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## Breastfeeding and Exposure to Past, Current, and Neighborhood Violence

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### Abstract

**Objectives**—Breastfeeding has short- and long-term health benefits for children and mothers, but US breastfeeding rates are suboptimal. Exposure to violence may contribute to these low rates, which vary by race/ethnicity. We studied: (1) whether patterns of violence exposure differ by race/ethnicity and (2) whether these patterns are associated with breastfeeding outcomes.

**Methods**—We conducted a secondary analysis of data drawn from self-report surveys completed by a convenience sample of low-income postpartum women (n=760) in upstate New York. Latent class analysis was used to identify groups of women with similar responses to seven violence measures, including childhood physical and/or sexual violence, experience of partner violence during or just after pregnancy (physical, emotional, verbal), and neighborhood violence (perceived or by ZIP code). Logistic regression and survival analysis were utilized to determine if classes were associated with breastfeeding initiation, duration, and exclusivity, controlling for demographics.

**Results**—Exposure to at least one form of violence was high in this sample (87%). We identified 4 classes defined by violence exposure (combining current and historical exposures). Violence exposure patterns differed between racial/ethnic groups, but patterns were inconsistently associated with breastfeeding plans or outcomes. For White women, history of violence exposure increased the likelihood of earlier breastfeeding cessation. By contrast, among Black women, history of violence exposure increased the likelihood of having a breastfeeding plan and initiating breastfeeding.

**Conclusions for Practice**—Some differences between violence exposure classes are likely due to the correlation between race/ethnicity and socioeconomic status in the community studied.

Additional studies are warranted to better understand how exposure to violence is related to breastfeeding and how best to support women making decisions about intention, initiation, and duration of breastfeeding.

### Keywords

Breastfeeding; exposure to violence; latent class analysis; domestic violence; neighborhood; vulnerable populations

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### Objectives

Breastfeeding has important, well-established short and long-term health benefits to the infant and mother (Eidelman et al., 2012; Ip et al., 2007; Office on Women's Health, 2016). Numerous psychosocial factors are acknowledged to interfere with breastfeeding outcomes (initiation, duration, exclusive breastfeeding) and prenatal intention (plan) to breastfeed (Singh, Kogan, & Dee, 2007). There is a growing body of literature on women's experiences of violence across the lifespan and its impact on birth outcomes, including breastfeeding (Sharps, Laughon, & Giangrande, 2007; Silverman, Decker, Reed, & Raj, 2006). In the United States (US), nearly 36% of women report lifetime physical abuse, rape, and/or stalking by intimate partners (Black et al., 2011). Significantly more Black non-Hispanic women (44%) and multiracial non-Hispanic women (54%) report lifetime experience of rape, physical violence, or stalking by an intimate partner compared to White non-Hispanic women (35%) (Black et al., 2011). Pregnancy is not protective against abuse. Four to eight percent of pregnant women in the US report experience intimate partner violence (IPV) (Sharps, Laughon, & Giangrande, 2007). Also, approximately 32% of US women report a history of childhood sexual abuse (CSA) and 19.5% report childhood physical abuse (Briere & Elliot, 2003).

The relationship between breastfeeding and IPV, prior to, during, and after pregnancy, has been a subject of several studies that show mixed results. Bair-Merritt and colleagues examined breastfeeding as one of several physical health outcomes of childhood exposure to IPV (Bair-Merritt, Blackstone, & Feudtner, 2006). Identifying only one study for inclusion in their review, they concluded that there was insufficient evidence of a relationship between the two (Bair-Merritt et al., 2006). A later study, using data from over 100,000 women, found lower rates of breastfeeding initiation and higher rates of early breastfeeding termination among women with IPV during pregnancy (Silverman et al., 2006). However, this relationship was not maintained in multivariable models. A study by Bullock et al. (2001) of 150 women showed no relationship between IPV and breastfeeding initiation or duration among low-income women. A more recent study of 6,410 mothers of infants showed similar results; there was no significant difference in the rate of breastfeeding by sexually assault experience, either in childhood or adulthood (Kendall-Tackett, Cong, & Hale, 2013).

Ogbo et al., (2017) examined exclusive breastfeeding (EBF) in the first month after birth among 17,564 live births in Australia; their findings show an early cessation of EBF among abused women compared to non-abused women. A large prospective cohort of 53,934

women reported that both past childhood abuse and recent IPV were associated with early cessation of breastfeeding (Sørbo, Lukasse, Brantsæter, & Grimstad, 2015). A study conducted in Brazil (N=564) identified a relationship between women's exposure to severe IPV and early termination of exclusive breastfeeding (Hasselmann, Lindsay, Surkan, Vianna, & Werneck, 2016). Suboptimal breastfeeding (initiation and exclusivity) was associated with maternal lifetime IPV among African women (Misch & Yount, 2014). A study of feeding practices among Indian women demonstrated a relationship with IPV exposure and lower rates of exclusivity, but not initiation (Zureick-Brown, Lavilla, & Yount, 2015). Findings from a cluster randomized controlled trial with 2,111 Australian women and a cross-sectional study with 731 women from Sweden showed no difference in breastfeeding rates and EBF by IPV experiences (James et al., 2014; Finnbogadóttir & Thies-Lagergren, 2017). While several samples mentioned above had experiences of childhood and adult victimization, none of these studies included exposure to neighborhood violence in their analyses.

