Evaluation of an Educational Intervention to Inform and Empower Expectant Mothers

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Evaluation of an Educational Intervention to Inform and Empower Expectant Mothers

Abstract

Objective: To increase participant knowledge regarding avoidable cesarean sections (CS), and confidence to self-advocate and initiate conversation with their health care team regarding their birth plans, with a long-term goal of decreasing avoidable CS.

Design: Quality improvement initiative.


Participants: Low-risk expectant mothers without prior cesarean sections.

Intervention/Measurements: Based on available literature, our educational intervention for the project included a brief video and modified pamphlet with information directly from the My Birth Matters free consumer toolkit. The intervention process consisted of a pre-intervention survey, video and modified pamphlet intervention, and post-intervention survey.

Results: Following implementation of the educational intervention, post-intervention survey results demonstrated statistically significant increases for both knowledge (t=5.165, p=<0.001) and confidence (t=2.563, p=0.017) scores, and 93% of participants reported hearing new information.

Conclusion: This quality improvement initiative was successful in educating participants regarding CS and increasing confidence to self-advocate. Due to the ease of implementation and potential magnitude of impact, low-risk pregnant women would benefit from receiving this valuable information about CS. Due to the COVID-19 pandemic, this also provides clinics an opportunity to continue patient education, whether in-person education is feasible or not. If long-term outcomes indicate reduction of avoidable CS, this brief educational intervention will serve as a simple, easy tool to implement in a variety of patient populations to address the rising rates of CS in the United States.

Keywords
cesarean delivery, cesarean section, avoidable c-section, patient education, education intervention, low-risk mothers, childbirth plans, c-section knowledge, childbirth confidence, conversation with providers

Disciplines
Community Health and Preventive Medicine | Maternal and Child Health | Maternal, Child Health and Neonatal Nursing | Nursing | Nursing Midwifery | Public Health and Community Nursing | Public Health Education and Promotion | Women's Health

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Evaluation of an Educational Intervention to Inform and Empower Expectant Mothers

Irene Guo, Felicia Rzeszewski, and Samantha Sipler

University of Pennsylvania

Submitted in partial fulfillment of the requirements for the

Doctor of Nursing Practice Degree
Abstract

**Objective:** To increase participant knowledge regarding avoidable cesarean sections (CS), and confidence to self-advocate and initiate conversation with their health care team regarding their birth plans, with a long-term goal of decreasing avoidable CS.

**Design:** Quality improvement initiative.

**Setting/Local Problem:** Obstetrics and gynecology clinic for low-income, underserved patients affiliated with an urban teaching hospital in Philadelphia, Pennsylvania.

**Participants:** Low-risk expectant mothers without prior cesarean sections.

**Intervention/Measurements:** Based on available literature, our educational intervention for the project included a brief video and modified pamphlet with information directly from the My Birth Matters free consumer toolkit. The intervention process consisted of a pre-intervention survey, video and modified pamphlet intervention, and post-intervention survey.

**Results:** Following implementation of the educational intervention, post-intervention survey results demonstrated statistically significant increases for both knowledge ($t=5.165$, $p<0.001$) and confidence ($t=2.563$, $p=0.017$) scores, and 93% of participants reported hearing new information.

**Conclusion:** This quality improvement initiative was successful in educating participants regarding CS and increasing confidence to self-advocate. Due to the ease of implementation and potential magnitude of impact, low-risk pregnant women would benefit from receiving this valuable information about CS. Due to the COVID-19 pandemic, this also provides clinics an opportunity to continue patient education, whether in-person education is feasible or not. If long-term outcomes indicate reduction of avoidable CS, this brief educational intervention will serve
as a simple, easy tool to implement in a variety of patient populations to address the rising rates of CS in the United States.

**Keyword**s: Cesarean delivery, cesarean section, avoidable c-section, patient education, education intervention, low-risk mothers, childbirth plans, c-section knowledge, childbirth confidence, conversation with providers

**Précis**

After an educational intervention at a low-income women’s health clinic, low-risk expectant mothers demonstrated increased knowledge and confidence regarding cesarean sections and their birth plans.

