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Original Research

Relationship Between Hospital-Level Percentage of Midwife-Attended Births and Obstetric Procedure Utilization

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Introduction: Research has shown good outcomes among individual low-risk women who receive perinatal care from midwives, yet little is known about how hospital-level variation in midwifery care relates to procedure use and maternal health. This study aimed to document the association between the hospital-level proportion of midwife-attended births and obstetric procedure utilization.

Methods: This analysis used 2 data sources: Healthcare Cost and Utilization Project State Inpatient Database data for New York in 2014, and New York State Department of Health data on the percentage of midwife-attended births at hospitals in the state in 2014. Using logistic regression, we estimated the association between the hospital-level percentage of midwife-attended births and 4 outcomes among low-risk women: labor induction, cesarean birth, episiotomy, and severe maternal morbidity.

Results: Hospital-level percentage of midwife-attended births was not associated with reduced odds of labor induction or severe maternal morbidity. Women who gave births at hospitals with more midwife-attended births had lower odds of giving birth by cesarean (eg, adjusted odds ratio [aOR], 0.70; 95% confidence interval [CI], 0.59-0.82 at a hospital with 15% to 40% of births attended by midwives, compared to no midwife-attended births) and lower odds of episiotomy (eg, aOR, 0.41; 95% CI, 0.23-0.74 at a hospital with more than 40% of births attended by midwives, compared to no midwife-attended births).

Discussion: Our results indicate that hospitals with more midwife-attended births have lower utilization of some obstetric procedures among low-risk women; this raises the possibility of improving value in maternity care through greater access to midwifery care.

Keywords: cesarean birth, health care quality, maternity care, midwifery care, obstetric procedure utilization

INTRODUCTION

Slightly fewer than 4 million women give birth each year in the United States, and childbirth is the most common reason for hospitalization.[1,2] A growing body of research shows that low-risk women who receive perinatal care from midwives have favorable birth outcomes and fewer unnecessary procedures, compared with low-risk women cared for by physicians.[3] The American College of Nurse-Midwives' philosophy of care highlights the importance of partnership between the woman and midwife as well as not intervening in the normal process of birth unless complications arise.[4] Although use of midwifery care has grown substantially since the 1980s,[5] in 2014, midwives attended 9% of US births[2]; in contrast, midwives attend more than two-thirds of births in some other industrialized countries, including France, Australia, and the United Kingdom.[6] In the United States, the majority of midwife-attended births are attended by certified nurse-midwives (CNMs) or certified midwives (CMs) in hospitals, where more than 98% of births take place.[2] The scope of practice for CNMs varies by state, and even among states with similar scope-of-practice laws, there is substantial variation in the proportion of midwife-attended births.[7–9]

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Changes in use of midwifery care have occurred alongside changes in care utilization and outcomes of childbirth. US maternal morbidity and mortality rates have been increasing over the past several decades.[10,11] At the same time, obstetric procedure use has become more common. For example, rates of labor induction as reported in birth certificate data have risen from 9.5% in 1990 to 23% of births in 2014,[2,12] and one study found that as many as 40% of labor inductions occur without a medical indication.[13] More than 32% of women giving birth in the United States each year give birth via cesarean.[2] There is consensus among experts that this cesarean rate is too high, with negative health consequences for women and their infants,[14] as well as higher costs.[15] Wide variation in cesarean birth rates across hospitals—which is not accounted for by differences in patient risk—suggests that clinical training and practice patterns may drive some of the overuse of this procedure.[16]

Little is known about how hospital-level variation in the proportion of births attended by midwives relates to procedure use and maternal health. The presence of midwives in a hospital could impact the use of procedures if the midwives themselves are less likely to use procedures such as labor induction or cesarean birth. Beyond the practice patterns of the midwives themselves, it is possible that midwives practicing in a hospital could indirectly influence procedure use by affecting the likelihood of procedure use by all providers caring for birthing women at that hospital.[17] It is also possible that hospitals choosing to employ larger numbers

