
Evidence Brief: Doula Support for Veterans

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AUTHORS

Author roles, affiliations, and contributions to the present report (using the [CRediT taxonomy](#)) are summarized in the table below.

Author	Role and Affiliation	Report Contribution
Basmah Rahman, MPH	Research Associate, ESP Coordinating Center, Portland VA Health Care System Portland, OR	Project administration, Supervision, Investigation, Writing – original draft, Writing – review & editing, Investigation, Visualization, Data curation
Beth E. Williams, NP	Clinician Investigator, ESP Coordinating Center, Portland VA Health Care System Portland, OR	Investigation, Writing – original draft, Data curation, Writing – review & editing
Johanna K. Anderson, MPH	Senior Research Associate, ESP Coordinating Center, Portland VA Health Care System Portland, OR	Methodology, Investigation, Supervision, Data curation, Writing – review & editing
Rachel M. Ward, BA	Research Assistant, ESP Coordinating Center, Portland VA Health Care System Portland, OR	Investigation, Data curation, Visualization, Writing – review & editing
Katherine Mackey, MD, MPP	Clinician Investigator, ESP Coordinating Center, Portland VA Health Care System Portland, OR	Supervision, Writing – review & editing
Nicholas J. Parr, PhD, MPH	Associate Director, ESP Coordinating Center, Portland VA Health Care System Portland, OR	Conceptualization, Methodology, Writing – review & editing, Project administration

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The findings and conclusions in this document are those of the author(s) who are responsible for its contents and do not necessarily represent the views of the Department of Veterans Affairs or the United States government. Therefore, no statement in this article should be construed as an official position of the Department of Veterans Affairs. No investigators have any affiliations or financial involvement (eg, employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties) that conflict with material presented in the report.

PREFACE

The VA Evidence Synthesis Program (ESP) was established in 2007 to provide timely and accurate syntheses of targeted health care topics of importance to clinicians, managers, and policymakers as they work to improve the health and health care of Veterans. These reports help:

- Develop clinical policies informed by evidence;
- Implement effective services to improve patient outcomes and to support VA clinical practice guidelines and performance measures; and
- Set the direction for future research to address gaps in clinical knowledge.

The program comprises four ESP Centers across the US and a Coordinating Center located in Portland, Oregon. Center Directors are VA clinicians and recognized leaders in the field of evidence synthesis with close ties to the AHRQ Evidence-based Practice Center Program. The Coordinating Center was created to manage program operations, ensure methodological consistency and quality of products, interface with stakeholders, and address urgent evidence needs. To ensure responsiveness to the needs of decision-makers, the program is governed by a Steering Committee composed of health system leadership and researchers. The program solicits nominations for review topics several times a year via the [program website](#).

The present report was developed in response to a request from the VHA Office of Women's Health, Reproductive Health Division. The scope was further developed with input from Operational Partners (below) and the ESP Coordinating Center review team.

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Operational Partners

Operational partners are system-level stakeholders who help ensure relevance of the review topic to the VA, contribute to the development of and approve final project scope and timeframe for completion, provide feedback on the draft report, and provide consultation on strategies for dissemination of the report to the field and relevant groups.

Amanda M. Johnson, MD, FACOG

Director, Reproductive Health Division
VHA Office of Women's Health

Peer Reviewers

The Coordinating Center sought input from external peer reviewers to review the draft report and provide feedback on the objectives, scope, methods used, perception of bias, and omitted evidence (see Appendix D in Supplemental Materials for disposition of comments). Peer reviewers must disclose any relevant financial or non-financial conflicts of interest. Because of

their unique clinical or content expertise, individuals with potential conflicts may be retained. The Coordinating Center works to balance, manage, or mitigate any potential nonfinancial conflicts of interest identified.

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EXECUTIVE SUMMARY

Key Findings

- Doula support may be associated with reduced rate of cesarean births, reduced use of oxytocin or Pitocin, reduced use of epidural, shorter duration of labor, and higher Apgar scores for neonates.
- Doula support could be associated with reduced labor pain, fewer low birthweight neonates, and fewer NICU admissions, but more well-designed studies with clear adherence to doula intervention are needed to better determine impact.
- No evidence of harms of doula support or support by layperson companionship during labor were identified.
- Evidence on doula support is generally limited by inconsistency in study methodologies and intervention definitions, and future research to identify key program components and optimal intervention characteristics is warranted.

Women are the fastest-growing US Veteran cohort, largely due to the dramatic increase in women entering and separating from military service over the last half century. With the increased number of Veteran women, the Veterans Health Administration (VHA) has experienced greater demand for tailored health services for Veteran women. VHA currently provides maternity care through purchased care in the community, and also employs Maternity Care Coordinators to navigate care for pregnant Veterans with their providers in and outside the VHA to ensure access to needed resources during pregnancy and the postpartum period. Pregnant Veterans may be at increased risk for adverse pregnancy outcomes due to complex medical and mental health conditions, underscoring the need for comprehensive well-coordinated maternity care.

Contemporary maternal labor and delivery care often consists of a hospital-based birth with a team of obstetrical medical providers, and ideally added support from a birth companion of the pregnant person's choice. One model of providing support to the pregnant person is through the use of trained labor support from a doula. Doulas act as both coaches and companions to the pregnant individual and provide a range of reproductive care services depending on their degree of training and the clinical care setting. The most comprehensive care provided by doulas (hereafter referred to as *full-spectrum care*) includes prenatal visits with childbirth education for expectant families, support during labor and delivery, postpartum care, lactation support, miscarriage support, and support for the loss of a pregnancy or stillbirth if needed. In the US, doula credentialing is not a requirement and is not standardized, but several organizations have developed training programs that range from weekend workshops to a full range of

Background

The Evidence Synthesis Program Coordinating Center is responding to a request from the VHA Office of Women's Health, Reproductive Health Division, for an Evidence Brief on the benefits of doula support for pregnant, birthing, and postpartum Veterans. Findings from this brief will be used to inform development and piloting of a VA doula support program, which is intended to support the best possible maternal and infant outcomes for Veterans.

Methods

To identify studies, we searched MEDLINE, Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials, and other sources up to January 4, 2022. We used prespecified criteria for study selection, data abstraction, and rating internal validity and strength of the evidence. See the Methods section and our PROSPERO protocol for full details of our methodology.

coursework and examination. In non-US settings, the role of a doula may be performed by a layperson (such as a close relative) with minimal training.

Supportive care during labor may enhance physiological labor processes and maternal feelings of agency and confidence in their own ability to successfully navigate the labor. In this way, it has been proposed that doula care may lead to reduced use of epidurals or other interventions (eg, oxytocin or Pitocin). The aim of the present report was to synthesize available evidence on the benefits and harms of doula support programs, with a focus on maternal, infant, and delivery outcomes as well as implementation characteristics of successful doula support initiatives. The report is intended to inform VHA policymaking related to comprehensive maternity care provided for pregnant Veterans.

We identified 41 relevant studies whose findings are summarized in Table ES-1 and Table ES-2. Included studies most often addressed delivery outcomes, followed by maternal and infant outcomes. Included studies suggest that trained doulas could be associated with a reduced rate of cesarean birth, whereas layperson doulas may reduce or have no effect on cesarean rates. We also found evidence that doula care by either trained or lay doulas could reduce or have no association with labor augmentation with oxytocin and reduction in labor pain. Both trained and layperson doula support was associated with shortened duration of labor, whereas only trained doula support appeared to have an association with reduction in epidural use. Importantly, this review did not identify any harms related to intrapartum doula care. With respect to neonatal outcomes, included studies suggest possible benefits of doula support on Apgar scores, frequency of low birth weight neonates, and neonatal intensive care unit (NICU) admission, and doula support did not appear to have negative impact.

Table ES-1. Summary of Findings – Trained Doula Support

Outcome	Strength of Evidence (SOE)	Summary
<i>Maternal and Delivery Outcomes</i>		
Maternal Mortality w/ Trained Doula Support	1 Cohort/non-RCT <i>Insufficient SOE</i>	Trained doula support may not be associated with maternal mortality
Cesarean w/ Trained Doula Support	12 RCTs 13 Cohort/non-RCTs <i>Moderate SOE</i>	Trained doula support may be associated with reduced rate of cesarean
Oxytocin/Pitocin use w/ Trained Doula Support	10 RCTs 2 Cohort/non-RCTs <i>Moderate SOE</i>	Trained doula support is likely associated with reduced or no difference in the use of oxytocin or Pitocin
Epidural use w/ Trained Doula Support	11 RCTs 6 Cohort/non-RCTs <i>Moderate SOE</i>	Trained doula support is likely associated with reduced or no difference in the use of epidural.
Labor Pain w/ Trained Doula Support	2 RCTs 3 Cohort/non-RCTs <i>Low SOE</i>	Trained doula support may be associated with reduced or no difference in labor pain
Duration of Labor w/ Trained Doula Support	12 RCTs 3 Cohort/non-RCTs <i>Moderate SOE</i>	Trained doula support is likely associated with shorter duration of labor

Outcome	Strength of Evidence (SOE)	Summary
<i>Neonatal Outcomes</i>		
Infant Mortality w/ Trained Doula Support	1 Cohort/non-RCTs <i>Insufficient SOE</i>	It is unclear whether trained doula support impacts infant mortality
Apgar Score w/ Trained Doula Support	9 RCTs 7 Cohort/non-RCTs <i>Low SOE</i>	Trained doula support may or may not be associated with better Apgar scores
Low Birth Weight w/ Trained Doula Support	2 RCTs 4 Cohort/non-RCTs <i>Low SOE</i>	Trained doula support may be associated with reduced or no difference in rates of low birth weight
NICU Admission w/ Trained Doula Support	3 RCTs 1 Cohort/non-RCT <i>Low SOE</i>	Trained doula support may be associated with lower or no difference in NICU admissions

Abbreviations. NICU=neonatal intensive care unit; RCT=randomized controlled trial; SOE=strength of evidence.

Available evidence on doula support has several important limitations. We were limited in our ability to compare findings across studies due to inconsistencies in study design and methodology, as well as the inconsistent and diverse definitions of trained labor support, its duration, and the varying quality and scope of doula training. Some studies also did not provide a clear description of how doula programs may have been implemented or relied on retrospective medical record review for presence of support person with no other descriptors on support provided. Common limitations among the RCTs included lack of information on non-adherence to interventions and lack of information on missing data. Limitations of observational studies included lack of information on doula support implementation and adherence, self-selection of patients into doula and control groups, and lack of statistical analysis.

