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Editorial

Reflecting on 2022 and Moving Forward in 2023

The dawn of the new year provides an opportunity to reflect on achievements from 2022 and set goals for the coming year. Most significant for the *Journal of Midwifery & Women's Health* (*JMWH*) was the launch of our new Senior Editorial Team; we have now completed a full year together. After presenting our new team to the American College of Nurse-Midwives (ACNM) membership and readers of *JMWH*,[1] we rolled up our sleeves and partnered with peer reviewers and authors to publish 6 issues of *JMWH* including 2 theme issues offering continuing education to midwives. We have also worked to increase inclusivity in our publication standards, editorial board, and authors.

The Aims and Scope statement defines a journal's purpose and the range of articles the journal editors will consider for publication. This important statement was reviewed by the Editors and Associate Editors. We reflected on the focus of *JMWH* as a society journal based in the United States; the ACNM Mission, Vision, and Core Values[2]; and our commitment to global health. The result is an expanded statement reflecting just that.

The Journal of Midwifery & Women's Health *(*JMWH*) is the official journal of the American College of Nurse-Midwives. Within a culture of inclusion and antiracism,* JMWH *advocates for health equity, access to quality care for all persons, and excellence in midwifery. Articles published in* JMWH *include new research and current knowledge across a broad range of clinical and interprofessional topics including perinatal care, sexual and reproductive health, gynecology, primary care, public health, health care policy, and global health. Implications for midwifery practice, policy, education, research, and workforce development in the United States are emphasized. International health articles with global perspectives and broad implications are welcomed.* JMWH *uses a double anonymous peer review process to ensure manuscripts meet the highest standards of scholarly work and welcomes submissions from midwives, collaborating health professionals, scientists, and others with an interest in the Journal's scope.*

In addition, the *JMWH* Editorial Leadership Team explored how to best identify differences among the editors, editorial board, peer reviewers, and authors to improve representation of the midwifery profession and those served by midwives. Concurrently, a strategy was implemented to collect data by ScholarOne, the online system for managing *JMWH* manuscript submission and review. Beginning in August 2022, all authors, peer reviewers, and editors are now asked to voluntarily identify their race, ethnicity, and gender when they next login to the system. This information is not visible to the editorial team and not accessible at any stage of the publication process. We will aggregate and analyze these anonymous data after a year to document a baseline and make plans going forward.

At the ACNM Annual Meeting in Chicago, May 2022, the Editorial Leadership Team began drafting a statement of inclusivity for the Journal. We have reviewed statements by other journals and suggestions for consideration from our publisher.[3] Following deliberation by the editors and members of the editorial board, *JMWH* is pleased to share our inaugural Statement of Inclusivity. The statement includes action steps which will be reviewed and revised annually with an analysis of the progress toward stated goals. The Statement of Inclusivity is presented here for readers and will be available on the JMWH.org website.

The Journal of Midwifery & Women's Health (JMWH*), as the official journal of the American College of Nurse-Midwives (ACNM), is committed to an inclusive approach to publishing articles that elevate midwifery by advancing the health and well-being of diverse populations. We support the use of inclusive language that acknowledges diversity and differences among individuals. The* JMWH *approach to publication review aims to mitigate bias, be antiracist, and be responsive to the profession. In this inaugural Statement of Inclusivity, we commit to the following actionable goals:*

- *Collect initial anonymous baseline data related to race, ethnicity, and gender from editors, editorial board members, peer reviewers, and authors, including annual assessment and evaluation*
- *Increase racial, ethnic, and gender diversity of peer reviewers and authors by supporting new peer reviewers and authors through focused mentoring strategies*
- *Encourage authors to include a reflexivity/positionality statement that identifies their relationship to the topics and communities discussed when submitting a manuscript to* JMWH*, providing guidance for authors and peer reviewers*
- *Publish guidelines in 2023 for authors who submit manuscripts that include variables related to racial health inequities*

As 2022 wound down, we were thrilled to present readers with the November/December 2022 issue of *JMWH* highlighting midwifery-led care models. Those articles present models to improve care for persons of color, gender-diverse individuals, persons with potential mental health concerns, birthing people requiring transfer from community birth sites to the hospital, individuals needing earlier prenatal advice and consultation, postpartum individuals and their newborns, and models to teach ultrasound and group prenatal care models to midwives internationally.[4] We hope you enjoy reading these articles and find inspiration for your practice, your teaching, and policy work to advance the profession and the needs of those for whom we provide care.

The November/December 2022 issue also features a new *Share with Women* column with information about potential postpartum problems. Postpartum persons are encouraged to seek help, talk with their health care providers, and be

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confident asking for what they need.[5] The *Share with Women* column transitions to *Ask the Midwife*[6] in 2023. This change is made to be gender inclusive and reflect the question-and-answer format of the column. Existing *Share with Women* columns will retain that heading until they are updated in the future.

Looking forward in 2023, the editors welcome your continued support and involvement in *JMWH*. We plan to enhance resources for peer reviewers and newer authors this year. If you would like to join our team of peer reviewers or are interested in submitting a manuscript, please contact JMWH@acnm.org.[7,8] Be sure to join us at the ACNM annual meeting in Orlando in May 2023 for a session on becoming an author with *JMWH*. We also plan to partner with our publisher for an ACNM member webinar, in advance of the session at the annual meeting, to introduce you to recent new authors who will share their experience. Look for theme issues this year on climate and environmental effects on perinatal and reproductive health and contemporary issues in contraception and abortion care. Please be in touch and let us know how we can better serve the midwifery community.

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Review
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Evaluation and Treatment of Vulvodynia: State of the Science

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Vulvodynia affects 7% of American women, yet clinicians often lack awareness of its presentation. It is underdiagnosed and often misdiagnosed as vaginitis. The etiology of vulvodynia remains unknown, making it difficult to identify or develop effective treatment methods. The purpose of this article is to (1) review the presentation and evaluation of vulvodynia, (2) review the research on vulvodynia treatments, and (3) aid the clinician in the selection of vulvodynia treatment methods. The level of evidence to support vulvodynia treatment varies from case series to randomized controlled trials (RCTs). Oral desipramine with 5% lidocaine cream, intravaginal diazepam tablets with intravaginal transcutaneous electric nerve stimulation (TENS), botulinum toxin type A 50 units, enoxaparin sodium subcutaneous injections, intravaginal TENS (as a single therapy), multimodal physical therapy, overnight 5% lidocaine ointment, and acupuncture had the highest level of evidence with at least one RCT or comparative effectiveness trial. Pre to posttest reduction in vulvar pain and/or dyspareunia in non-RCT studies included studies of gabapentin cream, amitriptyline cream, amitriptyline with baclofen cream, up to 6 weeks' oral itraconazole therapy, multimodal physical therapy, vaginal dilators, electromyography biofeedback, hypnotherapy, cognitive behavioral therapy, cold knife vestibulectomy, and laser therapy. There is a lack of rigorous RCTs with large sample sizes for the treatment of vulvodynia, rendering it difficult to determine efficacy of most treatment methods. Clinicians will be guided in the selection of best treatments for vulvodynia that have the highest level of evidence and are least invasive.
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Keywords: pain management, pharmacology, patient education

INTRODUCTION

Vulvodynia is chronic vulvar pain of unknown etiology lasting at least 3 months in duration and may be accompanied by other potentially associated factors.[1] Vulvodynia can severely impact the lives of women and of individuals assigned female sex at birth. Vulvodynia often affects the ability to have sexual intercourse, devastating intimate relationships.[2,3] Even with adjuvant drugs and opioids, women with vulvodynia reported an average pain intensity score of 6.7 out of 10; 60% of women drank alcohol and 43% used analgesics (including opioids) and alcohol together to reduce their pain.[4] Vulvodynia can cause severe chronic pain resulting in physical disability[5] and can lead to suicidal ideation.[6]

Vulvodynia pain can be localized to one area, generalized to multiple areas, or mixed (localized and generalized). Pain can be either provoked (by vaginal penetration or contact to the vulva), spontaneous, or mixed (provoked and spontaneous). The onset of pain is either primary (with first intercourse or tampon insertion) or secondary (occurring later). The pain pattern can be either continuous or constant, rhythmic or intermittent, and transient or brief.[7] The 2 most common types of vulvodynia are provoked vestibulodynia (PV) and generalized vulvodynia. PV is localized pain confined to the vulvar vestibule and vaginal introitus that is provoked or triggered by touch.[7,8] Generalized vulvodynia is unprovoked or spontaneous diffuse pain of the vulva and may extend into the inner thighs and perineum.[7,8] Terms used for PV are not standardized and include *localized provoked vestibulodynia*, *vestibulodynia*, *provoked vestibulodynia*, *vulvar vestibulitis*, *provoked vulvodynia*, and *localized vulvodynia*. Some published studies do not differentiate between vulvodynia types (provoked and generalized vulvodynia) and report findings on unspecified vulvodynia. The purpose of this article was to (1) review the presentation and evaluation of vulvodynia, (2) review the research on vulvodynia treatments, and (3) aid the clinician in the selection of vulvodynia treatment methods.