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Quick Points

- Evidence shows that midwifery care results in favorable birth outcomes for low-risk women, but little is known about how hospital-level variation in the proportion of births attended by midwives relates to procedure use and maternal health.
- The goal of this study was to document the association between the proportion of midwife-attended births at the hospital level and obstetric procedure utilization and maternal outcomes among low-risk women, using data from New York State in 2014.
- Hospitals varied substantially in midwifery presence; about 25% of low-risk childbirth-related hospitalizations occurred at hospitals with no midwife-attended births, while 7% were at hospitals with more than 40% of births attended by midwives.
- Births that occurred at hospitals with a higher proportion of midwife-attended births had lower use of some obstetric procedures, including cesarean and episiotomy.

of midwives may have a greater commitment to low-intervention birth, whether at the hospital- or labor and delivery-unit level. The aim of this study was to determine the association between the proportion of midwife-attended births at the hospital level and obstetric procedure utilization and maternal outcomes.

METHODS

Data and Sample

This study is a retrospective, cross-sectional analysis using 2 sources of secondary data: the 2014 Healthcare Cost and Utilization Project State Inpatient Database for New York, and New York State Department of Health data on the percentage of births attended by CNMs or CMs at hospitals in the state in 2014. CMs are educated similarly to CNMs but are individuals without a nursing background. The CM credential is legally recognized in certain states only, one of which is New York. New York State documents the proportion of births attended by midwives in each hospital, and it makes this information freely available online. Information about hospitals' maternity care practices, which includes hospital-level rates of cesarean birth, episiotomy, and vaginal birth after cesarean, is made publicly available in compliance with New York's Maternity Information Law.[18] Data from the State Inpatient Database contain 100% of all discharge records from all patients cared for in community hospitals. This research used deidentified, existing records and was granted exemption by the University of Minnesota institutional review board.

Using a validated algorithm for identifying births using administrative data, we distinguished birth records in hospital discharge data using diagnosis, procedure, and payment codes.[19] We excluded births from hospitals that had too few births to meet the requirement to report the percentage of midwife-attended births in the New York State data (n = 126). We conducted analyses using a sample of low-risk women (N = 164,653), identified using diagnostic codes, based on published criteria identified by the Society for Maternal-Fetal Medicine.[20] Following these criteria, women were excluded from the low-risk category based on codes indicating multiple gestation, malpresentation, fetal factors such as hydrocephaly, uterine or placental factors such as uterine rupture or umbilical cord prolapse, and stillbirth.

Measures

The independent variable in this analysis was the percentage of births attended by CNMs or CMs by hospital. We coded hospitals' percentages of midwife-attended births into the following categories: 1) none; 2) up to and including 15%; 3) more than 15%, up to and including 40%; and 4) more than 40%. We determined these cutpoints empirically based on the distribution of hospitals and women giving birth in each category. We examined whether the largest category—up to and including 15%—should be further divided, or whether the percentage of midwife-attended births could be included as a linear variable. Results were robust to different ways of measuring this variable.

Outcomes for this analysis were constructed using International Classification of Diseases, Ninth Revision (ICD-9) diagnosis and procedure codes. We examined 5 outcomes: labor induction, nonindicated labor induction, episiotomy, cesarean birth, and severe maternal morbidity. Cesarean birth was identified by diagnosis-related group codes 765 or 766, or ICD-9 codes 740.xx, 741.xx, 742.xx, 744.xx, 749.9. Labor induction was identified by ICD-9 codes 73.01, 73.1x, 73.4x, 659.0x, 659.1x. To define nonindicated labor inductions, we excluded childbirth hospitalizations with conditions identified by the Joint Commission as potentially justifying elective birth prior to 39 weeks' gestation (leaving 65,228 hospitalizations)[21]; the remaining cases with induction of labor were coded as nonindicated. Episiotomy was identified by ICD-9 procedure code 736; this outcome was only assessed among women who gave birth vaginally without a diagnosis of shoulder dystocia (n = 133,579). Finally, we identified severe maternal morbidity based on a validated algorithm.[19,22]

Our analyses also controlled for patient-level sociodemographic characteristics, including age, race/ethnicity, and insurance type. We also controlled for the following clinical risk factors: diabetes (ICD-9 codes 648.8x and 250.xx) and hypertension/preeclampsia/eclampsia (ICD-9 codes 642.0x, 642.1x, 642.2x, 642.3 × 642.4x, 642.5x, 642.6x). We additionally controlled for weekend hospital admission, since literature suggests that obstetric procedure use and outcomes may be different on weekends than on weekdays.[23] Individual data on birth attendant type are not included in these hospital discharge records.

