

Maternal and neonatal outcomes among incarcerated women who gave birth in custody

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Abstract

Background: In the United States, the population of incarcerated women has increased by more than 600% since the 1980s. With this rise, correctional facilities have faced new challenges meeting the health care needs of women, especially those who are pregnant. This retrospective cohort study sought to describe five indicators of maternal and neonatal health among women who gave birth in custody, and to compare outcomes among incarcerated women who did and did not receive enhanced pregnancy support.

Methods: We used deidentified electronic health records (EHRs) to examine maternal and neonatal birth outcomes (ie, mode of birth, low birthweight, preterm birth, APGAR score, NICU admission) among women who gave birth in custody. Regression models examined differences in outcomes between women who received enhanced pregnancy support—group prenatal education and one-on-one doula visits—and a historical control group of women who received standard prenatal care.

Results: Adverse maternal and neonatal birth outcomes in this sample were rare. No differences in outcomes were found between incarcerated women who received enhanced pregnancy support and the historical control group.

Conclusions: Despite evidence for the benefits of enhanced pregnancy support in the general population, this study did not find differences in outcomes between incarcerated women who did and did not receive support. Integrated data from prison and hospital records are innovative, but effect measurement is limited by sample size. Future research should include primary data collection on maternal, neonatal, and dyadic outcomes longitudinally and across prisons.

KEY WORDS

birth outcomes, doulas, pregnancy, prison

1 | INTRODUCTION

The number of women incarcerated in the United States (US) increased more than 600% since the 1980s.¹⁻³ Today more than 200 000 women are incarcerated.⁴ Three-quarters of women who are incarcerated are of childbearing age, and most are mothers with minor children.^{1,5} As this population has rapidly increased, prisons and jails have faced challenges in meeting the unique health care needs of women, especially pregnant women.

Nationally, limited data are available about pregnant women who are incarcerated.⁶⁻¹⁰ Correctional facilities do not systematically track pregnancy rates; however, national estimates indicate that approximately 3%-4% of women are pregnant when entering prison.^{6,11} Compared with pregnant women in the general population, pregnant women who are incarcerated are more likely to have risk factors associated with poor perinatal outcomes, including preterm and small-for-gestational-age infants.¹²⁻¹⁴ Such outcomes are likely a result of risk factors that may or may not have preceded incarceration, including chronic medical or mental health conditions and limited access to health care.^{13,15-19}

Research on births in custody is especially lacking.⁷⁻¹⁰ Sufrin and colleagues reported that, on average, 6% of births to incarcerated women were preterm and 32% were cesarean births, but rates varied substantially across states.⁶ The few studies that have examined birth outcomes among women who are incarcerated have mixed findings. Some researchers have asserted that prison may provide some protection to otherwise marginalized women, in terms of shelter, basic medical care, and regular meals.^{20,21} Martin et al found rates of low birthweight among infants born to women who were incarcerated during pregnancy were similar to rates among infants born to women who were never incarcerated, but rates were higher among infants born to women who were incarcerated during a time other than pregnancy.²⁰ In contrast, Bell et al¹² found that women who had been in jail for part of their pregnancy had higher odds of low birthweight and preterm birth compared with women with Medicaid-funded births in the community, but this relationship was modified by maternal age.

Several health care and corrections organizations²²⁻²⁴ have developed standards for caring for pregnant women during incarceration. The extent to which correctional facilities meet these standards varies considerably by state and facility.^{6,25,26} Health services for women in prison have often been considered inadequate or below the standard of care typically provided in community settings.^{17,27} Ferszt and Clarke¹⁷ studied the health care practices of 19 prisons and described living conditions, health care, and counseling practices that failed to meet pregnant women's basic needs. In a national survey, Maruschak¹¹ found that only about half of pregnant women in state prisons received some type of pregnancy care. Health

care practitioners at community hospitals may also lack knowledge about standards of care or relevant state laws (eg, antishackling laws), which may further affect the experiences of women who give birth in custody.²⁸

