



## Effective Health Care

### Childbirth Education Impact on Cesarean Section Rates

#### Results of Topic Selection Process & Next Steps

The nominator, Lamaze International, is interested in a new evidence review on the effectiveness of childbirth education on cesarean delivery and related intermediate outcomes to promote education to health care providers and policy-makers.

Due to limited program resources, the program is unable to develop a review at this time. No further activity on this nomination will be undertaken by the Effective Health Care (EHC) Program.

#### Topic Brief

**Topic Number and Name:** 0827 Childbirth education impact on cesarean section rates

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**Conflict of Interest:** None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

## Background

As the U.S. general fertility rate declined in 2016, the cesarean delivery rate dropped as well<sup>1</sup>. Despite this, the U.S. has one of the highest cesarean section rates in the world; the U.S. rate is nearly double the rates of Norway and the Netherlands<sup>2</sup>. The 2016 cesarean delivery rate was 31.9%, a decline from both the previous year and the 2009 peak rate of 32.9%<sup>1</sup>. However, the World Health Organization recommends the ideal cesarean delivery rate to be between 10% and 15%. In addition higher cesarean delivery rates are not associated with reduced maternal or newborn mortality rates<sup>3</sup>. Cesarean deliveries may be performed due to medical indications such as labor dystocia, abnormal or indeterminate fetal heart rate tracing, or suspected fetal macrosomia<sup>4</sup>. Other reasons unrelated to medical necessity such as patient preference and health care practice variation can also increase the rate of cesarean deliveries<sup>4</sup>. While all deliveries are potentially harmful to the mother and child, the risk for several potential harms such as hemorrhage, uterine rupture, shock, infection, and long-term harms such as placental abnormalities in subsequent pregnancies was greater for cesarean delivery compared to vaginal delivery<sup>4</sup>. Additionally, cesarean deliveries are expensive. In 2013, the average total cost of a cesarean delivery for a woman with commercial insurance was \$27,866 compared to \$18,329 for a vaginal delivery, while total Medicaid cost for a cesarean delivery was \$50,373 and \$29,800 for a vaginal delivery.<sup>5</sup>

A 2012 Agency for Healthcare Research and Quality (AHRQ) systematic review examined strategies to reduce cesarean section rates using interventions implemented during pregnancy or during labor. Only one included study involved childbirth education during pregnancy, specifically focused on how to push in labor, and reported no difference in cesarean rate between the group who received the structured education and the control group receiving usual care<sup>6</sup>. In a 2012 survey, 53% of mothers reported having taken a childbirth class for at least one of their pregnancies<sup>7</sup>. However, a variety of antenatal education is available to pregnant women, and the content in these interventions related to cesarean delivery also varies. A review that further evaluates the literature and identifies the components of efficacious programs that reduced cesarean deliveries without indication could help improve the content and structure of childbirth education programs.

## Nominator and Stakeholder Engagement

This nominator, Lamaze International, provided feedback on key questions and population, interventions, comparators, and outcomes (PICOs). They suggested altering the key questions to compare the effectiveness of childbirth education interventions by characteristics such as frequency and quality. However, given the variety of interventions described in the literature and the range of detail used to describe them, this did not seem possible. Based on consultation with a topic expert, we added a key question focused on the common components of efficacious childbirth education interventions (including frequency and duration) as that would be useful to health systems.

## Key Questions and PICOs

The key questions for this nomination are:

1. What is the effect of childbirth education on a woman's psychosocial health (e.g., fear of childbirth, breastfeeding), physical health (e.g., pain, perineal trauma), health care utilization (e.g., length of hospital stay, delivery interventions) and satisfaction with birth experience?
2. What is the effectiveness of childbirth education to reduce cesarean deliveries?
3. What are the essential components of efficacious childbirth education interventions?
  - a) People delivering the intervention
  - b) Content of education
  - c) Frequency and duration of education

- d) Setting/Location
  - e) Organizational context (e.g., large group vs small group, lecture-based vs discussion)
4. What are the harms associated with childbirth education interventions?

To define the inclusion criteria for the key questions, we specify the PICO of interest (Table 1).