Table 1. Characteristics of Low-Risk Birth Hospitalizations in New York State Inpatient Database, 2014 (N = 164,653)

	N	%
Age, y		
Less than 18	2238	1.4
18-23	30,718	18.7
24-29	53,244	32.3
30-34	48,167	29.3
35-39	24,354	14.8
40 and older	5932	3.6
Race/ethnicity		
White	77,509	47.1
Black	23,768	14.4
Hispanic	26,771	16.3
Asian or Pacific Islander	13,872	8.4
American Indian	642	0.4
Other	22,091	13.4
Primary payer		
Medicaid	79,658	48.3
Private insurance	78,399	47.6
Self pay	2758	1.7
Other	3838	2.3
Admitted on a weekend		
No	126,765	77.0
Yes	37,888	23.0
Diabetes (preexisting or gestational)		
No	153,322	93.1
Yes	11,331	6.9
Hypertension (including preeclampsia)		
No	151,856	92.2
Yes	12,797	7.8
Hospital percent of midwife-attended births		
None	41,688	25.3
≤15%	83,626	50.8
>15% but ≤ 40%	27,161	16.5
>40%	12,178	7.4
Labor induction		
No	127,105	77.2
Yes	37,548	22.8
Nonindicated induction of labor (among those without potential conditions)		
No	60,480	92.7
Yes	4748	7.3
Cesarean birth		
No	135,704	82.4
Yes	28,949	17.6
Episiotomy (among vaginal births without shoulder dystocia)		
No	118,796	88.9
Yes	14,783	11.1
Severe maternal morbidity		
No	161,465	98.1
Yes	3188	1.9

(*Continued*)

Table 1. Characteristics of Low-Risk Birth Hospitalizations in New York State Inpatient Database, 2014 (N = 164,653)

Analysis

We present cross-tabulations of hospitalization characteristics and obstetric procedure outcomes by hospital proportion of midwife-attended births, using chi-square tests to identify statistically significant variation. We estimated multivariate logistic regression models for each outcome with childbirth-related maternal hospitalization as the unit of analysis. The models employed clustered standard errors to account for correlation within hospitals. As a sensitivity analysis, we examined results among all births rather than focusing on low-risk births only, and results were substantively unchanged.

RESULTS

There were 134 hospitals in New York State in 2014 with childbirth hospitalizations identified in the State Inpatient Database; 126 of those hospitals had a sufficient number of births to report statistics on births to the New York Department of Health. Of these 126 hospitals, 33 (26.2%) had no midwife-attended births. Fifty-five hospitals (43.7%) had up to and including 15% of births attended by midwives, 22 hospitals (17.5%) had more than 15% and up to and including 40% attended by midwives, and 16 hospitals (12.7%) had more than 40% of births attended by midwives.

Characteristics of the study population are shown in Table 1. Approximately 25% of low-risk women with childbirth-related hospitalizations in this study gave birth at hospitals with no midwife-attended births. Fifty percent of hospitalizations were at hospitals that had 1% to 15% of births attended by midwives. Seventeen percent occurred at hospitals with 16% to 40% of births attended by midwives, and 7% occurred at hospitals with more than 40% of births attended by midwives.

In this sample of low-risk women, 82.4% gave birth vaginally, and 17.6% gave birth by cesarean. Labor induction occurred in 22.8% of low-risk childbirth hospitalizations, with nonindicated induction in 7.3%. Episiotomy was used in 11.1% of vaginal low-risk births. Severe maternal morbidity occurred in 1.9% of low-risk childbirth hospitalizations.