Similar to studies on the relationship between IPV and breastfeeding, studies of women survivors of CSA present mixed results on the association between experiencing CSA and breastfeeding intention and initiation. Kendall-Tackett (2007) reviewed the limited literature regarding sexual abuse and breastfeeding and concluded that women with a history of CSA, when compared with non-abused women, are more likely to intend to and initiate breastfeeding. A study of 78 Mexican American young adults did not show a significant association between CSA history and feeding choice (Bowman, Ryberg, & Becker, 2008). Coles et al. (2016) analyzed data from nearly 4,000 Australian women demonstrating no difference in rates of breastfeeding at six months by CSA experience.

When describing the pathways connecting women's experiences of IPV and breastfeeding, Kendall-Tackett (2007) highlighted that some barriers related to breastfeeding are more prevalent in women in abusive relationships. These factors include smoking, shorter postpartum hospital stays, preterm deliveries, low birth weight, and non-supportive partners. Further, IPV- and childhood abuse-related trauma might impact cortisol levels in the mother, leading to a delayed milk supply post delivery. This delay might influence the women to quit breastfeeding as they might think that they are producing inadequate amount of breastmilk.

There is a scant body of literature on neighborhood context and its relationship to breastfeeding. Data from the National Survey of Children's Health show that women from perceived safe neighborhoods had slightly higher rates of breastfeeding initiation (73.4% vs 68.0%). This difference shrank to less than 3% at 6 months postpartum for breastfeeding duration (38.1% vs. 35.3%). Neighborhood safety was not found to be significant in multivariable models (Singh et al., 2007). A study among a sample of predominately unmarried urban women (N=4228) found neighborhood socioeconomic context was associated with higher odds of initiating and sustaining breastfeeding (Burdette, 2013).

In sum, studies to date related to breastfeeding and violence exposure across the lifespan are limited. No studies were found that combined both early life and current, and interpersonal and community, exposure to violence. This preliminary study seeks to fill this gap by creating exposure patterns combining prior and current interpersonal with neighborhood

exposure to violence. Latent class analysis (LCA) is a method to identify distinct groups of observations (called classes) that have common features, and combine a variety of measures to a smaller number of classes, which may represent common patterns of experience. LCA has been used in a variety of social and behavioral science areas, including violence exposure and association with mental health (Cavanaugh et al., 2012; Lambert, Nylund-Gibson, Copeland-Linder, & Jalongo, 2010). Here we examine classes of maternal violence exposure by race and ethnicity. This analysis may help us understand the relationship between these patterns of experience and an outcome such as breastfeeding behavior. Our research questions were: (1) do patterns of violence exposure differ by race and ethnicity and (2) are these patterns associated with breastfeeding outcomes, including initiation, duration, and exclusivity?

## Methods

Secondary data analysis was conducted on data drawn from self-report surveillance surveys completed by a convenience sample of postpartum women (n=760) in upstate New York (2009–2011). As described in Dozier et al. (2012), this surveillance survey was distributed to all women with infants between 5–7 months old who received well-baby care at 4 low-income serving practices (4 pediatric; 1 family medicine). Mailings occurred at approximately 5–7 months postpartum and included items about the pre-pregnancy, prenatal, and postpartum periods. A second mailing was sent 3 weeks later. Other follow-up (e.g., by telephone) was not possible because only addresses were provided by the participating practices. The response rate was 21%. The over 80 survey items were primarily based on US Centers for Disease Control’s Pregnancy Risk Assessment Monitoring System (version 6) (CDC, 2016). Only women who answered all questions pertaining to violence in their past and present were included in the analysis (n=499). Of these 499 women, 49 were excluded: 40 answered “Mixed or Other Race” and 9 did not answer the race question.

The outcome, breastfeeding, was based on maternal self-report, and included initiation (ever breastfed), duration (did breastfeeding continue through 4 weeks and through 13 weeks), and exclusivity (was breastfeeding the only source of nutrition for the infant at 4 weeks and at 13 weeks).

The primary independent variables were exposure to violence, including past and current violence exposure in several domains. Specific survey items are footnoted in Table 1. [TABLE 1] Questions regarding arguments with husband or partner and emotional cruelty by husband or partner were based on the Stressful Life Events Questionnaire originally developed by Barnett et al (1993) and adapted by O’Connor (2013). Women rated how safe they felt during the day and during the night in their neighborhood on 4-level scales from very safe to not safe, which we dichotomized to very safe during both the day and the night vs. usually, somewhat, or not safe either during the day or at night. Nine ZIP codes in the service area surveyed are known for substantially higher poverty and violence rates. These geographically-contiguous ZIP codes were coded as inner city, and the remaining ZIP codes were not inner city. Demographic information gathered are listed in Table 1 and used as covariates.