**Callouts**

1. Due to the increased rate of C-sections, educating expectant mothers and encouraging shared decision-making are priorities to reduce avoidable C-sections.

2. This quality improvement initiative was successful in educating participants regarding avoidable C-sections and increasing confidence to self-advocate and initiate conversations with their healthcare team.

3. Due to the ease of implementation and potential magnitude of impact, low-risk pregnant women would benefit from receiving this patient education about C-sections.
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Background and Significance

The rising rate of cesarean sections (CS) represents a growing concern in both developing and developed nations. Although CS can be valuable and lifesaving when medically necessary, they are also surgical procedures associated with short and long term risks for mothers and infants. In 2017, the Centers for Disease Control and Prevention (CDC) reported that one in every three registered births in the United States (U.S.) were performed through CS. Between 1996 and 2009, the global CS rate increased by 60% without evidence of improved maternal and fetal outcomes (Center for Disease Control and Prevention, 2019). The CDC and World Health Organization (WHO) recently expressed concerns regarding these alarming figures. The WHO considers the ideal CS rate 10-15%, stating rates “greater than 10% do not associate with reduction in maternal and newborn mortality rates” (World Health Organization [WHO], 2018).

When compared to the U.S., other developed countries such as Norway, Finland, and Sweden have average CS rates of approximately 16%, considerably more consistent with the standard set by the WHO (WHO, 2018). Cesarean delivery is considered the most common abdominal surgery in the world (Peahl et al., 2019). With its significant increase in use, CS can pose associated risks for both mother and baby. These risks include higher rates of maternal complications, longer recovery times, higher neonatal intensive care unit admission rates, and impaired breastfeeding relationships between mother and baby (Smith et al., 2016). According to the American College of Obstetrics and Gynecologists (2018), maternal complications associated with CS include hemorrhage, infection, repeat CS in subsequent pregnancies, formation of adhesions, placenta accreta or previa, and hysterectomy. In addition, compared to vaginal delivery, infants born via CS have
higher risks of respiratory complications at birth and higher rates of asthma and allergies due to lack of maternal antibody exposure from the vaginal canal (American College of Obstetrics and Gynecologist Committee, 2018).

Considering nearly one third of U.S. childbirths are CS, along with the associated risks for mothers and infants, the implementation of methods to help reduce CS rates is more important than ever. The Joint Commission of the U.S. plans to begin public reporting of hospitals with CS rates greater than 30% to help promote performance improvement (The Joint Commission on Accreditation of Healthcare Organizations, 2019). In addition, a national initiative set by the federal government in Healthy People 2020 aims to reduce first-time, low-risk CS rates to 23.9% by 2020 (Office of Disease Prevention and Health Promotion, 2019).

CDC data from 2019 showed that 31.7% of all births, and 25.6% of NTSV (nulliparous, term, singleton, vertex: “low-risk”), in the United States were CS (2020). In response to the Healthy People 2020 objectives, the California Health Care Foundation (CHCF), California Maternal Quality Care Collaborative (CMQCC), and Consumer Reports developed the “My Birth Matters” campaign. According to the campaign, women are encouraged to actively participate in their birth plans while gaining awareness of CS overuse and strategies to promote vaginal birth (My Birth Matters, 2018). The campaign’s non-clinical interventions showed an overall increase in participant confidence, motivation, and self-advocacy about vaginal birth decisions and initiating conversations about CS with their healthcare providers (My Birth Matters, 2018).

Although the reasons for increased CS rates are multifactorial, healthcare providers strongly influence the ability of mothers to make informed decisions about their childbirths. An urban teaching hospital in Philadelphia, Pennsylvania recorded over 5,000 births in 2017. Of those 5,000 births, 32% were CS and 3% were repeat CS. Due to the high volume of deliveries at
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this hospital, educating expectant mothers and encouraging informed, shared decision-making between mothers and the health care team is a priority. Reducing CS in low-risk mothers requires a multifaceted approach from multiple stakeholders including the patient. [Callout #1]

A literature review was performed across four domains: PubMed, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Scopus, and Embase. The review began with a broad assessment of the literature to gather available knowledge regarding the rising rates of CS and how to effectively reduce these rates. Various studies claim that the cause of increased CS rates is multifactorial and are potentially contributed to personal preference, fear of pain, and cultural influences (Kingdon et al., 2018). This was followed by a review of the current evidence regarding methods to decrease the rate of CS while maintaining attainable expectations in the clinical setting. The final focused review was to identify the evidence to support the need for additional patient education regarding avoidable CS.