In bivariate analyses, sociodemographic characteristics were associated with the percentage of midwife-attended births at the hospital (Table 2). Hospitals with no midwife-attended births had lower proportions of white and black women giving birth and higher proportions of Asian/Pacific

Table 2. Characteristics of Low-Risk Birth Hospitalizations by Hospital Percentage of Midwife-Attended Births (N = 164,653)

	Hospital percent age of midwife-attended births				
	None	≤15%	>15% but ≤40%	>40%	
	%	%	%	%	*P* value
Age, y					<.001
Less than 18	1.1	1.3	1.5	2.1	
18-23	15.2	18.1	22.7	25.0	
24-29	28.4	32.7	36.0	35.2	
30-34	32.8	29.6	25.2	23.9	
35-39	17.8	14.8	11.7	11.4	
40 and older	4.6	3.5	2.9	2.4	
Race/ethnicity					<.001
White	43.4	47.2	51.3	49.6	
Black	12.2	15.5	15.0	13.5	
Hispanic	17.8	15.0	14.6	23.6	
Asian or Pacific Islander	10.8	8.1	7.8	3.8	
American Indian	0.4	0.3	0.5	0.8	
Other	15.4	14.0	10.8	8.7	
Primary payer					<.001
Medicaid	37.8	47.6	61.4	61.0	
Private insurance	58.4	49.5	30.7	35.9	
Self-pay	1.2	1.3	3.6	1.7	
Other	2.6	1.7	4.3	1.5	
Admitted on a weekend					.157
No	77.3	76.9	76.7	77.2	
Yes	22.7	23.1	23.3	22.8	
Diabetes (preexisting or gestational)					<.001
No	92.8	93.4	92.8	93.3	
Yes	7.2	6.6	7.2	6.7	
Hypertension (including preeclampsia)					<.001
No	91.7	92.6	91.5	92.9	
Yes	8.3	7.4	8.5	7.1	
Induction of labor					<.001
No	76.1	77.6	78.8	77.8	
Yes	24.9	22.4	21.2	22.2	
Nonindicated induction of labor (among those without potential conditions)					<.001
No	90.3	93.2	94.7	93.1	
Yes	9.7	6.8	5.3	6.9	
Cesarean birth					<.001
No	79.3	82.5	85.9	84.6	
Yes	20.7	17.5	14.1	15.4	
Episiotomy (among vaginal births without shoulder dystocia)					<.001
No	86.0	88.1	93.1	94.2	
Yes	14.0	11.9	6.9	5.8	
Severe maternal mortality					<.001
No	97.9	98.1	98.2	98.3	
Yes	2.2	1.9	1.8	1.7	

Table 3. Adjusted Odds of Labor Induction by Hospital Percentage of Midwife-Attended Births and Covariates Among Low-Risk Childbirth Hospitalizations (N = 164,653)[a,b]

	Labor Induction			Nonindicated Labor Induction[c]		
	aOR	95% CI	*P* value	aOR	95% CI	*P* value
Hospital percentage of midwife-attended births						
None	Ref					
≤15%	0.89	0.72, 1.11	0.306	0.69	0.53, 0.91	.009
>15% but ≤40%	0.84	0.57, 1.23	0.365	0.53	0.34, 0.82	.005
>40%	0.90	0.66, 1.22	0.486	0.72	0.47, 1.10	.126
Age, y						
< 18	Ref					
18-23	1.03	0.90, 1.17	0.709	1.28	0.92, 1.79	.148
24-29	1.02	0.89, 1.17	0.782	1.42	1.02, 1.98	.037
30-34	1.00	0.86, 1.15	0.955	1.41	0.99, 1.99	.055
35-39	1.06	0.91, 1.24	0.429	1.57	1.12, 2.20	.010
40 and older	1.21	1.02, 1.44	0.030	2.34	1.59, 3.46	<.001
Race/ethnicity						
White	Ref					
Black	0.90	0.76, 1.05	0.183	0.62	0.50, 0.78	<.001
Hispanic	0.94	0.82, 1.08	0.399	0.57	0.45, 0.71	<.001
Asian or Pacific Islander	0.73	0.57, 0.93	0.010	0.45	0.31, 0.66	<.001
American Indian	1.23	0.83, 1.64	0.147	0.94	0.52, 1.69	.834
Other	0.95	0.83, 1.09	0.462	0.58	0.48, 0.71	<.001
Primary payer						
Medicaid	Ref					
Private insurance	1.22	1.11, 1.34	0.000	1.29	1.10, 1.50	.002
Self pay	0.97	0.75, 1.27	0.848	1.19	0.91, 1.54	.201
Other	1.36	1.12, 1.66	0.002	2.02	1.43, 2.85	<.001
Admitted on a weekend	0.61	0.57, 0.66	<0.001	0.55	0.48, 0.62	<.001
Diabetes (pre-existing or gestational)	1.80	1.69, 1.92	<0.001	4.75	1.22, 18.58	.025
Hypertension	3.12	2.88, 3.38	<0.001	—		—