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Continuing education (CE) is available for this article. To obtain CE online, please visit http://www.jmwhce.org. A CE form that includes the test questions is available in the print edition of this issue.

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Quick Points

- A cotton swab test of the vulva should be performed to diagnose vulvodynia.
- Clinicians should prescribe treatments that are the least invasive and have the highest level of evidence.
- There is an urgent need to perform high-quality randomized controlled trials of treatments for vulvodynia.

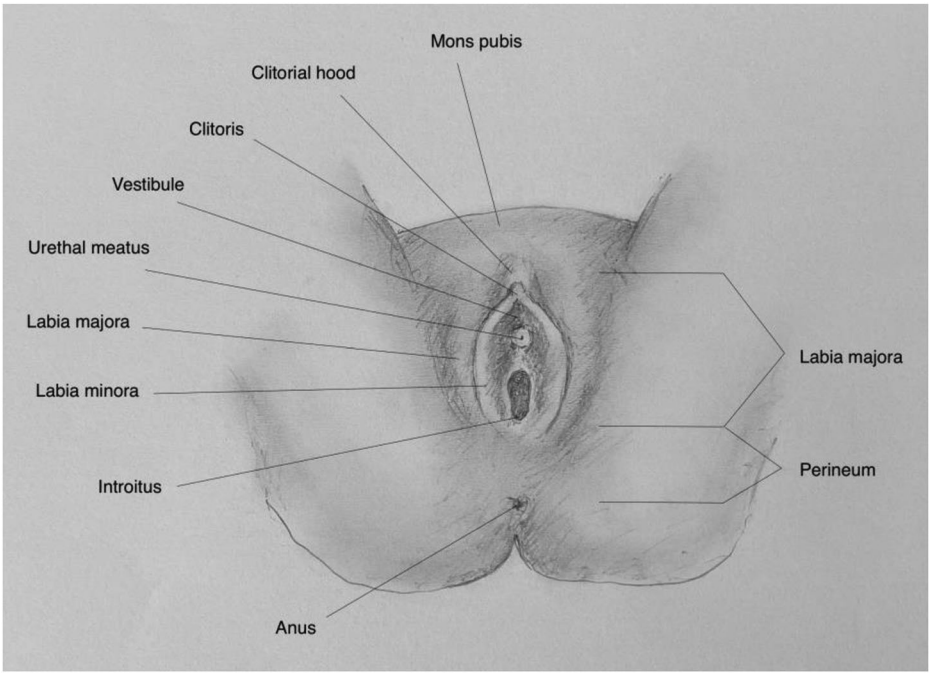

Figure 1. Vulvar Anatomy.

Source: Image courtesy of Pavlina Vagoun-Gutierrez.

SIGNS AND SYMPTOMS OF VULVODYNIA

The pain of vulvodynia may be described as itching, burning, or stabbing and is often accompanied by dyspareunia.[1] Women frequently present with a report of long-standing or recurring vaginitis, with negative laboratory findings, that does not resolve despite receiving a myriad of treatments. Often, women with vulvodynia cannot tolerate anything touching their vulva, such as underclothing or tight-fitting pants, or sitting for prolonged periods, all of which may trigger pain.

HISTORY OF THE PRESENT ILLNESS AND VULVODYNIA

When vulvodynia is suspected, the clinical evaluation focuses on whether women have the following clinical signs and symptoms that may be implicated in, associated with, or lead to the development of vulvodynia: (1) vulvar pain that started while on combined oral contraceptives (COCs), as COCs may promote changes in the vulvar morphology;[9] (2) allergic reactions, chronic infections, and yeast infections, as there may be an exaggerated immune response to common pathogens such as *Candida albicans*;[10] and (3) urinary frequency, urgency, hesitancy, feeling of incomplete emptying of the bladder, or constipation, which may be signs of hypertonic pelvic floor muscles associated with vulvodynia.[1,11]

The clinician should also inquire about other associated factors that can be associated with vulvodynia such as (1) lower back pain, which may constrict muscles, vessels, and nerves with referred pain to the vulva;[12] (2) hip, groin, or buttock pain, which may be due to a torn labrum resulting in pelvic floor muscle dysfunction and vulvar pain;[13] (3) traumatic childbirth or long bicycle trips, which can lead to pudendal neuralgia and can similarly present with vulvar pain; (4) vulvar burning, soreness, or itching, which may be due to nerve damage that may or may not be associated with low back pain, sciatica, and spinal pathology; and/or (5) genitourinary syndrome of menopause, which may present with vaginal/vulvar pain and/or dyspareunia.

CLINICAL EXAMINATION TO DIAGNOSE VULVODYNIA

Dyspareunia associated with vulvodynia is superficial and occurs at the vaginal introitus, fourchette, and/or outer one-third of the vagina. There is no cervical motion tenderness because the dyspareunia is superficial and not a sign of a peritoneal mass or infection.

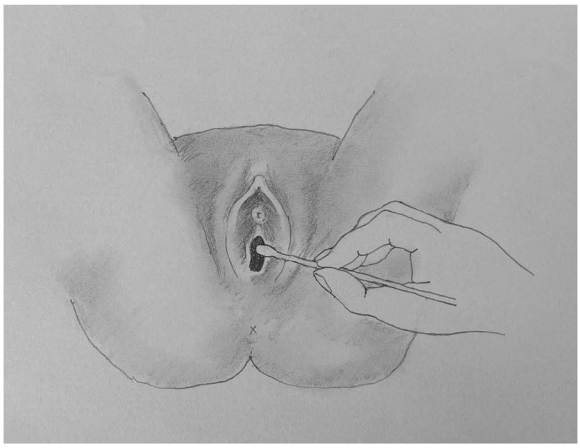

Figure 2. Cotton Swab Test to Assess for Vulvar Allodynia.

Source: Image courtesy of Pavlina Vagoun-Gutierrez.

If vulvodynia is suspected, a detailed gynecologic examination of the vulvar anatomy should be performed for allodynia (painful response to an unpainful stimulus) using a cotton swab test (Figure 1). Allodynia, a symptom of neuropathic pain, is caused by a lesion or disease of the nervous system and reflects peripheral or central nervous system changes that may occur in chronic pain conditions.[14] The pain of vulvodynia may have a neuropathic component.[7,15] To assess for allodynia, the examiner should perform a cotton swab test (Figure 2). Gentle pressure is applied with a cotton swab starting at the thigh and moving medially to the labia majora, interlabial sulcus, clitoral hood, labia minora, and sites within the vulvar vestibule at 2, 4, 6, 8, 10, and 12 o'clock.[16] Pain is recorded on a 0 to 10 numeric ratings scale (NRS). If the pain is confined to the vulvar vestibule, the diagnosis is localized vestibulodynia; if the pain extends to areas outside the vulvar vestibule, the diagnosis is generalized vulvodynia.

Pelvic floor muscle dysfunction is caused by hypertonic muscles with tenderness and can be present in women with vulvodynia.[1,11] Tenderness can be elicited with firm digital pressure to both the levator ani muscle group and the obturator internus in women with vulvodynia. The levator ani muscle group (puborectalis, pubococcygeus, and the iliococcygeus) comprises most of the pelvic floor (Figure 3) that supports the bladder and rectum. The obturator internus muscle in the pelvic wall (Figure 3) connects to the pelvic floor via the arcuate tendon levator ani. Both the levator ani and the obturator internus should be palpated by applying even pressure with the index and middle finger of the examining hand during the digital examination, and the pain should be recorded on a 0 to 10 NRS.