Some correctional facilities have developed programs to specifically meet the unique needs of pregnant women ranging from prenatal yoga to prison nurseries.^{29,30} Bard, Knight, and Plugge¹⁰ conducted a systematic review of perinatal health care services and outcomes among incarcerated pregnant women. They reviewed 18 studies and compared usual models of care ($n = 7$), enhanced care ($n = 6$), and programs that include coordination of community care on release ($n = 5$).¹⁰ Enhanced care models included services such as prenatal education, improved nutrition, and doula support.¹⁰ Women who received enhanced care were less likely to have a preterm or cesarean birth compared with women who received usual care.¹⁰ However, they cautioned that more rigorous evaluations of these programs are necessary.¹⁰

Four of the enhanced care models examined by Bard et al¹⁰ were doula or birth support programs. A doula is a "person trained and experienced in childbirth who provides continuous physical, emotional, and informational support to the mother before, during and just after birth."³¹ Doulas do not provide medical support or have clinical responsibilities.³²

There are several possible mechanisms through which doula support may improve maternal outcomes.^{33,34} Kozhimannil and colleagues found that by addressing women's health literacy and social support needs, doulas improved access to, and the quality of, health care services received by low-income women.³⁴ Other typical sources of support (eg, the birthing person's partner or mother) are prohibited for women who give birth under correctional custody who cannot have visitors at the hospital. In this context, doulas may play an especially important role.

Although there are no studies to date on the effectiveness of doula support for pregnant women in prison, researchers have demonstrated the benefits of doula support among women in the general population and among low-income women who were not incarcerated.³⁵⁻³⁸ Hodnett et al³⁷ found that women who received continuous intrapartum support were more likely to have spontaneous vaginal births. Kozhimannil et al,³⁸ comparing Medicaid beneficiaries who received doula care with a national comparison group, found that doula care was associated with lower rates of cesarean and preterm births, resulting in cost savings to states. Through improved maternal and neonatal birth outcomes, doula-supported births have potential cost savings to prisons, which primarily incarcerate women from disadvantaged and minoritized backgrounds.³⁹

Given these benefits, doula support has recently been offered to pregnant women in several correctional facilities across the United States; however, evaluations of these programs are rare.¹⁰ Our team has demonstrated the feasibility

of providing enhanced pregnancy support with doulas to women in a state prison, and described low cesarean and preterm birth rates among program participants.^{40,41} In the current study, we conducted a retrospective cohort study of deidentified electronic health records (EHRs) and prison records to characterize the maternal and neonatal birth outcomes of women who gave birth while in custody in a state prison, and to test for differences between women who received enhanced pregnancy support with doulas and those who received usual prenatal care (described below) across five outcomes: mode of birth (vaginal versus cesarean), low birthweight, preterm birth, admission to the neonatal intensive care unit (NICU), and APGAR score.

2 | METHODS

2.1 | Setting

This study retrospectively examined the maternal and neonatal birth outcomes of pregnant women incarcerated at one Midwest state prison. This facility is the state's only prison for women, and it houses individuals of all custody levels from minimum to maximum security. At the end of 2016, there were 639 women (6.5% of the state's prisoners) in custody at this facility.⁴² In the state in which this study was conducted, women do not receive expedited parole because of pregnancy, and thus, most women who enter prison pregnant will also give birth while in custody.

Per prison policy, all women under the age of 60 were tested for pregnancy on admission. Pregnant women received standard prenatal care (ie, regular medical checkups and screening tests) from the prison's health service until 36 weeks' gestation, including one consult at 28 weeks at a local obstetrics clinic. A formal transfer of care to the same clinic occurred at 36 weeks. When active labor began, or on the day of their scheduled birth, women were transported to a hospital attached to the clinic. The hospital is within five miles of the prison and has a level 2 special care nursery.

2.2 | Data sources

Multiple sources of data were merged through data use agreements between the University of Minnesota (the evaluators of the intervention program), the health care system (the hospital where women gave birth), and the Minnesota Department of Corrections (DOC). The Institutional Review Board at the University of Minnesota and the Human Subjects Review Board at the Minnesota DOC approved this study.

We obtained records from the DOC for adult women who gave birth while incarcerated, identified through health

system billing records between 2002 and 2016 for a singleton birth ($n = 208$). We determined which women (matching by name, date of birth, and year of delivery) had received enhanced pregnancy support (intervention group). We then obtained hospital health care system EHR data (matched by name and date of birth) for women who permitted use of their private health information for research. Notably, EHR records were only available for births between 2007 and 2016. In this query, the health care system identified 8 additional nonduplicate records for women who gave birth and were admitted from or discharged to the state's prison. Deidentified records for women were returned to researchers at the University of Minnesota for analysis as shown in Figure 1.