[a]Standard errors are adjusted for clustering within hospitals.
[b]Models adjusted for hospital percentage of midwife-attended births, patient age, patient race, primary payer for the hospitalization, weekend admission, preexisting or gestational diabetes, and hypertension.
[c]Model N = 65,228.

Islander women and women who identified as "other" race/ethnicity giving birth. Hospitals with more than 40% of midwife-attended births had higher proportions of Hispanic and American Indian women giving birth, compared to hospitals with lower proportions of midwife-attended births. Women whose births were covered by Medicaid were more likely to be at hospitals with higher proportions of midwife-attended births, while women with private insurance were more likely to give birth at hospitals with no midwife-attended births. The percent age of midwife-attended births was statistically significantly associated with each outcome (Table 2). Hospitals with no midwife-attended births had the highest rates of labor induction, nonindicated labor induction, cesarean birth, episiotomy, and severe maternal morbidity ($P <$ .05 for all comparisons described).

After adjusting for patient-level sociodemographic characteristics, clinical risk factors, and weekend hospital admission, the hospital-level percentage of midwife-attended births was not associated with odds of labor induction (Table 3). Odds of nonindicated labor induction were lower at hospitals with 1% to 15% and 15% to 40% of births attended by midwives, compared to hospitals with no midwifery presence ($P < .01$). However, odds of nonindicated labor induction were not statistically different at hospitals with the highest proportion of midwife-attended births, compared to hospitals with no midwifery presence. As reported in Table 4, women who gave birth at hospitals with more midwife-attended births generally had lower odds of giving birth by cesarean (eg, aOR, 0.70; 95% CI, 0.59-0.82; $P <$ .001 at a hospital with 15% to 40% of births attended by midwives, compared to no midwife-attended births) and lower odds of episiotomy (eg, aOR, 0.41; 95% CI, 0.23-0.74; $P = .003$ at a hospital with more than 40% of births attended by midwives, compared to no midwife-attended births). Hospital percentage of midwife-attended births was not associated with women's odds of severe maternal morbidity.

Table 4. Adjusted Odds of Outcomes by Hospital Percentage of Midwife-Attended Births and Covariates Among Low-Risk Childbirth Hospitalizations (N = 164,653)[a]

	Cesarean Birth			Episiotomy[b]			Severe Maternal Morbidity[c]		
	aOR	95% CI	*P* value	aOR	95% CI	*P* value	aOR	95% CI	*P* value
Hospital percent of midwife-attended births									
None	Ref			Ref			Ref		
≤15%	0.85	0.73, 0.98	.024	0.85	0.56, 1.30	.451	0.90	0.68, 1.20	.476
>15% but ≤40%	0.70	0.59, 0.82	<.001	0.48	0.24, 0.97	.040	0.82	0.53, 1.28	.386
> 40%	0.78	0.66, 0.93	.006	0.41	0.23, 0.74	.003	0.76	0.54, 1.06	.107
Age, y									
< 18	Ref			Ref			Ref		
18-23	1.15	1.01, 1.31	.030	0.84	0.69, 1.02	.080	0.71	0.55, 0.90	.004
24-29	1.16	1.01, 1.34	.034	0.66	0.56, 0.78	<.001	0.67	0.53, 0.87	.002
30-34	1.21	1.04, 1.4	.013	0.54	0.45, 0.66	<.001	0.67	0.53, 0.86	.001
35-39	1.34	1.15, 1.56	<.001	0.45	0.37, 0.56	<.001	0.77	0.59, 1.00	.053
40 and older	1.95	1.66, 2.29	<.001	0.42	0.34, 0.54	<.001	0.99	0.74, 1.31	.938
Race/ethnicity									
White	Ref			Ref			Ref		
Black	1.69	1.47, 1.95	<.001	0.66	0.54, 0.80	<.001	2.18	1.79, 2.66	<.001
Hispanic	1.25	1.98, 1.42	.001	0.73	0.57, 0.95	.018	1.75	1.42, 2.15	<.001
Asian or Pacific Islander	1.20	1.03, 1.4	.021	2.19	1.52, 3.15	<.001	1.13	0.90, 1.43	.291
American Indian	1.34	1.05, 1.72	.019	0.99	0.69, 1.43	.958	1.79	1.01, 3.18	.046
Other	1.25	1.12, 1.39	<.001	1.03	0.84, 1.25	.803	1.39	1.19, 1.63	<.001
Primary payer									
Medicaid	Ref			Ref			Ref		
Private insurance	1.41	1.29, 1.54	<.001	1.41	1.19, 1.67	<.001	0.90	0.79, 1.02	.103
Self-pay	1.16	0.97, 1.38	.109	1.03	0.79, 1.36	.815	1.09	0.84, 1.42	.496
Other	1.11	0.87, 1.41	.390	0.85	0.57, 1.26	.415	0.89	0.58, 1.35	.581
Admitted on a weekend	0.78	0.75, 0.81	<.001	1.00	0.96, 1.05	.846	0.91	0.83, 1.00	.060
Diabetes (preexisting or gestational)	1.67	1.57, 1.78	<.001	1.04	0.96, 1.14	.325	1.11	0.98, 1.26	.090
Hypertension	2.30	2.14, 2.47	<.001	0.79	0.70, 0.89	<.001	2.88	2.56, 3.23	<.001