TREATMENTS FOR VULVAR PAIN AND DYSPAREUNIA

The goal of this review is to present the myriad of vulvodynia treatments that patients of midwives are prescribed by other clinicians. All dosages and treatment regimens can be found in Tables 1 to 10. There is a paucity of research on vulvodynia, and many of the studies reviewed are almost 2 decades old with few newer treatment studies that demonstrated efficacy. Our initial search for research articles revealed anecdotal reports and individual case reports of women with vulvodynia, but they were not high quality and were not included in this review. Forty-one studies with the highest level of evidence for each treatment including case series were ultimately included in this review. The level of evidence was evaluated with the rating system from the Centre for Evidence-Based Medicine at the University of Oxford (Table 11).[17]

Overall, there is great variability in treatments prescribed for vulvodynia. Results from the National Vulvodynia Registry[18] showed that a total of 78 different treatments were

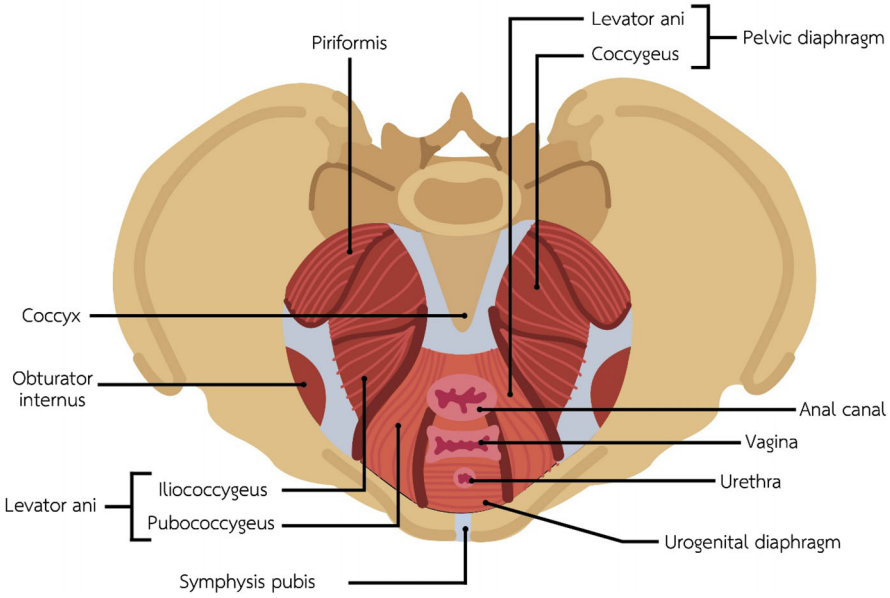

Figure 3. Pelvic Floor and Pelvic Wall Musculature

Table 1. Topical Treatments for Vulvodynia

Treatment	Author, Year, Sample Size, Conditions	Level of Evidence	Study Design, Treatment Groups, Dosages	Results
Lidocaine	Zolnoun et al[23] 2003 N = 61 Vulvar vestibulitis	2c	Prospective cohort uncontrolled 5% lidocaine ointment applied generously to the vulvar vestibule and also to a cotton ball that was kept in vulvar vestibule overnight	Ability to have intercourse increased from 36% to 76% posttreatment ($P = .002$). Daily vulvar pain (VAS 0-100) reduced from 27.4 to 17.0 ($P = .004$). Dyspareunia (VAS 0-100) reduced from 76.2 to 37.0 ($P = .001$).
Corticosteroid vs GCBT	Bergeron et al[26] 2016 N = 97 PV	2b	Uncontrolled randomized trial 2 groups: (1) Hydrocortisone 1% cream every d for 13 wk (2) GCBT, 10 2-h sessions for 13 wk	Hydrocortisone reduced mean (SD) dyspareunia (MPQ PPI, NRS 0-10) from 7.7 (2.1) to 5.6 (3.3) at 13 wk ($P < .01$) and to 5.9 (3.1) ($P < .01$) at 6-mo follow-up. GCBT reduced mean (SD) dyspareunia from 7.3 (2.5) at baseline to 5.5 (2.7) at 13 wk ($P < .01$) and to 5.2 (2.9) ($P < .01$) at 6-mo follow-up. GCBT significantly reduced dyspareunia compared with hydrocortisone at 6 mo ($P < .01$).
Gabapentin cream	Boardman et al[28] 2008 N = 51 LV, n = 32 GV, n = 19	2c	Retrospective chart review 3 arms: (1) 2% gabapentin cream: LV (n = 9), GV (n = 9) (2) 4% gabapentin cream: LV (n = 7), GV (n = 3) (3) 6% gabapentin cream: LV (n = 16), GV (n = 6) Used for 8 wk but did not state how often was applied	Mean (SD) vulvar pain (VAS 0-10) in LV reduced significantly from 7.9 (2.0) to 2.7 (1.6) ($P < .001$). Mean (SD) vulvar pain in GV reduced significantly from 5.8 (1.7) to 2.0 (2.3) ($P < .001$). Pain improved at least 50% in 80% participants with 29% having complete pain relief in at least 8 wk. Varying doses of gabapentin cream were not accounted for in the statistical analysis.
2% amitriptyline cream	Pagano and Wong[30] 2012 N = 150 Vulvodynia	2c	Prospective, uncontrolled study 2% amitriptyline cream twice daily for 30 d	Dyspareunia (Marinoff dyspareunia scale, 1-3) response: 84 (56%) responded positively to treatment, 15 (10%) participants reported excellent improvement, 44 (29.3%) reported moderate improvement, 25 (16.7%) reported slight but noticeable improvement, 66 (44%) no improvement. 16 participants ceased treatment due to skin irritation. No analysis for significance or posttreatment grading was reported.

(*Continued*)

Table 1. Topical Treatments for Vulvodynia

Treatment	Author, Year, Sample Size, Conditions	Level of Evidence	Study Design, Treatment Groups, Dosages	Results
2% amitriptyline cream with 2% baclofen cream	Nyirjesy et al[29] 2009 N = 38 PV	2c	Retrospective study, uncontrolled 2% amitriptyline cream with 2% baclofen cream twice daily for 4-6 wk and up to 33 wk	Dyspareunia (NRS 1-5) significantly reduced from 4 to 2 ($P = .05$).
Amitriptyline-ketamine gel	Poterucha et al[31] 2012 N = 13 Women with genital, rectal, perineal pain	4	Retrospective chart review Amitriptyline-ketamine gel applied to vulva, perineum, rectum, or groin 2-4 times per d Duration unspecified	Of the 13 women using amitriptyline-ketamine gel, 2 (15%) had no response, 4 (31%) had less than 50% relief, 6 (46%) had 50%-99% relief, and 1 (8%) had complete relief ($P = .84$). Pain was measured by asking participants which of the categories listed they fell into. No significance testing was reported.
Equine conjugated estrogen cream 0.3 mg	Langlais et al[33] 2017 N = 20 Vulvodynia	2b	Double-blind RCT Equine conjugated estrogen cream 0.3 mg or placebo cream applied at bedtime for 8 wk	Equine conjugated estrogen significantly reduced global dyspareunia (VAS 0-10) 27% (95% CI, −1% to 55%) ($P < .05$). Placebo reduced global estrogen 3% (95% CI, −8% to 14%). The difference between the 2 groups was not significant ($P = .29$). Means for each treatment methods were not reported.
Topical estradiol 0.03% and testosterone 0.01% cream	Burrows and Goldstein[32] 2013 N = 50 Vestibulodynia	2c	Retrospective database chart review of 50 consecutive premenopausal women on combined contraceptive pills Topical estradiol 0.03% and testosterone 0.01% cream applied to the vulvar vestibule twice daily for 20 wk	Cotton swab test vulvar pain (NRS 0-10) reduced from 7.5 to 2 ($P = .001$). Long-term use of testosterone in premenopausal women has not been evaluated.
Nifedipine cream	Bornstein et al[35] N = 30 Localized PV	2b	Double-blind RCT 3 arms of 10 participants: (1) 0.2% nifedipine cream (2) 0.4% nifedipine cream (3) Placebo cream Each cream applied 4 times per d for 6 wk	Nifedipine 0.2% significantly reduced mean (SD) dyspareunia (NRS 0-100) from 90.5 (9.0) to 61.9 (34.2) ($P = .01$). Nifedipine 0.4% significantly reduced mean (SD) dyspareunia from 92.5 (7.2) to 72.5 (27.6) ($P = .06$). Placebo significantly reduced mean (SD) dyspareunia from 88.0 (12.9) to 48.1 (42.8) ($P = .04$). Treatment methods were not compared with each other.

Abbreviations: GCBT, group cognitive behavioral therapy; GV, generalized vulvodynia; LV, localized vulvodynia; MPQ PPI, McGill Pain Questionnaire Present Pain Index; NRS, numeric ratings scale; RCT, randomized controlled trial; PV, provoked vestibulodynia; VAS, visual analog scale.