Research suggests the best method for patient involvement is through education (Kingdon et al., 2018). As supported in literature, providers can positively influence the education mothers receive in order to increase knowledge about CS and encourage informed decision making about their care and birth plans. Informing patients of the risks and benefits of both CS and vaginal birth ensures patient confidence and involvement in birth plan development. A Cochrane review determined that patient decision aids lead to increased patient participation and informed decisions, development of realistic expectations, and decreased conflict surrounding childbirth decision making (Kingdon et al., 2018). Similarly, the use of decision aids, supported by a randomized controlled trial performed by Montgomery et al. in 2007, resulted in a higher number of women choosing to have a vaginal birth (Emmett et al., 2011).
This reinforces the importance of education and shared decision-making with expectant mothers during the childbirth planning process.

Prompted by the international rise in cesarean delivery rates, more healthcare facilities are implementing measures to decrease CS rates and facilitate positive patient outcomes through evidence-based approaches. In alignment with goals proposed by Healthy People 2020 and the U.S. Joint Commission to reduce CS rates, the primary objective of this quality improvement project is to assess the effectiveness of an educational intervention on low-risk pregnant women’s knowledge regarding CS, and confidence to self-advocate and initiate conversation with healthcare providers regarding their childbirth plans.

Theoretical Framework

Johns Hopkins Nursing Evidence-based Practice Model

The Johns Hopkins Nursing Evidence-based Practice Model (JHNEBP) utilizes a three-step approach to guide evidence-based research into direct clinical practice. Their model is referred to as PET: Practice Question, Evidence, and Translation (Dang & Dearholt, 2017). It is described as identifying a problem, searching for the most recent evidence, and applying the evidence into clinical practice. The goal of the JHNEBP model is to ensure the latest research and best practices are translated into patient care (Dang & Dearholt, 2017).

Implementation of the JHNEBP model assists with application of the most current evidence-based research into clinical practice for improvement in patient outcomes. The model supports evaluation of this quality improvement DNP project by identification of the growing issue of global CS rates, presentation of an evidenced-based educational intervention in a women’s health clinic—affiliated with an urban teaching hospital that delivers most of the city’s
births, and assessment of the intervention’s effect on CS knowledge and confidence for self-advocacy related to childbirth.

Plan Do Study Act

In addition to the JHNEBP Model, aspects of Plan Do Study Act (PDSA) methodology for Quality Improvement were utilized for this quality improvement initiative. The Institute of Healthcare Improvement’s Model for Improvement with PDSA is concise, generalizable, and complementary to JHNEBP. PDSA supports change and the promotion of high-quality patient care through attainable process improvements (Institute for Healthcare Improvement, 2017).

The PDSA model supported this quality improvement project through utilization of small-scale change in the clinical setting to enable improvement.

Purpose Statement

The purpose of this quality improvement project was to evaluate the effectiveness of an educational intervention on low-risk pregnant women’s knowledge regarding avoidable CS, and confidence to self-advocate and initiate conversation with their healthcare team regarding their childbirth plan. The goals included increased post-intervention knowledge about avoiding CS unless necessary and self-reported confidence to initiate conversation with healthcare providers about birth plans.

Methods

Context

The targeted population for the project included low-risk expectant mothers at an obstetrics (OB) and gynecology clinic for low-income, underserved patients in Philadelphia, PA. The clinic is a medical resident-run practice with approximately 15,000 outpatient visits per year.
offering a variety of maternity services, including care for high-risk patients at their high-risk clinic.