In summary, available evidence suggests that full-spectrum trained doula support services in the form of continuous support during labor and delivery may be beneficial to birthing individuals. Specifically, we found that this type of support may improve birth (*eg*, higher 5-minute Apgar scores and reduced NICU admission) and maternal delivery outcomes (*eg*, reduced need for cesarean, reduced need for Pitocin/oxytocin). We found no evidence of harms of doula support or support by layperson companionship during labor. Evidence on doula support is generally limited by inconsistency in study methodologies and intervention definitions. Future research to identify key program components and optimal intervention characteristics is warranted.

Table ES-2. Summary of Findings – Layperson as Doula Support

Outcome	Strength of Evidence (SOE)	Summary
<i>Maternal and Delivery Outcomes</i>		
Cesarean w/ Layperson as Doula Support	5 RCTs 3 Cohort/non-RCTs <i>Low SOE</i>	Layperson as doula support may not be associated with reduced rate of cesarean
Oxytocin/Pitocin Use w/ Layperson as Doula Support	5 RCTs <i>Moderate SOE</i>	Layperson as doula support is likely associated with reduced or no difference in the use of oxytocin or Pitocin
Epidural Use	1 RCT <i>Insufficient SOE</i>	Layperson as doula support is not likely associated with the use of epidural

Outcome	Strength of Evidence (SOE)	Summary
w/ Layperson as Doula Support		
Labor Pain w/ Layperson as Doula Support	3 RCTs <i>Low SOE</i>	Layperson as doula support may be associated with reduced or no difference in labor pain
Duration of Labor w/ Layperson as Doula Support	5 RCTs 1 Cohort/non-RCTs <i>Moderate SOE</i>	Layperson as doula support is likely associated with shorter duration of labor
<i>Neonatal Outcomes</i>		
Apgar Score w/ Layperson as Doula Support	3 RCTs 2 Cohort/non-RCTs <i>Low SOE</i>	Layperson as doula support may be associated with better or no difference in Apgar scores
NICU Admission w/ Layperson as Doula Support	1 RCT 1 Cohort/non-RCT <i>Low SOE</i>	Layperson as doula support may be associated with lower NICU admissions

Abbreviations. NICU=neonatal intensive care unit; RCT=randomized controlled trial; SOE=strength of evidence.

EVIDENCE BRIEF

INTRODUCTION

PURPOSE

The ESP Coordinating Center (ESP CC) is responding to a request from the Veterans Health Administration (VHA) Office of Women's Health, Reproductive Health Division, for an Evidence Brief on the benefits of doula support for pregnant, birthing, and postpartum Veterans. Findings from this Brief will be used to inform development and piloting of a US Department of Veterans Affairs (VA) doula support program, which is intended to support the best possible maternal and infant outcomes for Veterans.

BACKGROUND

Over the last half century, the number of women entering and retiring from military services has increased dramatically¹ and has resulted in Veteran women being the fastest-growing US Veteran cohort.² In 1973, women composed only 2% of the enlisted forces and 8% of the officer corps. Today, they represent 16% of enlisted personnel and 19% of officers,³ and by some estimates, female service members will make up more than 16% of the total US Veteran population by 2042.⁴ With the increased number of Veteran women, the Veterans Health Administration (VHA) has experienced greater demand for tailored health services for Veteran women and their female partners/dependents of Veterans. VHA currently provides maternity care through purchased care in the community, and also employs Maternity Care Coordinators (MCCs) to navigate care for pregnant Veterans with their providers in and outside the VHA to ensure access to needed resources during pregnancy and the postpartum period.⁵

Coordination of comprehensive maternity care with ongoing VHA care is necessary, in part, due to the complex medical and mental health conditions that may increase pregnant Veterans' risk for adverse pregnancy outcomes.⁶ Veteran women have been shown to have a higher risk of gestational diabetes and hypertensive disorders of pregnancy⁷ and may experience higher rates of spontaneous abortion and ectopic pregnancies than their non-Veteran counterparts.⁸ High rates of military sexual trauma have also been found to be associated with poor birth outcomes including lower infant birth weight, less likelihood of full-term birth, and higher risk of postpartum depression.⁹ Additionally, Veteran women may be entering pregnancy with musculoskeletal conditions that could influence the trajectory of their pregnancy and birth. Musculoskeletal conditions are among the most common diagnoses in women returning from deployment and women are more likely to have back pain, joint disorders, and other musculoskeletal disorders after military service than their male counterparts.¹⁰

Contemporary maternal labor and delivery (L&D) care often consists of a hospital-based birth with a team of obstetrical medical providers. Birth companions or doulas can provide complementary continuous labor support throughout a pregnancy and are a globally recommended model of care. Doulas act as both coaches and companions to the pregnant individual and provide a range of reproductive care services depending on their degree of training and the clinical care setting. The most comprehensive care provided by doulas includes prenatal visits with childbirth education for expectant families, support during labor and delivery, postpartum care, lactation support, miscarriage support, and support for the loss of a pregnancy

or stillbirth if needed.¹¹ In the US, doula credentialing is not a requirement and is not standardized, but several organizations have developed training programs that range from weekend workshops to a full range of coursework and examination. In non-US settings, the role of a doula may be performed by a layperson (such as a close relative) with minimal training.

The American College of Obstetricians and Gynecologists (ACOG) cites doula support as “one of the most effective tools to improve labor and delivery,”¹² as trained and experienced doulas can fill important gaps in maternal health care by providing continuous physical and emotional support during pregnancy, childbirth, and the postpartum period.¹³ High rates of cesarean birth and the use of medical interventions during labor in the US are associated with significant morbidity and mortality.¹⁴ One of the leading causes of primary cesarean delivery is arrested labor, which in the hospital setting is often addressed with the use of oxytocin.¹⁵ Supportive care during labor may enhance physiological labor processes and maternal feelings of agency and confidence in the birthing person’s ability to successfully navigate the labor, possibly reducing the need for labor interventions such as use of oxytocin or epidural analgesia.¹⁵

The aim of the present report was to synthesize available evidence on the benefits and harms of doula support programs, with a focus on maternal, infant, and delivery outcomes as well as implementation characteristics of successful doula support initiatives. The report is intended to inform VHA policymaking related to comprehensive maternity care provided for pregnant Veterans.

METHODS

PROTOCOL

A preregistered protocol for this review can be found on the PROSPERO international prospective register of systematic reviews (<http://www.crd.york.ac.uk/PROSPERO/>; registration number CRD42022302806).

KEY QUESTIONS

The following key questions (KQs) were the focus of this review:

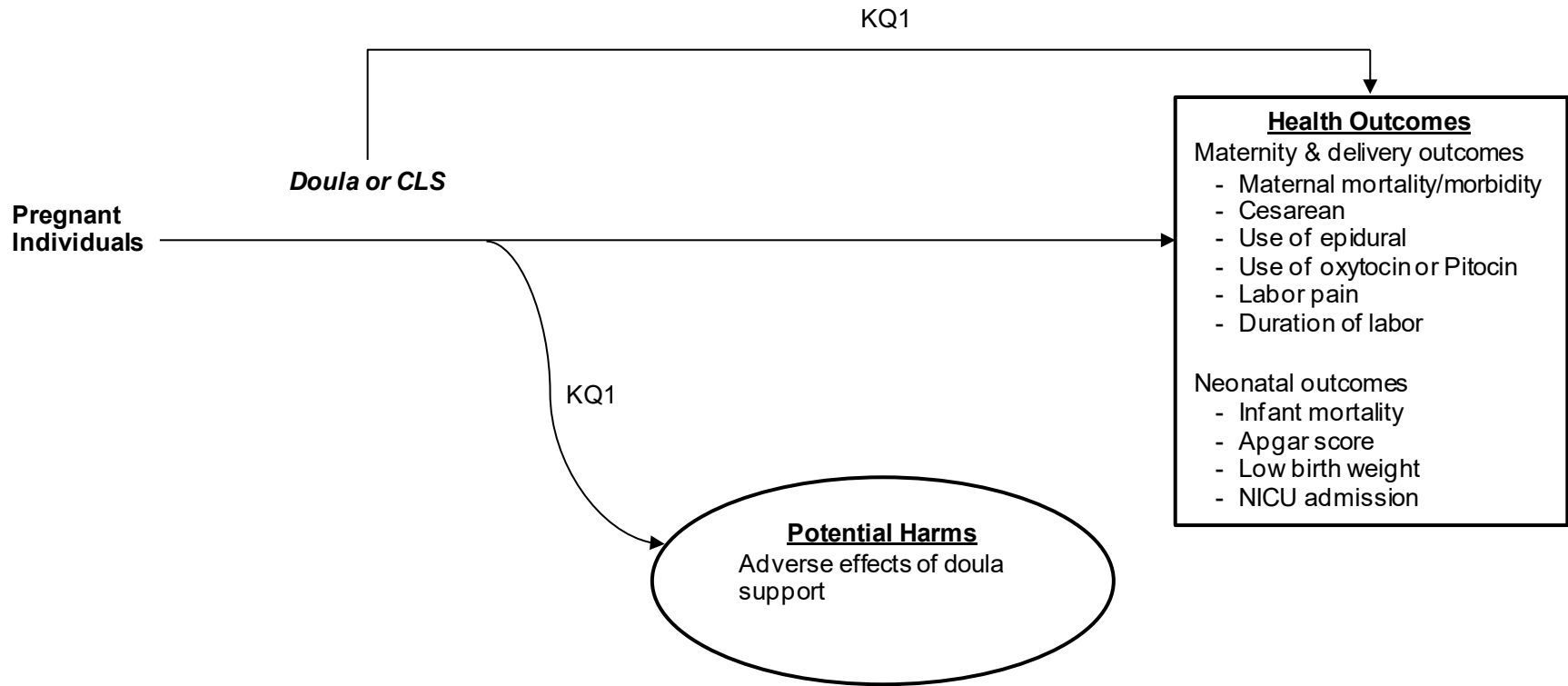
KQ1: What are the benefits and harms of doula support programs to maternal and neonatal outcomes?

KQ2: What are the implementation characteristics of doula support programs shown to improve maternal and infant outcomes?