LCA was used to identify groups of women with similar responses to the seven violence measures described above. The number of classes for each group was based on several model fit statistics (Akaike information criterion [AIC] and adjusted Bayesian information criterion [BIC]) and interpretability of classes. In addition, we tested for measurement invariance by race and ethnicity. The PROC LCA macro for SAS was used for LCA (Collins & Lanza, 2010) and SAS was used for all other analyses. We also explored using the violence measures that differentiated the classes most strongly associated with breastfeeding outcomes to predict these outcomes directly.

Logistic regression was utilized to determine if classes were associated with breastfeeding initiation. Survival analysis was conducted for breastfeeding duration and exclusivity outcomes. For all models, the covariates (dichotomous, except as noted) included: English spoken, age (3 categories), smoking history, alcohol history, high school completion, self-reported depression (pre- or postnatal), school and work status, body mass index (BMI; 3 categories; underweight omitted due to small sample size), and prior births. We controlled for BMI in these models, because BMI is negatively correlated with initiation of breastfeeding (Krause, Lovelady, & Ostbye, 2011). Because having a breastfeeding plan was a strong predictor of breastfeeding outcomes, models were run with and without this variable.

## Results

Most of the women in this study were between 20 and 29 years old. See Table 1 for demographic information by race and ethnicity. The most common forms of violence exposure were inner city ZIP code (69%), perceived neighborhood safety (46%), and arguing with husband or partner (46%). The least commonly reported exposure was physical abuse during pregnancy (13%). Overall, 87% of the sample reported at least one exposure to violence (not in table). The same proportion of Black and Hispanic women reported at least one exposure to violence (92%), while fewer White women reported at least one exposure (74%;  $P<.001$ ).

We started with a constrained model that used the same class structure for all race/ethnicity groups. In this model, AIC suggested 5 classes, BIC suggested 3 classes, and the adjusted-BIC suggested 4 classes as the best fit for this model (Online Resource 1). After reviewing the interpretability of the classes for each race/ethnicity, we chose the 4-class model, because the fourth class was meaningfully different from the first three, but the fifth class did not improve interpretation. We then considered an unconstrained model to test measurement invariance by race/ethnicity; measurement invariance is an assumption that the classes are the same for each group. Measurement invariance was not rejected in the three- and four-class models ( $P<.08$ ), but was rejected in the five-class model ( $P<0.007$ ), based on the difference in  $G^2$  between constrained and unconstrained models. Due to the moderate sample size and low p-value for the final 4-class model, we chose the conservative approach of stratifying all subsequent analyses using non-Hispanic Black, non-Hispanic White, and Hispanic categories.

To finalize the number of classes, we conducted a bootstrapped likelihood ratio test, comparing the model fit of each model to the model with one less class. Based on this and the AIC, we found that 3 classes were supported for Black and Hispanic women, but 4 for White women. The adjusted-BIC also supported 3 classes for Black and Hispanic women, but supported 5 classes for White women. For consistency between racial/ethnic groups, and because the fourth class was meaningfully different, we used 4 classes for the remainder of our analyses. These 4 classes have slightly different meanings for the different racial/ethnic groups, as described below. We therefore used these race/ethnic group-specific classes for all subsequent analyses.

Figure 1 shows the violence exposure items that correspond to each class. [FIGURE 1] Class A is characterized by history of violence exposure and current partner arguments. Class A<sub>W</sub> White women were also likely to report living in unsafe neighborhoods, Class A<sub>B</sub> Black women were likely to report physical abuse during pregnancy, and Class A<sub>H</sub> Hispanic women were likely to report living in unsafe neighborhoods and the inner city. Class B women had elevated likelihood of having history of violence exposure, some likelihood of current partner arguments, and living in bad neighborhoods. Class C women had elevated levels on all measure of violence, including current violence exposure, history of exposure, and neighborhood exposure. Class D women overall had lower violence exposure, but Black Class D<sub>B</sub> and Hispanic Class D<sub>H</sub> women were likely to live in the inner city.

In bivariate models, White women in Class B<sub>W</sub> were more likely to initiate breastfeeding than White women in Class D<sub>W</sub> ( $P<0.045$ ) and White women in Class A<sub>W</sub> were less likely to continue breastfeeding for 4 weeks ( $P<0.038$ ) and 13 weeks ( $P<0.002$ ), breastfeed exclusively for 4 weeks ( $P<0.031$ ) and 13 weeks ( $P<0.019$ ) than White women in Class D<sub>W</sub>. Hispanic women in Class B<sub>H</sub> were less likely to continue breastfeeding ( $P<0.03$ ) or breastfeed exclusively ( $P<0.04$ ) for 13 weeks than Hispanic women in Class D<sub>H</sub>. No other statistically significant bivariate associations were found.