Like all quality improvement projects, potential risks may impede project progression. Potential barriers for this educational intervention included resistance from clinic staff, inability to acquire patients and engage patient participation, and interruption of workflow. Lack of patient engagement could have led to a smaller sample size negatively impacting quality of results and analysis. To promote buy-in and adequate participation, the intervention was created with time constraints in mind. The entire intervention (pre-test, intervention, post-test) was brief, taking no longer than ten minutes from start to finish, making it simple for patients to complete while waiting for their appointments. Completing the entire intervention at once decreased potential loss to follow-up. Additional unexpected difficulties included changes in practice, complex work environments, alterations in scheduling and clinic visits, along with numerous restrictions and delays due to the COVID-19 pandemic.

The financial cost of this project was minimal. The greatest expense was the printing costs for the educational pamphlet. The video and two surveys utilized for the intervention were viewed and completed on an iPad provided by the project team. The provided educational material was part of a free consumer education campaign, My Birth Matters, and dissemination of this information is encouraged. Utilization of this material was approved by a consultant to California Health Care Foundation (CHCF) for the My Birth Matters campaign. The timeline for the project was approximately 12 months from identification of the clinical problem to project completion.

**Interventions**
This project proposed an educational intervention for OB patients at the clinic in Philadelphia, Pennsylvania. Patients were eligible if they were 1) new to the OB clinic and 2) had no past medical history of a CS. Exclusion criteria consisted of women with prior CS, non-English speaking, and patients who already established care at the clinic. Project implementation took place from August 10, 2020 to September 1, 2020. Supported by evidence that patient education changes knowledge, beliefs, and practice, this informational session was presented to expectant mothers in order to address the project’s goals and outcomes of interest.

Implementation of the intervention consisted of one primary phase. This included patient recruitment for the project; consent to participate; completion of the pre-test; completion of the educational intervention, including a brief video and modified pamphlet; and completion of the post-test. Patients were recruited by chart review based on eligibility criteria. The team members reviewed the clinic schedule prior to arrival and determined appropriate candidates based on patient medical records. Participants were then guided through a four-step implementation process: Steps 1 & 4: Assessments, Steps 2 & 3: Interventions (See Figure 1).

On days of implementation, individual DNP team members met with potential eligible patients in the waiting room before their office visits, or in the exam room prior to seeing their provider. The patients were informed of the purpose of the project, the survey and teaching, and given the option to participate in the study. Upon agreement to partake in the study, each participant was assigned a unique identifier which was used to link their pre- and post-survey results. The allocated number was determined using the date followed by numbers one through ten. Implementation surveys and video were presented electronically on an Apple iPad. The pamphlet was provided in paper form. Clear instructions were provided to all participants before
the intervention, and along the way if necessary. The entire intervention was completed, from
start to finish, during the patient’s clinic visit.

**Step 2: Video Intervention**

The project team utilized a brief educational video from My Birth Matters campaign, consistent with their free published toolkit (California Health Care Foundation, 2018). My Birth Matters campaign was created in partnership with the California Health Care Foundation (CHCF), California Maternal Quality Care Collaborative (CMQCC), and Consumer Reports in 2018 as part of a broader statewide effort to lower rates of low-risk, first-time CS in California hospitals. Although there are four available educational videos, the group chose to incorporate only one with a new mother discussing CS. The new mother in the video discussed the increased prevalence of CS, even when mother and baby are healthy. She encouraged mothers to educate themselves about steps to take to reduce their chances of having an avoidable CS. The video also encouraged mothers to initiate a conversation with their healthcare team about their birth options and plan, with a takeaway message that “your voice matters” (My Birth Matters campaign, 2018).

**Step 3: Pamphlet Intervention**

After participants viewed the one-minute educational video, they were asked to review a pamphlet as part of the educational intervention. The pamphlet was created by the team, adapted from My Birth Matters campaign. The pamphlet information came directly from their free consumer toolkit, including material from the other three videos that was not included in Step 2: Video Intervention.

**Study of Interventions**
This quality improvement (QI) project utilized a pre-test/post-test design to collect and analyze data determining the effectiveness of a CS-focused patient education intervention. The JHNEBP Model was used as a framework for the project. The short-term goals of the educational intervention were developed to improve patient knowledge about avoidable CS and confidence to initiate conversation with their healthcare team regarding their birth plans. Success was measured using pre-intervention and post-intervention surveys that assessed the impact of the intervention on the goals mentioned above. Although this project focused on patient knowledge and confidence, the long-term goal of this initiative is an overall reduction of avoidable CS, which was not an outcome assessed in this project. The measurable outcomes for the project included:

1. After a CS educational intervention, patients will demonstrate increased knowledge of the importance of reducing avoidable CS.
2. After a CS educational intervention, patients will report increased confidence to self-advocate and initiate conversation with their health care team regarding their birth plans.
3. Patients will self-report preferred vaginal delivery versus scheduled CS.