ANALYTIC FRAMEWORK

The analytic framework shown in Figure 1 provides a conceptual overview of this review. The benefits and harms of doula support programs in terms of maternal outcomes (*maternal mortality/morbidity, labor pain, and complications resulting from labor*), neonatal outcomes (*infant mortality, Apgar scores, low birth weight, neonatal intensive care unit stay*), and delivery outcomes (*cesarean, duration of labor need for labor augmentation*) were of interest (KQ1). Implementation characteristics of doula support programs shown to improve maternal and infant outcomes were also of interest (KQ2).

Figure 1. Analytic Framework



Abbreviations. CLS=continuous labor support; KQ=key question; NICU=neonatal intensive care unit.

ELIGIBILITY CRITERIA

The ESP included studies that met the following criteria:

<i>Population</i>	Pregnant, birthing, or postpartum adults
<i>Intervention</i>	Doula support (<i>ie</i> , one-on-one emotional support during pregnancy, labor, and/or postpartum)
<i>Comparator</i>	No doula support (<i>ie</i> , pregnant, birthing, or postpartum adults not receiving doula support)
<i>Outcomes</i>	<ul style="list-style-type: none"> • <i>KQ1</i>: Maternal mortality and severe morbidity (as defined by the Centers for Disease Control and Prevention; excluding blood product transfusion), neonatal outcomes (<i>eg</i>, low birth weight, neonatal intensive care unit stay), and reduction in low-risk cesarean delivery (<i>ie</i>, nulliparous, term, singleton, vertex [NTSV^a] cesarean births) • <i>KQ2</i>: Implementation characteristics (<i>eg</i>, level of training, timing [<i>ie</i>, during pregnancy, birthing, or postpartum period])
<i>Timing</i>	Any
<i>Setting</i>	Any
<i>Study Design</i>	Any, but we may prioritize articles using a best-evidence approach to accommodate Evidence Brief timeline.

Note. ^aNulliparous, Term, Singleton, Vertex (NTSV) describes a live birth at or beyond 37.0 weeks gestation, in the individual's first pregnancy, that are singleton (no twins or beyond) and in the vertex presentation (no breech or transverse positions), via cesarean birth.

DATA SOURCES AND SEARCHES

To identify articles relevant to the key questions, a research librarian searched Ovid MEDLINE, CINAHL, Cochrane Database of Systematic Reviews, and ClinicalTrials.gov, as well as AHRQ and HSR&D databases, through January 2022 using terms for *doula support* and *labor/birth companions* (see Appendix A in Supplemental Materials for complete search strategies). Additional citations were identified from hand-searching reference lists of existing systematic reviews and consultation with content experts. We included all relevant studies from 2 systematic reviews^{15,16} and 1 meta-analysis¹⁶ of relevant studies encompassing this topic. We limited the search to published and indexed articles involving human subjects available in the English language. Study selection was based on the eligibility criteria described above. Studies of labor support by trained professionals such as registered nurses (RNs), nurse practitioners (NPs), midwives, or other labor and delivery professionals were excluded. Titles, abstracts, and full-text articles were reviewed by 1 investigator and checked by another using an online systematic review platform (PICO Portal¹⁷). All disagreements were resolved by consensus or discussion with a third investigator.

DATA ABSTRACTION AND ASSESSMENT

Effect information and population, intervention, and comparator characteristics were abstracted from all included studies. The internal validity (risk of bias) of each included study was rated using the ROBINS-I tool for observational studies¹⁸ and the Cochrane risk of bias tool for randomized controlled trials (RCTs).¹⁹ All data abstraction and internal validity ratings were first completed by 1 investigator and then checked by another; disagreements were resolved by consensus or discussion with a third investigator.

We graded the strength of the evidence (SOE) for each outcome based on the AHRQ Methods Guide for Comparative Effectiveness Reviews.²⁰ This approach provides a rating of confidence in reported findings based on trial methodology (design, quality, and risk of bias), consistency (whether effects are in the same direction and have a consistent magnitude), and directness (whether assessed outcomes are clinically important to patients and providers). When information on precision of findings (eg, confidence intervals) is available, certainty of evidence is also evaluated. For this review, we applied the following general algorithm: *high strength* evidence consisted of multiple, large studies with low risk of bias, consistent and precise findings, and clinically relevant outcomes; *moderate strength* evidence consisted of multiple studies with low to unclear risk of bias, consistent and precise findings, and clinically relevant outcomes; *low strength* evidence consisted of a single study, or multiple small studies, with unclear to high risk of bias, inconsistent or imprecise findings, and/or outcomes with limited clinical relevance; and *insufficient* evidence consisted of a single study with unclear or high risk of bias, or no available studies.

SYNTHESIS

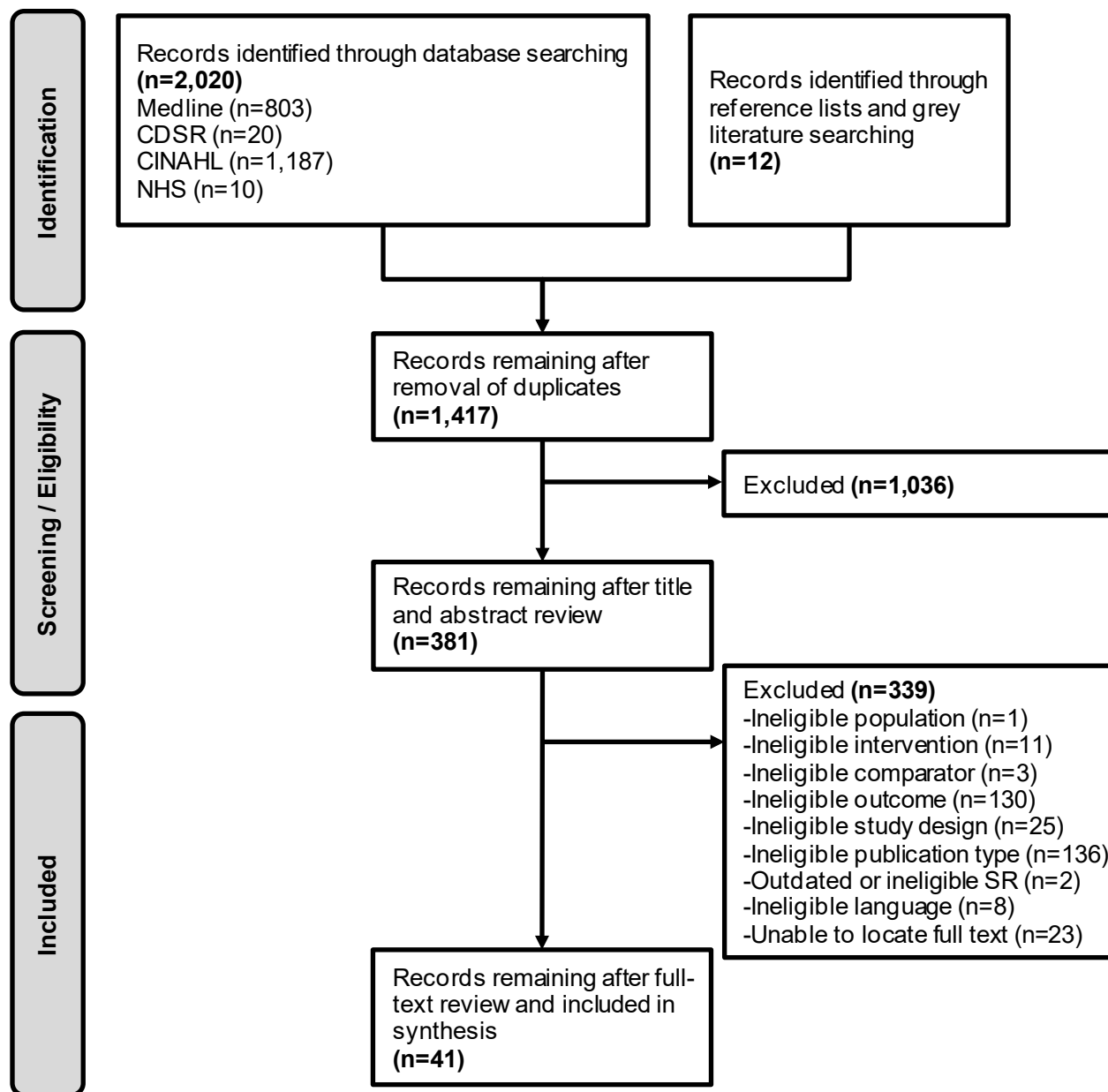
We synthesized the evidence narratively by outcomes (maternal and delivery, and neonatal), and by type of doula/continuous labor support (trained doula support and layperson doula support).

RESULTS

LITERATURE FLOW

The literature flow diagram (Figure 2) summarizes the results of the study selection process (full list of excluded studies available in Appendix B in Supplemental Materials).

Figure 2. Literature Flowchart



Abbreviations. CDSR=Cochrane Register of Systematic Reviews; CINAHL=Cumulative Index of Nursing and Allied Health; NHS=National Health Service (UK).

LITERATURE OVERVIEW

Our search identified 381 potentially relevant articles after deduplication and initial title and abstract screening. We included 41 primary studies (in 42 publications), which are summarized in Table 1 (see Appendix C in Supplemental Materials for full study details).

Most studies²¹⁻⁵² examined the impact of trained doula support (*eg*, certified doulas, traditional birth attendants [TBAs], or doula-trained labor and delivery staff such as nurses, midwives, or Lamaze coaches). The remaining studies⁵³⁻⁶¹ examined the effect of untrained labor support (*eg*, family members, partners, or friends) who provided companionship to the birthing individual and had less than 2 hours of instruction or were provided no birthing education. Among the 41 studies reporting patient sample size, the median sample size was 8,979 (range: 34 to 280,087), with 5 studies including more than 10,000 patients in their sample by utilizing national data or retrospective medical record data. We identified 13 studies in progress (see Appendix F in Supplemental Materials) examining perinatal birth outcomes or maternal satisfaction outcomes related to continuous labor support utilizing trained doulas.

Of the studies that met inclusion criteria, 22 were RCTs, 7 were prospective cohort studies, 11 were retrospective cohort studies, and 1 was a non-randomized controlled trial. Most studies were rated as unclear risk of bias, and only 6 of 41 included studies were rated as low risk of bias. Common limitations among the RCTs included lack of information on non-adherence to interventions and lack of information on missing data. Limitations of observational studies included lack of information on doula support implementation and adherence, self-selection of patients into doula and control groups, and lack of statistical analysis.