In multivariable models including violence exposure classes, Hispanic women in Class B<sub>H</sub> were more likely to initiate breastfeeding when controlling for breastfeeding plan, but more likely to stop before 13 weeks when not controlling for breastfeeding plan, than Hispanic women in Class D<sub>H</sub> (Table 2). [TABLE 2] White women in Class A<sub>W</sub> were less likely to continue breastfeeding to 13 weeks than those in Class D<sub>W</sub>, controlling for breastfeeding plan. There were no other associations between violence exposure classes and breastfeeding behaviors.

Breastfeeding intention was the most consistent predictor of breastfeeding outcomes. Current smoking was associated with increased breastfeeding in some cases. Working and going to school had mixed impacts on breastfeeding outcomes, with White women generally breastfeeding more if they had less than a high school education and were in school, but others breastfeeding less if they were in school or worked. Age also had mixed results, with older Hispanic and younger White women breastfeeding more. Depression was associated with less breastfeeding in a few models, as was non-primarily English speaking for White women. Having a previous child increased breastfeeding for Black and Hispanic women in some models.

Because of the limited associations found between violence exposure classes and breastfeeding outcomes, we explored associations between specific aspects of violence exposure and breastfeeding. We focused on history of violence exposure because that appeared to be a defining characteristic of the classes that were associated with breastfeeding outcomes. We defined a new variable (history of violence exposure) as reporting sexual abuse as a child or physical abuse when younger. For White women, a history of violence exposure was associated with ending breastfeeding earlier at both 4 and 13 weeks postpartum (Table 3). [TABLE 3] The association for White women holds when breastfeeding intention is removed as a covariate (Supplemental Table S2). When breastfeeding intention was removed from the model, an association between history of violence exposure and breastfeeding initiation is apparent for Black women.

Because breastfeeding plan was a consistent predictor of breastfeeding initiation and longer breastfeeding duration, we explored the associations between these factors. We found significant ( $P < .05$ ) bivariate associations between breastfeeding plan and each breastfeeding outcome, except for duration at 4 weeks for White and Hispanic women (not shown in tables). In addition, we explored multivariable models using breastfeeding plan as an outcome, testing both the exposure of classes and history of violence as predictors, and including the same covariates as our other models. The only multivariable model that was significant was for Black women, with these women being more likely to have a breastfeeding plan if they had a history of violence ( $p = 0.04$ ) or prior pregnancies ( $p = 0.04$ ).

## Conclusions for Practice

Our latent class analysis of surveillance data from a convenience sample of low-income women resulted in identification of meaningful classes defined by violence exposure, combining current and history of exposure. Results show that this group of women had very high levels of violence exposure with 87% of the sample reporting childhood, recent/current, and/or neighborhood exposure to violence. Further, we found that violence exposure patterns were different between racial and ethnic groups, but similar to other studies (Black et al., 2011; Kendall-Tackett, 2007) with Black and Hispanic women reporting higher levels of violence in their lives (92%) compared to White women (74%). These patterns of violence were inconsistently associated with breastfeeding plans or outcomes.

Based on our class analysis, we conducted additional analyses using only history of violence as the exposure. For White women, a history of violence exposure increased the likelihood of earlier breastfeeding cessation. This finding suggests that White women with a history of violence who begin breastfeeding may need additional support to continue breastfeeding. Because we do not know the reasons why they stopped breastfeeding, additional research is needed to determine the appropriate form of support. By contrast, for Black women, a history of violence exposure increased the likelihood that they would have a breastfeeding plan. This contrary finding may suggest an opportunity to support the intention to breastfeed.

The majority of our findings are consistent with the trend of violence exposure being associated with decreased breastfeeding behaviors. The one exception was Black women

with a history of violence being more likely to have a plan to breastfeed. The literature also showed an exception with women who had a history of childhood sexual abuse, which is one of the two measures our history of violence exposures variable was based on. Therefore, it appears that there may be a difference in impact of recent vs. previous exposure.

The strong association between having a breastfeeding plan and other breastfeeding outcomes was not surprising, but the differences by race and ethnicity have not been previously reported, to our knowledge. Some differences between violence exposure classes are likely due to the correlation between race and socioeconomic status in the community studied. The majority of the Hispanic (80%) and Black women (81%) lived in the inner city, while a minority of the White women did (41%). This difference is reflected in the class characteristics. All of the Hispanic classes and all but one of the Black classes were characterized as having many inner city residents. The Black class with a low percentage of inner city residents accounted for only a small portion of the Black sample (4.7%). In contrast, only two of the White classes had a high percentage of inner city residents and these classes accounted for a minority of the White sample (39.9%). Because of these differences between inner city residence by race and the use of inner city residence to create the classes, it follows that White classes were characterized differently than Black or Hispanic classes. We note that living in the inner city was not correlated with perceived neighborhood safety by race. From these data, we do not know if the neighborhoods were substantially different, or if the perceptions were different.