2.3 | Sample

The analytic sample included 117 women, aged 18 years or older who had a singleton birth while incarcerated in the state's women's prison between 2007 and 2016.

2.3.1 | Historical control group: Standard prenatal care

The historical control group ($n = 41$, 35% of the analytic sample) received prenatal care as described above.

2.3.2 | Intervention group: Enhanced pregnancy support

Women in the intervention group ($n = 76$, 65% of the analytic sample) received enhanced pregnancy and parenting support in addition to standard prenatal care. In March 2010, the prison started offering a weekly, 2-hour Pregnancy and Mothering program facilitated by a local community-based organization. The 12-week program provided group-based support and education for pregnant and postpartum women in the prison. In November 2010, the program expanded to provide one-on-one support from a doula. The doula met with the woman individually at least twice before birth, and provided prenatal education, birth planning, and emotional support. At the time of labor, the doula met the client at the hospital and remained with her throughout the birth. The doula also provided support at the time of separation from her infant (typically 48-72 hours postpartum). The client met with the doula twice after returning to prison for postpartum support.

A prison case manager provided information about the program to pregnant women who were expected to give birth in custody. Women then met with the program coordinator

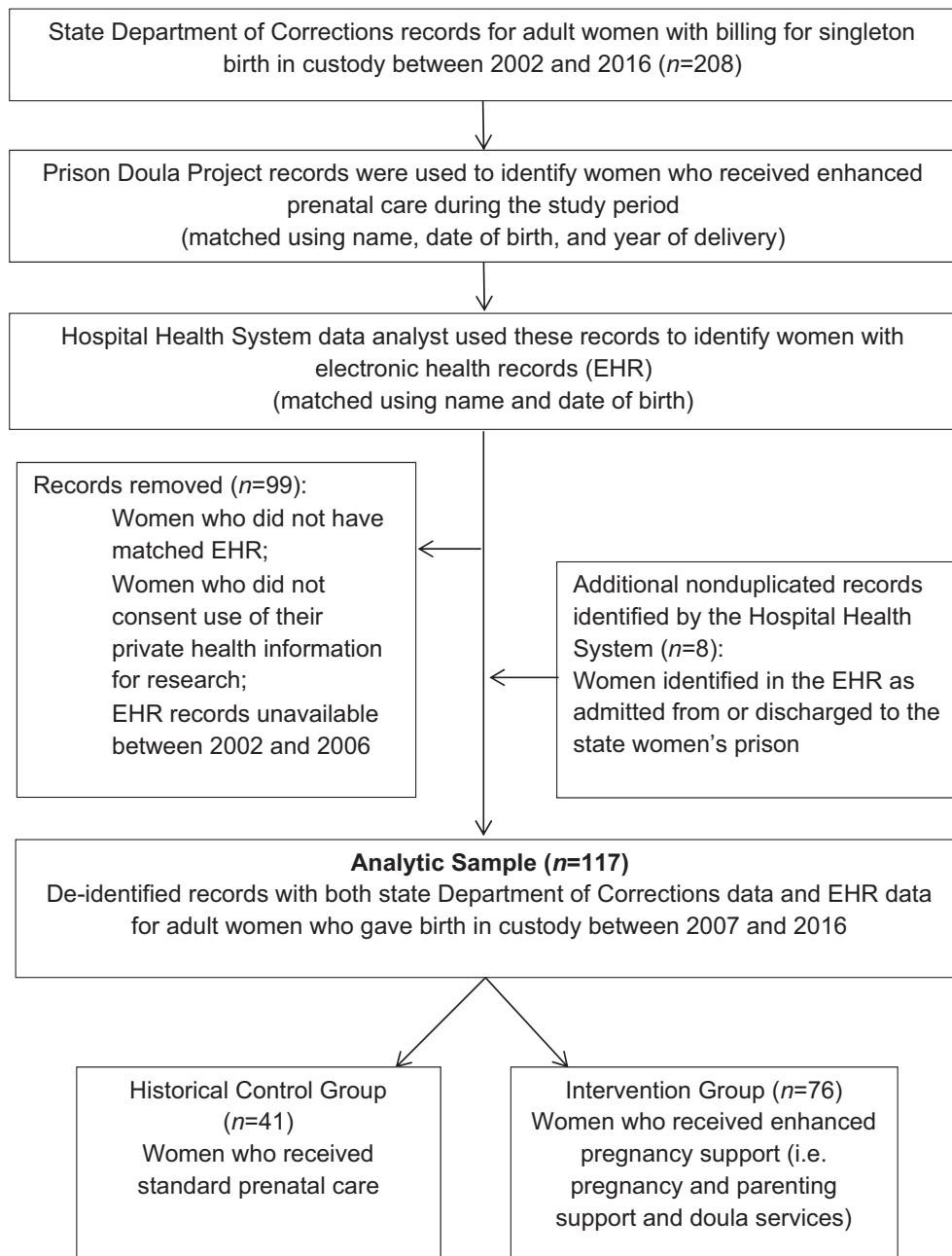


FIGURE 1 Flow chart of methods used to obtain analytic sample

to learn more about the voluntary program. All the women who were referred to the program and met with the program coordinator opted to receive services. Although rare, women who did not receive the full intervention were included in analysis. For example, women who met with a doula before birth, but who did not receive doula services at the time of birth because of special circumstances (eg, snowstorm), were included in analysis, consistent with an intent-to-treat approach.⁴³ Detailed program information—including information about frequency, dose, and program components—has been presented elsewhere.⁴⁴⁻⁴⁶

