0.002
Yes	19 (57.6)	11 (52.4)	11 (40.8)	9 (18.4)	
Last infant Breastfed (n=67)					0.014
Yes	18 (81.8)	6 (46.2)	9 (64.3)	6 (33.3)	
Delivery					0.872
Vaginal	19 (57.6)	12 (57.1)	17 (63.0)	26 (53.1)	
Cesarean	14 (42.4)	9 (42.9)	10 (37.0)	23 (46.9)	
Prenatal Care					0.100
Private	27 (81.8)	16 (76.2)	19 (70.4)	28 (57.1)	
University Clinic	6 (18.2)	5 (23.8)	8 (29.6)	21 (42.9)	
Provider					0.029
Physician	19 (57.6)	3 (14.3)	9 (33.3)	16 (32.7)	
Midwife	2 (6.1)	3 (14.3)	5 (18.5)	11 (22.5)	
Both	12 (36.4)	15 (71.4)	13 (48.2)	22 (44.9)	
Education					0.010
High school or less	8 (24.2)	1 (4.8)	9 (33.3)	19 (38.8)	
Some College	4 (12.1)	7 (33.3)	2 (7.4)	12 (24.5)	
College Graduate	9 (27.3)	5 (23.8)	12 (44.4)	9 (18.4)	
Post Graduate	12 (36.4)	8 (38.1)	4 (14.8)	9 (18.4)	
Working/Attending School Prior to Pregnancy					0.507
Yes	23 (69.7)	17 (80.1)	19 (70.4)	40 (81.6)	
Returning to Work/School					0.036
Yes	22 (66.7)	17 (81.0)	20 (74.1)	45 (91.8)	
Paid Maternity Leave					0.329
Yes	14 (63.6)	9 (52.9)	8 (40.0)	19 (42.2)	
Amount of Time off					0.343
</= 6 weeks	6 (27.3)	6 (35.3)	5 (25.0)	20 (44.4)	
6 - 12 weeks	11 (50.0)	9 (53.0)	11 (55.0)	19 (42.2)	
> 12 weeks	5 (22.8)	2 (11.8)	4 (20.0)	6 (13.3)	
Medications					0.863
Yes	3 (9.1)	1 (4.8)	2 (7.4)	6 (12.2)	
Smoking (current or directly prior to pregnancy)					0.018
Yes	0 (0.0)	0 (0.0)	3 (11.1)	8 (16.3)	
Married					0.003
Yes	29 (87.9)	17 (81.0)	17 (63.0)	25 (51.0)	
Lives with					0.209
Family	4 (12.1)	4 (19.1)	5 (18.5)	16 (32.7)	
Significant Other	29 (87.9)	17 (81.0)	22 (81.5)	32 (65.3)	
Alone	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.0)	
Income					0.036
<\$10,000	6 (18.2)	4 (19.1)	6 (22.2)	13 (26.5)	
\$10,000-\$24,000	0 (0.0)	1 (4.8)	5 (18.5)	10 (20.4)	
>\$24,000	27 (81.8)	16 (76.2)	16 (59.3)	26 (53.1)	
Timing of Decision					0.040
Before Pregnancy	27 (81.8)	18 (85.7)	22 (81.5)	29 (59.2)	
Beginning of Pregnancy	5 (15.2)	0 (0.0)	3 (11.1)	5 (10.2)	
End of Pregnancy	1 (3.0)	2 (9.5)	1 (3.7)	11 (22.5)	
Postpartum	0 (0.0)	1 (4.8)	1 (3.7)	4 (8.2)	

* p = .05

(predominantly Caucasian (42.9%) or African American (32.7%), nulliparous (63.3%), and without prior breastfeeding experience (81.6%). Although the majority were married (51%), this group had a significantly higher proportion of unmarried women than the other groups ($p=.003$). The majority of the women had less than a college education (63.3%) and while most earned more than \$24,000 per year (53.1%), a significant proportion earned less than \$10,000 (26.5%) ($p=.036$).