These data are limited by being primarily self-report and collected postpartum, which may introduce recall bias and bias towards denying violence exposure. The data are also a convenience sample of moderate size, which may have reduced our ability to detect associations with small effect sizes. However, the availability of multiple types of violence exposure linked with collection of breastfeeding outcomes in the time period of breastfeeding provided a novel opportunity to explore these associations. Unlike other studies that have relied on breastfeeding recall after a longer time period, in this study breastfeeding was reported within 5–7 months postpartum. Another strength of this analysis was the use of LCA to distinguish violence exposure classes between race and ethnicity.

While our methodology demonstrated that violence exposure was associated with poorer breastfeeding outcomes, as noted by Cerruli et al. (2010), additional studies are warranted to improve our understanding of the relationship between violence exposure and breastfeeding outcomes among low- and non-low-income populations. Additional research is also needed on how to utilize information on exposure to violence to modify interventions that support prenatal decision making about breastfeeding intention, initiation of breastfeeding and sustaining breastfeeding, and how to take race into account when determining which women would benefit most from a targeted intervention.

Because of the life-long benefits of breastfeeding, identifying women who would benefit from interventions to improve breastfeeding outcomes should be a public health priority. Our findings add to the existing literature that violence exposure may reduce breastfeeding or limit breastfeeding duration, and present a new finding that there may be differences in patterns of violence exposure by race.



## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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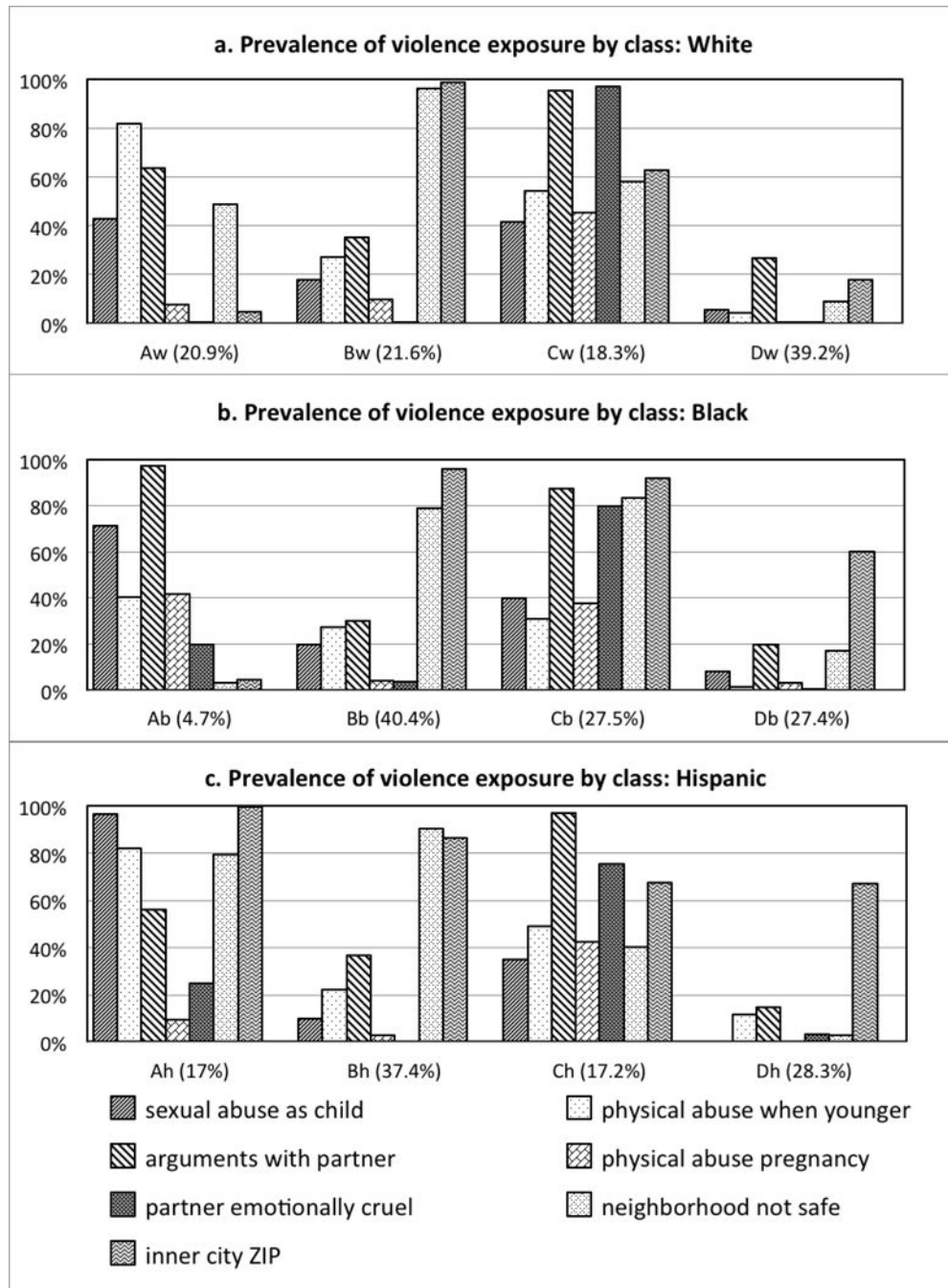
### Significance