Measures

In order to measure the outcomes of this project, several methods were used for data collection, including a demographic data questionnaire, pre-and post-survey design (baseline and post-educational session), and option for feedback after completion of the intervention. The pre-test/post-test design was chosen for this project because it allowed for immediate evaluation of patient knowledge and confidence after the intervention phase. Given the absence of specific
tools assessing the construct of interest, the team members designed a specific eleven question (Likert 1-5) survey (see Appendix A and B).

**Step 1: Pre-Intervention Survey**

**Patient Survey.** A pre-intervention eleven item (5-point Likert scale: strongly disagree, disagree, neutral, agree, and strongly agree) survey was created using Qualtrics software. The survey was broken down into three instruments: participant knowledge regarding avoidance of unnecessary CS, confidence to self-advocate and initiate a conversation with their healthcare team regarding their birth plan, and participant preference in childbirth method. The knowledge-based survey questions were created from an informational video (CMQCC, 2018) provided by the My Birth Matter campaign, as well as a pamphlet created by the project team with information downloaded directly from the My Birth Matters free consumer education toolkit. The confidence-based survey questions were created by the team due to the lack of validated surveys containing suitable questions pertaining to the study. The questions were designed to evaluate participant confidence to advocate for themselves and initiate conversation with their healthcare team regarding their childbirth plan.

Potential scores for the primary outcomes in pre-and-post surveys ranged from 8 to 40: knowledge (5 to 25) and confidence (3 to 15). Higher scores indicated an increase in knowledge about avoidable CS and increase in self-confidence to start a conversation about their birth plans with their healthcare providers. Potential scores for the secondary outcome (patient preferences) in the pre-and-post surveys ranged from 3 to 15, with higher scores indicating increased desire for vaginal birth delivery.

**Demographics & Patient Characteristics.** The demographic data collected from the questionnaire was utilized to identify characteristics and trends of participants. The areas of interest included age, gestational age, number of prior child births, marital status, employment
status, and highest level of education (see Table 1). This information was useful in identifying patterns related to marital status, gestational ages, and education levels.

Step 4: Post-Intervention Assessment

The same eleven item (5-point Likert scale) pre-intervention survey measuring knowledge, confidence, and preference was used for the post-intervention survey. This was used to measure participant knowledge and confidence immediately after receiving the CS educational intervention consisting of the video and pamphlet. Expected outcomes included increased participant confidence and knowledge after receiving the educational intervention.

Qualitative Feedback. A brief follow-up section was included in the post-survey including three questions that gathered participants’ feedback on the project.

Analysis Plan

Demographic variables including race, level of education, sexual orientation, marital status, employment status and prior vaginal childbirths were measured on a nominal level. Demographic variables such as age and gestational age were measured on a scale level. Descriptive statistics were used for analysis to summarize patient demographic characteristics and other studied measures. The independent variable was the CS educational intervention for low-risk mothers at the clinic without a history of CS. The dependent variables included: patient knowledge of the importance of avoiding unnecessary CS and confidence to self-advocate and initiate conversation with their health care team regarding their birth plans. After parametric assumptions were met, a paired sample t-test was used to compare mean patient knowledge and confidence scores between the pre- and post-intervention period.

Ethical Considerations
The Human Subjects Electronic Research Application (HS-ERA) for the University of Pennsylvania was completed. The University of Pennsylvania Institutional Review Board (IRB) determined this project qualified as a quality improvement initiative prior to DNP project initiation. Given that the project did not meet the definition of Human Subjects research, no further IRB review was required. There were no notable conflicts of interest. Names or other identifying characteristics of participants, such as date of birth or data from medical charts, were not collected. Participation in the study was confidential and voluntary. Each patient was assigned a random identifier to link their pre- and post-survey results, however, no identifiable information was used. The information collected from the electronic surveys was stored on Qualtrics, along with a Microsoft Excel spreadsheet on a password protected computer.

