

Short Communication

Certified Nurse Midwife (CNM) Attitudes about Birth and Primary Cesarean Section Rates

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Keywords

• Midwives; C-section; Medical birth; Holistic birth; Birth attitude

Abstract

In this small retrospective cohort study we analyzed birth data from the International Center for Maternity's [CIMA] database from 2009-2015 (n=5,291) to evaluate if primary cesarean section rates are associated with midwives' attitudes towards the medical model of birth. CIMA is a midwife-led practice that mainly serves Hispanic immigrants in the Atlanta, GA area. CIMA has a primary cesarean section rate of 13.7%; the national average is 21.5%. After developing survey questions, we used a focus group of five midwives. The survey had a total of 13 points possible; a low score indicates commitment to the medical model of birth. We used simple linear regression to investigate each of the survey questions and the total score with primary cesarean section rates as the dependent variable. Scores ranged from 6.4-12.8 out of 13 possible points. The average score for CIMA's 11 midwives was 10.33 [95% CI: (8.82, 11.83)]. The results suggested an inverse relationship between the survey's holistic score and primary cesarean section rates. Using the total score as the independent variable, the model yielded an r^2 of .45. Our results indicate that CIMA's midwives identify more with the holistic model of birth and that this algorithm could statistically predict, to some degree, a midwife's primary cesarean section rate. Our findings, taken in context with previous midwife studies, suggest that a survey detailing midwives' attitudes towards the medical model of birth might predict primary cesarean section rates.

ABBREVIATIONS

CNM: Certified Nurse Midwife

INTRODUCTION

The World Health Organization recommends a cesarean section (C-section) rate between 10% and 15% for all countries [1]. In a worldwide ecological study WHO found that below a 10% C-section rate, maternal and neonatal mortality decreased when cesarean section rates increased. However, as C-section rates increased above 10%, no effects on mortality rates were shown [2]. At a population level, C-section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates [2].

In 2014, approximately 32.2% of all documented live births in the United States were delivered by cesarean section [3]. The national average primary C-section rate is 21.5% [4] and 22.7% in Georgia [5]. United States 2015 data showed that rates of maternal morbidity for first births were higher for cesarean sections than vaginal deliveries. Women getting a primary C-section had an average blood transfusion rate of 525.1 per 100,000 and intensive care unit admission rates of 383.1 per 100,000 births [6]. Mothers who had a vaginal delivery with no history of C-sections had lower rates for all maternal morbidities compared to those with C-section deliveries; this trend spanned all age, race, and education levels [6]. Interventions that could increase vaginal birth rates could include midwife-led deliveries of low-risk pregnancies.

In 1979, the sociologist Barbara Katz-Rothman coined the phrase 'medical model of birth'. Hospital births led by physicians commonly differ from home births and midwife-led births in the amount of medications, repositioning the woman in labor, and deadlines for labor progression (i.e. actively managing a birth compared to the holistic approach of letting the birth progress naturally) [5]. This switch to the medical model of birth is regarded as a social redefinition of birth [5]. The medical (hospital) model of birth divides the birth process into stages with guidelines on the length of each stage [6]. Hospital births tend to look at labor and delivery as a condition with giving birth as the treatment [6,7]. The medical model of birth helps control how the laboring mother progresses by directly intervening when adverse events occur or in the absence of key labor events [7].

The holistic midwifery model used by many modern midwives requires continuous observation of labor and its processes with little to no active management. The midwifery model stresses the normality of pregnancy and birth with an emphasis on the natural ability of women to experience birth without routine intervention [7]. The midwife is responsible for knowing the signs of fetal and maternal distress during pregnancy and labor. The midwife makes the decision to intervene or seek assistance from an obstetrician should the situation require it [8]. Midwives, on average, spend more time with their patients, have lower rates of post-partum hemorrhage, episiotomies, and perineal tears of all degrees and try more alternative birthing positions than their physician counterparts [7-15]. The medical model of

birth is more costly on average with expenses upwards of \$8,000 compared to \$3,500 for the midwife model [10]. It requires more medications and interventions, and is not proven safer or more effective for low-risk pregnancies than the holistic midwifery model of birth [8]. Avoiding initial obstetric intervention while providing women with one-to-one prenatal care and labor support decreases the chance that a woman and baby will require medical or surgical interventions during birth [15].