Table 1. Characteristics of Included Studies

Study Country Design	N	Population	Intervention Characteristics	Comparator	Outcomes Assessed
<i>Trained Doula Support (Certified Doula, TBA, or Trained L&D Staff)</i>					
Austad 2020 ²¹ <i>Guatemala</i> Cohort	782	Birthing persons under TBA care as part of coverage of the MHA program.	TBAs trained as OCNs within the rural Maya villages in Guatemala	No OCN Services	Cesarean birth Duration of labor Infant mortality
Bolbol-Haghighi 2016 ²² <i>Iran</i> RCT	100	Pregnant adult with expected normal childbirth, without presence of disease, depression, or pregnancy complications	Midwifery students trained for supportive care by a skilled midwife	Routine care	Cesarean birth Oxytocin/Pitocin use Apgar score
Byrskog 2020 ²³ <i>Sweden</i> Cohort	17,699	Migrant birthing persons in Sweden who had received CBD services between 2008 and 2016	CBDs bilingual in Swedish and the birthing person's own language trained by registered midwives with CBD accreditation	Routine care	Cesarean birth Epidural use Apgar score Low birth weight
Campbell 2006 ²⁴ <i>US</i> RCT	600	Nulliparous, singleton, low-risk pregnant persons able to identify female friend or family to act as doula	Female friend or relative who had 2 sessions (2hrs) of labor support training	Control group had support people of their own choosing, but not doula-trained	Cesarean birth Epidural use Duration of labor Apgar score
Chen 2020 ²⁵ <i>Northern Taiwan</i> Cohort	220	Pregnant individuals able to communicate in Chinese or Taiwanese with term pregnancies ≥ 38 weeks	DONA-certified doulas	Routine care	Cesarean birth Oxytocin/Pitocin use Apgar score
Cogan 1988 ²⁶ <i>US</i> RCT	34	Pregnant persons (primigravids and multigravidas) at 26 to 37 weeks' gestation	Lamaze childbirth preparation instructor acting as a doula throughout labor	Routine care	Epidural Use Oxytocin/Pitocin use Duration of labor Apgar score Low birth weight NICU admission
Dickinson 2002 ²⁷ <i>Australia</i> RCT	992	Nulliparous pregnant persons with uncomplicated singleton fetus at term, cervical dilatation <5 cm,	Midwifery Support + pharmacologic and nonpharmacologic alternatives to epidural	Epidural for pain relief only	Cesarean birth Epidural use Duration of labor Apgar score

Study Country Design	N	Population	Intervention Characteristics	Comparator	Outcomes Assessed
Dundek 2006 ²⁸ <i>US</i> (Somali community) Cohort	348	Somali birthing persons who have been served by a Somali doula have given birth to live infants at this hospital	Hospital-based on-call DONA certified Somali women providing culturally competent doula care to Somali patients	Non-doula attended Somali births	Cesarean birth
Feng 2013 ²⁹ <i>China</i> Cohort	400	The primiparas with singleton fetus with uncomplicated singleton fetus at term	Doula Midwife + EPI Doula Midwife + analgesia	No support and no EPI	Cesarean birth Oxytocin/Pitocin use Labor pain Duration of labor
Fulton 2011 ³⁰ <i>US</i> Cohort	60	Primiparas, currently receiving public health insurance, English/Spanish speaking, not scheduled for C-section, ≤5 cm dilated	Doula midwife (identified through medical record review, no details provided).	Routine care	Epidural use Labor pain Apgar score
Gagnon 1997 ³¹ Gagnon 1999 ⁶² <i>Canada</i> RCT	413	Singleton pregnancies >37 weeks gestation, in labor and stimulated with oxytocin	Nurse 1:1 support during labor and birth	Routine care	Cesarean birth Oxytocin/Pitocin use Epidural use Duration of labor Apgar score NICU admission
Goedkoop 2009 ³² <i>UK</i> Cohort	140	Active NHS doulas in 2008	Doula support during birth and postnatal - any setting	NHS statistics for general maternity services	Cesarean birth Epidural use
Gordon 1999 ³³ <i>US</i> RCT	314	Nulliparous uncomplicated pregnancies in labor w/ cervix <5 cm dilated, >18 years old	Hospital based doula with CBD training	Routine care	Cesarean birth Oxytocin/Pitocin use Epidural use
Gruber 2013 ³⁴ <i>US</i> Cohort	226	Expectant individuals who attended at least 3 childbirth classes through Healthy Moms Healthy Babies program	Certified doula support during prenatal, birth, and postpartum period + childbirth education Doula support and at least 2 pre and 2 post-partum visits	Routine care	Maternal complications Cesarean birth

Study Country Design	N	Population	Intervention Characteristics	Comparator	Outcomes Assessed
Hans 2018 ³⁵ US RCT	312	Birthing persons meeting sociodemographic risk criteria from HFA/PAT models	Doula and home-visit services including pre/post-natal visits.	Pregnancies referred to available case management services	Cesarean birth Epidural use Low birth weight NICU admission
Hodnett 2002 ³⁶ US & Canada RCT	6915	Singleton or twin pregnancies >34 weeks gestation and established labor at time of randomization giving birth at a hospital with cesarean rates >15%, excluded if they were already expecting support with a doula	Continuous labor support by trained labor support nurse	Routine care	Cesarean birth Epidural use Apgar score
Isbir 2017 ³⁷ Turkey RCT	72	>18 years old, literate, primary education, ≥37 weeks gestation, ≤3 cm dilation, participants were excluded if they underwent cesarean birth, primipara or multipara, no contraindications to normal/vaginal birth	Midwifery students with obstetrics training in their 3rd year	Routine care	Labor pain Duration of labor
Kashanian 2010 ³⁸ Iran RCT	100	Nulliparous birthing persons aged 18-34 (low risk), with gestational age 38-42 weeks, live singleton fetus, cephalic presentation and expected normal birth weight	Midwife providing 1:1 support during labor, patient education from midwife	Routine care	Cesarean birth Oxytocin/Pitocin use Duration of labor Apgar score
Kennell 1991 ³⁹ US RCT	616	Nulliparous birthing persons, aged 13-34, with singleton uncomplicated pregnancy.	Trained doula who underwent 3-week training	Routine care	Cesarean birth Oxytocin/Pitocin use Epidural use Duration of labor
Kozhimannil 2013 ⁴⁰ US Cohort	280,087	Medicaid-funded singleton births and/or Medicaid beneficiaries	Everyday Miracles doula (DONA certified)	Routine care	Cesarean birth Epidural use Low Birth weight
Kozhimannil 2014 ⁴¹ US Cohort	2400	Birthing persons who gave birth to single infant in US hospital between 7/1/2011 and 6/30/2012, aged 18-45	Doula/trained labor assistant	Individuals with no doula support and individuals who indicated desire for	Cesarean birth

Study Country Design	N	Population	Intervention Characteristics	Comparator	Outcomes Assessed
				doula care but did not have it	
Langer 1998 ⁴² <i>Mexico</i> RCT	724	Single fetus, no previous vaginal delivery, <6 cm dilated, no indications of severe obstetric disease or elective C-section	Doula accompanied mother without interruption throughout labor, childbirth, and immediate post-partum period.	Routine care	Cesarean birth Epidural use Duration of labor Apgar score
Lesser 2005 ⁴³ <i>US</i> RCT	221	Patients >35 weeks of gestation, single gestation, English-speaking, no indication of elective C-section	Volunteer layperson, trained by La Leche League members	Routine care	Cesarean birth Oxytocin/Pitocin use Epidural use Duration of labor
McGrath 2008 ⁴⁴ <i>US</i> RCT	420	Nulliparous birthing persons 18-41 years in the 3rd trimester of an uncomplicated pregnancy, expected to be accompanied during labor by their male partner	Trained doula support	Routine care	Cesarean birth Oxytocin/Pitocin use Epidural use Apgar score
Mottl-Santiago 2008 ⁴⁵ <i>US</i> Cohort	11,471	Birthing persons giving birth at Boston Medical Center	Birth Sisters program providing support throughout active labor, birth, and the first several hours postpartum	No Birth Sisters program support	Cesarean birth Epidural use Apgar score
Nommsen-Rivers 2009 ⁴⁶ <i>US</i> Cohort	169	Primiparous, low-income birthing persons without known high-risk condition, English/Spanish speaking, within 20-mile radius of hospital, not scheduled for C-section, ≤5 cm cervical dilation	Trained volunteers who provided support through L&D, and 2 home post-partum visits	Routine care	Labor pain Apgar score
Ravangard 2017 ⁴⁷ <i>Iran</i> RCT	150	Nulliparous birthing persons, 16 to 44 years of age, gestational age of at least 32 weeks, no pregnancy complications, cephalic presentation	Doula presence during delivery (details of support NR)	Other non-medical methods of support (hot shower, aromatherapy, <i>etc</i>)	Labor pain
Shelp 2004 ⁶³ <i>US</i> (Somali community) Cohort	104	Somali birthing persons	Trained Somali layperson	No Somali doula support	Cesarean birth Apgar score

Study Country Design	N	Population	Intervention Characteristics	Comparator	Outcomes Assessed
Spiby 2015 ⁴⁹ <i>UK</i> Cohort	507	Disadvantaged birthing persons, referred to doula services	Trained volunteer doulas	Routine care	Cesarean birth Low birth weight NICU admission
Thomas 2017 ⁵⁰ <i>US</i> Cohort	489	Birthing persons who met WIC requirements in Black & Latino neighborhoods of Brooklyn, NY	Certified, full spectrum doulas subcontracted to support Healthy Start Brooklyn.	Non HSB program participants	Cesarean birth Low birth weight
Trueba 2000 ⁵¹ <i>Mexico</i> RCT	100	Birthing persons at term, engaged in an active phase of labor, exhibited ≥ 3 cm cervical dilatation, were nulliparous, had no previous uterine incision, and possessed adequate pelvises	Students from the Lamaze International Childbirth Educator program at Anahuac University under supervision of trained doula	Routine care	Cesarean birth Oxytocin/Pitocin use Duration of labor
Zhang 2018 ⁵² <i>China</i> Cohort	579	Birthing persons	Current or retired nurses with experience in midwifery and healthcare in the hospital	TENS unit OR Epidural analgesia	Apgar score Duration of labor
<i>Layperson as Doula (Partner, Friend or Relative)</i>					
Gadappa 2021 ⁵³ <i>India</i> Cohort	8,749	Birthing persons with singleton live fetus with cephalic presentation ≥ 37 weeks of gestational age, low risk, planning to deliver in hospital	Female friend/relative	Usual delivery care	Maternal complications Cesarean birth Apgar score NICU admission
Hofmeyr 1991 ⁵⁴ <i>South Africa</i> RCT	189	Nulliparous birthing persons in active labor, without obstetric complications, < 6 cm dilated	Lay volunteer trained in CLS by the researchers	Usual delivery care	Labor pain Cesarean birth Apgar score
Kabakian-Khasholian 2018 ⁵⁵ <i>Egypt, Lebanon, Syria</i> Cohort	2,491	Low-risk birthing persons (aged > 18) who arrived at the hospital with a female relative and who were planning a vaginal birth	Female relative provided with IEC materials	Usual delivery care	Cesarean birth Apgar score
KC 2020 ⁵⁶ <i>Nepal</i> Cohort	10,321	Birthing persons at 22+ weeks of gestation	Labor companion	Usual delivery care	Infant mortality Cesarean birth Low birth weight