**What is known?**

Some specific types of violence have been associated with breastfeeding patterns, but findings are inconsistent.

**What this article adds?**

We include a variety of violence measures, including childhood physical and/or sexual violence, experience of partner violence during or just after pregnancy, and neighborhood measures, combining them using latent class analysis, and allowed for differences by racial and ethnic backgrounds. Having a history of violence exposure impacted White and Black women differently, and was a stronger predictor of breastfeeding behaviors than exposure to violence during pregnancy.



**Figure 1.** Violence history for each class by race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic). Within each race/ethnicity, four classes were identified (A, B, C, D), but these classes are not the same between race/ethnicity (White Class A [A<sub>W</sub>] is similar, but not identical, to Black Class A [A<sub>B</sub>]). For each class, the percentage of the racial/ethnic group in that class is indicated parenthetically (e.g., 20.9% of White women were in Class A<sub>W</sub>).

**Table 1**

Sample description

	White (n=133)		Black (n=197)		Hispanic (n=120)		Total (n=450)	
	n	%	n	%	n	%	n	%
English speaking	10	80	179	91	44	37	329	73
	6							
Age (years)								
<20	5	4	16	8	16	13	37	8
20-29	86	65	118	60	72	60	276	61
30-49	39	29	53	27	22	18	114	25
Body Mass Index								
Underweight	9	7	8	4	4	3	21	5
Healthy weight	64	48	71	36	48	40	183	41
Overweight	29	22	55	28	40	33	124	28
Obese	31	23	63	32	26	22	120	27
Depressed	35	26	51	26	35	29	121	27
Had a breastfeeding plan	61	46	75	38	49	41	185	41
Smoker								
Never	49	37	99	50	50	42	198	44
Current	49	37	51	26	41	34	141	31
Former smoker	35	26	49	25	29	24	113	25
Alcohol consumption								
Never	29	22	73	37	50	42	152	34
Current	73	55	97	46	53	44	223	50
Former drinker	31	23	32	16	17	14	80	18
Work & school attendance								
Neither	73	55	79	40	58	48	210	47
Work	45	34	73	37	34	28	152	34
School	15	11	22	11	22	18	59	13
Work and School	0	0	18	9	8	7	26	6
Completed high school	10	82	152	77	82	68	343	76
	9							

	White (n=133)		Black (n=197)		Hispanic (n=120)		Total (n=450)	
	n	%	n	%	n	%	n	%
Any prior birth	59	44	67	34	54	45	180	40
Violence exposure								
Sexually abused as a child <sup>a</sup>	29	22	47	24	32	27	108	24
Physical abuse (when younger) <sup>b</sup>	47	35	43	22	41	34	131	29
Physical abuse (during pregnancy) <sup>b</sup>	16	12	30	15	12	10	58	13
Argue with husband or partner <sup>c</sup>	65	49	91	46	53	44	209	46
Emotional cruelty of husband or partner <sup>d</sup>	24	18	47	24	22	18	93	21
Perceived unsafe neighborhood safety <sup>e</sup>	73	55	79	40	54	45	206	46
Inner city zip code <sup>f</sup>	55	41	160	81	96	80	311	69
History of Violence <sup>g</sup>								
Yes	57	13	69	15	49	11	175	39
No	76	17	128	28	71	16	275	61

<sup>a</sup>Have you ever been sexually abused? (as a child) (Yes)

<sup>b</sup>Did anyone close to you hit, slap, kick, choke or physically abuse you in any other way? Check all that apply: Never, when I was younger, In the year before my pregnancy, during pregnancy, since baby's birth

<sup>c</sup>I had a serious argument with my husband or partner

<sup>d</sup>My husband or partner was emotionally cruel to me (Yes, affected me a lot and Yes affected me a little)

<sup>e</sup>Calculated variable combining responses from How safe do you feel during the day in the neighborhood you live in now? and How safe do you feel at night in the neighborhood you live in now?; response option of Very safe, usually safe, somewhat safe; not safe. Dichotomized to very safe during both the day and the night vs. all other responses

<sup>f</sup>Nine geographically contiguous zipcodes with a concentration of poverty and violence

<sup>g</sup>Calculated combining answering "yes" to either sexual abuse as a child or physical abuse when younger