Table 2. Diazepam Vaginal Suppositories and Tablets for the Treatment of Hypertonic Pelvic Floor Dysfunction

Treatment	Author, Year, Sample Size, Conditions	Level of Evidence	Study Design, Treatment Groups, Dosages	Results
Diazepam intravaginal suppository	Crisp et al[46] 2013 N = 21 Hypertonic pelvic floor dysfunction	1b	Double-blind RCT Diazepam 10 mg or placebo intravaginal suppository at bedtime for 28 d	Diazepam significantly reduced mean (SD) muscle tone (EMG) from 3.16 (0.88) microvolts to 2.77 (0.91) microvolts ($P = .02$). Placebo significantly reduced mean (SD) muscle tone from 2.7 (0.328) microvolts to 1.87 (1.3) microvolts ($P = .02$). The difference between the diazepam and placebo group was not significant. Diazepam significantly reduced mean (SD) worst pelvic pain (VAS 10 cm) from 8.42 (1.02) to 8.5 (1.22) at 2 wk to 8.0 (1.9) at 4 wk. *P* values not reported. Placebo reduced mean (SD) worst pelvic pain from 8.86 (1.07) to 7.29 (2.14) at 2 wk, and to 6.71 (2.69) at 4 wk. *P* values not reported. The difference between the diazepam and placebo group was not significant ($P = 0.431$).
Diazepam intravaginal capsules	Holland et al[47] 2019 N = 35 Hypertonic pelvic floor dysfunction	1b	Double-blind RCT 10 mg diazepam capsules or placebo 1-2 times d intravaginally for 4 wk	Diazepam reduced pelvic pain and levator ani spasm median pain scores (VAS 100 mm) from 59 (95% CI, 50-80) to 50 (95% CI, 20-75). Placebo reduced pelvic pain and levator ani spasm median pain scores from 58 (95% CI, 35-75) to 39 (95% CI, 5-55). Diazepam had 0 median change in the VAS score (100 mm). The placebo group had a 12-point median change. There was not a significant difference in the improvement between the groups ($P = .53$).

(*Continued*)

Table 2. (Continued)

Treatment	Author, Year, Sample Size, Conditions	Level of Evidence	Study Design, Treatment Groups, Dosages	Results
Diazepam and intravaginal TENS	Murina et al[48] 2018 N = 42 Vestibulodynia	1b	Double-blind RCT 10 mg diazepam tablet at bedtime and intravaginal TENS 3 times per wk for 60 d Placebo tablet at bedtime and intravaginal TENS 3 times per wk for 60 d	Diazepam and TENS reduced mean (SD) cotton swab test vulvar pain (VAS 10 cm) from 7.5 (2) to 4.7 (no SD). Placebo and TENS reduced cotton swab test vulvar pain from 7.2 (1.7) to 4.3 (no SD). No significant difference in pain reduction between groups. *P* value not provided. Diazepam and TENS reduced mean (SD) dyspareunia (Marinoff dyspareunia scale 0-3) from 2.5 (0.5) to 1.6 (no SD). Placebo and TENS reduced mean (SD) pain from 2.0 (1.3) to 1.3 (no SD). Within-group significance testing was not calculated. Diazepam significantly improvement in dyspareunia compared with the placebo group ($P < .01$).

Abbreviations: EMG, electromyography; RCT, randomized controlled trial; TENS, transcutaneous electrical nerve stimulation; VAS, visual analog scale.

prescribed to 282 women to reduce their vulvodynia symptoms. Importantly, 72% had been prescribed more than one treatment. Findings highlighted that clinicians may need to prescribe multiple therapies for vulvodynia and that studies may need to replicate real-life conditions.[18] Because the etiology of vulvodynia remains unclear, multiple therapies with different mechanisms of action can either potentiate one another or target different pain mechanisms.[18]

Although the following treatments may have been tested in women with unspecified vulvodynia or for one type of vulvodynia, considering the state of the science, clinicians may consider treating women with either type of vulvodynia. The first 3 treatment groups reviewed are topical, intravaginal, and oral therapies. Topical and intravaginal treatments are localized pharmacologic treatments that are commonly prescribed first. If there is inadequate pain relief, oral therapies are often added. The fourth group of therapies, pelvic floor physical therapy, multimodal therapies, and acupuncture, are minimally invasive and non-pharmacologic. They are prescribed if there is an inadequate response to previously attempted therapies. Unfortunately, third-party insurance, Medicaid, and Medicare reimbursement for these therapies is limited or unavailable, which limits their accessibility.[19]

The fifth group is injection therapies. They are more invasive and may be prescribed when there is a poor response to the previous therapies. Some clinicians may prescribe them in lieu of pelvic floor physical therapy and particularly acupuncture if they practice within a strict biomedical model. The sixth group, psychological interventions, are presented next, as they are not commonly prescribed because of availability and access issues and are often not considered by the clinician who practices within a strict biomedical model. The seventh group, surgical interventions, are the most invasive therapies and may be prescribed when all other treatment options have failed. The authors reviewed medical cannabis last to update clinicians on progress in this area. There is great interest in treating chronic pain conditions and pelvic pain with medical cannabis.[20] The following medications or devices are being used off-label for the treatment of vulvodynia: amitriptyline, desipramine, nifedipine, milnacipran, botulinum toxin type A, low-molecular-weight heparin, and electromyography (EMG) biofeedback.

Topical Treatments

Topical treatments (Table 1) are attractive because they can be applied to the targeted area and have little systemic

absorption. Topical treatments for vulvodynia include 5% lidocaine ointment,[21–23] capsaicin,[24,25] corticosteroids,[26,27] antiepileptics,[28] tricyclic antidepressants (TCAs),[29–31] hormones,[32,33] mast cell stabilizers,[34] and calcium channel blockers.[35]

Lidocaine, a local anesthetic, is prescribed as a gel, ointment, or cream and is used to numb the burning pain of vulvodynia. In PV, there is an increase in unmyelinated C-fibers that transmit dull, delayed, diffuse, achy, and burning pain and in calcitonin gene–related peptide that promotes nerve irritation.[36,37] Lidocaine blocks the conduction of C-fibers, but it also can block calcitonin gene–related peptide and calm irritable nociceptors (peripheral sensory neurons) when it is used continuously.[38] One large multicenter parallel group randomized trial,[22] one randomized controlled trial (RCT),[21] and one uncontrolled study[23] showed that lidocaine applied to the vulvar vestibule reduced vulvar pain and dyspareunia either alone or with oral desipramine (a TCA) in women with PV.

Capsaicin is the active ingredient found in chili peppers and has been used in many over-the-counter pain preparations. The adverse-effect profile does not warrant prescribing capsaicin for women, as it can cause vulvar burning and can result in vulvar nerve damage.[39]

One percent hydrocortisone cream decreases inflammation. Long-term use of hydrocortisone causes thinning of skin and vulvar mucosa. In an uncontrolled randomized trial, pre- to post-treatment, 1% hydrocortisone reduced dyspareunia in women with PV, but it did not significantly reduce dyspareunia compared with group cognitive behavioral therapy (CBT).[26] Triamcinolone, a medium potency topical steroid, along with oral amitriptyline, did not reduce vulvar pain in women with PV.[27] Even though rapid pain relief is unpredictable and rarely possible,[16] there are no data on the long-term use of corticosteroid creams for management of vulvodynia.

Gabapentin, an antiepileptic, exerts its effect on the voltage-dependent calcium ion channels at the postsynaptic terminal of the spinal cord dorsal horn,[40] resulting in reduced neuropathic pain. In a retrospective chart review,[28] gabapentin cream reduced vulvar pain in PV and generalized vulvodynia pre- to post-treatment. Gabapentin cream must be obtained through a compounding pharmacy. Efficacy of gabapentin cream needs to be tested in future RCTs. Amitriptyline is a TCA that treats chronic neuropathic pain.[41] Amitriptyline cream alone[30] and amitriptyline cream with baclofen cream, an antispasmotic,[29] showed a reduction in dyspareunia in unspecified vulvodynia and in PV. These studies had no control group. Ketamine is used to treat neuropathic pain.[42] A case series of 7 women[31] showed relief of genital, perineal, and rectal pain after applying amitriptyline-ketamine cream to affected areas. Efficacy of amitriptyline cream, baclofen cream, and amitriptyline-ketamine cream needs to be tested in RCTs.

Conjugated equine estrogen[33] and estradiol/testosterone cream[32] increase the elasticity, thickness, and moisture of the vulvar epithelium. In a small-sample double-blind RCT of 20 women with PV,[33] equine conjugated estrogen showed no reduction in dyspareunia compared with the placebo cream control group. In a retrospective chart review of estradiol/testosterone cream for premenopausal women with PV,[32] vulvar pain was reduced pre- to post-treatment. Efficacy of both conjugated equine estrogen cream and estradiol/testosterone cream need to be tested in RCTs. The health effects of long-term hormone creams in premenopausal women have not been studied.

Diazepam Vaginal Suppositories and Tablets

Diazepam is an antispasmodic and anticonvulsant that acts on gamma-amino butyric acid (GABA) receptors located in the brain (Table 2).[43] GABA is the main inhibitory neurotransmitter in the central nervous system. Diazepam vaginal suppositories and tablets have been prescribed to treat vulvodynia[18] and vulvar pain related to hypertonic pelvic floor muscles.[11,43–45] Studies conducted on the use of vaginal diazepam have targeted women with pelvic pain related to hypertonic pelvic floor muscles[46–48] but not specifically vulvodynia. There were 2 small-sample double-blind RCTs[46,47] of vaginal diazepam for hypertonic pelvic floor dysfunction that showed no reduction in vulvar pain. A third double-blinded RCT[48] of diazepam with intravaginal transcutaneous electrical nerve stimulation (TENS) versus placebo with TENS for PV also showed no reduction in vulvar pain but did show a significant reduction in dyspareunia. All 3 studies were underpowered. Efficacy of diazepam vaginal suppositories and tablets with or without TENS needs to be tested in larger RCTs.