2.4 | Variables

Maternal demographic characteristics were measured as age in years at admission to the hospital for birth (continuous); race (categorical; American Indian/Alaska Native, Asian, Black/African American, Native Hawaiian/other Pacific Islander, White, Patient Declined/Missing); ethnicity (categorical; Hispanic or Latina, non-Hispanic or Latina, Patient Declined/Missing); highest level of education completed (dichotomous; high school degree/GED or less than high school degree/GED); year of delivery (continuous); and months incarcerated

TABLE 1 Characteristics of pregnant women who are incarcerated, comparisons by control and intervention groups, 2007-2016

Characteristics	Total sample	Standard prenatal care (control)	Enhanced pregnancy support (intervention)
	N (valid %)	n (valid %)	n (valid %)
	117	41 (35.0)	76 (65.0)
Age at hospital admission ^a			
18-24 y	33 (28.2)	14 (34.1)	19 (25.0)
25-29 y	42 (35.9)	15 (36.6)	27 (35.5)
30-34 y	23 (19.7)	5 (12.2)	18 (23.7)
35+ y	19 (16.2)	7 (17.1)	12 (15.8)
Race ^a			
Asian	5 (4.5)	1 (2.6)	4 (5.6)
American Indian or Alaska Native	16 (14.4)	2 (5.1)	14 (19.4)
Black or African American	25 (22.5)	12 (30.8)	13 (18.1)
Native Hawaiian or Other Pacific Islander	1 (0.9)	0 (0.0)	1 (1.4)
White	64 (57.7)	24 (61.5)	40 (55.6)
Missing/patient declined	6	2	4
Ethnicity ^a			
Non-Hispanic/Latina	104 (93.7)	37 (94.9)	67 (93.1)
Hispanic/Latina	7 (6.3)	2 (5.1)	5 (6.9)
Missing/patient declined	6	2	4
Education ^b			
Less than high school degree/GED	39 (35.8)	8 (24.2)	31 (40.8)
High school degree/GED or higher	70 (64.2)	25 (75.8)	45 (59.2)
Missing	8	8	0
Year of delivery ^{a,b}			
2007	4 (3.4)	4 (9.8)	0 (0.0)
2008	7 (6.0)	7 (17.1)	0 (0.0)
2009	9 (7.7)	9 (22.0)	0 (0.0)
2010	15 (12.8)	13 (31.7)	2 (2.6)
2011	17 (14.5)	3 (7.3)	14 (18.4)
2012	6 (5.1)	1 (2.4)	5 (6.6)
2013	15 (12.8)	0 (0.0)	15 (19.7)
2014	15 (12.8)	1 (2.4)	14 (18.4)
2015	14 (12.0)	1 (2.4)	13 (17.1)
2016	15 (12.8)	2 (4.9)	13 (17.1)
Missing	0	0	0
	Mean (SD) [missing] Median [range]	Mean (SD) [missing] Median [range]	Mean (SD) [missing] Median [range]
Months incarcerated before birth ^{a,b}	4.0 (2.2) [8] 4.2 [0.1, 8.2]	3.7 (2.4) [8] 4.2 [0.3, 7.8]	4.2 (2.2) [0] 4.3 [0.1, 8.2]

