



Factors Associated With Breastfeeding Success by Race: A Retrospective Study.



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Introduction

Racial disparities exist in many aspects of maternal and neonatal care including successful breastfeeding.

The desire to breastfeed is multifactorial and is influenced by pre-birth breastfeeding plan, demographics, intrapartum and postpartum events such as the use of neuraxial anesthesia, and mode of delivery.

There are numerous health benefits for mother and baby related to breastfeeding.

Purpose

The purpose of this study is to assess factors associated with breastfeeding success by race with a specific focus on pre-birth breastfeeding plan and time duration from birth until initiation of skin to skin contact and from birth to the first feed.

Methods

A database query of our electronic medical records was performed for all patients that met our study criteria during the study period.

Mother’s demographic information, pre-delivery feeding plan (exclusive BF, exclusive formula, or mixed), time to first feed, and time to skin to skin were compared among different post-partum feeding practices (exclusive BF vs. mixed vs. exclusive formula), and compared across race/ethnic groups (White, Black, Hispanic, Asian and Other) using ANOVA, Chi-square, and Fisher’s exact statistical tests as appropriate. Logistic regression was used to investigate the independent effect of each variable on exclusive BF.

Patient Demographics and Intended Feeding Plan by Race

	Overall (n = 12587)	White (n = 7912)	Hispanic (n = 1838)	Black (n = 1030)	Asian (n = 999)	Other (n = 808)	p-value
ASA Class n (%)							< 0.001
Unknown or < 3	12175 (97)	7749 (98)	1730 (94)	930 (90)	984 (98.5)	782 (97)	
3+	412 (3)	163 (2)	108 (6)	100 (10)	15 (1.5)	26 (3)	
Anesthetic Technique							< 0.001
Regional Anesthesia	10772 (85.5)	6758 (85.4)	1552 (84.4)	863 (84)	903 (90.4)	696 (86)	
Maternal Age (years) Median [IQR]	31 [27 - 35]	32 [27 - 35]	30 [25 - 34]	29 [25 - 33]	33 [31 - 36]	32 [28 - 36]	< 0.001
BMI Median [IQR]	28 [25 - 31]	27 [25 - 30]	31 [27 - 34]	31 [27 - 36]	27 [24 - 29]	28 [26 - 32]	< 0.001
Gravidity Median [IQR]	2 [1 - 4]	2 [1 - 4]	2 [1 - 4]	3 [1 - 4]	2 [1 - 2]	2 [1 - 3]	< 0.001
Parity Median [IQR]	0 [0 - 2]	1 [0 - 2]	1 [0 - 1]	1 [0 - 1]	0 [0 - 1]	0 [0 - 1]	< 0.001
Gestational Age Median [IQR]	39 [38 - 40]	39 [39 - 40]	39 [38 - 40]	39 [38 - 40]	39 [38 - 40]	39 [38.5 - 40]	< 0.001
Intended Feeding Plan n (%)							< 0.001
Breastfeeding Only	9761 (77.6)	6455 (82)	1243 (67.7)	624 (60.6)	802 (80.3)	637 (78.8)	
Breast feeding and formula	2275 (18.1)	1138 (14)	504 (27.4)	311 (30.2)	179 (17.9)	143 (17.7)	
Formula Only	500 (4)	288 (3.6)	82 (4.5)	89 (8.6)	18 (1.8)	23 (2.9)	
Undecided	42 (0.3)	23 (0.3)	8 (0.4)	6 (0.6)	0 (0)	5 (0.6)	



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Table 2: Post delivery feeding group by race

	Overall (n= 12587)	White (n = 7912)	Hispanic (n = 1838)	Black (n = 1030)	Asian (n = 999)	Other (n = 808)	p-value
Feeding Group n (%)							< 0.001
Breastfeeding Only	3996 (32)	2803 (35)	421 (23)	216 (21)	291 (29)	265 (33)	
Breastfeeding and formula	7718 (61)	4653 (59)	1234 (67)	664 (65)	664 (67)	502 (62)	
Formula Only	873 (6.9)	456 (6)	183 (10)	150 (15)	43 (4)	41 (5)	

Feeding Results by Race

- Although 77.6% of our sample intended to exclusively breastfeed, the majority of our patients practiced mixed feeding with only 38% of our cohort exclusively breastfed.
- When assessed by racial groups, White patients had the highest rate of exclusive breastfeeding (35%) and Black patients were the least likely to exclusively breastfeed (21%).
- Compared to other racial groups, Black women had the least breastfeeding interactions with their newborns in all measured breastfeeding parameters.
- The average breastfeeding proportion was lowest among Black women (52%) and 15% of the Black women had never breastfed.
- Our Asian and Hispanic populations had the largest percent of mixed feeding at 67% as compared to 61% overall.