Oral Medications

Oral medications (Table 3) are often prescribed if topical and intravaginal treatments offer incomplete relief. Oral antifungals are initially prescribed for women's common symptoms of vulvar burning and itching with or without confirmatory laboratory testing for vulvar vaginitis. It is only after there is little relief that the clinician may suspect a diagnosis of vulvodynia.[49] In an uncontrolled retrospective chart review, women reporting vulvar burning and itching were given 6 to 8 weeks of daily fluconazole with subsequent negative fungal cultures and an insufficient reduction in vulvar pain.[49] Women then began a regimen of oral daily itraconazole for 5 to 6 weeks. There was a 70% reduction in vulvar burning and itching. Efficacy of daily fluconazole followed by itraconazole needs to be tested in an RCT. Caution must be exercised if prescribing 5 to 6 weeks of itraconazole therapy for women with vulvodynia that is refractory to fluconazole, even with negative fungal cultures. Because of the risk of hepatotoxicity, liver function needs to be monitored every 3 to 4 weeks during itraconazole therapy.

Oral TCAs, serotonin norepinephrine reuptake inhibitors (SNRIs), selective serotonin reuptake inhibitors (SSRIs), and antiepileptics are prescribed for chronic neuropathic pain. TCAs, SNRIs, SSRIs, and antiepileptics can reduce neuropathic pain by influencing neurotransmitters affecting pain in the central and peripheral nervous systems.[41] Their ability to reduce pain in women with vulvodynia has been inconsistent.[21,27,45,50]

One 4-arm double-blind RCT used oral desipramine (a TCA) and 5% lidocaine cream for dyspareunia.[21] Desipramine compared with placebo did not reduce dyspareunia, but

Table 3. Oral Medications for the Treatment of Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Fluconazole and itraconazole	Rothenberger et al[49] 2021 N = 106 PV	2c	Retrospective cohort chart review with no control 200 mg fluconazole daily for 6-8 wk. If there was insufficient reduction of vulvar pain and a negative fungal culture, itraconazole therapy 200 mg twice daily was used for at least 5 wk Due to risk of hepatotoxicity; liver function tests were carried out every 3-4 wk during treatment period	Mean (SD) decrease in cotton swab test vulvar vestibule pain (NRS 0-10) from baseline to 9 wk was 60.7% (39%). 66.0% of participants had significant pain reduction of >50% reduction ($P = 0.043$). The optimal window for pain improvement was 5-6 wk with an average reduction of 69.6%. 5 women discontinued, 3 due to gastrointestinal adverse effects, 1 due to elevated liver function, 1 after seizure during treatment.
Oral desipramine with topical lidocaine vs oral desipramine only vs topical lidocaine only	Foster et al[21] 2010 N = 133 PV	1b	Double-blind placebo RCT 4 arms, 12 wk: (1) 25 mg oral desipramine daily with a 25 mg increase every wk until 150 mg daily; 5% lidocaine cream applied 4 times daily to painful areas (2) Placebo desipramine and placebo topical lidocaine (3) Oral desipramine protocol with placebo topical lidocaine (4) Placebo desipramine with topical lidocaine protocol	Desipramine with lidocaine cream reduced tampon test pain (NRS 0-10) significantly by 36% ($t = -2.13$; $P = .04$). Oral desipramine and placebo topical lidocaine reduced pain by 24% ($t = 0.90$; $P = .37$). Placebo desipramine and topical lidocaine cream reduced pain by 20% ($t = 1.27$; $P = .21$). Placebo oral desipramine and placebo topical cream reduced pain by 33% (no t-score provided). There was no significant reduction in pain when interventions were used singularly. Pain scores were not provided.
Oral amitriptyline vs oral amitriptyline and topical triamcinolone	Brown et al[27] 2009 N = 43 Vulvodynia	2b	RCT (1) Oral amitriptyline: 10-20 mg daily (2) Oral amitriptyline: 10-20 mg daily and 0.1% topical triamcinolone at bedtime (3) Self-management control 12-wk intervention	Oral amitriptyline reduced mean (SD) vulvar pain (MPQ PPI, 0-5) by 1.4 (1.6) points. Oral amitriptyline and triamcinolone reduced mean (SD) pain by 0.8 (1.9) points. Self-management reduced mean (SD) pain by 0.7 (1.6) points. No significant difference between self-management, oral amitriptyline, and oral amitriptyline and triamcinolone at 12 wk. No P values reported.

(*Continued*)

Table 3. Oral Medications for the Treatment of Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Amitriptyline vs amitriptyline and PT	Bardin et al[45] 2020 N = 57 PV	2b	RCT (1) Daily home PT and amitriptyline 25 mg at bedtime for 8 wk (2) Amitriptyline 25 mg at bedtime for 8 wk	Amitriptyline only reduced cotton swab test mean (SD) vulvar pain (NRS 0-10) significantly from 6.6 (2.0) to 4.4 (2.5) ($P = .018$). PT and amitriptyline reduced mean (SD) vulvar pain significantly from 6.3 (2.0) to 2.9 (2.06) ($P < .001$). Amitriptyline only increased mean (SD) pain during intercourse (NRS 0-10) from 2.4 (2.6) to 2.5 (2.5) ($P = .91$). PT and amitriptyline reduced mean (SD) pain during intercourse significantly from 7.5 (3.1) to 3.1 (2.6) ($P < .001$).
Milnacipran	Brown et al[50] 2015 N = 22 PV	2c	Clinical intervention with no control group Milnacipran from 12.5 to 200 mg/d over 6 wk followed by 6 wk on maximum dose	Milnacipran reduced mean (SD) pain (MPQ PRI 0-45) significantly from 20 (8.9) to 12.3 (13.3) ($P = .001$). Mean (SD) coital pain (NRS 0-10) reduced from 6.94 (2.51) to 3.43 (2.82) ($P = .001$).
PEA, transpolydatin, and TENS vs TENS	Murina et al[52] 2013 N = 20 Vestibulodynia	1b	RCT (1) PEA 400 mg and transpolydatin 40 mg twice daily with intravaginal TENS self-administered at home for 60 d (2) Placebo and intravaginal TENS self-administered at home for 60 d	PEA, transpolydatin, intravaginal TENS significantly reduced mean (SD) pain intensity (VAS 10 cm) from 5.8 (1.1) to 2.2 (1.6) ($P < .05$). Placebo and intravaginal TENS significantly reduced mean (SD) pain intensity from 6.2 (1.1) to 2.3 (1.5) ($P < .05$). No significant reduction between groups ($P = .57$). PEA, transpolydatin, intravaginal TENS reduced mean (SD) dyspareunia (Marinoff dyspareunia scale 0-3) from 2.8 (0.4) to 1.0 (0.9); not significant; no *P* value provided. Placebo and intravaginal TENS reduced mean (SD) dyspareunia from 2.6 (0.5) to 1.1 (0.9); not significant; no *P* value provided. No significant reduction between groups ($P = .38$). PEA and transpolydatin found to be more effective than placebo in cases with more recent onset (VAS, $P < .01$, Marinoff $P < .01$).

(*Continued*)

Table 3. Oral Medications for the Treatment of Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Gabapentin	Brown et al[89] 2018 N = 89 PV	1b	Double-blind RCT with crossover over 16 wk Gabapentin 1200-3000 mg/d or placebo, increasing dose over 4 wk followed by 2 wk maintenance, then 2 wk taper down (wash out); then switch to other therapy	Gabapentin reduced mean dyspareunia (tampon test, NRS 0-10) by 3.9 (95% CI, 3.4-4.5) points. Placebo reduced mean pain scores by 4.3 (95% CI, 3.7-4.9). Difference −0.3 (95% CI, −0.7 to 0.1) ($P = .07$).
Gabapentin	Bachmann et al[90] 2019 N = 66 PV	1b	Double-blind RCT with crossover 16-wk study Gabapentin 1200-3000 mg/d or placebo, increasing dose over 4 wk followed by 2 wk maintenance, then 2 wk taper down (wash out); then switch to other therapy	Gabapentin did not significantly improve dyspareunia (FSFIp 0-5) ($P = .23$).

Abbreviations: FSFIp Female Sexual Function Index Sensory Pain Subscale; MPQ PPI, McGill Pain Questionnaire Present Pain Index; MPQ PRI, McGill Pain Questionnaire Pain Rating Index; NRS, numeric ratings scale; PEA, palmitoylethanolamide; PT, physical therapy; PV, provoked vestibulodynia; RCT, randomized controlled trial; TENS, transcutaneous electrical nerve stimulation; VAS, visual analog scale.

desipramine with 5% lidocaine did reduce dyspareunia in women with PV. One RCT using amitriptyline alone and amitriptyline with triamcinolone cream did not reduce vulvar pain in women with PV.[27] A second RCT of amitriptyline, and amitriptyline with physical therapy,[45] showed amitriptyline alone reduced vulvar pain but not dyspareunia. Amitriptyline with physical therapy reduced vulvar pain and dyspareunia.