**Results**

The educational intervention for this QI project assessed patient knowledge about avoidable CS and confidence to initiate conversations about their birth plans with healthcare providers. As previously mentioned, the intervention included a brief educational video and modified pamphlet created from the My Birth Matters campaign. Implementation was approximately one month with the entire intervention phase completed at each patient’s appointment. A total of 30 participants were recruited for the educational intervention. Three participants were excluded after completion of the intervention: two participants with language barriers (English not their primary language) and one participant with a history of CS. A total of 27 participants met inclusion criteria and were included in data analysis.

Demographic data analysis showed that participant ages ranged from 18 to 39-years-old, 41% between the ages of 25 and 29, and an average age of 27-years-old. Gestational ages ranged from 3 to 36 weeks, 48% between 10 and 19 weeks, and an average of 14 weeks gestation.
Participant educational levels were primarily high school graduates or some college but no degrees (74%). Most participants identified their race as Black or African American (56%), sexual orientation as heterosexual (93%), marital status as single (74%), and prior vaginal childbirths as zero to one (69%) (see Table 1).

Combined knowledge and confidence survey scores ranged from 25 to 36 on the pre-survey, and 27 to 39 on the post-survey (on a scale of 8 to 40). A histogram was created depicting normally distributed data. After computing a paired sample t-test to measure patients’ knowledge about CS, there was a statistically significant difference between pre-intervention and post-intervention scores (t=5.165, p=<0.001) (See Table 2). Patients’ confidence scores also showed a statistically significant difference between pre-intervention and post-intervention (t=2.563, p=0.017) (See Table 2). Knowledge regarding avoidable CS increased by 9% (pre-survey score 17.19 [1.94], post-survey score 19.59 [2.60]) and confidence increased by 2% (pre-survey score 12.9 [1.68], post-survey score 13.4 [1.45]) (see Table 2 and Figure 2).

Discussion

The primary outcomes measured were patient knowledge and confidence; observed outcomes of the intervention were consistent with anticipated outcomes. In the pre-intervention survey, most participants were unaware that 1) many CS are avoidable, and 2) having one CS increases the likelihood of having repeat CS on subsequent deliveries. After the intervention, correct responses to these two questions increased by 48% and 37% respectively. In the follow-up questionnaire, 93% of participants self-reported hearing new information during the intervention. Given the average participant age and education level, this quality improvement project further demonstrates the importance of empowering low-risk expectant mothers to help them make informed birth plan decisions.
Project results were comparable to findings from extensive research conducted by CHCF, CMQCC, and Consumer Reports when developing My Birth Matters campaign, where there was reported increased participant confidence with decision for vaginal birth and motivation to advocate for themselves after their video intervention (CHCF, 2018). This initiative may reduce avoidable CS in low-risk pregnant women without prior CS by educating expectant mothers regarding the benefits of vaginal birth and importance of avoiding CS unless necessary, while promoting confidence to effectively communicate with their health care teams. Ideally, low-risk mothers who gain CS-related understanding and confidence become better advocates for themselves, their babies, and childbirths.

A secondary exploratory outcome, self-reported childbirth delivery method preferences, did not result in a statistically significant change between pre-and-post surveys ($t=0.348$, $p=0.731$). However, 100% of participants self-reported planning for vaginal birth in the post-survey, compared to only 96% in the pre-survey. Participant preference was chosen as a secondary outcome due to the difficulty of changing a patient’s decision within a limited amount of time. Despite most participants already planning for vaginal births (the desired outcome of the intervention) on their pre-surveys, many participants were clearly unaware of important differences between vaginal and cesarean deliveries; this was evidenced by the significant difference in knowledge scores in the pre/post-survey assessments.