**Table 1.** Key Questions and PICO

Key Questions	What is the effect of childbirth education on a woman's psychosocial health (e.g. fear of childbirth, breastfeeding), physical health (e.g. pain, perineal trauma), health care utilization (e.g. length of hospital stay, delivery interventions) and satisfaction with birth experience?	What is the effectiveness of childbirth education to reduce cesarean deliveries?	What are the essential components of efficacious childbirth education interventions? a) People delivering the intervention b) Content of education c) Frequency and duration of education d) Setting/Location e) Organizational context (e.g., large group vs small group, lecture-based vs discussion)	What are the harms associated with childbirth education interventions?
	Low-risk (NTSV) pregnant women	Low-risk (NTSV) pregnant women	Low-risk (NTSV) pregnant women	Low-risk (NTSV) pregnant women
	Childbirth education on birth outcomes including mode of delivery; antenatal education; prenatal education; birth preparation sessions	Childbirth education on birth outcomes including mode of delivery; antenatal education; prenatal education; birth preparation sessions	N/A	Childbirth education on birth outcomes including mode of delivery; antenatal education; prenatal education; birth preparation sessions
	No childbirth education; usual care; other interventions such as pamphlets or decision aids; self-driven research	No childbirth education; usual care; other interventions such as pamphlets or decision aids; self-driven research	N/A	No childbirth education; usual care; other interventions such as pamphlets or decision aids; self-driven research
	Psychosocial health outcomes (e.g. fear of childbirth, breastfeeding), physical health outcomes (e.g. pain, perineal trauma), health care utilization (e.g. length of hospital stay, delivery interventions) and satisfaction with birth experience	Rate of a primary cesarean delivery; cesarean delivery harms; rate of cesarean delivery by indication	N/A	Psychosocial health outcomes (e.g. fear of childbirth, breastfeeding), physical health outcomes (e.g. pain, perineal trauma), health care utilization (e.g. length of hospital stay, delivery interventions) and satisfaction with

				birth experience; cost of education; time spent on education
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Abbreviations: NTSV = nulliparous, term, singleton, and vertex

## Methods

We assessed nomination 0827 Childbirth education impact on cesarean section rates, for priority for a systematic review or other AHRQ EHC report with a hierarchical process using established selection criteria. Assessment of each criteria determined the need to evaluate the next one. See Appendix A for detailed description of the criteria.

1. Determine the *appropriateness* of the nominated topic for inclusion in the EHC program.
2. Establish the overall *importance* of a potential topic as representing a health or healthcare issue in the United States.
3. Determine the *desirability of new evidence review* by examining whether a new systematic review or other AHRQ product would be duplicative.
4. Assess the *potential impact* a new systematic review or other AHRQ product.
5. Assess whether the *current state of the evidence* allows for a systematic review or other AHRQ product (feasibility).
6. Determine the *potential value* of a new systematic review or other AHRQ product.

### Appropriateness and Importance

We assessed the nomination for appropriateness and importance.

### Desirability of New Review/Duplication

We searched for high-quality, completed or in-process evidence reviews published in the last three years on the key questions of the nomination. See Appendix B for sources searched.

### Impact of a New Evidence Review

The impact of a new evidence review was qualitatively assessed by analyzing the current standard of care, the existence of potential knowledge gaps, and practice variation. We considered whether it was possible for this review to influence the current state of practice through various dissemination pathways (practice recommendation, clinical guidelines, etc.).

### Feasibility of New Evidence Review

We conducted a literature search in PubMed from December 2013 to December 2018. See Appendix C for the PubMed search strategy and links to the ClinicalTrials.gov search.

We reviewed all identified titles and abstracts for inclusion and classified identified studies by key question and study design to assess the size and scope of a potential evidence review.

### Value

We assessed the nomination for value. We considered whether or not the clinical, consumer, or policymaking context had the potential to respond with evidence-based change; and if a partner organization would use this evidence review to influence practice.

## Results

See Appendix A for detailed assessments of all EPC selection criteria.