^aData source electronic health records.^bData source state department of corrections administrative records.

before birth (continuous). Maternal age, race, and ethnicity were extracted from the EHR; education was extracted from the DOC records; year of delivery was matched across EHR and DOC records for each woman; and months incarcerated before birth were calculated using both DOC and EHR records. Records from the prison doula project were used to determine condition (dichotomous; historical control or intervention). We identified five maternal and neonatal birth outcomes that have been assessed in prior research with incarcerated women and could be reliably documented for all participants from the EHR: mode of birth (dichotomous; cesarean or vaginal); low birthweight (dichotomous; <2500 g); preterm birth (dichotomous; <37 weeks' completed gestation); NICU admission (dichotomous); and APGAR score at 5 minutes (continuous).¹⁰

2.5 | Data analysis

Maternal demographic and birth outcome variables were summarized using descriptive statistics. We also conducted tests of association for maternal demographic characteristics and outcomes between the control and intervention groups with the Pearson *t* tests for continuous variables or the Fisher exact test for categorical variables.

Outcomes for the control and intervention groups were examined using multiple linear and logistic regression models, with adjustment for key factors based on prior research, including mean-centered maternal age, race/ethnicity (recoded as a dichotomous variable; white, non-Hispanic, and all other races and ethnicities), education level, year of delivery (mean-centered), and months incarcerated before birth. Year of delivery was included to adjust for confounding of the intervention with time, and to adjust for other potential time-associated trends in maternal and neonatal birth outcomes. Analyses were conducted with R (Version 3.6.0; Vienna, Austria).⁴⁷

3 | RESULTS

Characteristics of women who gave birth while incarcerated between 2007 and 2016, including women who received standard prenatal care (historical control group) and women who received enhanced pregnancy support (intervention group), are summarized in Table 1. Among all women who gave birth while incarcerated, most were under the age of 30 (64.1%); most were white (57.7%) and non-Hispanic (93.7%); and slightly more than one-third (35.8%) had less than a high school degree or GED. Women were in custody

TABLE 2 Maternal and neonatal birth outcomes among incarcerated women receiving enhanced pregnancy support and women receiving standard prenatal care, 2007-2016

Outcome	Total sample	Standard prenatal care (control)	Enhanced pregnancy support (intervention)
	N (valid %)	n (valid %)	n (valid %)
	117 (100)	41 (35.0)	76 (65.0)
Mode of birth			
Vaginal	90 (76.9)	35 (85.4)	55 (72.4)
Cesarean	27 (23.1)	6 (14.6)	21 (27.6)
Low birthweight (<2500 g)			
Not low birthweight	106 (95.5)	33 (94.3)	73 (96.1)
Low birthweight	5 (4.5)	2 (5.7)	3 (3.9)
Missing	6	6	0
Preterm birth (<37 wk)			
Not preterm	109 (94.0)	37 (92.5)	72 (94.7)
Preterm	7 (6.0)	3 (7.5)	4 (5.3)
Missing	1	1	0
NICU admission			
No	110 (94.0)	37 (90.2)	73 (96.1)
Yes	7 (6.0)	4 (9.8)	3 (3.9)
	Mean (SD) [missing] Median [range]	Mean (SD) [missing] Median [range]	Mean (SD) [missing] Median [range]
APGAR score (5 min)	8.85 (0.61) [7] 9.0 [5.0, 10.0]	8.9 (0.6) [6] 9.0 [6.0, 10.0]	8.8 (0.6) [1] 9.0 [5.0, 9.0]

Note: Data source for variables was EHR.