Certified Nurse-Midwives (CNMs), referred to as midwives, go through extensive training to receive certification to deliver their patients' babies. The current literature lacks research on variations in C-section rates among patients of midwives. The purpose of this study is to characterize variations in one small clinic in a large city in the Southeastern USA. This preliminary study will help provide a better understanding of midwives' attitudes towards the medical and holistic models of birth using midwives from the International Maternity Center, Centro Internacional de Maternidad [CIMA], a midwife-led practice, as the study population. By quantifying these attitudes through a scaled questionnaire, this study will investigate the association between midwives' attitudes to the medical model of giving birth and primary cesarean section rates, providing valuable insight on how midwifery at a large scale could affect national cesarean section trends.

MATERIALS AND METHODS

Study population and data collection

This retrospective cohort study uses patient data collected by the International Maternity Center [CIMA] and survey results from CIMA midwives. The International Maternity Center, Centro Internacional de Maternidad, [CIMA] is a midwife-delivery led practice offering comprehensive prenatal care and delivery assistance to mothers of all races and backgrounds in Atlanta, Ga. CIMA midwives lead prenatal care visits in CIMA's clinics and births at Northside Hospital. CIMA midwives are all certified nurse-midwives with unique views on motherhood, pregnancy, labor, and childbirth. CIMA's midwives have varying degrees of commitment to the medical model of birth.

CIMA began collecting electronic data on its patients starting in 2005. Midwives and their assistants are responsible for data entry, cleaning, and upkeep. After consenting, patient information was entered into a secure database, de-identified, and then analyzed. This database included only information relevant to a birth event. Emory's IRB institution granted approval for this study in June of 2015.

The original database contained information on 9,699 births. Patients with multiple births (twins), duplicate entries, miscarriages, still births, non-primary cesarean sections or with missing information on critical birth outcome variables such as APGAR scores and birth weight were excluded from the analytic dataset. We used total of 5,291 births and 11 midwives for this analysis.

We developed the survey under the close advice of a practicing obstetrician with decades of experience working alongside midwives. The researchers conducted a literature review to gain an understanding of topics that were debated on in the midwife

field and/or divided the professionals in the midwife field. We developed survey questions based on identified topics to illicit a quick response and were therefore kept short and simple. After every survey question, a free text comments section was provided for the midwives to explain their answer, provide an anecdote, or express an opinion to mimic a verbal cognitive interview.

We used two holistic model-based midwives and three clinical model-based midwives to evaluate the questionnaire for biases and completeness prior to releasing the survey to study participants. The survey was sent out in a beta format to test the questions as well as the tool itself. The midwives in the focus group filled out the survey and then submitted their opinions and comments via email to the researchers. Edits to the questions were made, and the process was repeated until the focus group midwives submitted no substantial comments or edits to the researchers. We designed the questions in the survey to purposefully distinguish midwives' preferences for the medical vs. the holistic model. Any question that did not have a 2:3 split between the 5 validation midwives was not included in the final survey. We sent surveys to participants electronically using Google Forms. All responses were submitted within two weeks. The midwives were not told how the survey was scored in order to reduce bias. The final survey is its entirety is in Table 2.

Statistical analysis

Survey results were exported from Google Forms into Microsoft Excel. We scaled all questions to be worth 1 point. Questions where all midwives answered homogenously were removed from the total score and analysis. After exclusions, 13 out of 16 questions remained. The lower the score of the midwife, the more she or he is committed to the hospital model of birth.

We used SAS 9.4 for descriptive and analytic analyses. We performed simple linear regression using primary cesarean section rates as the dependent variable and the holistic score as the independent. Each survey question was analyzed individually as the independent variable to see which questions predicted the cesarean section rate best. The aim of data analysis was to gauge the association between cesarean section rates and the holistic score while identifying any key survey questions.