The strengths of this quality improvement initiative included leadership support and engagement, along with buy-in from stakeholders. Clinic management, staff, and patients were receptive and supportive, allowing for successful implementation of the intervention. Every eligible patient recruited willingly agreed to participate. Limitations of this quality improvement project included a global pandemic affecting in-person appointments, number of participants, the
lack of a validated survey, an immediate post-intervention survey, project generalizability, and the overall project time frame. Due to the COVID-19 pandemic, with additional regulations and health safety requirements for office appointments, the data collection timeframe was shorter and sample size smaller than anticipated. Many initial patient appointments were completed via telemedicine to limit in-person contact, and unavailable to interview for the project. Another limitation was the lack of validated surveys encompassing the desired project outcome measurements. A validated and reliable measure did not exist for this project, so the project team created a survey based on information from the My Birth Matters campaign. In addition, administration of the post-survey closely after presentation of the educational intervention may have contributed to favorable outcomes. Results may have been different if compared to a post-survey that was given to patients after their clinic visit. Limitations to the generalizability of the project include only English-speaking patients, a limited sample size, and specific underserved patient population serviced by the clinic. Due to the lack of a translator for the surveys and educational material, only English-speaking patients were eligible to participate. Therefore, the project sample does not reflect the general population and may indicate patient sample bias.

Conclusion

Given the increasing national and global rates of CS, patient education and involvement are necessary to increase patient knowledge regarding avoidable CS. At a clinic affiliated with an urban teaching hospital in Philadelphia, where most of the city’s deliveries are performed, implementation of a patient educational intervention was associated with an increase in confidence and knowledge post-intervention. Following review of a brief educational video and pamphlet, low-risk mothers without histories of CS exhibited increased knowledge about CS and
self-reported confidence to initiate conversations about birth plans with their healthcare
promoters. This educational intervention yielded both statistically and clinically significant
results and may help reduce future avoidable CS in the sample population of low-risk mothers.
The implications for practice and future quality improvement initiatives focus on additional
patient education regarding CS and encouragement for involvement in childbirth planning
conversations. The suggested next steps for this quality improvement project are follow-up after
childbirth to identify actual method of delivery and calculation of CS rates, as well as a
permanent educational implementation at the clinic. The educational intervention may produce
similar positive results if implemented for other patients delivering at the same urban teaching
hospital in Philadelphia, clinics for under-served pregnant women, obstetrician offices, or
anywhere patients would benefit from additional CS education.

According to the WHO, 68% of countries experienced disruptions to reproductive,
maternal, and childcare services due to COVID-19 (WHO, 2020). This quality improvement
initiative provides clinics an opportunity to continue patient education throughout the pandemic,
whether in-person education is feasible or not. The pamphlets can be distributed during patient
appointments or emailed to expectant mothers along with the video and other My Birth Matters
educational material. Due to the ease of implementation, potential magnitude of impact, and lack
of any negative associated consequences, low-risk pregnant women would benefit from receiving
this valuable information about CS. If long-term outcomes indicate reduction of avoidable CS
and decreased CS rates, this brief educational intervention will serve as a simple, easy tool to
implement in a variety of patient populations to address the rising rates of CS in the U.S.
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References


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### Table 1

**Demographic Information (n=27)**

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</tr>
<tr>
<td>Master’s degree</td>
<td>1</td>
<td>3.7</td>
</tr>
<tr>
<td><strong>Sexual orientation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>25</td>
<td>92.6</td>
</tr>
<tr>
<td>Bisexual</td>
<td>1</td>
<td>3.7</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>3.7</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>20</td>
<td>74.1</td>
</tr>
<tr>
<td>Married</td>
<td>5</td>
<td>18.5</td>
</tr>
<tr>
<td>Separated</td>
<td>1</td>
<td>3.7</td>
</tr>
<tr>
<td>Divorced</td>
<td>1</td>
<td>3.7</td>
</tr>
<tr>
<td><strong>Employment status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>12</td>
<td>44.4</td>
</tr>
<tr>
<td>Full-time employed</td>
<td>10</td>
<td>37</td>
</tr>
<tr>
<td>Part-time employed</td>
<td>5</td>
<td>18.5</td>
</tr>
<tr>
<td><strong>Prior vaginal childbirths</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zero</td>
<td>9</td>
<td>34.6</td>
</tr>
<tr>
<td>One</td>
<td>9</td>
<td>34.6</td>
</tr>
<tr>
<td>Two</td>
<td>5</td>
<td>19.2</td>
</tr>
<tr>
<td>Three</td>
<td>3</td>
<td>11.5</td>
</tr>
</tbody>
</table>
Figure 1
Four Step Implementation Process