TABLE 3 Logistic and linear regression results of maternal and neonatal birth outcomes of incarcerated women with and without enhanced pregnancy support

Predictor	Outcome				
	Cesarean birth	Low birthweight	Preterm birth	NICU admission	APGAR score (5 min)
	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	Estimate (95% CI)
Intercept	1.59 (0.29, 9.00)	0.69 (0.03, 12.62)	0.25 (0.01, 2.84)	0.002 (0.000, 0.27)*	8.67 (8.32, 9.02)*
Enhanced pregnancy support	0.73 (0.12, 4.41)	1.41 (0.07, 31.03)	0.43 (0.02, 5.94)	0.38 (0.00, 30.72)	0.23 (−0.12, 0.57)
Maternal age (y)	1.01 (0.92, 1.12)	0.88 (0.67, 1.08)	0.93 (0.75, 1.10)	1.06 (0.82, 1.36)	0.00 (−0.02, 0.02)
Race/ethnicity: white, non-Hispanic	0.77 (0.27, 2.18)	0.66 (0.06, 5.81)	2.43 (0.46, 18.74)	0.49 (0.02, 8.48)	−0.23 (−0.44, −0.02)*
Education: high school degree/GED or higher	0.27 (0.09, 0.72)*	0.11 (0.01, 0.89)	0.55 (0.10, 3.20)	1.38 (0.10, 35.28)	0.04 (−0.17, 0.26)
Year of delivery	1.21 (0.90, 1.67)	0.76 (0.34, 1.52)	1.07 (0.65, 1.83)	1.09 (0.52, 2.57)	−0.06 (−0.12, 0.00)
Months incarcerated before birth	0.84 (0.66, 1.05)	0.52 (0.25, 0.87)*	0.76 (0.51, 1.09)	1.86 (1.00, 4.87)	0.03 (−0.01, 0.08)

*Statistically significant, $P < .05$.

an average of 4 months before birth. The Fisher exact tests and the Pearson t tests revealed no statistically significant differences between groups for maternal age, race/ethnicity, maternal education, or months incarcerated before birth.

Maternal and neonatal birth outcomes of women who gave birth in custody are summarized in Table 2. Overall, the rates of adverse maternal and neonatal outcomes examined in this study were rare. About 23% of women gave birth by cesarean. Less than 5% of women gave birth to infants that were low birthweight, and 6% of women gave birth before 37 weeks (ie, preterm). Six percent of infants born to women who gave birth while incarcerated were admitted to the NICU, and infants had a median APGAR score of 9. The Fisher exact tests and the Pearson tests indicated no statistically significant differences between the control and intervention groups for five key outcomes—mode of birth, low birthweight, preterm birth, NICU admission, and APGAR score.

Logistic and linear regression models, summarized in Table 3, revealed no statistically significant differences in the five outcomes between the control and intervention groups. All models were adjusted for maternal age, race/ethnicity, highest level of education completed, year of delivery, and months incarcerated before birth.

4 | DISCUSSION

Pregnant women who are incarcerated have high rates of substance use, mental health conditions, chronic medical conditions, and limited access to health care, all of which may increase their risk for poor birth outcomes.¹²⁻¹⁸ Yet, a limited number of studies have examined these risks or outcomes

among women who give birth in custody. In this analysis, rates of adverse neonatal birth outcomes (ie, low birthweight, preterm birth, NICU admission) were low, and less than one-quarter of women had cesarean births. Women who received enhanced pregnancy support had similar maternal and neonatal birth outcomes to the historical control group of women who received standard prenatal care.

Similar to our results, a 2019 study by Sufrin et al⁶ estimated that 6% of infants born to women in state and federal prison were preterm. In the current study, the average rate of cesarean birth (23.1%) was lower than the estimated 30% cesarean rate in Sufrin's national sample.⁶ However, our results are consistent with cesarean rates in Minnesota, which are also lower than the national average.⁴⁸

Rates of adverse birth outcomes among the study sample were also lower than state and national averages for women who were not incarcerated. In 2016, the state and national rates of cesarean birth were 26.8%⁴⁸ and 31.9%,⁴⁹ respectively. Another national study estimated a cesarean rate of 31.5% among Medicaid beneficiaries.³⁸ In the current sample, less than one-quarter of women gave birth by means of cesarean.