RESULTS AND DISCUSSION

Survey Results

All eleven CIMA midwives completed the survey within 2 weeks of receiving it. The primary C-section rates for each CIMA midwife are in Table 1. Aggregate scores and responses from the survey are in Table 2. In this pilot study, the least holistic midwives have the highest primary cesarean section rates. This trend was not as evident in the upper values of the holistic midwife score.

Scores ranged from 6.4-12.8 out of 13 possible points. The average score for CIMA's 11 midwives was 10.33 [95% CI: (8.82, 11.83)]. The mean primary cesarean section rate is 13.70 [95% CI: (11.93, 15.48)]; the national average primary cesarean section rate is 21.5%. This difference in primary C-section means between CIM and the state of Georgia is highly significant ($p < .0001$).

Linear regression results

We used linear regression to investigate the association between primary cesarean section rates and the holistic midwife score. We tested the predictive uses of the scoring system with primary cesarean section rates as the dependent variable for linear regression analysis. We did not include individual questions all in one model due to high collinearity. Therefore, each of the questions was modeled separately. Results from questions with an r^2 of .4 or higher are found in Table 3. Three questions met the r^2 requirements previously described.

When the totaled score was used in the model as the independent variable, the model yielded an r^2 of .45. About 45% of the variation in primary cesarean section rates can be attributed to the differences in midwife scores. The linear regression predicts a decrease of .79% in primary cesarean section rates for every 1 point increase on a 13 point scale in a midwife's holistic score. Overall, we infer that CIMA's midwives positively identify with the holistic model of birth.

DISCUSSION

This study found that CIMA midwives not only have a primary cesarean section rate lower than both the national and the state rate. CIMA midwives' primary C-section rates also conform to WHO recommendations with an average rate of 10.3%. Our results indicate that a holistic midwife scoring algorithm might statistically predict a midwife's primary cesarean section rate. The linear regression results predict a decrease of .79% in primary cesarean section rates for every 1-point increase in a midwife's holistic midwife score. The clinically centered questions regarding progression through labor stages showed the most correlation with cesarean section rates. These preliminary results are consistent with the hypothesis that a higher holistic midwife score results in a reduced primary cesarean section rate compared to those who prefer the medical model.

These findings are plausible in several respects. Consider specific questions from the survey, such as the questions regarding home births. A midwife who does not feel he/she needs to work in a hospital is more likely to be comfortable waiting to see how a labor progresses before intervening and more comfortable in a non-hospital setting. One holistic leaning midwife commented in the survey, "the ideal birth is any birth that both the mother and baby are healthy and have good outcomes."

To our knowledge, this is the first investigation of a scoring system to predict midwives' primary cesarean section rates. The self-developed survey is one of the first ventures into midwifery's effect on cesarean sections using attitudes on models of birth as the predictor. The dataset used is from a longstanding midwife-driven practice that deals with mainly immigrant and low-income mothers. CIMA is a distinct practice in the Atlanta area fulfilling a niche need in prenatal care, sexual health, and family planning for women who may not be able to get it elsewhere due to citizenship or financial restrictions.

This study has several limitations. First, it is a pilot study. Second, eleven midwives is a small sample size. The results and conclusions in this study might not be applicable to a different set of midwives, a different practice, or a different patient

population. A small but informed team self-developed the survey. A more diverse team and more rigorous validations would help strengthen this survey. The focus group used to validate the survey was small, comprising only 2 holistic midwives and 3 medical model-based midwives. A validation that uses a coefficient of reliability or consistency, such as Cronbach's alpha, would help determine the reliability of the survey and its individual parts [15]. A formal cognitive interview with the focus group midwives prior to releasing the survey to the study participants would have provided valuable real-time feedback that might have been missed using the electronic comments format. The focus group midwives could have been interviewed in person using the 'think-aloud procedure' to probe for relevant information [16]. A cognitive interview with the focus group midwives would also provide the researchers with new ways to ask the questions in the survey and/or new questions. Increasing the number of midwives used to validate the tool would also strengthen the value of the tool.