Women who reported a simple positive response from their provider were seen in similar proportions by physician/midwifery and physician only practices, with a significant minority seen by midwives (18.5%) ($p=.029$). The women were predominantly Caucasian (63.0%), with a significant Hispanic minority (25.9%) ($p=.026$). Just over half of the women were multiparous (51.9%), and the majority of these multiparous women (64.3%) had breastfed their last child. The majority were married (63.0%), had a college education or more (59.2%) and earned more than \$24,000 per year (59.3%).

Of women who received a neutral response, the majority were seen in physician/midwife practices (71.4%). They were predominantly Caucasian (57.1%) with a sizeable African American minority (19.1%), married (81.0%), multiparous (61.9%) and had experience breastfeeding (52.4%). Most had a college education or higher (61.9%) and earned more than \$24,000 per year (76.2%).

Finally, women who were not asked about their breastfeeding plans and thus were not encouraged in any way to breastfeed were seen predominantly in physician only or mixed physician/midwife practices. They were predominantly Caucasian (66.7%) with a significant Hispanic minority (18.2%). This group had the highest percentage of

multiparous women (66.7%), of whom 81.8% had breast fed their last infant. The group also had the highest percentage of married women (87.9%), with the highest levels of college graduates (63.7%) and income greater than \$24,000 (81.8%) in the group.

Table 7 presents the unadjusted and adjusted odds ratios from the multivariate analysis. There was no detectable impact on the likelihood of breastfeeding compared to formula-feeding if providers asked women about their concerns, or asked about and addressed their concerns versus not asking at all in either the unadjusted or adjusted odds ratios. Provider response to the patient's feeding choice had a significant impact on the likelihood of breastfeeding compared to formula-feeding in the unadjusted analysis. The unadjusted odds ratios reveal a decreased likelihood of breastfeeding compared to formula-feeding with either a neutral response (OR=0.196, CI 0.043-.907) or encouragement to breastfeed (OR=0.188, 0.047-0.744) versus not being ask at all. The latter group includes many women who had decided to formula-feed prior to pregnancy and ultimately did formula-feed despite counseling. When adjusted for race/ethnicity and education, the two strongest confounders in multivariate analysis, provider response no longer has the observed impact on breastfeeding rates. There was no detected impact of addressing women's concerns or provider response on the likelihood of mixed-feeding compared to formula-feeding.

Interestingly, when the impact of race/ethnicity on feeding methods is adjusted for educational status of the mother, there is no longer a difference in breastfeeding rates between African Americans and Caucasians. Hispanic women, however, continue to breast and mixed-feed at higher rates than African Americans even after adjusting for education. This finding, however, may be related to maternal country of birth outside of

Table 7 - Unadjusted and adjusted odds ratios of breastfeeding or mixed feeding compared to formula feeding by how provider addressed concerns and responded to stated feeding choice during prenatal care compared to those who were not asked.

Feeding Choice		Unadjusted Odds Ratio	95% CI	Adjusted Odds Ratio *	95% CI
Breast	Asked about feeding plans	0.308	0.079-1.202	0.325	0.066-1.610
	Asked and addressed concerns	0.275	0.067-1.131	0.776	0.134-4.489
	Neutral response to feeding choice	0.196	0.043-.907	0.16	0.024-1.085
	Positive response to feeding choice	1.375	0.210-9.009	2.349	0.283-19.465
	Encouraged to breastfeed	0.188	0.047-0.744	0.338	0.065-1.755
Mixed	Asked about feeding plans	0.346	0.068-1.759	0.384	0.057-2.572
	Asked and addressed concerns	0.550	0.108-2.805	0.692	0.098-4.868
	Neutral response to feeding choice	0.214	0.031-1.486	0.197	0.019-2.073
	Positive response to feeding	0.750	0.078-7.206	0.777	0.061-9.905
	Encouraged to breastfeed	0.500	0.104-2.407	0.638	0.098-4.177

* Adjusted models controlled for education and race/ethnicity

the United States. Adjusting for this variable, the race/ethnicity of a woman becomes non-significant, while site of maternal birth becomes predictive of feeding choice.