Although our findings contradict what we expected, previous research examining birth outcomes among incarcerated women has had mixed findings. Incarceration may provide some protective factors (eg, shelter, medical care, regular meals).^{20,21} Understanding the complex social determinants of health among women who are incarcerated is necessary to more fully understand the potential relationship between incarceration and maternal and neonatal birth outcomes, and to inform prevention and intervention efforts.^{7,20,21}

As rates of female incarceration have increased, prisons have faced challenges in providing gender-specific and trauma-informed care to adequately meet the needs of women, including pregnancy care.^{11,17,21} In response, a handful of state prisons have implemented doula programs. We examined the maternal and neonatal outcomes of one such enhanced pregnancy support program at a single Midwest prison. Substantial evidence indicates that enhanced pregnancy support is associated with a range of benefits in the general population.³⁵⁻³⁸ A Cochrane review assessed the effects of continuous, one-on-one support during childbirth, including doula support, and concluded that it may improve maternal and infant outcomes (eg, increased spontaneous vaginal birth, decreased cesarean birth, and decreased low five-minute APGAR score).⁵⁰ However, in the current study, we did not find intervention effects on any of the five health indicators that were retrospectively available in the EHR for both the historical control and intervention groups. Given the low prevalence of adverse birth outcomes among women in this prison, the five indicators in this study may not be the most salient when testing intervention effectiveness.

The World Health Organization (WHO) has identified access to skilled birth attendance and adequate obstetric care as a key strategy to reduce maternal and newborn mortality and morbidity.⁵¹ WHO's quality standards acknowledge the complex relationship between women's experience of care and their birth outcomes, and identify the important role that doulas may have in improving maternal and infant health.⁵¹ To that end, future research with incarcerated women should examine the impact of enhanced pregnancy support on outcomes beyond those included in this study, including perceived support, satisfaction with the birth and postpartum experience, and maternal depression.

4.1 | Limitations

The results of this study have several limitations, including incomplete data sources, a small sample size, and limited variable availability. Of the 216 records identified for women who gave birth while incarcerated between 2002 and 2016, only 117 records (54%) matched with EHR records and had consented to use of their data for the health care system's research, thus limiting the sample size and reducing the power to detect differences in maternal and neonatal birth outcomes between the control and intervention groups. It is also uncertain whether this limited analytic sample resulted in selection effects. The size of the historical control group was substantially limited by the availability of EHR before 2004 when the health care system began implementing their EHR system; the obstetrics department was one of the last departments to begin using EHR around 2007. As a

result, the study observation period was limited to 2007 to 2016 and the historical control group ($n = 41$) was smaller than expected. In addition, there were some ($n = 8$) women who did not receive intervention services after the program started in March 2010 (Table 1). It is unclear why these women did not receive services (eg, did not receive program information from the case manager, declined referral to the program), and whether they may be systematically different from other women in the control group. This study used data from one enhanced pregnancy support program in one state prison, and the sample identified as predominantly white, non-Hispanic, thus limiting generalizability of the study's findings.

In addition, several desired variables for analysis were not well measured or reliably captured in the EHR. Many key variables are included in the analysis, but several covariates, including both demographic characteristics (eg, gravidity, parity) and maternal risk factors (eg, lack of recommended prenatal visits, chronic medical or mental health conditions, prior pregnancy outcomes), were not able to be reliably extracted from the EHR. Such factors may moderate outcomes and are important to consider in future research with this population. Although our analysis adjusted for time (ie, inclusion of year of delivery), variations in practice and interventions (eg, cesarean trends) within this hospital system among all women who gave birth during this time period may not be fully adjusted for in our models.

In this study, the intervention was measured as a binary variable to identify women who received enhanced pregnancy support and a historical control group who received standard prenatal care. Future studies should consider assessing dose of the intervention (eg, number of one-on-one doula visits) to identify key intervention components.

4.2 | Conclusions

A major contribution of this study has been identifying and creating an EHR data set for a hard to access, vulnerable population—pregnant women who are incarcerated. These data are a valuable source of information about the health of women who gave birth while in custody. Despite this innovative approach to integrating multiple sources of data to better understand this understudied population, we were likely underpowered to detect significant differences between groups using a small sample in only one state prison. Longitudinal assessments would also provide information about the effectiveness of the intervention, and the impact on a range of outcomes (eg, mental health indicators, recidivism, etc) over time. Systematic and ongoing data collection, with integration between prison and health care systems, is essential to understanding this patient population. As more states move to implement enhanced pregnancy services for incarcerated

women, including doula support, integration of data across sites will be critical to assessing the impact of this model for improving maternal and infant health.⁵²

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available because of privacy or ethical restrictions.

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