There is only one study that used SNRIs and no studies that used SSRIs for vulvodynia even though they are commonly prescribed.[18,50] Milnacipran (an SNRI) reduced pain and dyspareunia in one uncontrolled study.[50] Efficacy of SSRIs and SNRIs need to be tested in RCTs.

Women with vulvodynia can have an increased number of vulvar mast cells, which are part of the inflammatory response.[51] Palmitoylethanolamide (PEA) is an endogenous fatty acid amide that targets mast cell infiltration, and trans-polydatin is a natural antiinflammatory compound found in foods.[52] An RCT of PEA with trans-polydatin and intravaginal TENS compared with oral placebo and intravaginal TENS (Figure 4) showed no reduction of vulvar pain and dyspareunia except for in newly diagnosed women.[52] Both PEA and trans-polydatin are natural food supplements. There is evidence to support the use of PEA and TENS only in women who are newly diagnosed with vulvodynia.

Figure 4. Intravaginal Probe Used with Transcutaneous Electrical Nerve Stimulation.

Source: Vaginal probe courtesy of BEACMED s.r.l, Portalbera (PV), Italy.

Pelvic Floor Physical Therapy and Multimodal Therapy

Pelvic floor physical therapy is used to treat pelvic floor dysfunction and hypertonic pelvic floor muscles associated with vulvodynia (Table 4).[45,53,54] Pelvic floor physical therapy includes dilators, EMG biofeedback, and TENS.

Dilators desensitize the vulva to touch and pressure and stretch hypertonic pelvic floor muscles and the vagina.[54] One uncontrolled prospective study showed dilators[55] reduced dyspareunia. Dilators as a standalone therapy are a cost-effective, self-administered at home, and noninvasive intervention with a low adverse-effect profile. Efficacy of dilators as a single therapy needs to be tested in RCTs.

EMG biofeedback offers women immediate visual feedback regarding their pelvic floor muscle tonus. By watching a monitor, women learn how it feels when their pelvic floor

Table 4. Pelvic Floor Physical Therapy for the Treatment of Pelvic Floor Dysfunction and Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Dilators	Murina et al[55] 2008 N = 15 Vestibulodynia	2c	Uncontrolled observational prospective 4 sizes of sequentially larger vaginal dilators over 8 wk	Mean (SD) dyspareunia (Marinoff dyspareunia scale 0-3) reduced significantly from 2.2 (0.4) to 1.1 (0.9) ($P < .001$).
EMG biofeedback vs topical lidocaine	Danielsson et al[58] 2006 N = 46 Vulvar vestibulitis	2b	Randomized prospective cohort study 2 arms, no control group: (1) EMG biofeedback 3 times per d with intravaginal probe (2) 2% topical lidocaine gel applied 5-7 times per d for 2 mo, then 5% topical lidocaine ointment applied 5-7 times per d for 4 mo Follow-up at 6 mo and 12 mo	Both treatments showed significant improvement in vestibular pressure pain threshold (grams) (biofeedback group $P = .02$, lidocaine group $P = .007$) and pain threshold intensity (VAS 0-100) (biofeedback group $P = .001$, lidocaine group $P = .002$) at 12 mo. Neither the pain nor pain intensity had significant improvement when compared with one another. Compliance for 3 sessions of biofeedback per d was low.
TENS	Murina et al[60] 2008 N = 40 Vestibulodynia	1b	Double-blind placebo controlled RCT 2 arms: (1) TENS 2 times per wk with electrodes placed at the introitus for 10 wk (2) TENS placebo 2 times per wk with electrodes placed at the introitus for 10 wk 60- and 90-d follow-up	TENS reduced mean (SD) vulvar pain (VAS 0-10) significantly from 6.2 (1.9) to 2.1 (2.7) ($P = .004$) at 60 d posttest, and to 2.8 (2.5) ($P = .004$) at 90 d posttest. TENS placebo reduced mean (SD) vulvar pain from 6.7 (2.0) to 5.7 (2.2) at 60 d posttest, and to 5.6 (2.1) at 90 d posttest. Placebo pain reductions were statistically significant; no P value provided. Between-group comparisons were not conducted. TENS reduced mean (SD) dyspareunia (Marinoff dyspareunia scale 0-3) significantly from 2.7 (0.4) to 1.1 (0.9) ($P = .001$) at 60 d posttest, and to 1.1 (0.9) ($P = .001$) at 90 d posttest. TENS placebo reduced mean (SD) dyspareunia from 2.7 (0.4), to 2.4 (0.8) at 60 d posttest, and to 2.4 (0.8) at 90 d posttest. Neither reduction in pain due to placebo was significant; P values not provided. Between-group comparisons were not conducted.

(*Continued*)

Table 4. Pelvic Floor Physical Therapy for the Treatment of Pelvic Floor Dysfunction and Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Multimodal approach	Brotto et al[2] 2015 N = 116 PV	2b	Uncontrolled prospective study Multimodal approach Each participant received (1) 2 educational informational sessions on PV, (2) 3 educational psychological sessions, (3) 3 pelvic floor education sessions including home exercises and in office biofeedback, (4) final session with gynecologist to discuss skills acquired, referrals needed, and community resources All sessions over 10-12 wk	Dyspareunia (VAS 0-10) reduced significantly from pretreatment to posttreatment ($\beta = -5.3$, $P < .001$).
Multimodal physical therapy vs lidocaine	Morin et al[22] 2021 N = 212 PV	2c	Multicenter parallel group randomized trial 1:1 (1) Multimodal physical therapy: (a) education, (b) pelvic floor muscle exercises with biofeedback, (c) manual therapy, (d) dilation (2) Overnight lidocaine 5% ointment vestibule with gauze soaked in lidocaine applied to vulvar vestibule Baseline, posttreatment (10 wk), and 6-mo follow-up	Physical therapy significantly reduced mean (SD) dyspareunia (NRS 0-10) from 7.3 (0.2), to 2.7 (0.2) at 10 wk ($P <$ .01), with results maintained through follow-up at 6 mo 3.0 (0.2). Overnight lidocaine significantly reduced mean (SD) dyspareunia from 7.3 (0.2), to 4.5 (0.2) at 10 wk ($P < .01$), with results maintained through 6-mo follow-up 4.8 (0.2). Physical therapy significantly reduced dyspareunia compared with lidocaine from baseline to 10 wk, and through follow-up at 6 mo ($P < .001$).

Abbreviations: EMG, electromyography; NRS, numeric ratings scale; PV, provoked vestibulodynia; RCT, randomized controlled trial; TENS, transcutaneous electrical nerve stimulation; VAS, visual analog scale.

muscles contract and relax. Three uncontrolled studies of EMG biofeedback[56–58] all showed a reduction in vulvar pain. EMG biofeedback is a noninvasive intervention with a low adverse-effect profile. Efficacy of biofeedback needs to be tested in RCTs.

TENS inhibits pain by (1) blocking pain signals at the injury from being propagated to larger afferent fibers in the central nervous system for processing (gate control theory)[59] and (2) stimulating the release of endogenous opioids.[60] A double-blind placebo RCT compared intravaginal TENS with a TENS sham.[60] TENS significantly reduced pain and dyspareunia.

There are 2 studies that have tested an interprofessional multimodal combined therapy approach. In the first study, which was uncontrolled,[2] 116 women received educational sessions on PV, psychology, pelvic floor exercises and biofeedback as well as a session with a gynecologist. Findings showed a significant decrease in dyspareunia at 3 months. In the second, a large multicenter parallel group randomized trial,[22] 212 women with PV were randomized to either multiple modality physical therapy (physical therapy, education, pelvic floor exercises with biofeedback, manual therapy, and dilation) or overnight 5% lidocaine ointment applied to the vulva. Findings showed a significant reduction in dyspareunia in both groups that was maintained at 6 months. Participants in the multimodal physical therapy group had significant improvement in all the measured outcomes; moreover, there was a significant reduction in pain and treatment effectiveness in women who received multimodal physical therapy compared with lidocaine.