Table 8 displays the impact of the provider response to feeding choice on the timing of a women’s decision regarding feeding broken down by feeding choice. As discussed previously, the majority of breastfeeders (71.9%) decided on their feeding plans prior to pregnancy. The majority of breastfeeders who made their decision before pregnancy were either encouraged to breastfeed (38.3%) or got a positive response

Table 8 - Impact of Provider response on timing of decision regarding infant feeding

Variable	Decision Before Pregnancy	Decision During Pregnancy	p value
Breastfeeders	n=47	n=7	
Provider Response			0.500
Neutral	11 (23.4)	0 (0.0)	
Positive	18 (38.3)	4 (57.1)	
Encouraged Breastfeeding	18 (38.3)	3 (42.9)	
Formula-feeders	n=15	n=8	
Provider Response			0.830
Neutral	4 (26.7)	3 (37.5)	
Positive	2 (13.3)	0 (0.0)	
Encouraged Breastfeeding	9 (60.0)	5 (62.5)	
Mixed-feeders	n=7	n=13	
Provider Response			0.004
Neutral	3 (42.9)	0 (0.0)	
Positive	2 (28.6)	1 (7.7)	
Encouraged Breastfeeding	2 (28.6)	12 (92.3)	

(38.3%) although a sizeable portion received a neutral response (23.4%). Among women who decided to breastfeed during pregnancy, 100% were either encouraged to breastfeed (42.9%) or got a positive response (57.1%). Although these numbers were not significant ($p=.500$), it is worth noting that no one who ultimately decided to breastfeed during pregnancy had received a neutral response from her provider when she initially discussed her feeding plans.

Compared to breastfeeders, a larger proportion of formula-feeders (34.7%) made their decision during pregnancy. The majority of both women who made their decision to formula-feed before (60.0%) and during pregnancy (62.5%) were encouraged to breastfeed, although a large minority in both groups received neutral responses. There was no difference in statistical difference between groups ($p=.830$).

The majority of mixed-feeders made their feeding decision during pregnancy (65%). Of the women who chose to mixed-feed *during* pregnancy, 92.3% had been encouraged to breastfeed, compared to 28.6% of mixed-feeders who made their choice *before* pregnancy. Among mixed-feeders, women who were encouraged to breastfeed were more likely to decide on method of feeding during pregnancy than prior to pregnancy ($p=.004$). Again, similar to the breastfeeders, it is worth noting that no one who ultimately decided to mixed-feed during pregnancy had received a neutral response from her provider when she initially discussed her feeding plans

Discussion

The overall breastfeeding initiation rates and profile of socio-demographic factors that influence feeding choice in our sample are similar to the 2005 National Immunization Survey statistics[1]; age, race, income, and education all were associated with infant feeding choice. In addition, we found that country of origin, location of prenatal care, type of provider, presence of paid maternity leave and amount of time off, marital status, smoking, taking medications, and the timing of decision were also associated with feeding choice. Although the results are specific to this region, we feel comfortable that our sample is an adequate cross-section of the population seeking care at this large academic urban hospital.

In order to examine the gap in communication between providers and patients regarding breastfeeding, we first examined women's concerns about breastfeeding, whether these are addressed during prenatal care, and if addressing these concerns ultimately has an impact on feeding practice. We found that the overwhelming majority of women have concerns regarding breastfeeding, regardless of their ultimate plans for infant feeding. While 81.5% of women initially listed a concern regarding breastfeeding, 95.4% shared at least one of the eight common concerns identified in the literature. During the prenatal period, one quarter of patients had their primary concern about breastfeeding addressed, while common concerns women identified were addressed from 0.0% to 27.3% of the time.

Multivariate analysis did not reveal that addressing patients' concerns during prenatal care had an impact on breastfeeding initiation rates. It is possible that a relationship exists, and that due to the small sample size we did not have the statistical

power to detect the relationship. Another possibility is that addressing patients' concerns is most relevant in the subset of patients who have not made their feeding choice prior to pregnancy. Women who meet this description make only 26.2% of our sample (n=34), and therefore we have only 8% power to detect a 10% difference in breastfeeding initiation rates.