A reevaluation of the survey, using the results of the question-by-question analysis and incorporating more clinical knowledge-based questions, could help strengthen the survey for future and broader uses. A reevaluation of the survey questions would involve including using more clinically-based questions like questions 13 and 14. Question 13 regards allowing a woman to continue with active labor for more than 10 hours (greater than 6cm), which according to the American Congress of Obstetricians and Gynecologists (ACOG), is normal and should not be considered as a reason for induction or cesarean section. ACOG says more than 20 hours in active labor is not a cause for concern if the mother and baby have good vitals [17]. Question 14 regards allowing a primigravid woman to continue in the second stage of labor for more than 3 hours before intervening. ACOG recommends that women spend at least 2 hours in the second stage, but does not issue a maximum, stating that some women can be in this stage for 5 hours or more and deliver healthy babies [18]. Clinically-based questions like the ones above are better at teasing out the midwives who are not as concerned with the amount of time the mother spends in specific stages, but rather focuses on the vitals and status of mom and baby as indications for complications.

The other question that met the r^2 criteria asked if the midwife would support a friend or family member who decided that a home birth was the right course of action for her pregnancy. This question should illicit an emotional response as it draws on the midwife's personal feelings about birth within the context of someone he or she is intimately familiar with. Questions like this might help tease out the more emotional attitudes towards the profession and field, helping hone in on the motivations behind the attitude that fuel the midwife to take or not take actions with their patients.

The comments in the survey offered a rich collection of opinions, anecdotes, and musings on midwifery, birth, and labor. The midwifery model of care presented briefly in this paper was mentioned multiple times in the survey comments section. One midwife, when asked why she became a midwife responded with, "I liked the midwifery model of care: respect for the normal physiology of pregnancy and birth and an egalitarian midwife-patient relationship." Another CIMA midwife simply stated that

she “fell in love with birth,” when asked the same question. While this study cannot make conclusions on other CNMs, CIMA midwives have a clear relationship with many principles in the holistic model of birth. Out of 11 midwives, nine responded that birth is a process that should be mainly observed. Multiple midwives mentioned the ‘power’ of spending ample time with their patients and having the opportunity for one-on-one prenatal and labor care in one of the comments section of the survey. These strong feelings and attitudes about birth and the holistic midwife model of birth could be why CIMA midwives have a lower primary cesarean section rate compared to the whole state of Georgia or the nation. A qualitative analysis of a large group of midwives would provide more conclusive results.

CONCLUSION

Our results, in context with previous studies on midwives and delivery in the United States, suggest a scoring system might gauge midwives’ attitudes towards the medical model of birth in predicting cesarean section rates. Midwives attended 320,983 births in 2013, representing 12% of all vaginal births and 8.2% of total births in the United States [11]. On a large scale, midwives that are less inclined to follow the medical model of birth could help lower the cesarean section rate of a specific geographic location to a value closer to WHO’s recommendations. Midwifery care models help support women by providing improved education, communication, and care planning for all staged of early motherhood [16]. Midwives complete many actions that stave off cesarean sections: patience with laboring mothers, free mobility for laboring mothers, minimal interventions during labor, and fetal rotation techniques [1]. In one study switch to collaborative midwifery models of care have shown decreases in primary cesarean section rates after 12 months [20]; multiple studies show that women in midwife model of birth have a primary cesarean section rate ranging from 14-23% less compared to women in the medical model of birth [21-27]. These comparisons are only valid for low-risk pregnancies in nulliparous women.

Multiple studies indicate that a switch from private or hospital birth setting to a more collaborative midwifery model of birth lowers cesarean section rates, increases vaginal birth after cesarean rates, and shows improved fetal and maternal outcomes including a reduction in fetal and maternal complications and an increase in positive health outcomes immediately following birth [16-24]. A large-scale investigation using a greater number of midwives in addition to a revised survey with a robust validation would better characterize the survey’s predictive value.

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