<table>
<thead>
<tr>
<th>Step 1: Pre-Intervention Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion of informed consent and pre-test survey via Qualtrics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2: Video Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>View brief educational video, directly from My Birth Matters campaign</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3: Pamphlet Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review Pamphlet, created by project team, adapted from My Birth Matters campaign</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 4: Post-Intervention Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion of post-test survey via Qualtrics</td>
</tr>
</tbody>
</table>
Table 2

*Pre/Post Intervention Assessment of Primary Outcomes*

<table>
<thead>
<tr>
<th>Primary Outcomes</th>
<th>n= 27</th>
<th>PRE Mean (SD)</th>
<th>POST Mean (SD)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td>17.2 (1.94)</td>
<td>19.4 (2.60)</td>
<td>5.165</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Confidence</td>
<td></td>
<td>12.9 (1.68)</td>
<td>13.4 (1.45)</td>
<td>2.563</td>
<td>0.017</td>
</tr>
</tbody>
</table>

SD = standard deviation
Figure 2

Percent of Total Pre/Post Scores on Primary Outcome Assessments

<table>
<thead>
<tr>
<th>PRIMARY OUTCOMES</th>
<th>PRE-INTERVENTION</th>
<th>POST-INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATIENT CS KNOWLEDGE</td>
<td>69%</td>
<td>78%</td>
</tr>
<tr>
<td>PATIENT CONFIDENCE</td>
<td>52%</td>
<td>54%</td>
</tr>
</tbody>
</table>

n= 27
Appendix A

Electronic Patient Education Survey

Demographic Questions
1. What is your year of birth?
2. Gestational age in weeks (How many weeks pregnant are you?)
3. How many times have you given birth?
4. Choose one or more races that you consider yourself to be:
   - White
   - Black or African American
   - Asian
   - American Indian
   - Hispanic
   - Native Hawaiian
   - Other
5. Which of the following best describes your sexual orientation?
   - Heterosexual (straight)
   - Homosexual (gay)
   - Bisexual
   - Other
   - Prefer not to say
6. Are you married, widowed, divorced, separated, or never married?
   - Single
   - Married
   - Separated
   - Divorced
   - Widowed
7. What is the highest level of school you have completed or the highest degree you have received?
   - Less than high school degree
   - High school graduate (high school diploma or equivalent including GED)
   - Some college but no degree
   - Associate degree in college (2-year)
   - Bachelor's degree in college (4-year)
   - Master's degree
   - Doctoral degree
   - Professional degrees (JD, MD)
8. Which statement best describes your current employment status?
   - Full-time employed
   - Part-time employed
   - Self-employed
   - Unemployed
   - Retired
   - Disabled
   - Student
   - Other
   - Prefer not to answer
Appendix B

Electronic Patient Education Survey

Below you are presented with a list of statements. Please indicate to what extent you agree or disagree with them by checking the appropriate option next to each statement.

<table>
<thead>
<tr>
<th>Pre-Survey</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I plan to deliver my baby by scheduled cesarean section/c-section.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I plan to deliver my baby by vaginal birth method.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would ask for a c-section even if I know the complications.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recovery after vaginal delivery takes longer than c-section.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complications of vaginal delivery are more common than c-section.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Many c-sections can be avoided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-sections could be <em>lifesaving</em> if my healthcare team thinks it is absolutely necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I have a c-section for this delivery, I am more likely to have another c-section next time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel confident about my <em>level of knowledge</em> around pregnancy and birth.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel confident to <em>start a conversation</em> with my provider about my childbirth options.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel confident to <em>make my own decisions</em> about my childbirth plan.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Post-Survey</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
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<th>Strongly Agree</th>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feedback</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoyed the information provided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I heard new information.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Do you give us permissions to follow up on your birth plan in your medical record after you give birth?

Yes, I give you permission for follow-up

No, I DO not give you permission for follow-up

Do you have any other comments, questions, or concerns?