**Table 2**

Models predicting breastfeeding initiation and probability of stopping, including violence exposure classes as predictors.<sup>a</sup> Violence exposure classes are labeled A through D, with subscripts indicating the race/ethnicity because the class structures vary by race/ethnicity.<sup>b</sup> Model 1 includes classes, breastfeeding plan, and covariates, while Model 2 includes only classes and covariates

Predictors	BF initiation		BF duration: 4 weeks		BF duration: 13 weeks		BF exclusivity: 4 weeks		BF exclusivity: 13 weeks	
	Odds Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	
White										
Model 1										
Class A <sub>W</sub> vs. D <sub>W</sub>	2.37 (0.46, 12.1)	2.57 (0.70, 10.70)	2.86 (1.01, 8.53) <sup>*</sup>	1.89 (0.90, 3.95)	1.74 (0.87, 3.43)					
Class B <sub>W</sub> vs. D <sub>W</sub>	0.38 (0.08, 1.73)	1.40 (0.26, 6.91)	2.11 (0.54, 7.94)	1.52 (0.64, 3.46)	1.30 (0.59, 2.76)					
Class C <sub>W</sub> vs. D <sub>W</sub>	0.88 (0.18, 4.36)	0.63 (0.07, 3.99)	1.19 (0.29, 4.68)	1.08 (0.38, 2.67)	1.26 (0.53, 2.77)					
Breastfeeding plan	- <sup>c</sup>	0.45 (0.15, 1.30)	0.23 (0.09, 0.53) <sup>**</sup>	0.72 (0.39, 1.32)	0.65 (0.38, 1.13)					
Model 2:										
Class A <sub>W</sub> vs. D <sub>W</sub>	3.39 (0.75, 15.29)	1.97 (0.56, 7.30)	2.21 (0.80, 6.35)	1.79 (0.87, 3.68)	1.61 (0.82, 3.13)					
Class B <sub>W</sub> vs. D <sub>W</sub>	0.44 (0.14, 1.41)	1.06 (0.20, 4.76)	1.18 (0.32, 4.14)	1.40 (0.60, 3.09)	1.18 (0.54, 2.43)					
Class C <sub>W</sub> vs. D <sub>W</sub>	0.74 (0.20, 2.74)	0.49 (0.06, 2.68)	1.19 (0.31, 4.35)	1.10 (0.39, 2.65)	1.21 (0.52, 2.65)					
Black										
Model 1										
Class A <sub>B</sub> vs. D <sub>B</sub>	2.50 (0.24, 25.85)	0.96 (0.05, 5.70)	1.24 (0.35, 3.54)	0.67 (0.16, 1.92)	0.66 (0.22, 1.58)					
Class B <sub>B</sub> vs. D <sub>B</sub>	1.26 (0.57, 2.81)	1.21 (0.46, 3.43)	1.05 (0.57, 1.96)	1.23 (0.75, 2.05)	1.42 (0.91, 2.25)					
Class C <sub>B</sub> vs. D <sub>B</sub>	1.70 (0.66, 4.37)	0.75 (0.23, 2.40)	0.76 (0.38, 1.54)	1.15 (0.67, 2.00)	1.40 (0.85, 2.34)					
Breastfeeding plan	9.40 (3.51, 25.21) <sup>**</sup>	0.37 (0.14, 0.89) <sup>*</sup>	0.29 (0.16, 0.48) <sup>**</sup>	0.56 (0.37, 0.85) <sup>**</sup>	- <sup>d</sup>					
Model 2:										
Class A <sub>B</sub> vs. D <sub>B</sub>	4.50 (0.52, 39.30)	1.40 (0.21, 5.93)	0.95 (0.31, 2.42)	0.69 (0.20, 1.79)	0.66 (0.25, 1.47)					
Class B <sub>B</sub> vs. D <sub>B</sub>	1.28 (0.61, 2.69)	1.09 (0.41, 3.05)	0.88 (0.48, 1.65)	1.24 (0.76, 2.07)	1.41 (0.90, 2.23)					
Class C <sub>B</sub> vs. D <sub>B</sub>	1.98 (0.82, 4.75)	0.67 (0.21, 2.10)	0.64 (0.32, 1.28)	1.11 (0.64, 1.92)	1.31 (0.79, 2.18)					
Hispanic										
Model 1										
Class A <sub>H</sub> vs. D <sub>H</sub>	0.25 (0.025, 2.40)	1.70 (0.45, 6.08)	2.16 (0.80, 5.74)	1.02 (0.45, 2.14)	1.07 (0.51, 2.14)					