Acupuncture

Women often turn to acupuncture to relieve vulvodynia (Table 5).[16] According to acupuncture theory, when

Table 5. Acupuncture for the Treatment of Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Acupuncture	Schlaeger et al[64] 2015 N = 36 Vulvodynia	1b	RCT 1:1 Standardized acupuncture protocol twice per wk for 5 wk, total 10 sessions compared with waitlist control group Women in the waitlist control group received 10 sessions free acupuncture upon study completion	Acupuncture reduced mean (SD) pain (SF-MPQ, VAS 0-10) from 5.6 (1.9) to 2.7 (1.7). Usual care control reduced mean (SD) pain from 5.7 (2.3) to 5.1 (2.9). Acupuncture significantly reduced pain compared with usual care ($P = .003$). Acupuncture improved mean (SD) dyspareunia (FSFIp, 0-5) from 1.9 (1.3) to 3.2 (1.9). Usual care control improved dyspareunia from 1.7 (1.8) to 1.4 (1.8). Acupuncture significantly improved care compared with usual care ($P = .003$).

Abbreviations: FSFIp, Female Sexual Function Index Sensory Pain Subscale; RCT, randomized controlled trial; SF-MPQ, Short Form McGill Pain Questionnaire; VAS, visual analog scale.

the vital energy (*qi*) is blocked in vulvodynia, there is resultant pain and heat (felt as vulvar burning, stinging, and/or itching).[61] Acupuncture is applied to acupoints on the abdomen, suprapubically, and the extremities, but not directly to the vulva. Acupuncture moves blocked *qi*, relax pelvic floor muscles, and reduce pain and heat in the vulva. The physiologic mechanisms of acupuncture include increased release of mu opioids[62] and beta endorphins, both important in reducing the sensation of pain.[63] Acupuncture in an RCT[64] significantly reduced vulvar pain and dyspareunia in vulvodynia compared with a waitlist control. This standardized acupuncture guideline is currently being replicated in a National Institutes of Health (NIH)–funded double-blind sham placebo–controlled RCT of acupuncture for vulvodynia;[65,66] results will be reported in 2023. Acupuncture is a minimally invasive, non-pharmacologic intervention with a low adverse-effect profile.

Injections

Botulinum toxin type A injections[67–69] and low-molecular-weight-heparin[70] have been used to treat vulvodynia (Table 6). Botulinum toxin type A prevents the release of acetylcholine at the neuromuscular junction resulting in muscle paralysis and has been used in the prevention of migraine headaches.[71] Botulinum toxin type A is injected into trigger points (painful areas on the vulvar vestibule) and/or into hypertonic pelvic floor muscles. Out of 3 studies,[67–69] one double-blind RCT[67] showed that 50 units of botulinum toxin type A reduced dyspareunia but not vulvar pain in women with vulvodynia. The second double-blind RCT[69] showed no difference in vulvar pain between botulinum toxin type A 20 units and placebo at 3 and 6 months. The third study was uncontrolled.[68] Efficacy of botulinum toxin type A 50 units needs to be replicated in a larger RCT.

Low-molecular-weight heparin reduces pain by increasing blood flow to the vulvar stroma, reducing the release of nerve growth factor from mast cells, and decreasing inflammation.[70] In a single-blind RCT,[70] enoxaparin sodium administered subcutaneously to the abdomen by self-injection every day for 90 days showed a significant reduction in vulvar pain at 180 days compared with placebo.[70] Coagulation monitoring is not necessary with low-molecular-weight heparin, but women should be taught self-monitoring for bleeding and bruising. Evidence suggests low-molecular-weight heparin be used up to 90 days' duration.

Psychological Interventions

Cognitive Behavioral Therapy

CBT is used as a non-pharmacologic option for the management of PV (Table 7).[72] There were 2 uncontrolled studies of group CBT and other psychological modalities.[73,74] The first showed a reduction of dyspareunia in women with PV receiving group CBT.[73] The second showed a non-significant reduction in vulvar pain on a scale of 0 to 6, from 2.6 to 1.5 at 10 weeks posttreatment, and to 1.3 at one year posttreatment in unspecified vulvodynia compared with supportive psychotherapy.[74] There were 5 separate randomized uncontrolled studies of CBT with non-psychological interventions: 1% hydrocortisone cream,[26] physical therapy,[72] vestibulectomy plus EMG biofeedback,[56,57] and 5% lidocaine.[75] In the first uncontrolled randomized study, CBT significantly

Table 6. Injections for the Treatment of Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Botulinum toxin type A	Diomande et al[67] 2019 N = 33 PV	1b	Double-blind RCT 3 arms: (1) Botulinum toxin type A 50 units (2) Botulinum toxin type A 100 units (3) Saline injections 1 injection subcutaneously into the dorsal vulvar vestibulum Pain assessed at 3 mo	Botulinum toxin type A 50 units reduced mean (SD) pain (VAS 0-10 cm) from 6.6 (2.0) to 0.2 (2.6) but not significantly more than the placebo ($P = .4$). Botulinum toxin type A 100 units reduced cotton swab test mean (SD) vulvar pain from 7.4 (1.9) to 6.0 (1.8) but not significantly more than the placebo ($P = .2$). Saline reduced mean (SD) pain from 7.0 (2.2) to 0.5 (1.3). Botulinum toxin type A 50 units reduced (Marinoff dyspareunia scale 0-3) dyspareunia from 2.0 to 1.5, significantly more than the placebo ($P = .03$). Botulinum toxin 100 units reduced dyspareunia from 2.5 to 1.5, but not significantly more than the placebo ($P = .3$). Saline dyspareunia pain score remained the same from before to after treatment: 2.0.
Botulinum toxin type A diluted in saline	Petersen et al[69] 2009 N = 60 PV	1b	Double-blind RCT 1 injection in to bulbospongiosus of botulinum toxin type A 20 units diluted in 0.5 mL normal saline or 0.5 mL placebo saline 6-mo follow-ups	Botulinum toxin 20 units and the placebo significantly reduced pain (VAS 10 cm) from baseline (botulinum toxin type A, 7.5; placebo, 7.6) to 6 mo (6-mo values not provided) ($P < .001$). There was not a significant difference between improvement in the botulinum toxin 20 units group compared with the placebo group ($P = .984$).
Botulinum toxin type A	Hansen et al[68] 2019 N = 109 PV	2b	Prospective uncontrolled trial 100 units botulinum toxin type A 50 units to each side	Cotton swab test vulvar pain (NRS 0-10) (n = 63) reduced significantly from 6.8 to 5.5, at 6 mo ($P < .01$). Dyspareunia (NRS 0-10) (n = 44) reduced significantly from 7.8 to 5.8 ($P < .01$). 30 participants dropped before follow-up.

(*Continued*)

Table 6. (Continued)

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Enoxaparin	Farajun et al[70] 2012 N = 40 PV	1b	Single-blinded RCT Self-administered 40 mg enoxaparin (low-molecular-weight heparin) or placebo saline self-administered subcutaneously to the abdomen every d for 90 d Pain measured at 90 and 180 d Enoxaparin sodium requires daily self-injections and may promote bruising and bleeding	Enoxaparin reduced cotton swab test vulvar pain (NRS 0-10) from 8.2 to 6.25 at end of treatment and to 5.8 at 180-d follow-up. Saline reduced pain from 7.5 to 6.6 at end of treatment However, pain increased to 6.8 at 180-d follow-up. Enoxaparin reduced pain significantly compared with saline from baseline to 180-d follow-up ($P = .004$). Enoxaparin sodium significantly reduced pain during intercourse (percentage reduced) 28.9% at 90 d ($P = .057$). Placebo reduced pain by 4.4%; P value not provided.

Abbreviations: NRS, numeric ratings scale; PV, provoked vestibulodynia; RCT, randomized controlled trial; VAS, visual analog scale.

reduced dyspareunia compared with 1% hydrocortisone cream at 6 months.[26] In the second uncontrolled randomized study, CBT and physical therapy[72] showed a decrease in vulvar pain and dyspareunia. Physical therapy significantly reduced vulvar pain more than CBT, but there was no significant difference between CBT's and physical therapy's reduction in dyspareunia. In the third uncontrolled randomized study, CBT compared with vestibulectomy compared with EMG biofeedback[56,57] showed reduced vulvar pain and dyspareunia in all 3 groups at 6 months for women with PV. In a continuation of the same study at 2.5 years, vestibulectomy had a greater reduction in vulvar pain, but all groups had a sustained reduction in pain. Both CBT and vestibulectomy reduced dyspareunia at 2.5 years. However, women in the CBT group were significantly more satisfied with their treatment than women who received vestibulectomy, suggesting that women may prefer less invasive treatments. In the fourth uncontrolled randomized study, both cognitive behavioral couples therapy and 5% overnight lidocaine ointment[75] reduced dyspareunia at 12-week and 6-month follow-up in women with PV, but treatment groups were not compared with one another. Use of CBT can be limited by a lack of CBT providers and access to CBT for women with low income. Efficacy of CBT needs to be tested in RCTs.

Hypnosis

Hypnosis for vulvodynia has only been evaluated in one uncontrolled study[76] that showed a significant reduction of vulvar pain and dyspareunia (Table 7). Because hypnosis is a noninvasive therapy for the treatment of chronic pain conditions,[77] it may be considered a viable treatment option for women with PV. Efficacy of hypnosis needs to be tested in RCTs.