Table 3: Maternal Neonate Interactions by race

	Overall (n= 12587)	White (n = 7912)	Hispanic (n = 1838)	Black (n = 1030)	Asian (n = 999)	Other (n = 808)	p-value
First Feed (min)	54 [33 - 132]	51 [31 - 128]	57 [35- 137]	60 [39 - 169]	55 [35 - 120]	56 [34-132]	< 0.001
First Breastfeed* (min)	57 [34 - 194]	54 [32 - 179]	59 [36 - 222]	61 [39 - 299]	60 [38 - 184]	59 [35 - 214]	< 0.001
First Skin to Skin (min)	11 [1 - 30]	11 [1 - 29]	13 [2 - 30]	14 [2 - 35]	10 [1 - 25]	15 [2 - 32]	0.229
*n = 11584							

Maternal - Neonatal Interaction Results by Race

- Times to first feed/breastfeed were longer in all racial groups when compared to white patients.
- Time to first skin-to-skin was not significantly different between racial groups.

Bivariate Associations with Feeding Group

- Women who breastfed exclusively were
 - 98% ASA class < 3,
 - 84% had regional anesthesia (as compared to 86% and 88% in the mixed and formula feeding groups, respectively),
 - they were older than the other feeding groups with a median age of 33,
 - and smaller BMI (27).
- Exclusive breastfeeding was associated with shortest interval for feeding interactions
- Formula feeding was associated with shorter time intervals for first skin to skin

Table 4: Bivariate associations of baseline characteristics and maternal neonate interaction with observed feeding group

	Breastfeeding Only (n= 3996)	Mixed (n = 7718)	Formula Only (n = 873)	p-value
ASA Class n (%)				< 0.001
Unknown or < 3	3924 (32)	7434 (61)	817 (7)	
3+	72 (17)	284 (69)	56 (14)	
Anesthetic Technique n (%)				< 0.001
Regional Anesthesia	3354 (31)	6646 (62)	772 (7)	
No Anesthesia	642 (35)	1072 (59)	101 (6)	
Maternal Age (years) Median [IQR]	33 [30 - 35]	31 [26 - 34]	30 [26 - 34]	< 0.001
BMI Median [IQR]	27 [25 - 30]	28 [26 - 32]	29 [26 - 33]	< 0.001
Gravidity Median [IQR]	2 [1 - 3]	2 [1 - 4]	3 [2 - 4]	< 0.001
Parity Median [IQR]	1 [0 - 1]	1 [0 - 2]	1 [0 - 2]	< 0.001
Gestational Age Median [IQR]	39 [39 - 40]	39 [38 - 40]	39 [38 - 40]	< 0.001
Intended Feeding Plan n (%)				< 0.001
Breastfeeding Only	3719 (38)	5799 (59)	243 (3)	
Breastfeeding and formula	266 (12)	1805 (79)	204 (9)	
Formula Only	5 (1)	84 (17)	411 (82)	
Undecided	4 (10)	24 (57)	14 (33)	
Maternal Neonate Interactions Median [IQR]				
First Feed (min)	48 [31 - 96]	54 [33 - 134]	90 [50 - 248]	< 0.001
First Breastfeed (min)	49 [32 - 98]	60 [35 - 255]	--	< 0.001
First Skin to Skin (min)	10 [1 - 23]	14 [3 - 35]	9 [0 - 20]	< 0.001