[a]Models adjusted for hospital percentage of midwife-attended births, patient age, patient race, primary payer for the hospitalization, weekend admission, preexisting or gestational diabetes, and hypertension.
[b]Model N = 133,579
[c]The severe maternal morbidity variable is based on the CDC's definition, which identifies 21 indicators of severe maternal morbidity: acute myocardial infarction, acute renal failure, adult respiratory distress syndrome, amniotic fluid embolism, aneurysm, cardiac arrest/ventricular fibrillation, disseminated intravascular coagulation, eclampsia, heart failure/arrest during surgery or procedure, puerperal cerebrovascular disorders, pulmonary edema/acute heart failure, severe anesthesia complications, sepsis, shock, sickle cell disease with crisis, air and thrombotic embolism, blood transfusion, conversion of cardiac rhythm, hysterectomy, temporary tracheostomy, and ventilation.
Standard errors are adjusted for clustering within hospitals.

DISCUSSION

In New York State, births that occurred at hospitals with a higher proportion of midwife-attended births had lower use of some obstetric procedures, including cesarean birth and episiotomy. Births at hospitals with some midwifery presence but not the highest proportion of births attended by midwives (more than 40%) also had lower use of nonindicated labor induction. These findings are consistent with previous studies documenting lower obstetric procedure use and similar maternal and neonatal outcomes among women cared for by midwives compared to women cared for by obstetricians[3,24]; these results indicate that the presence of midwifery care within a hospital is associated with lower procedure use as well.

Previous studies have shown that the hospital environment may be important in determining the provision of childbirth-related care.[16,25] For example, rates of maternal morbidity and obstetric procedures (cesarean birth and labor induction) vary widely across hospitals, and this variation is not explained by patient risk factors.[16,25–27] Midwives may be an important factor in influencing the hospital environment. The midwifery philosophy of care emphasizes the inherent normalcy of birth,[4] and midwives may bring this attitude with them to the labor and delivery unit in ways that change patterns of care provision.[28] Hospital administration that is supportive of midwifery may shape the broader environment as well, or be indicative of a commitment to reducing unwarranted procedure use.[29] Hospitals where midwives attend a larger proportion of the births may also

structure their care for women differently; for example, one hospital combined a midwifery service with a laborist model of care and found that this resulted in lower rates of primary cesarean birth and higher rates of vaginal birth after cesarean (VBAC).[30] Findings in the present study may result from less frequent use of procedures among births attended by midwives alone, but it is also possible that having more midwives in a hospital changes the culture and practice patterns among all of the clinicians, staff, and support personnel interacting with childbearing women in that hospital.