## Appropriateness and Importance

This is an appropriate and important topic. The 2016 U.S. cesarean delivery rate, at 31.9%, is over double the ideal population cesarean delivery rate of 10-15%.<sup>1,3</sup> Cesarean deliveries pose significant health risks and are typically more expensive than vaginal delivery.<sup>5</sup>

## Desirability of New Review/Duplication

A new evidence review would not be duplicative of an existing product. See Table 2, Duplication column.

## Impact of a New Evidence Review

A new systematic review may have high impact. There is wide variation in childbirth education interventions described in the literature, both in description of the interventions and the in the content and format of the education interventions.<sup>4</sup>

## Feasibility of a New Evidence Review

A new evidence review is feasible. A total of 18 primary studies<sup>8-25</sup> were identified that would address key question 1. Eleven<sup>8-18</sup> were randomized control trials, while the remaining seven were comprised of pre/post<sup>19,20</sup>, quasi-experimental<sup>21,22</sup>, cross-sectional survey<sup>23</sup>, prospective<sup>24</sup>, and observational<sup>25</sup> studies. Four clinical trials<sup>26-29</sup> were identified that would address key question 1.

Ten primary studies<sup>10,11,14,15,20,23,25,30-32</sup> were identified that would address key question 2, comprised of five randomized control trials<sup>10,11,14,15,30</sup>, two cohort studies<sup>31,32</sup>, a cross-sectional survey<sup>23</sup>, a pre/post study<sup>20</sup>, and an observational study<sup>25</sup>. One relevant clinical trial<sup>33</sup> for key question 2 was identified.

One cohort study<sup>31</sup> was identified that would address key question 3.

None of the studies that were reviewed clearly addressed key question 4.

See Table 2, Feasibility column.

**Table 2.** Key Questions and Results for Duplication and Feasibility

Key Question	Duplication (12/2013-12/2018)	Feasibility (12/2013-12/2018)
KQ 1: What is the effect of childbirth education on a woman's psychosocial health, physical health, health care utilization, and satisfaction with birth experience?	Total number of identified systematic reviews: 0	<u>Size/scope of review</u> Relevant Studies Identified: 18 <ul style="list-style-type: none"> <li>• RCT: 11<sup>8-18</sup></li> <li>• Pre/post: 2<sup>19,20</sup></li> <li>• Quasi-experimental: 2<sup>21,22</sup></li> <li>• Cross-sectional survey: 1<sup>23</sup></li> <li>• Prospective: 1<sup>24</sup></li> <li>• Observational: 1<sup>25</sup></li> </ul> <u>Clinicaltrials.gov:</u> 4 <ul style="list-style-type: none"> <li>• Active: 2<sup>26,27</sup></li> <li>• Complete: 1<sup>28</sup></li> <li>• Other: 1<sup>29</sup></li> </ul>

Key Question	Duplication (12/2013-12/2018)	Feasibility (12/2013-12/2018)
KQ 2: What is the effectiveness of childbirth education to reduce cesarean deliveries?	Total number of identified systematic reviews: 0	<u>Size/scope of review</u> Relevant Studies Identified: 10 <ul style="list-style-type: none"> <li>• RCT: 5<sup>10, 11, 14, 15, 30</sup></li> <li>• Cohort: 2<sup>31, 32</sup></li> <li>• Cross-sectional survey: 1<sup>23</sup></li> <li>• Pre/post: 1<sup>20</sup></li> <li>• Observational: 1<sup>25</sup></li> </ul> <u>Clinicaltrials.gov: 1</u> <ul style="list-style-type: none"> <li>• Complete: 1<sup>33</sup></li> </ul>
KQ 3: What are the essential components of efficacious childbirth education interventions?	Total number of identified systematic reviews: 0	<u>Size/scope of review</u> Relevant Studies Identified: 1 <ul style="list-style-type: none"> <li>• Cohort: 1<sup>31</sup></li> </ul> <u>Clinicaltrials.gov: 0</u>
KQ 4: What are the harms associated with childbirth education interventions?	Total number of identified systematic reviews: 0	<u>Size/scope of review</u> Relevant Studies Identified: 0  <u>Clinicaltrials.gov: 0</u>

Abbreviations: KQ=Key Question; RCT=randomized control trial

## Value

The potential for value is high, as childbirth education interventions are amendable to evidence-based change, and the American College of Obstetricians and Gynecologists agreed to partner on this topic if it were to go forward as an evidence review.