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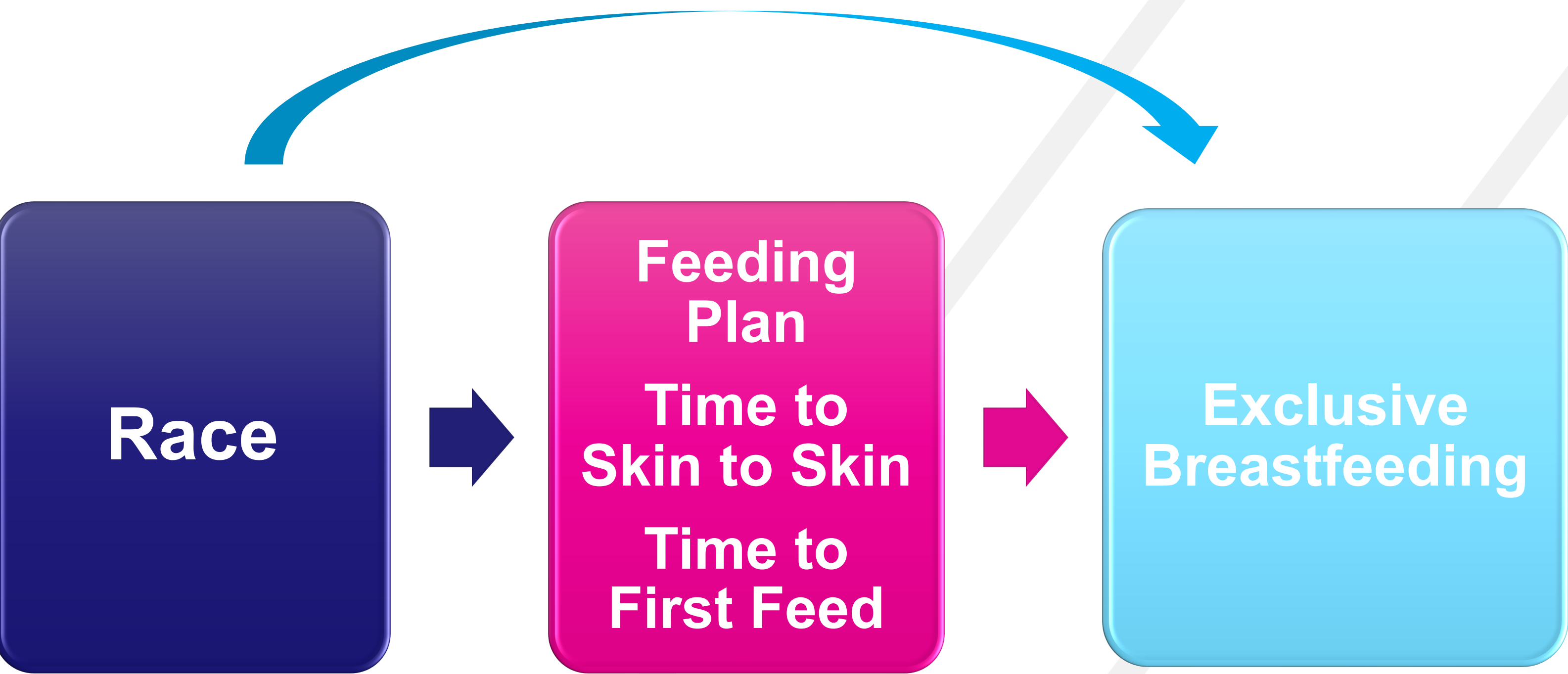
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Table 5: Logistic regression model for predicting exclusive breastfeeding

		Odds ratio (OR)	OR 95% confidence limits		P-value
Race and ethnicity	Blacks	0.7758	0.6901	0.8721	<.0001
	Asian	0.6513	0.5900	0.7189	<.0001
	Hispanics	0.7664	0.7045	0.8337	<.0001
	Other	0.8656	0.7873	0.9516	0.0028
	(Ref: White)				
Self-declared feeding plan	Breastfeeding and formula	0.3933	0.3517	0.4398	<.0001
	Formula only	0.0344	0.0161	0.0734	<.0001
	Undecided	0.3186	0.1364	0.7443	0.0082
	(Ref: Exclusive breast)				
Pre-partum parity	1	1.0324	0.9827	1.0847	0.2053
	2	0.8412	0.7744	0.9136	<.0001
	3	0.6117	0.5351	0.6994	<.0001
	4+	0.3516	0.3022	0.4090	<.0001
	(Ref: 0)				
Gestational age (week)		1.0360	1.0119	1.0607	0.0032
ASA status	3+	0.7588	0.6171	0.9331	0.0089
	(Ref: 1 or 2)				
Anesthetic technique	Regional	0.8208	0.7730	0.8716	<.0001
	(Ref: None)				
Time to first skin-to-skin contact (per 10 minutes)		0.9965	0.9948	0.9982	<.0001
Time to first feed (per 10 minutes)		0.9961	0.9943	0.9978	<.0001

Table 6: Model summary for racial disparity on the choice of exclusive breastfeeding (Odds Ratio and 95%CI)

	Model 1 All covariates as shown in Table 5	Model 2 Exclude first feed variable	Model 3 Exclude First Skin variable	Model 4 Excluded feeding plan variable
Black	0.776 (0.690, 0.872)	0.771 (0.686, 0.867)	0.775 (0.689, 0.871)	0.689 (0.610, 0.778)
Asian	0.651 (0.590, 0.719)	0.651 (0.590, 0.720)	0.648 (0.587, 0.715)	0.631 (0.570, 0.698)
Hispanics	0.766 (0.705, 0.834)	0.765 (0.703, 0.832)	0.768 (0.706, 0.836)	0.711 (0.651, 0.775)
Other	0.866 (0.787, 0.952)	0.864 (0.786, 0.950)	0.862 (0.784, 0.947)	0.844 (0.765, 0.932)
White (ref)	--	--	--	--



Conclusion:

- Race is an important predictor of exclusive breastfeeding:
 - As compared to white women, Asians had the lowest odds of exclusive breastfeeding, followed by Hispanics, Blacks, and other
- Intended feeding plan was also an important predictor of exclusive breastfeeding. Intending to solely use formula had an odds ratio of 0.0344 [0.0161 – 0.0734] 95% CI, p < 0.001 of doing exclusive breastfeeding during the hospital admission.
- Initiating skin to skin or feeding earlier had minimal effect on exclusive breastfeeding.
- The effect of race is not mediated by the maternal-neonatal interactions, meaning decreasing time to first feed or first skin to skin for a particular racial group did not increase the likelihood to exclusively breastfeed.
- However, the effect of race was mediated by intended feeding plan.

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