This analysis detected an association between hospital percentage of midwife-attended births and cesarean births, episiotomy, and nonindicated labor induction, but no association with severe maternal morbidity or labor induction overall. Although a review of randomized controlled trials found no association between midwife-led care and cesarean birth,[3] recent studies in the United States have found midwifery care to be linked to lower cesarean rates among low-risk women.[24,31] A recent systematic review of US studies also found that the vast majority indicated lower chances of cesarean birth among women cared for by CNMs in labor and birth, compared to those cared for by physicians.[32] Cesarean birth and episiotomy are 2 obstetric procedures with the strongest clinical consensus around the benefits of reducing unnecessary use.[14,33] There is still substantial debate about what the negative health effects of elective labor induction may be, and particularly about the relationship between labor induction and cesarean birth.[34–39] However, labor induction may be associated with increased resource use (eg, higher rates of neonatal intensive care unit [NICU] admission, longer prebirth hospital stay, higher rates of epidural analgesia use) compared to expectant management,[37,40] although not all studies have found this to be the case.[39] Combining lower utilization rates for procedures with a lower-cost workforce model, increasing the presence of midwifery in hospital-based maternity care services has potential for reducing costs and improving value.

Increasing value in maternity care is of particularly urgent importance to state Medicaid programs, which finance almost half of all US births.[41] Added financial pressure may result from forthcoming changes to the financing of Medicaid, if the Patient Protection and Affordable Care Act were to be repealed. This study showed that hospitals with more midwife-attended births care for a disproportionately larger share of women with Medicaid versus private insurance, compared with hospitals with fewer midwife-attended births. Hospital payer mix for childbirth affects hospital finances, as Medicaid pays approximately half of what private health plans pay to hospitals for a childbirth.[15] More midwives working in hospitals with a payer mix that favors Medicaid may suggest that a shift toward greater use of high-value maternity services has already begun among hospitals with more financial constraints on resources for their maternity care service lines. Increasingly, private payers and hospitals with a greater proportion of private payers may follow their lead, and these results suggest that greater use of midwifery holds the potential to increase the effectiveness of care.

Given the finding that midwifery presence at the hospital level in this study is associated with lower intervention care among low-risk women, states may want to consider policies that facilitate the practice of midwifery and greater use of this type of care. For example, previous research has found that autonomous practice for CNMs is associated with a greater supply of CNMs, and with a greater likelihood of births being attended by midwives.[8] An examination of the nurse-midwifery environment across all states in 2015 found that New York CNMs were second out of the 50 states and the District of Columbia in professional authority.[42] Other states may consider whether their regulatory environments may influence access to and value derived from midwifery care.

Limitations

While this is the first study to characterize the relationship between hospital-level midwifery presence and obstetric procedure use, there are some limitations to the analysis. First, we did not have information on the birth attendant for each childbirth hospitalization. Therefore, we could not assess whether the lower procedure use detected was due only to lower procedure use among midwives or among all maternity clinicians in hospitals with more midwife-attended births. Further, we were not able to specifically examine whether midwives practiced the midwifery model of care. Second, the clinical characteristics that we were able to control for were limited by what is available in diagnostic and procedure codes. For example, we were not able to include a measure of gestational age, whether adequate prenatal care had been received, or number of previous births. Hospitals where larger numbers of midwives work may attract women who are healthier or who have a stronger preference for a low-intervention birth, in ways that were not captured with this data. Third, hospitals choosing to employ larger numbers of midwives may be different from hospitals that do not employ midwives, and these differences may be what leads to lower procedure use. Differences could include hospital characteristics such as birth volume, teaching status, and rurality, which this analysis did not control for. Fourth, the ability to detect differences in severe maternal morbidity in this analysis may have been limited by the rarity of the outcome. Finally, data came from a single state, and results may not be generalizable to the entire United States.

CONCLUSION

Women who gave birth at hospitals with a larger percentage of midwife-attended births were less likely to have a cesarean birth or an episiotomy. Despite evidence of the potential benefits of midwife-led maternity care, less than 10% of US births are attended by midwives. The results of this analysis suggest that more midwife-attended births may be correlated with fewer obstetric procedures, which could lower costs without lowering the quality of care. This raises the possibility of improving value in maternity care through greater access to midwifery care for childbearing women in the United States.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

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