## Summary of Findings

- Appropriateness and importance: The topic is both appropriate and important.
- Duplication: A new review would not be duplicative of an existing product.
- Impact: A new systematic review has high impact potential. There is variation in childbirth education interventions described in the literature.
- Feasibility: A new review is feasible. The evidence base is likely small. We identified 21 primary studies and 5 clinical trials that address at least one key question.
- Value: The potential for value is high because along with the nominator, the American College of Obstetricians and Gynecologists and the American Academy of Family Physicians expressed interest in being a partner on this topic if it moves forward for an evidence review.

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## Appendix A. Selection Criteria Assessment

Selection Criteria	
1a. Does the nomination represent a health care drug, intervention, device, technology, or health care system/setting available (or soon to be available) in the U.S.?	Yes, childbirth education is available to pregnant women in the U.S., often through a health system.
1b. Is the nomination a request for a systematic review?	Yes
1c. Is the focus on effectiveness or comparative effectiveness?	Yes
1d. Is the nomination focus supported by a logic model or biologic plausibility? Is it consistent or coherent with what is known about the topic?	Yes
2a. Represents a significant disease burden; large proportion of the population	Yes, the U.S. cesarean delivery rate is over double the ideal population cesarean delivery rate of 10-15%. <sup>1,3</sup> In 2016 there were 3,945,875 births in the U.S, and so this topic potentially affects millions of people a year. <sup>34</sup>
2b. Is of high public interest; affects health care decision making, outcomes, or costs for a large proportion of the US population or for a vulnerable population	Yes, cesarean deliveries pose significant health risks, and are on average more expensive than vaginal delivery <sup>5</sup> .
2c. Represents important uncertainty for decision makers	Yes, there is variation in format and content of childbirth education and that variation may have different effects on cesarean delivery rates.
2d. Incorporates issues around both clinical benefits and potential clinical harms	Yes
2e. Represents high costs due to common use, high unit costs, or high associated costs to consumers, to patients, to health care systems, or to payers	Yes, the total average cost for a cesarean delivery under commercial insurance was \$27,866 compared to \$18,329 for vaginal delivery. <sup>5</sup> The average total Medicaid cost for a cesarean delivery was \$50,373 compared to \$29,800. <sup>5</sup> Cesarean delivery on average is more expensive.
3. Would not be redundant (i.e., the proposed topic is not already covered by available or soon-to-be available high-quality systematic review by AHRQ or others)	Yes, the topic is not already covered by an available or soon-to-be available high-quality systematic review.
4a. Is the standard of care unclear (guidelines not available or guidelines inconsistent, indicating an information gap that may be addressed by a new evidence review)?	Yes, there is variation in childbirth education interventions described in the literature. <sup>4</sup>
4b. Is there practice variation (guideline inconsistent with current practice, indicating a potential implementation gap and not best addressed by a new evidence review)?	There is no evidence that practice varies from guidance.
5. Effectively utilizes existing research and knowledge by considering: - Adequacy (type and volume) of research for conducting a systematic review	<i>Size/scope of review:</i> We identified 18 primary studies <sup>8-25</sup> and 4 clinical trials <sup>26-29</sup> that would address KQ1.

<p>- Newly available evidence (particularly for updates or new technologies)</p>	<p>We identified 10 primary studies<sup>10, 11, 14, 15, 20, 23, 25, 30-32</sup> and 1 clinical trial<sup>33</sup> that would address KQ2.</p> <p>We identified one primary study<sup>31</sup> that would address KQ3.</p>
<p>6. Value</p>	
<p>6a. The proposed topic exists within a clinical, consumer, or policy-making context that is amenable to evidence-based change</p>	<p>Yes, childbirth education interventions are amenable to evidence-based change.</p>
<p>6b. Identified partner who will use the systematic review to influence practice (such as a guideline or recommendation)</p>	<p>Yes, the American College of Obstetricians and Gynecologists and the American Academy of Family Physicians agreed to partner on this topic if it were to go forward as an evidence review.</p>