Regardless, descriptive data from the study clearly indicate that women's concerns regarding breastfeeding are not being adequately addressed by their providers during prenatal care. While providers often report feeling they lack knowledge regarding breastfeeding counseling, the concerns commonly listed in this study are practical rather than complex medical issues. The majority of breastfeeders were most concerned about their ability to succeed, milk supply, while formula-feeders worried about possible social or lifestyle issues as well as going back to work. Mixed-feeders lacked confidence and were concerned about going back to work. Overall, going back to work was the most common concern, yet many women reported not ever having discussed pumping and milk storage with their provider. One woman shared her story:

“With my first baby I was worried I wouldn't have enough milk. My mother-in-law told me she had worried about that too, but if that happened I could drink oatmeal with milk and it would encourage my milk to come in. I ended up having too much milk. No one told me about pumps while I was pregnant, so I had to call the hospital because of all the milk and they told me to come get a pump.”

Several women reported they were not comfortable bringing up more personal concerns such as body image or sexuality with their providers, but would have discussed these issues if the provider had started the conversation. None of the subjects in the study reported discussing sexuality and breastfeeding with their provider, yet the issue is likely quite prevalent. As one patient reported:

“After a year of breastfeeding my daughter, things were not good with my husband. I didn’t want him to touch me, I didn’t want to have sex, I didn’t feel attractive. I had a hard time dividing myself into woman and mother. I felt that my (breasts) became part of the baby, that they belonged to the baby. Eventually I decided from the waist down I was available for my husband. From the waist up was for my baby. I never told anyone about this problem while it was happening. But once I stopped breastfeeding I asked my friends if they had had similar issues while they were breastfeeding. They all reported similar problems.”

Although not all patients may wish to discuss concerns with their providers, the small percentage who had their concerns addressed in this study suggests the opportunity for dialogue with providers is often not created during prenatal care.

The second way in which we sought to understand the gap in communication between providers and patients was by examining whether patients were asked about their feeding plans, and if so, whether a neutral or positive response to a woman’s feeding choice versus directed encouragement of breastfeeding and education ultimately has an impact on feeding practices. We found women were equally likely to be asked their feeding plans, but more likely to be encouraged to breastfeed, if they were either planning to formula or mixed-feed. Because of the high rates at which these two groups were encouraged to breastfeed, at first glance the unadjusted odds ratio appears to indicate that provider encouragement to breastfeed actually led to decreased breastfeeding rates. Instead, we believe the odds ratio reveals that although women who planned to formula or mixed-feed were encouraged to breastfeed at relatively high frequency, only a small portion changed their mind and decided to breastfeed. A neutral response from the provider, which was most common in formula-feeders, was also linked to a decreased likelihood of breastfeeding in the unadjusted analysis. This odds ratio suggests that if a woman is planning to formula-feed, a neutral response from her provider is unlikely to

change her mind. The decreased likelihood of breastfeeding with either provider encouragement or a neutral response did not remain after adjustment for race/ethnicity and education. This indicates that both race/ethnicity and education are important confounders of the relationship between provider response and ultimate feeding choice. Both variables are linked to the type of response elicited by the provider as well as to the feeding practice. For example, African Americans may be more likely to have received a neutral response or encouragement to breastfeed than the other groups, but they were also much more likely to formula-feed. The disappearance of the impact of provider response on feeding choice in the adjusted analysis reveals the essential role of race/ethnicity and the associated cultural values as well as education and knowledge on feeding choice.

Another possible explanation for the small percentage of women who decided to breastfeed after provider encouragement is the method of communication. Numerous women offered qualitative information on how communication with their provider influenced their feeding decision. The method and words providers use to encourage are critical. One woman reported that her midwife “pushed breastfeeding down my throat”. Ultimately, she decided to bottle feed. Another woman reported:

“If a doctor had asked me week after week and told me that breastfeeding was best the way my mother-in-law did, I would have walked out of the office feeling harassed. I would have walked out of there thinking ‘leave me alone because these are my (breasts), my body.’ I couldn’t have said that to my mother-in-law”.

One Mexican woman reported feeling insulted when her doctor asked “Are you bottle or breastfeeding?” Because most women in Mexico breastfeed their babies, being asked in this manner made her feel defensive. She feels this question creates a “barrier” between

Latina women and providers. The patient suggested instead asking, “I know in Mexico most women breastfeed, what have you decided?”

Other women found providers to be powerful allies when they made decisions not supported in their community. One young African American woman mentioned that after discussion with her midwife she decided to breastfeed because she felt it was best for her baby. Her friends were discouraging, and told her she would have a ‘whiny, needy baby’ that she would never be able to wean. She found the support of her midwife enabled her to follow through with her decision. Providers must find the balance between providing information and encouragement and respecting a woman’s right to make her own decision.