Study Country Design	N	Population	Intervention Characteristics	Comparator	Outcomes Assessed
Klaus 1986 ⁵⁷ <i>Guatemala</i> RCT	417	Primigravids in early labor with cervical dilation of ≤ 3 cm	Guatemalan layperson with no obstetric training provided constant support and companionship	Usual delivery care	Cesarean birth NICU admission
Madi 1999 ⁵⁸ <i>Botswana</i> RCT	109	Primigravids with singleton pregnancy, no history of complications, 38-42 weeks gestation, and cephalic presentation	Female relative support	Usual delivery care	Cesarean birth Apgar score
Morhason-Bello 2009 ⁵⁹ <i>Nigeria</i> RCT	585	Pregnant singleton birthing persons with anticipated vaginal delivery, without previous caesarean, intrauterine fetal death, planned induction, multiple pregnancy, malpresentation, and/or chronic medical disorders	Labor companion	Usual delivery care	Labor pain Cesarean birth
Safarzadeh 2012 ⁶⁰ <i>Iran</i> RCT	150	Primiparous birthing persons in active labor with singleton pregnancy without severe obstetric disease	Female relative	Usual delivery care	Labor pain
Yuenyong 2012 ⁶¹ <i>Thailand</i> RCT	120	Birthing	Female relative	Usual delivery care	Cesarean birth Apgar score

Abbreviations. CBD=community-based doula; CLS=continuous labor support; DONA=Doulas of North America; EPI=epidural analgesia; HFA=Health Families America; HSB=Health Start Brooklyn; IEC=information, communication, & education; L&D=labor & delivery; MHA=Mayan Health Alliance; NHS=National Health Services; NICU=newborn intensive care unit; NR=not reported; OCN=obstetric care navigators; PAT=Parents as Teachers; RCT=randomized controlled trial; TBA=traditional birth attendant; TENS=transcutaneous electrical nerve stimulation; UK=United Kingdom; US=United States.

Notes. Apgar Score (appearance, pulse, grimace, activity, respiration) refers to a newborn assessment comprised of five components (color, heart rate, reflexes, muscle tone, and respiration), each scored as 0, 1, or 2, and the normative total value is >7 out of 10.

EFFECTIVENESS OF DOULA SUPPORT

Maternal and Delivery Outcomes

Maternal Mortality

It is unclear whether doula support impacts maternal mortality; our confidence in these findings is limited as this outcome was reported by a single observational study reporting maternal mortality outcomes (insufficient SOE) with wide variation in how the intervention was implemented across different locations.²¹ This study reported no maternal deaths among indigenous communities in Guatemala who were provided trained TBAs as obstetric care navigators (OCNs) to connect birthing individuals to clinics as needed for medical intervention (*ie*, providing medical intervention for high-risk patients) or among those without OCN support.

Cesarean Delivery

Trained doula support is likely associated with reduced rate or no difference in cesarean delivery rates, our confidence in these findings is moderate (moderate SOE) as they are supported by a large number of studies ($N = 25$) consistently reporting a reduction in or generally low rates of cesarean delivery with some methodological concerns. Of the 25 studies identified that used trained doula support, 7 studies^{25,29,38,39,44,51,63} reported lower rates of cesarean compared with no doula support, and 10 studies^{27,28,31,32,34,36,42-45,50} reported low rates of cesarean, but no significant differences between groups. Seven studies^{23,24,33,35,40,41,49} reported similar rates of cesarean across groups. A single study²¹ reported slightly higher rates of cesarean among doula-supported births, but in this study (described above), an increase in cesarean suggests that the doulas had escalated emergent cases to clinical care, as was the intent of the intervention.

Laypersons as doula support may also be associated with a reduced rate of cesarean delivery, but our confidence in these findings is low (low SOE) due to a smaller number of studies ($N = 8$) with inconsistent findings across studies and some study methodological limitations. Among the 8 studies where a layperson provided doula support, 4 studies^{53,57-59} reported lower cesarean rates with doula support, and 2 reported generally lower cesarean rates (nonsignificant).^{54,61} The remaining 2 studies^{55,56} reported higher rates of cesarean in supported groups. However, the studies reporting higher cesarean rates were likely limited by recall bias (semi-structured interviews conducted without consideration for time elapsed since the birth occurred) and inconsistent data collection methods in 1 study,⁵⁶ and variation in intervention birthing policies, intervention adherence, and time that the doula was allowed to spend with the birthing person among study locations in the second study.⁵⁵

Oxytocin/Pitocin Use

Consistent findings from 12 generally well-conducted studies indicated that trained doula support is likely associated with reduced or no difference in the use of oxytocin or Pitocin to accelerate labor progress (moderate SOE). Of the 12 studies reporting oxytocin or Pitocin use in births supported by a trained doula, 4 studies^{38,39,44,51} reported significantly lower use of oxytocin or Pitocin use in doula-supported births. A single prospective cohort study from Taiwan,²⁵ rated as high risk of bias based on high numbers of unexplained excluded participants and poor detail on participant selection, reported higher use of oxytocin or Pitocin in doula-supported births (66/97 [67.4%] vs 12/55 [33.3%], $p < .001$), while the remaining 7 studies (in 8

publications)^{22,26,29,31,33,37,43,62} reported similar rates of usage across groups with no significant differences in oxytocin or Pitocin use.

Layperson as doula support is also likely associated with reduced use of oxytocin or Pitocin to accelerate labor progress. Five studies consistently reported reduced rates of oxytocin or Pitocin use with layperson doula support (moderate SOE). All 5 studies⁵⁷⁻⁶¹ reported lower use of oxytocin or Pitocin use in births supported by layperson as doula support. While 2 well-conducted studies^{57,58} reported a statistically significant lower use of oxytocin or Pitocin, the 3 remaining studies⁵⁹⁻⁶¹ reported lower rates of use with non-significant differences in oxytocin or Pitocin use.

Epidural Use

Findings from 17 studies consistently reported that trained doula support is likely associated with a reduced rate or no difference in the rates of epidural use (moderate SOE). Of the 17 studies reporting data on epidural use in births supported by a trained doula, 7 studies^{23,26,27,30,35,39,44} reported significantly lower rates of epidural use, and the remaining 10 studies^{24,31-34,36,40,42,43,45,62} reported lower but nonsignificant differences in rates of epidural use between doula-supported compared with non-doula-supported groups.

It is unclear whether a layperson as doula support impacts epidural use. A single RCT set in Thailand⁶¹ was identified and reported no significant difference in epidural use with layperson doula support (insufficient SOE).

Labor Pain

Trained doula support may be associated with reduced labor pain, but our confidence in these findings is low (low SOE), as they are based on a small number of studies ($N = 5$) with considerable methodological limitations. One study excluded a high number of potential participants based on intention to use formula versus breast milk postpartum²⁹ and 2 others had unclear inclusion and allocation protocols.^{30,46} Of the 5 studies^{29,30,37,46,47} that reported labor pain in groups supported by trained doulas, 1 cohort study²⁹ demonstrated lower levels of pain (<6 on the Visual Analogue Scale; active phase 3.6 vs 8.8, $p < .05$) compared with births without trained doula support, and another RCT⁴⁷ reported fewer birthing persons reporting labor pain with trained doula support (36.52% vs 41.72%, $p < .001$). Three other studies^{30,37,46} reported no significant difference in labor pain ratings between those with and without trained doula support.

Laypersons as doula support may also be associated with reduced labor pain, but similarly, our confidence in these findings is limited (low SOE) based on a small number of studies ($N = 3$) with consistent reporting of pain reduction in supported groups using different scales and measures of pain assessment. Three studies^{54,59,60} that reported labor pain data found lower levels of pain at the end of active labor among groups supported by a layperson doula. One RCT,⁵⁹ using an untrained companion of the birthing person's choice, reported a small but significant difference in pain levels between supported and unsupported groups (mean = 6.3, 95% CI [6.1, 6.5] vs 6.9, 95% CI [6.7, 7.1], $p < .001$). Another RCT⁶⁰ using an untrained female friend or relative selected by the birthing person for support reported nonsignificant differences in severe pain during the start of active labor among 8 patients, but reported significantly fewer reports of severe labor pain among supported birth compared with unsupported births at the end of active phase (36 doula vs 61 control, $p = .001$). The third study⁵⁴ did not fully report pain data but

reported that the supported group scored 50% lower (nonsignificant) on the McGill Pain Rating Index compared with the unsupported control group.

Duration of Labor

Trained doula support is likely associated with shorter duration of labor, based on 14 studies consistently reporting shorter labor duration (moderate SOE). Of the 14 studies reporting on duration of labor, 8 reported shorter labor times^{22,24,26,27,37-39,52} in the supported group with trained doula support, 4 studies (in 5 publications)^{29,31,42,43,51,62} reported shorter but nonsignificant differences between groups, and 1 cohort study set in Taiwan²⁵ reported longer total labor duration among doula supported births, but also higher rates of natural birth (87.0% vs 56.8%) among doula-supported births.