*Abbreviations: KQ=Key Question*

## Appendix B. Search for Evidence Reviews (Duplication)

Listed below are the sources searched, hierarchically

<b>Primary Search</b>
AHRQ: Evidence reports and technology assessments <a href="https://effectivehealthcare.ahrq.gov/">https://effectivehealthcare.ahrq.gov/</a> ; <a href="https://www.ahrq.gov/research/findings/ta/index.html">https://www.ahrq.gov/research/findings/ta/index.html</a> ; <a href="https://www.ahrq.gov/research/findings/evidence-based-reports/search.html">https://www.ahrq.gov/research/findings/evidence-based-reports/search.html</a>
VA Products: PBM, and HSR&D (ESP) publications, and VA/DoD EBCPG Program <a href="https://www.hsrdr.research.va.gov/publications/esp/">https://www.hsrdr.research.va.gov/publications/esp/</a>
Cochrane Systematic Reviews <a href="http://www.cochranelibrary.com/">http://www.cochranelibrary.com/</a>
HTA (CRD database): Health Technology Assessments <a href="http://www.crd.york.ac.uk/crdweb/">http://www.crd.york.ac.uk/crdweb/</a>
PubMed <a href="http://www.ncbi.nlm.nih.gov/pubmed">http://www.ncbi.nlm.nih.gov/pubmed</a>
<b>Secondary Search</b>
AHRQ Products in development <a href="https://effectivehealthcare.ahrq.gov/">https://effectivehealthcare.ahrq.gov/</a>
VA Products in development <a href="https://www.hsrdr.research.va.gov/publications/esp/">https://www.hsrdr.research.va.gov/publications/esp/</a>
Cochrane Protocols <a href="http://www.cochranelibrary.com/">http://www.cochranelibrary.com/</a>
PROSPERO Database (international prospective register of systematic reviews and protocols) <a href="http://www.crd.york.ac.uk/prospéro/">http://www.crd.york.ac.uk/prospéro/</a>

## Appendix C. Search Strategy & Results (Feasibility)

Feasibility	
MEDLINE(PubMed) searched on: December 14, 2018	
Concept	
Childbirth Education	("Prenatal Education"[Mesh]) OR (((((((("Labor Pain"[Mesh]) OR "Labor, Obstetric"[Mesh]) OR "Pregnancy Outcome"[Mesh]) OR "Parturition"[Mesh]) OR "Pregnant Women"[Mesh])) AND "Patient Education as Topic"[Mesh])
Limits: Female Adults and last 5 years	Filters activated: published in the last 5 years, Humans, Female, Adult: 19+ years.
Total N=185	
SR N=6	Systematic[sb]
RCT N=81	(((((((((groups[tiab])) OR (trial[tiab])) OR (randomly[tiab])) OR (drug therapy[sh])) OR (placebo[tiab])) OR (randomized[tiab])) OR (controlled clinical trial[pt])) OR (randomized controlled trial[pt])
Other N=98	
clinicalTrials.gov	144 Studies found for: childbirth   childbirth   education   Studies with Female Participants   Adult   First posted on or after 12/20/2013

Clinical Trials:

[https://clinicaltrials.gov/ct2/results?cond=&term=childbirth&type=&rslt=&recrs=a&recrs=f&recrs=d&recrs=e&age\\_v=&age=1&qndr=Female&intr=childbirth+education&titles=&outc=&spons=&lead=&id=&cntry=&state=&city=&dist=&locn=&strd\\_s=&strd\\_e=&prcd\\_s=&prcd\\_e=&sfpd\\_s=12%2F20%2F2013&sfpd\\_e=&lupd\\_s=&lupd\\_e=&sort=](https://clinicaltrials.gov/ct2/results?cond=&term=childbirth&type=&rslt=&recrs=a&recrs=f&recrs=d&recrs=e&age_v=&age=1&qndr=Female&intr=childbirth+education&titles=&outc=&spons=&lead=&id=&cntry=&state=&city=&dist=&locn=&strd_s=&strd_e=&prcd_s=&prcd_e=&sfpd_s=12%2F20%2F2013&sfpd_e=&lupd_s=&lupd_e=&sort=)