Predictors	BF initiation		BF duration: 4 weeks		BF duration: 13 weeks		BF exclusivity: 4 weeks		BF exclusivity: 13 weeks	
	Odds Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	
Class B <sub>H</sub> vs. D <sub>H</sub>	0.13 (0.02, 0.83)*	1.26 (0.41, 3.88)	2.06 (0.92, 4.76)	1.61 (0.89, 2.95)	1.68 (0.94, 3.06)					
Class C <sub>H</sub> vs. D <sub>H</sub>	0.17 (0.01, 2.00)	1.37 (0.26, 6.15)	2.42 (0.84, 7.10)	0.57 (0.19, 1.44)	1.12 (0.51, 2.31)					
Breastfeeding plan	- <sup>c</sup>	0.40 (0.16, 0.99)*	0.40 (0.21, 0.74)**	0.75 (0.45, 1.24)	- <sup>d</sup>					
Model 2:										
Class A <sub>H</sub> vs. D <sub>H</sub>	0.60 (0.12, 2.88)	1.30 (0.35, 4.54)	1.66 (0.63, 4.23)	0.96 (0.43, 2.00)	0.95 (0.45, 1.88)					
Class B <sub>H</sub> vs. D <sub>H</sub>	0.29 (0.07, 1.11)	1.22 (0.39, 3.80)	2.30 (1.06, 5.18)*	1.65 (0.92, 3.00)	1.72 (0.96, 3.11)					
Class C <sub>H</sub> vs. D <sub>H</sub>	0.33 (0.07, 1.67)	1.00 (0.19, 4.30)	2.22 (0.8, 6.08)	0.55 (0.18, 1.38)	1.05 (0.48, 2.15)					

\*  $P < 0.05$

\*\*  $P < 0.001$

<sup>a</sup>The following variables were included as covariates if they were significantly associated with the given outcome in bivariate tests: language (English vs. other), age, smoking history, alcohol history, education, depression, reasons for stopping breastfeeding (went back to school, went back to work, went back to both school and work, or neither), BMI, parity (no prior births vs. prior births).

<sup>b</sup>Joint tests of class contribution to each model were run; results are not presented because they were  $> 0.05$  in all cases.

<sup>c</sup>Not reported, because fewer than 3 individuals who had a breastfeeding plan did not initiate breastfeeding, leading to unreasonable standard error estimates.

<sup>d</sup>Not reported, because fewer than 3 individuals who had no breastfeeding plan continued exclusively breastfeeding through 13 weeks, leading to unreasonable standard error estimates.



**Table 3**

Models predicting breastfeeding initiation and probability of stopping, including history of violence exposure as a predictor. These models includes history of violence exposure, breastfeeding plan, and covariates.

Predictors	BF initiation		BF duration: 4 weeks		BF duration: 13 weeks		BF exclusivity: 4 weeks		BF exclusivity: 13 weeks	
	Odds Ratio (95% CI)		Hazard Ratio (95% CI)		Hazard Ratio (95% CI)		Hazard Ratio (95% CI)		Hazard Ratio (95% CI)	
White										
History of Violence Exposure	2.30 (0.70, 7.20)		5.92 (1.72, 27.98) <sup>*</sup>		3.33 (1.46, 8.00) <sup>**</sup>		1.73 (0.97, 3.11)		1.65 (0.95, 2.86)	
Breastfeeding plan	<i>b</i>		0.52 (0.17, 1.47)		0.28 (0.13, 0.59) <sup>**</sup>		0.76 (0.43, 1.39)		0.66 (0.39, 1.13)	
Black										
History of Violence Exposure	1.80 (0.90, 3.90)		0.66 (0.25, 1.59)		0.93 (0.54, 1.58)		0.95 (0.63, 1.43)		0.97 (0.67, 1.39)	
Breastfeeding plan	9.20 (3.40, 24.8)		0.39 (0.15, 0.93) <sup>*</sup>		0.29 (0.17, 0.50) <sup>**</sup>		0.55 (0.36, 0.84) <sup>**</sup>		<i>c</i>	
Hispanic										
History of Violence Exposure	0.90 (0.20, 3.80)		0.68 (0.25, 1.72)		0.87 (0.44, 1.68)		0.71 (0.41, 1.19)		0.83 (0.50, 1.35)	
Breastfeeding plan	<i>b</i>		0.46 (0.18, 1.11)		0.42 (0.23, 0.78) <sup>**</sup>		0.73 (0.44, 1.22)		<i>c</i>	

<sup>\*</sup> *P*<0.05

<sup>\*\*</sup> *P*<0.001

<sup>a</sup>The following variables were included as covariates if they were significantly associated with the given outcome in bivariate tests: language (English vs. other), age, smoking history, alcohol history, education, depression, reasons for stopping breastfeeding (went back to school, went back to work, went back to both school and work, or neither), BMI, parity (no prior births vs. prior births).

<sup>b</sup>Not reported, because fewer than 3 individuals who had a breastfeeding plan did not initiate breastfeeding, leading to unreasonable standard error estimates.

<sup>c</sup>Not reported, because fewer than 3 individuals who had no breastfeeding plan continued exclusively breastfeeding through 13 weeks, leading to unreasonable standard error estimates.