Different perceptions of what type of conversation entails ‘feeding counseling’, may explain the different rates seen in the literature between providers’ and patients’ reports of breastfeeding counseling [26]. In Connecticut, where our study was conducted, 76% of obstetricians reported counseling their patients to breastfeed in 2003 (Stone 2003), while in our study, 74.6% of patients reported simply being asked about their feeding plans. While these numbers are remarkably similar, only 50.4% reported being encouraged to breastfeed and 25.4% had their primary concern about breastfeeding addressed. We theorize that the similarity between the percentages of women who reported being asked about their feeding plans and the percentage of providers who report “counseling” their patients, is due to the possibility that providers define asking about feeding plans as “counseling”, while patients do not report being counseled unless they have a more in depth conversation. One patient reported:

“My doctor asked me if I was breast or bottle feeding. When I said breast, she marked it off on the computer, said “okay” and went on. I don’t know if it is because I am basically healthy and my pregnancy went well, but I felt like I was on an assembly line. She just checked off my answers on her sheet and I was done. I would have liked a little more information.”

Although this study did not show that addressing concerns or encouraging women to breastfeed had a significant impact on feeding outcomes, there is some evidence that being encouraged to breastfeed vs. receiving a neutral provider response and/or having concerns addressed may result in women considering breastfeeding during pregnancy and therefore delaying decision making. Our study supports the finding by others that the majority of breastfeeders appear to make their decision before pregnancy [3] as well as current thought that women who make their decision during pregnancy are at increased odds for either formula or mixed-feeding [7]. In this study the majority of women who made their feeding choice during pregnancy ultimately chose to mixed-feed their infants (47.1%), while those who decided prior to pregnancy predominantly chose breastfeeding (71.8%) ($p < .001$). One of the explanations for the delay in decision making is that women who decide on feeding plans during pregnancy continue to consider breastfeeding, sometimes until the time of delivery [6]. A focus group of pregnant women designed to reveal how women make their decisions regarding infant feeding found that unlike studies based on individual clinic situations that indicate the majority of women decide on feeding preference before becoming pregnant, a large proportion of women in these focus groups were indecisive and expressed interest in knowing more about breastfeeding. A significant number of women who initially indicated a preference for formula-feeding changed their minds after listening to other participants discuss the advantages of breastfeeding [34].

In our study, women who were asked about their plans and had their concerns addressed were significantly more likely to make their decision during pregnancy than women who were not asked their plans or were asked about their plans but did not have their concerns addressed ($p=.010$). Women who were encouraged to breastfeed were also more likely to make their decision during pregnancy than women who were not asked about their plans or received a neutral or positive response ($p=.040$). Women who ultimately chose mixed feeding were more likely to have made their decision during pregnancy versus before pregnancy if they received encouragement from providers rather than a neutral or positive response ($p=.004$). Encouragement did not seem to have the same impact on formula or breastfeeders.

If, as the literature suggests, only about one third of WIC eligible women who ultimately decide to breast or mixed-feed make this decision before pregnancy, the remainder of this group is either undecided or planning to formula-feed when they begin prenatal care. The high percentage of women who were encouraged to breastfeed during pregnancy who ultimately decided to mixed-feed is therefore quite significant, as these women are most likely adding breastfeeding to a previous plan to formula-feed. Although we did not identify a change in breastfeeding initiation rates, our study suggests that by encouraging women to breastfeed and addressing their concerns about breastfeeding, providers may be encouraging women to think more thoroughly about the possibility of breastfeeding thus delaying their decision.