Lay doula support is also likely to be associated with shorter or no difference in duration of labor, based on 6 studies consistently reporting reduction or no difference in labor duration (moderate SOE). Of the 6 studies reporting duration of labor with a layperson as doula support, 3 RCTs^{57,59,60} reported significantly shorter labor durations ($p < .05$ or better), and 2 studies^{54,61} had nonsignificant differences between supported groups compared with non-doula-supported groups. One cohort study⁵⁵ in hospital settings in Egypt, Lebanon, and Syria reported duration of labor was increased by 30 minutes ($p = .001$) after implementation of the birth companion model, but consistent with other included studies, the model was associated with significantly lowered cesarean birth rates.

Neonatal Outcomes

Infant Mortality

It is unclear whether trained doula support impacts infant mortality based on a single observational study directly reporting reduction in infant mortality with some methodological concerns (insufficient SOE). A single observational study²¹ of TBAs affiliated with the Mayan Health Alliance among rural Guatemalan villages observed fewer neonatal deaths among participants supported by TBAs compared to those who were not (6/276 [2.2%] vs 13/571 [2.8%]), although this difference was nonsignificant. Stillbirth rates were slightly higher in the doula-supported group (4/276 [1.5%] vs 0/571 [0%], $p = .007$). There were no studies identified that reported infant mortality rates among births supported by laypersons as doula.

Apgar Score

Trained doula support may or may not be associated with higher 5-minute Apgar scores (normative value = 7 to 10 points⁶⁴). Our confidence in these findings is limited by several studies with mixed findings and using different Apgar cut-off points (low SOE). We identified 16 studies that reported Apgar scores for neonates birthed with trained doula support. Nearly all studies had non-significant differences in Apgar at 1-minute assessment (Apgar of <7 at 1 min) but improved at the 5-minute assessment in both doula supported and non-doula-supported groups (Apgar of <7 at 5 minutes). Five studies^{22,24,26,30,36} reported higher Apgar at 5 minutes among doula-supported births (Apgar of >7 at 5 minutes, $p < .05$ or better), but one US-based study³⁰ employed an Apgar of 9 as a cut-off point instead of the standard value of 7 points. Nine studies^{23,25,27,31,38,42,44-46,48,52} reported no significant differences in Apgar score between doula-supported and non-doula-supported births with variation in whether Apgar scores were better or not between doula-supported and non-doula-supported births.

Laypersons as doula support may be associated with higher Apgar scores (5 min), but our confidence in these findings is limited by a small number of studies ($N = 5$) with mixed findings and some methodological concerns (low SOE). Of the 5 studies^{53-55,58,61} that reported Apgar scores in neonates birthed with layperson as doula support, 2 studies reported better Apgar scores with support. One South African RCT⁵⁴ utilizing a hospital volunteer as layperson support reported fewer neonates with Apgar score < 7 at 1 minute (12/87 [13.8%] vs 22/91 [24.2%], $p = 0.08$) and non-significant differences at 5 minutes. Another RCT set in India reported Apgar > 7 at 5 minutes for nearly all neonates in both groups irrespective of support (4174 (98.8%) vs 4233 (96.8%). Only 1 study⁵⁵ reported lower Apgar scores in layperson-supported births (Apgar score at 5 minutes < 6 : 11.6% vs 6.7%, 95% CI [0.03, 0.06], $p = .001$), although this study was limited by inconsistent adherence to the birth companion intervention and variation in hospital policies for companions in the birth space.

Low Birth Weight

Six studies reported fewer or no difference in the number of low birth weight (LBW) neonates with trained doula support with inconsistent classification of LBW (low SOE). Of these, 3 studies^{23,35,50} reported fewer LBW neonates with doula support, and 3 other studies^{26,40,49} found no significant difference in LBW between supported and unsupported births. The definition of low birth weight was not standardized across all studies, but many used ≤ 2500 grams as a cut-off (normative value > 2500 g, with LBW < 2500 g).⁶⁵ There were no studies identified that reported LBW among births supported by laypersons as doula.

NICU Admission

Trained doula support may be associated with lower NICU admission, based on 4 studies (in 5 publications) reporting non-significant differences in NICU admission rates between trained doula support and no support, but with mixed directions of effect (low SOE). NICU admissions were slightly lower in 1 study⁴⁹ and nonsignificant in the other 3 studies (in 4 publications).^{26,31,35,62} Similarly, in 2 studies with layperson doula support,^{53,57} NICU admission rates were lower or not significantly different between those with and without layperson doula support. Our confidence in these findings is limited by a small number of studies ($N = 2$) with some methodological concerns (low SOE).

HARMS OF DOULA SUPPORT

No studies were identified that reported harms related to trained doula support or support by laypersons acting as doula.

IMPLEMENTATION CHARACTERISTICS OF DOULA SUPPORT

No studies directly evaluated the impact of doula support implementation characteristics with maternal, delivery, or neonatal outcomes. Therefore, we were unable to synthesize evidence on successful doula programs. However, 32 studies provided implementation details for doula support, and key components are summarized in Table 2.

One systematic review⁶⁶ examined factors affecting the implementation of birth companions of choice in the labor and delivery space. Overall, the review reported positive experiences for the pregnant individual who was allowed a birthing companion, irrespective of the person providing the support. The most effective interventions were when support was provided by a non-

employee of the hospital. Major barriers to implementation included providers' negative perceptions of the birth companion, lack of resources to facilitate nurses or midwives' continuous presence with the pregnant person during labor and birth when they were the birthing companion of choice, constraints related to crowding and availability of space and privacy for the birthing family in the labor ward, and cultural preferences of the birthing person and companion.

Table 2. Characteristics of Doula Support

Support Type	Implementation Characteristics
Trained Doula Support ^{21-26,28-31,33-37,44,45,47-52,62}	<p>1:1 labor to delivery support</p> <ul style="list-style-type: none"> • Hospital-based certified doula or nurse/midwife with doula training as part of L&D team is assigned to birthing person either at initiation of active labor or at 3 cm dilation • Stays with birthing person to provide coaching and physical support through delivery <hr/> <p>1:1 start of labor to 2 hours postpartum support</p> <ul style="list-style-type: none"> • Hospital-based certified doula or doula-trained nurse/midwife as part of L&D team is assigned to birthing person either at initiation of active labor or at 3 cm dilation • Stays with birthing person to provide coaching and physical support through delivery • Provides breast-feeding and lactation support up to 2 hours postpartum <hr/> <p>1:1 Antenatal visits to postpartum support</p> <ul style="list-style-type: none"> • Private doula with credentials at hospital, may be part of L&D team, but begins contact with birthing person in the form of antenatal visits either at-home or in the hospital, provides education and works with birthing person on a birth plan while setting expectations for the labor/birthing process • Works with birthing person to understand requirements/needs/values of birthing person and acts as advocate for them in the delivery room • Stays with birthing person to provide coaching, emotional, and physical support through delivery • Provides breastfeeding and lactation support and postpartum visits • Provides grief support/counseling for birthing person in the case of unexpected birth outcomes or loss of pregnancy • Doulas often work independently from the hospital system and are specifically hired by the pregnant family. This independence helps keep them aligned with the preferences of their clients, and not influenced by hospital policies if they might go against preferences of the pregnant individual. It allows for advocacy of pregnant person's values and preferences.
Layperson as Doula Support ^{53-55,58-61}	<p>Family Relative/Friend</p> <ul style="list-style-type: none"> • Often a female person of the birthing person's choice that may have prior experience with labor and childbirth • May understand cultural or religious requirements/needs/values of birthing person and acts as advocate for them in the delivery room • Stays with birthing person to provide emotional and physical support through delivery as allowed by hospital policy <hr/> <p>Volunteer</p> <ul style="list-style-type: none"> • May be a friend/relative or hospital-based volunteer who stays with birthing person to provide emotional and physical support through delivery • May or may not have any previous pregnancy or childbirth experience

Abbreviation. L&D=labor and delivery.

DISCUSSION

This systematic review synthesized evidence on the benefits and harms of doula support initiatives and summarizes program implementation characteristics to inform development of a doula program within the VHA. Included studies suggest that trained doulas could be associated with a reduced rate of cesarean birth, whereas layperson doulas may reduce or have no effect on cesarean rates. We also found evidence that doula care by either trained or lay doulas could reduce or have no association with labor augmentation with oxytocin and reduction in labor pain. Both trained and layperson doula support was associated with shortened duration of labor, whereas only trained doula support appeared to have an association with reduction in epidural use. With respect to neonatal outcomes, included studies suggest possible benefits of doula support on Apgar scores, frequency of low birth weight neonates, and neonatal intensive care unit (NICU) admission, and doula support did not appear to have negative impact.

By categorizing interventions in our review based on doula training level, we hoped to learn how training could affect the above studied outcomes. There was a lack of evidence for a reduction in cesarean rates in the layperson doula intervention group. Otherwise, the positive associations for maternal/delivery outcomes including oxytocin use, duration of labor, and pain perception could be observed in studies with both trained and lay doulas.

Our findings are generally consistent with prior reviews and a meta-analysis on this topic. For example, a 2017 review¹⁵ explored outcomes of doula support in 27 trials (17 of which were included in the current review) and concluded that doula support was associated with increases in spontaneous vaginal delivery, decreases in cesarean rates, reduced use of intrapartum analgesia, shorter labors, and less likelihood of low 5-minute Apgar scores, with low strength of evidence for each of these findings. A 2015 meta-analysis¹⁶ of 5 RCTs (all included in this review) found that doula care significantly reduced cesarean rates and reduced instrumental vaginal delivery, an outcome not specifically addressed in the current review. In this review, epidural and oxytocin use was reduced in the doula care group but did not reach statistical significance. Similarly, a 2015 review⁶⁷ of 48 studies found a reduction in cesarean rates, epidural use, and labor augmentation with doula support. Finally, a 2012 AHRQ review⁶⁸ examining strategies to reduce cesarean rates in low-risk pregnant individuals included 4 studies of doula support programs grouped by whether care was delivered by trained doula or lay providers. This review found low strength of evidence to support a reduction in cesarean deliveries with trained doulas and only 1 RCT suggesting a similar reduction with lay providers of doula support.

Synthesizing evidence on how doula care may affect the subjective birthing experience of the mother was beyond the scope of this review. However, findings from a number of qualitative or mixed-methods studies have suggested that doula care can be useful for contributing to the positive experience of the mother, including through offering stability and security throughout the birthing process, increasing self-efficacy, and helping to advocate for the mother's needs throughout the birthing process.^{24,42,69} These potential benefits may be important in the context of intrapartum care among Veterans, particularly for Veterans with trauma histories or chronic pain. In the same vein, training in trauma-informed care and knowledge of the mental health conditions commonly affecting Veterans could help doulas best support birthing persons' mental health needs and facilitate referrals to a higher level of care when needed. A list of competencies used by major doula organizations (eg, Doulas of North America and the International Childbirth Education Association)^{13,70} and the birth doula scope of practice is provided in Appendix E.