The secondary aim of this study was to investigate whether the type of counseling provided by providers regarding infant feeding is influenced by patient socio-demographics and stated feeding plans. Unlike the majority of studies that indicate

young, African American poorly educated, unmarried, and low income women are less likely to receive counseling from providers to breastfeed, in our study area, physicians and midwives appear to be focusing their time on these patients. Previous studies have also shown provider reluctance to discuss breastfeeding with patients who have already made a decision to formula-feed, however, in this study mixed and formula-feeders were more likely to be encouraged to breastfeed than breastfeeders ($p=.016$). Mixed-feeders received the most encouragement to breastfeed, possibly because providers feel more comfortable if a woman is already considering some component of breastfeeding in her feeding regimen or the outcome of decision to mixed-feed is a reflection of the counseling they received. Breastfeeding women were the most likely to receive simply positive feedback, which may indicate the provider did not perceive a need for further information. Formula-feeders were the most likely to receive a neutral response (30%), which may reflect documented ambivalence on the part of some providers to engage in conversation with a woman who has already chosen to formula-feed [18, 21]. Providers may feel ambivalent about discussing breastfeeding with women who indicate a preference for formula-feeding, but the prenatal period is an essential time for intervention.

Strengths and Limitations

Many studies assessing the impact of providers on feeding outcomes loosely define “feeding counseling” regarding feeding practices. By allowing women to explain in their own words how their provider responded to their feeding choice, we were able to clearly define the provider patient interaction as either neutral, positive, or encouraging of breastfeeding. Women were also given the opportunity to freely discuss their concerns

about breastfeeding and what type of conversation, if any, they had regarding these concerns with their provider. In combination with the quantitative data derived from these conversations, the qualitative descriptions of the provider-patient interaction provide a clear evaluation of what breastfeeding counseling entails that is lacking in other studies of this type.

Interpretation of this cross-sectional study should consider several limitations. First, although the sample size was moderate (n=130), the number of formula-feeders was small (n=26). This limits the power for multivariate analysis. Second, the retrospective design introduces the possibility of recall bias. Participants were asked immediately post-partum about their interactions with their providers during pregnancy, therefore the maximum time patients were asked to recall is 36 weeks. Research suggests women's recall of events during pregnancy and delivery is both accurate and reproducible [49]. Furthermore, this study is most interested in what women recall regarding prenatal interactions at the point they are implementing their intention to breast or formula-feed. Therefore, if women do not recall a discussion during prenatal care regarding feeding on the first postpartum day, the discussion is unlikely to have made an impact on her decision. Therefore, the categorization of these women as not receiving encouragement or having had their concerns addressed is appropriate.

Conclusions

Over 95% of women had concerns about breastfeeding that they considered while making their feeding decision. The most common concerns women identified in this study were lack of confidence, ability to go back to work or school, and milk supply. Although brief discussion may have been adequate to address these issues, just over one

quarter of these women had their concern addressed by their provider during prenatal care. Providers responded to women's stated feeding choice with encouragement to breast feed just over one half of the time. Women were equally likely to be asked about their feeding plans, but more likely to be encouraged to breastfeed, if they were either planning to formula or mixed-feed compared to those planning to breastfeed. A neutral response from the provider, which was most common in formula-feeders, was linked to a decreased likelihood of breastfeeding in the unadjusted analysis.

Although our adjusted analyses were unable to identify an impact of addressing women's concerns or provider response to feeding choice on feeding outcome, the conclusion should not be that providers have no impact on women's decisions for several reasons. First, individually, women shared stories of discussion and encouragement from providers that ultimately influenced their decision to breastfeed. Women also revealed they do not equate simply being asked whether they will be breast or formula-feeding with counseling about breastfeeding and reported this type of interaction would be unlikely to influence decisions. Second, because of the small portion of women in the study who reported a true discussion regarding breastfeeding with their providers, it is possible we did not have the statistical power to detect the relationship between addressing concerns, provider response to feeding choice, and ultimate feeding outcome. Third, it is possible that addressing patients' concerns is most relevant in the subset of patients who make their feeding choice during pregnancy. Women who meet this description were also a small portion of our study group, and we did not have enough power to examine breastfeeding initiation rates among those who did and did not have their concerns addressed in this subset.

Finally, women who were asked about their plans and had their concerns addressed or were encouraged to breastfeed were significantly more likely to make their decision during pregnancy compared to before pregnancy than women whose providers did not discuss these issues. Likewise, a majority of mixed feeders reported making this decision during pregnancy suggesting that they may have decided to add breast milk to a previous plan to formula feed their infants. Although we did not identify a change in breastfeeding initiation rates, our study suggests that by encouraging women to breastfeed and addressing their concerns about breastfeeding, providers may be encouraging women to think more thoroughly about the possibility of breastfeeding, thus delaying their decision.

In order to effectively impact feeding outcomes and meet the goals of Healthy People 2010, providers need to create the space for women to ask questions about infant feeding and to encourage women to breastfeed in a respectful, culturally sensitive manner. Further research about effective methods of providing information regarding breastfeeding to women *prior* to pregnancy is essential. In addition, a larger study that focuses on women who make their decision during pregnancy is necessary to further understand the impact of providers on women's feeding choices.

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Appendix 1 – Survey

Today's Date ____/____/____

PPD # _____

Subject ID# _____

Congratulations on your new baby, and thank you so much for taking the time to talk with me. I am going to start out the interview with a few general questions about your prenatal care and your plans for feeding your baby.

How was the delivery? C-section Vaginal

A. Prenatal Care

A1. Where did you go for your prenatal care?

A2. Did you see a doctor or a midwife?

Doctor - 1

Midwife - 2

Both - 3

Don't know/didn't answer - 9

A3: Were you able to choose which type of provider?

Yes - 1

No - 2

Don't know/didn't answer - 9

A4. Did you see a pediatrician for a prenatal visit?

Yes - 1

No - 2

Don't know/didn't answer - 9

B. Feeding Preferences

B1. Have you decided how you are going to feed your baby?

Breastfeeding - 1

Bottle-feeding - 2

Both - 3

Don't know/didn't answer - 9

B2. When did you make this decision?

Before pregnancy - 1

Beginning of pregnancy - 2

End of pregnancy - 3

Postpartum - 4

Don't know/didn't answer - 9

If breastfeeding, B3, otherwise, B4.

B3. How long do you plan to breastfeed the baby?

Less than 6 weeks - 1

6 weeks to 6 months - 2

6 months to 1 year - 3

More than 1 year - 4

- B4. What helped you make your decision about how to feed your baby?
- B5: While making your decision, what concerns did you have about possibly breastfeeding the baby?
- B6: While making your decision, what concerns did you have about possibly formula feeding the baby?
- B7. During your pregnancy, did your provider ask you your plans for feeding your baby?
Yes – 1
No – 2
Don't know/didn't answer - 9
- B8. At that point, how did you answer?
Breast – 1
Bottle – 2
Mixed – 3
Undecided - 4
Don't know/didn't answer – 9
- B9. What did they say?
- B10. Did your provider ask you about any concerns you might have about feeding the baby?
Yes – 1
No – 2
Don't know/didn't answer – 9

IF BOTTLEFEEDING:

- B11. When you mentioned your plans to bottle-feed, did your provider talk to you about breastfeeding?
Yes – 1
No – 2
Don't know/didn't answer - 9
- B12. Did your provider review the benefits of breastfeeding with you?
Yes – 1
No – 2
Don't know/didn't answer - 9

C. Concerns re: feeding practices

Earlier in the interview, you mentioned a few concerns you had while making your decision about feeding the baby. Were these concerns addressed by your provider at any point during your prenatal care?

- C1. Concern #1 - _____
Yes – 1
No – 2
Don't know/didn't answer – 9
- C2. Concern #2 - _____
Yes – 1
No – 2
Don't know/didn't answer – 9

C3. Concern #3 - _____

Yes - 1

No - 2

Don't know/didn't answer - 9

In addition to the concerns you mentioned about feeding the baby, in other studies women have mentioned some of the following concerns about breastfeeding specifically. Regardless of how you are now feeding the baby, please let me know if any of these have been a concern to you, as well as whether they were addressed during your prenatal care.

C4. Concern that they may be unable to produce enough breast milk

Yes - 1

No - 2

Don't know /didn't answer - 9

If yes, Did your provider address this concern?

Yes - 1

No - 2

Don't know /didn't answer - 9

C5. Concern it may be difficult to maintain the health and good diet necessary for breastfeeding

Yes - 1

No - 2

Don't know /didn't answer - 9

If yes, Did your provider address this concern?

Yes - 1

No - 2

Don't know /didn't answer - 9

C6. Fear that breastfeeding will be painful

Yes - 1

No - 2

Don't know /didn't answer - 9

If yes, Did your provider address this concern?