The increased number of women separating from the armed forces has corresponded with recent legislative actions focusing on maternal and neonatal outcomes among Veterans. In November 2021, the Department of Defense announced a new program that will provide a certified doula and a lactation consultant to assist vaginal or cesarean births under the supervision of an authorized practitioner to users of the Tricare health program at civilian facilities in the US, with a projected expansion internationally by 2025.^{71,72} A similar pilot program will be implemented within the VHA according to the Delivering Optimally Urgent Labor Access for Veterans Affairs Act of 2021 (DOULA Act for VA), and the Protecting Moms Who Served Act of 2021 was recently passed to direct \$15 million towards VHA maternity care.

LIMITATIONS

Inconsistent methodology and design of included studies limits the ability to compare findings across studies, as does the inconsistent and diverse definition of trained labor support, its duration, and the varying quality and scope of doula training. Some studies also did not provide a clear description of how doula programs may have been implemented or relied on retrospective medical record review for presence of support person with no other descriptors on support provided. Wide variation in the type of doula (trained or layperson) and level and timing of doula support interventions reduced our ability to compare outcomes across studies. Additionally, some studies were conducted in developing countries while others were in high-income countries in which the context of birth is very different. Given the scope and purpose of this review, we focused on characteristics of doula support and outcomes of interest without consideration to health care system and health care access.

Limitations of our methods include single review at the abstract screening level and sequential review for study selection, data abstraction, and quality assessment (in contrast to dual independent review for all steps), which could have led to missing eligible studies. Although our scope focused on outcomes of greatest interest to VHA populations, these outcomes did not always align with the outcomes of interest in included studies. For example, in one included cohort study,⁵⁵ a doula program resulted in a significant change in birthing culture and woman-centered care in countries in which labor companionship in hospitals was previously not allowed. In another study,²¹ an increase in cesarean rates among the intervention group was a benefit (rather than an adverse event), as it indicated an increase in appropriate referrals for obstetric care among higher risk pregnant individuals where emergent medical care would not have been possible otherwise.

RESEARCH IN PROGRESS AND FUTURE RESEARCH

We identified 13 studies in progress (see Appendix F in Supplemental Materials) which examine perinatal birth outcomes or maternal satisfaction outcomes related to continuous labor support utilizing trained doulas. These studies are largely focused on US populations and aim to address issues around health care access and other social determinants of health impacting at-risk civilian pregnant individuals (eg, socioeconomic status, education, incarceration, race, and ethnicity). As noted in a 2018 evidence review conducted by the ESP,⁷³ few available research publications examine social determinants impacting health behaviors, health services utilization, and health outcomes for Veterans such as rurality, mental health, trauma, sexual orientation, and gender identity.

In addition, while not specifically described as a harm, some excluded studies⁷⁴⁻⁷⁶ reported anecdotal data from provider surveys that described some conflict between practitioners and doulas related to perceptions of obstetric/physician culture compared with natural birth “counter culture.” These studies suggest that such conflict could be perceived as harmful to the birthing environment or contribute to maternal anxiety if the patient is aware of the tension. These studies also reported improvement in working relationships through education about the scope of practice for birth and labor doulas and by clarification of roles on maternity care teams, particularly among staff with overlapping roles (*eg*, midwives and L&D team members). It may be important for future research and program implementations to include trainings to help ensure buy-in of personnel and reduce biases against doula-provided care.

The most applicable future research for VHA program planning would focus on the services provided by trauma-informed, full-spectrum doula care, as this is the type of model most employed in US settings and most likely to be piloted within the VHA. As noted, we found considerable variation among doula programs and little evidence identifying key program components. Moreover, many study interventions may not be accurate representations of real-world doula care, which is often more comprehensive and longitudinal.⁶⁷ In most studies, pregnant individuals met a doula at the time of presenting to the hospital in labor, whereas many professional doulas’ support is initiated in the prenatal period and continues after birth. Future research and program evaluations that aim to examine critical components and implementation characteristics (*eg*, timing of doula care initiation, training in trauma-informed care) would help clarify the best doula program model for the VHA context.

CONCLUSIONS

Available evidence suggests that full-spectrum trained doula support services in the form of continuous support during labor and delivery may be beneficial to birthing individuals. Specifically, we found that this type of support may improve birth (*eg*, higher 5-minute Apgar scores and reduced NICU admission) and maternal delivery outcomes (*eg*, reduced need for cesarean, reduced need for Pitocin/oxytocin). We found no evidence of harms of doula support or support by layperson companionship during labor. Evidence on doula support is generally limited by inconsistency in study methodologies and intervention definitions. Future research to identify key program components and optimal intervention characteristics is warranted.

REFERENCES

1. Women Veterans Task Force. *2012 Report - Strategies for Serving Our Women Veterans*. 2012.
2. Mattocks KM, Skanderson M, Goulet JL, et al. Pregnancy and mental health among women veterans returning from Iraq and Afghanistan. *Journal of Women's Health*. 2010;19(12):2159-2166.
3. Council on Foreign Relations. Demographics of the U.S. Military. <https://www.cfr.org/backgrounder/demographics-us-military#:~:text=Today%2C%20women%20represent%2016%20percent%20of%20the%20enlisted,inclusive%20force%20that%20attracts%20the%20country%E2%80%99s%20top%20talent>. Published 2020. Accessed 3/1/22.
4. Department of Veteran Affairs. *Study of Barriers for Women Veterans to VA Health Care*. 2015.
5. Department of Veteran Affairs. Women Veterans Health Care. <https://www.womenshealth.va.gov/WOMENSHEALTH/OutreachMaterials/GeneralHealthandWellness/maternity.asp>. Published 2022. Accessed.
6. Gray S. UMMS, VA launch first ever VA study of women's maternal health care. In. Vol 2022. UMass Chan Medical School 2016.
7. Katon J, Mattocks K, Zephyrin L, et al. Gestational diabetes and hypertensive disorders of pregnancy among women veterans deployed in service of operations in Afghanistan and Iraq. *Journal of women's health*. 2014;23(10):792-800.
8. Araneta MRG, Kamens DR, Zau AC, et al. Conception and pregnancy during the Persian Gulf War: the risk to women veterans. *Annals of epidemiology*. 2004;14(2):109-116.
9. Nillni YI, Fox AB, Cox K, Paul E, Vogt D, Galovski TE. The impact of military sexual trauma and warfare exposure on women veterans' perinatal outcomes. *Psychol Trauma*. 2021.
10. Preliminary Investigation of Outpatient Community Care Use Among Veteran VHA Patients, FY18. Women Veterans in the Veterans Health Administration; 2018. https://www.herc.research.va.gov/files/MPDF_WHEI-FY18-CC-Out-prelim.pdf. Accessed 3/8/2022.
11. National Health Law Center. *Building A Successful Program For Medi-Cal Coverage For Doula Care: Findings From A Survey of Doulas in California*. 2020.
12. ACOG. *Safe Prevention of the Primary Cesarean Delivery. Consensus Statement of the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine*. 2014.
13. DONA International. *Position Paper: The Birth Doula's Role in Maternity Care*. 2016.
14. Caughey AB, Cahill AG, Guise JM, Rouse DJ. Safe prevention of the primary cesarean delivery. *Am J Obstet Gynecol*. 2014;210(3):179-193.
15. Bohren MA, Hofmeyr GJ, Sakala C, Fukuzawa RK, Cuthbert A. Continuous support for women during childbirth. *Cochrane Database of Systematic Reviews*. 2017;7:CD003766.
16. Fortier JH, Godwin M. Doula support compared with standard care: Meta-analysis of the effects on the rate of medical interventions during labour for low-risk women delivering at term. *Canadian Family Physician*. 2015;61(6):e284-e292.
17. PICO Portal. www.picportal.org. Published 2021. Accessed.

18. Thomson H, Craig P, Hilton-Boon M, Campbell M, Katikireddi SV. Applying the ROBINS-I tool to natural experiments: an example from public health. *Systematic Reviews*. 2018;7(1):15.
19. Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ*. 2019;366:l4898.
20. Berkman ND, Lohr KN, Ansari MT, et al. Grading the strength of a body of evidence when assessing health care interventions: an EPC update. *J Clin Epidemiol*. 2015;68(11):1312-1324.
21. Austad K, Juarez M, Shryer H, Moratoya C, Rohloff P. Obstetric care navigation: results of a quality improvement project to provide accompaniment to women for facility-based maternity care in rural Guatemala. *BMJ Quality & Safety*. 2020;29(2):169-178.
22. Bolbol-Haghighi N, Masoumi SZ, Kazemi F. Effect of Continued Support of Midwifery Students in Labour on the Childbirth and Labour Consequences: A Randomized Controlled Clinical Trial. *Journal of Clinical and Diagnostic Research JCDR*. 2016;10(9):QC14-QC17.
23. Byrskog U, Small R, Schytt E. Community-based bilingual doulas for migrant women in labour and birth - findings from a Swedish register-based cohort study. *BMC Pregnancy & Childbirth*. 2020;20(1):721.
24. Campbell DA, Lake MF, Falk M, Backstrand JR. A randomized control trial of continuous support in labor by a lay doula. *J Obstet Gynecol Neonatal Nurs*. 2006;35(4):456-464.
25. Chen CC, Lee JF. Effectiveness of the doula program in Northern Taiwan. *Tzuchi Medical Journal*. 2020;32(4):373-379.
26. Cogan R, Spinnato JA. Social support during premature labor: effects on labor and the newborn. *Journal of Psychosomatic Obstetrics & Gynecology*. 1988;8(3):209-216.
27. Dickinson JE, Paech MJ, McDonald SJ, Evans SF. The impact of intrapartum analgesia on labour and delivery outcomes in nulliparous women. *Australian and New Zealand journal of obstetrics and gynaecology*. 2002;42(1):65-72.
28. Dundek LH. Establishment of a Somali doula program at a large metropolitan hospital. *Journal of Perinatal & Neonatal Nursing*. 2006;20(2):128-137.
29. Feng BB, Wang L, Zhai JJ. Investigation on delivery analgesia effect of combined spinal epidural anesthesia plus Doula and safety of mother and baby. *Clinical & Experimental Obstetrics & Gynecology*. 2013;40(4):574-578.
30. Fulton JM. *Doula Supported Childbirth: An Exploration of Maternal Sensitivity, Self-Efficacy, Responsivity, and Parental Attunement*, University of California, Davis; 2011.
31. Gagnon AJ, Waghorn K, Covell C. A randomized trial of one-to-one nurse support of women in labor. *Birth*. 1997;24(2):71-77.
32. Goedkoop V. Side by side -- a survey of doula care in the UK in 2008. *MIDIRS Midwifery Digest*. 2009;19(2):217-218.
33. Gordon NP, Walton D, McAdam E, Derman J, Gallitero G, Garrett L. Effects of providing hospital-based doulas in health maintenance organization hospitals. *Obstetrics & Gynecology*. 1999;93(3):422-426.
34. Gruber KJ, Cupito SH, Dobson CF. Impact of doulas on healthy birth outcomes. *Journal of Perinatal Education*. 2013;22(1):49-58.
35. Hans SL, Edwards RC, Zhang Y. Randomized Controlled Trial of Doula-Home-Visiting Services: Impact on Maternal and Infant Health. *Maternal & Child Health Journal*. 2018;22(Suppl 1):105-113.

36. Hodnett ED, Lowe NK, Hannah ME, et al. Effectiveness of nurses as providers of birth labor support in North American hospitals: a randomized controlled trial. *JAMA*. 2002;288(11):1373-1381.
37. Isbir GG, Sercekus P. The Effects of Intrapartum Supportive Care on Fear of Delivery and Labor Outcomes: A Single-Blind Randomized Controlled Trial. *Journal of Nursing Research*. 2017;25(2):112-119.
38. Kashanian M, Javadi F, Haghighi MM. Effect of continuous support during labor on duration of labor and rate of cesarean delivery. *International Journal of Gynecology & Obstetrics*. 2010;109(3):198-200.
39. Kennell J, Klaus M, McGrath S, Robertson S, Hinkley C. Continuous emotional support during labor in a US hospital. A randomized controlled trial. *JAMA*. 1991;265(17):2197-2201.
40. Kozhimannil. Doula care, birth outcomes, and costs among Medicaid beneficiaries. 2013.
41. Kozhimannil KB, Attanasio LB, Jou J, Joarnt LK, Johnson PJ, Gjerdingen DK. Potential benefits of increased access to doula support during childbirth. *American Journal of Managed Care*. 2014;20(8):e340-352.
42. Langer A, Campero L, Garcia C, Reynoso S. Effects of psychosocial support during labour and childbirth on breastfeeding, medical interventions, and mothers' wellbeing in a Mexican public hospital: a randomised clinical trial. *British Journal of Obstetrics & Gynaecology*. 1998;105(10):1056-1063.
43. Lesser PA, Maurer M, Stephens S, Yolkut R. Doulas for all. *International Journal of Childbirth Education*. 2005;20(3):28-32.
44. McGrath SK, Kennell JH. A randomized controlled trial of continuous labor support for middle-class couples: effect on cesarean delivery rates. *Birth*. 2008;35(2):92-97.
45. Mottl-Santiago J, Walker C, Ewan J, Vragovic O, Winder S, Stubblefield P. A hospital-based doula program and childbirth outcomes in an urban, multicultural setting. In. *Maternal & Child Health Journal*. Vol 122008:372-377.
46. Nommsen-Rivers LA, Mastergeorge AM, Hansen RL, Cullum AS, Dewey KG. Doula care, early breastfeeding outcomes, and breastfeeding status at 6 weeks postpartum among low-income primiparae. *J Obstet Gynecol Neonatal Nurs*. 2009;38(2):157-173.
47. Ravangard R, Basiri A, Sajjadnia Z, Shokrpour N. Comparison of the Effects of Using Physiological Methods and Accompanying a Doula in Deliveries on Nulliparous Women's Anxiety and Pain: A Case Study in Iran. *Health Care Manager*. 2017;36(4):372-379.
48. Shalev J. Having a doula during labor and delivery. *Midwifery Today & Childbirth Education*. 1992(24):8-9.
49. Spiby H, Green, J. M., Darwin, Z., Willmot, H., Knox, D., McLeish, J., & Smith, M. Multisite implementation of trained volunteer doula support for disadvantaged childbearing women: a mixed-methods evaluation. *Centre for Reviews and Dissemination*. 2015.
50. Thomas MP, Ammann G, Brazier E, Noyes P, Maybank A. Doula Services Within a Healthy Start Program: Increasing Access for an Underserved Population. *Maternal & Child Health Journal*. 2017;21(Suppl 1):59-64.
51. Trueba G, Contreras C, Velazco MT, Lara EG, Martinez HB. Alternative strategy to decrease cesarean section: support by doulas during labor. *Journal of Perinatal Education*. 2000;9(2):8-13.

52. Zhang Y, Johnston L, Ma D, Wang F, Zheng X, Xu X. An exploratory study of the effect of labor pain management on postpartum depression among Chinese women. *Ginekologia Polska*. 2018;89(11):627-636.
53. Gadappa SN, Deshpande SS. A Quasi-Experimental Study to Compare the Effect of Respectful Maternity Care Using Intrapartum Birth Companion of Her Choice on Maternal and Newborn Outcome in Tertiary Care Centre. *Journal of Obstetrics & Gynaecology of India*. 2021;71(Suppl 2):84-89.
54. Hofmeyr GJ, Nikodem VC, Wolman W-L, Chalmers BE, Kramer T. Companionship to modify the clinical birth environment: effects on progress and perceptions of labour, and breastfeeding. *BJOG: An International Journal of Obstetrics & Gynaecology*. 1991;98(8):756-764.
55. Kabakian-Khasholian T, Bashour H, El-Nemer A, Kharouf M, Elsheikh O, Labour Companionship Study G. Implementation of a labour companionship model in three public hospitals in Arab middle-income countries. *Acta Paediatrica*. 2018;107 Suppl 471:35-43.
56. KC A, Axelin A, Litorp H, Tinkari BS, Sunny AK, Gurung R. Coverage, associated factors, and impact of companionship during labor: A large-scale observational study in six hospitals in Nepal. *Birth*. 2020a;47(1):80-88.
57. Klaus MH, Kennell JH, Robertson SS, Sosa R. Effects of social support during parturition on maternal and infant morbidity. *British Medical Journal Clinical Research Ed*. 1986;293(6547):585-587.
58. Madi BC, Sandall J, Bennett R, MacLeod C. Effects of female relative support in labor: a randomized controlled trial. *Birth*. 1999;26(1):4-8.
59. Morhason-Bello IO, Adedokun BO, Ojengbede OA. Social support during childbirth as a catalyst for early breastfeeding initiation for first-time Nigerian mothers. *International Breastfeeding Journal*. 2009;4:7p-7p.
60. Safarzadeh A, Beigi M, Salehian T, Khojasteh F, Burayri T, Navabirigi S. Effect of doula support on labour pain and outcomes in primiparous women in Zahedan, southeastern Iran: a randomized controlled trial. *J Pain Relief*. 2012;1(5):2167-0846.1000112.
61. Yuenyong S, O'Brien B, Jirapeet V. Effects of labor support from close female relative on labor and maternal satisfaction in a Thai setting. *J Obstet Gynecol Neonatal Nurs*. 2012;41(1):45-56.
62. Gagnon AJ, Waghorn K. One-to-one nurse labor support of nulliparous women stimulated with oxytocin. *J Obstet Gynecol Neonatal Nurs*. 1999;28(4):371-376.
63. Shelp A. Women helping women: the Somali Doula Initiative. *International Journal of Childbirth Education*. 2004;19(4):4-7.
64. ACOG. Committee Opinion #644: The Apgar Score. <https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2015/10/the-apgar-score>. Published 2015. Accessed.
65. Cutland CL, Lackritz EM, Mallett-Moore T, et al. Low birth weight: Case definition & guidelines for data collection, analysis, and presentation of maternal immunization safety data. *Vaccine*. 2017;35(48 Pt A):6492-6500.
66. Kabakian-Khasholian T, Portela A. Companion of choice at birth: factors affecting implementation. *BMC Pregnancy and Childbirth*. 2017;17(1):265.
67. Steel A, Frawley J, Adams J, Diezel H. Trained or professional doulas in the support and care of pregnant and birthing women: a critical integrative review. *Health & Social Care in the Community*. 2015;23(3):225-241.

68. Hartmann KE, Andrews JC, Jerome RN, et al. *Agency for Healthcare Research and Quality*. 2012;12(13):10.
69. Lundgren I. Swedish women's experiences of doula support during childbirth. *Midwifery*. 2010;26(2):173-180.
70. ICEA. Certification Information, <https://icea.org/certification/icea-certification-philosophy-and-programscertification/>. Published 2022. Accessed.
71. Military.com. Tricare Maternity Care For Active Duty and Separating Families. [https://www.military.com/benefits/tricare/tricare-maternity-care-options.html#:~:text=Active%20duty%20service%20members%20are%20expected%20to%20receive,a%20local%20civilian%20hospital%20for%20the%20actual%20delivery](https://www.military.com/benefits/tricare/tricare-maternity-care-options.html#:~:text=Active%20duty%20service%20members%20are%20expected%20to%20receive,a%20local%20civilian%20hospital%20for%20the%20actual%20delivery.). Published 2022. Accessed.
72. Veterans Authority. Pilot Program For Tricare to Cover Doulas, Lactation Consultants Begin. 2021.
73. Duan-Porter W, Martinson BC, Greer N, et al. Evidence Review—Social Determinants of Health for Veterans. *J Gen Intern Med*. 2018;33(10):1785-1795.
74. Neel K, Goldman R, Marte D, Bello G, Nothnagle MB. Hospital-based maternity care practitioners' perceptions of doulas. *Birth*. 2019;46(2):355-361.
75. Summerton JV, Mtileni TR, Moshabela ME. Experiences and perceptions of birth companions supporting women in labour at a District Hospital in Limpopo, South Africa. *Curationis*. 2021;44(1):e1-e7.
76. Bohren MA, Berger BO, Munthe-Kaas H, Tuncalp O. Perceptions and experiences of labour companionship: a qualitative evidence synthesis. *Cochrane Database of Systematic Reviews*. 2019;3:CD012449.