Yes - 1

No - 2

Don't know /didn't answer - 9

C7. Fear that breastfeeding will restrict ability to attend work or school

Yes - 1

No - 2

Don't know /didn't answer - 9

If yes, Did your provider address this concern?

Yes - 1

No - 2

Don't know /didn't answer - 9

C8. Fear that breastfeeding will restrict social life

Yes - 1

No - 2

Don't know /didn't answer - 9

If yes, Did your provider address this concern?

Yes - 1

No - 2

Don't know /didn't answer - 9

C9. Anxiety or embarrassment about feeding in public places

Yes - 1

No - 2

Don't know /didn't answer - 9

If yes, Did your provider address this concern?

Yes - 1

No - 2

Don't know /didn't answer - 9

C10. Fear that breastfeeding will decrease physical or sexual attractiveness

Yes - 1

No - 2

Don't know /didn't answer - 9

If yes, Did your provider address this concern?

Yes - 1

No - 2

Don't know /didn't answer - 9

C11. Concern that breastfeeding will make it difficult to share breastfeeding responsibility with boyfriend/husband/partner

Yes - 1

No - 2

Don't know /didn't answer - 9

If yes, Did your provider address this concern?

Yes - 1

No - 2

Don't know /didn't answer - 9

The next few questions are to help me get an idea of your support system.

C12. I feel that my family and friends are supportive of my decision about how to feed the baby.

agree - 1
neutral - 2
disagree - 3
Don't know/didn't answer - 9

C13. I feel that my boyfriend/husband/partner/father of the baby is supportive of my decision about how to feed the baby.

agree - 1
neutral - 2
disagree - 3
Don't know/didn't answer - 9

C14. Who do you live with?

Family - 1
Husband/boyfriend/partner - 2
Alone - 3
Don't know/didn't answer - 9

C15. Are you married?

Yes - 1
No - 2
Don't know/didn't answer - 9

Finally, I have a few questions about your background.

D. Age

D1. How old are you?

E. Ethnicity/Race/Immigration

E1. Are you Hispanic or Latina?

Yes - 1
No - 2
Don't know/didn't answer - 9

E2. What race do you consider yourself?

White - 1
Black African - 2
Black African American - 3
Asian - 4
Native American or Alaskan - 5
Native Hawaiian or Pacific Islander - 6
More than one Race - 7
Other _____
Don't know/didn't answer - 9

E3. What country were you born in?

USA - 1

Other _____

Don't know/didn't answer - 9

E4. How long have you lived in the U.S.?

F. Education/Work

F1. What was the highest grade or year of school that you completed?

High School - 12

College - 16

Post Graduate - 17

Other _____

Don't know/didn't answer - 9

F2. Are you in school now?

Yes - 1

No - 2

Don't know/didn't answer - 9

F3. Before you had the baby, were you working?

No - 1

Part time - 2

Full time - 3

Don't know/didn't answer - 9

If working:

F4: When do you plan to return to work?

F5: Did you get any paid maternity leave?

Yes - 1

No - 2

Don't know/didn't answer - 9

G. Medical History

Now I am going to ask you some questions about your medical history.

G1. Are you taking any medications?

Yes - 1

No - 2

Don't know/didn't answer - 9

If yes, please list _____

G2: Do you smoke?

Yes - 1

No - 2

Don't know/didn't answer - 9

G3. How were you fed as a baby?

Breast - 1

Bottle - 2

Don't know/didn't answer - 9

G4. How many babies have you had?

If there are other children, go to G4, otherwise skip to H.

G5: How did you feed your previous children?

Child #1 *Breast – 1*
 Bottle – 2
Don't know/didn't answer – 9

Child #2 *Breast – 1*
 Bottle – 2
Don't know/didn't answer – 9

If any children were breastfed, go to G6.

G6. How long did you breastfeed each of the children?

Child 1 _____
Child 2 _____

G7: Did you have any specific problems breastfeeding?

H. Finances

H1. Which of the income ranges on this card is closest to your family's income?

A – 1
B – 2
C – 3
Don't know/didn't answer - 9

(A card with income ranges from less than \$10,000, between \$10,000-\$24,000, and above \$24,000)

Thank you so much for taking the time to answer these questions today!