Surgical Interventions

Cold Knife Vestibulectomy and Laser Therapy

It is unknown why vestibulectomy reduces vulvar pain and dyspareunia (Table 8). Two studies[56,57,78] on vestibulectomy found significant reduction in vulvar pain and dyspareunia, one of which was compared with group CBT and EMG biofeedback[56] that continued 2.5 years postoperatively.[57] Twenty-seven percent of women declined to participate after they had been randomized to the vestibulectomy group, suggesting that not all women may view vestibulectomy as an acceptable treatment option.[56] Vestibulectomy is not widely used because of limited patient acceptability. Because of its invasive nature, vestibulectomy should be considered a treatment of last resort.

KTP-Nd Yag laser uses a deep depth of ablation, may assist in remodeling collagen and vasculature, and may destroy pain fibers. There was a non-randomized case series[79] of 67 women who were self-selected to receive an interprofessional treatment program including up to 3 Yag laser treatments (35 women) at least one month apart compared with 32 women receiving usual care for vulvodynia without laser therapy. Baseline differences were not controlled. There was a significant reduction in pain at one-month follow-up in women receiving laser therapy, but no difference in pain at

Table 7. Psychological Interventions for the Treatment of Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
M-gCBT vs education support group	Guillet et al[73] 2019 N = 32 Localized provoked vulvodynia	2b	Randomized uncontrolled prospective cohort study 2 arms: (1) M-gCBT once per wk for 8 wk (2) Education support group therapy, 3 sessions in 8 wk	Education support group's dyspareunia (tampon test, Likert 0-10) reduced significantly from baseline to 3 mo ($P = .012$), and from baseline to 6 mo ($P < .001$). M-gCBT group's dyspareunia reduced significantly from baseline to 3 mo ($P < .001$), and from baseline to 6 mo ($P < .001$). There was no significant difference between dyspareunia scores in the education support group and M-gCBT group ($P = .427$).
CBT	Masheb et al[74] 2009 N = 50 Vulvodynia	2b	Randomized uncontrolled prospective cohort study CBT 1 session/wk for 10 wk Supportive psychotherapy 1 session/wk for 10 wk Baseline, posttreatment at 10 wk and 3, 6, and 12-mo follow-up	CBT reduced mean (SE) vulvar pain severity (Yale–New Haven Multidimensional Pain Severity scale, 0-6) from 2.6 (0.2) to 1.5 (0.3) at 10 wk posttreatment, and to 1.3 (0.3) at 1 y posttreatment. Supportive psychotherapy reduced mean (SE) vulvar pain severity from 3.0 (0.6) to 1.9 (0.3) at 10 wk posttreatment, and 1.3 (0.3) at 1 y posttreatment. There was not a significant difference improvement of vulvar pain severity between groups at 1 y ($F = 2.63$ $P = .053$).
CBT vs PT	Goldfinger et al[72] 2016 N = 20 PV	2b	Randomized uncontrolled CBT or PT 8 1.5-h one-on-one sessions of CBT or PT and homework activities Pain measured at baseline, posttreatment, and 6-mo follow-up	CBT reduced cotton swab test mean (SD) vulvar pain (NRS 0-10) from 3.94 (2.3) at pretreatment to 3.26 (2.69) at posttreatment ($P = .144$) and 2.62 (2.88) at follow-up (pretreatment to follow-up, $P = .009$). PT significantly reduced cotton swab test mean (SD) vulvar pain from 4.16 (1.53) at pretreatment to 1.28 (1.05) at posttreatment ($P = .001$) and 1.86 (2.22) at follow-up (pretreatment to follow-up, $P = .008$). PT reduced average cotton swab test vulvar pain significantly compared with CBT ($P = 0.009$). CBT significantly reduced mean (SD) pain intensity with intercourse (dyspareunia) from 5.2 (1.4) to 2.6 (1.43) at posttreatment ($P = .004$) to 2.1 (1.37) at 6 mo (pretreatment to follow-up, $P = .001$). PT significantly reduced mean (SD) pain intensity with intercourse from 5.05 (1.86) at pretreatment to 2.7 (2.36) at posttreatment ($P = .004$) to 2.4 (2.63) at follow-up (pretreatment to follow-up, $P < .001$). There was not a significant difference between the 2 groups; *P* value not provided.

(*Continued*)

Table 7. Psychological Interventions for the Treatment of Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
CBCT Lidocaine	Bergeron et al[75] 2021 N = 108 women and their partners PV	2b	Randomized uncontrolled trial 2 arms: (1) CBCT 1, 75-min session per wk for 12 wk (2) 5% lidocaine ointment overnight to vulvar vestibule	CBCT reduced mean (SD) pain intensity during intercourse (NRS 0-10) from 6.8 (1.8) at baseline to 4.7 (2.2) at 12 wk posttreatment, and to 4.5 (2.5) at 6 mo posttreatment. 5% overnight lidocaine reduced mean (SD) pain intensity during intercourse from 6.5 (1.8) at baseline to 4.7 (2.2) at 12 wk posttreatment, and to 4.7 (2.6) at 6 mo posttreatment. No significant difference between the treatment effect of CBCT vs 5% overnight lidocaine.
Hypnosis	Pukall et al[76] 2007 N = 8 Vulvar vestibulitis	2c	Case series with no control group Hypnotherapy, 6 sessions Follow-up at 1 mo and 6 mo posttreatment	Cotton swab test vulvar pain scores (NRS 0-10) significantly reduced from pretreatment to 1 and 6 mo posttreatment ($P \leq .01$). Cotton rub test vulvar pain scores (NRS 0-10) significantly reduced from pretreatment to 6 mo ($P \leq .05$) but not pretreatment to 1 mo posttreatment. Intercourse pain measured (MPQ PPI, 0-5) improved significantly between baseline and 1-mo follow-up, and baseline and 6-mo follow-up ($P = .006$); and intercourse-/nonintercourse-related pain frequency ($P = .03$). Nonintercourse vulvar pain severity MPQ PPI improved significantly between baseline and 1-mo follow-up, and baseline and 6-mo follow-up ($P = .002$).

Abbreviations: CBCT, cognitive behavioral couples therapy; CBT, cognitive behavioral therapy; M-gCBT, mindfulness-based group cognitive behavioral therapy; MPQ PPI, McGill Pain Questionnaire Present Pain Index; NRS, numeric ratings scale; PT, physical therapy.

9-to-12–month follow-up. There was a second case series[80] using fractional CO_2 laser (used for skin resurfacing at a superficial level) for PV; 67.6% of women with PV reported improvement, and all patients completed the therapy. Efficacy of both KTP-Nd Yag laser and CO_2 laser need to be tested in RCTs.

Arthroscopic Hip Surgery

Orthopedists, physiatrists, and physical therapists have observed a relationship between generalized vulvodynia and intra-articular hip disorders, such as femoro-acetabular impingement syndrome and labral tears (Table 8). The labrum is the connective tissue lining of the acetabulum (the hip socket) where the head of the femur inserts and aids in smooth movement and increases stability of the hip joint.[13,81] In a case series[13] of 26 individuals with femoro-acetabular impingement syndrome and vulvodynia, arthroscopic correction improved vulvar pain postoperatively in 6 (23%) women under the age of 30. Clinicians may consider an orthopedic source of vulvar pain and referral to an orthopedist and/or physical therapist as warranted.

Cannabis

Medical cannabis has been used to treat chronic neuropathic pain conditions (Table 9).[82] Cannabis has anti-inflammatory properties.[83] Medical cannabis is not legal in all states and remains illegal at the federal level. Therefore there are few federal funding mechanisms supporting studies on the pain-relieving properties of cannabis.[84] An online survey of 38 women with vulvodynia found that cannabis reduced vulvar pain and dyspareunia; however, the route of administration was not reported.[85] There have been no rigorous studies on the use of medical cannabis, including utility and safety profiles, for vulvodynia.

DISCUSSION

Vulvodynia research is in its infancy. Most studies lack control groups, have small sample sizes, and do not compare

Table 8. Surgical Treatments for Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Cold knife vestibulectomy vs GCBT vs EMG biofeedback	Bergeron et al[56,57] 2001 and 2008 N = 78 Vulvar vestibulitis	2b	2001: Prospective uncontrolled randomized trial 3 arms: (1) Cold knife vestibulectomy with a 6-wk postoperative visit (2) GCBT, 8 sessions over 12 wk (3) Surface EMG biofeedback 8 sessions over 12 wk with twice daily practice sessions All treatment methods had a posttreatment and 6-mo follow-up 2008: 2.5-y follow-up study conducted in 2008	2001: 7 of 26 (27%) of women randomized to the vestibulectomy group declined participation ($P < .01$). All 3 treatment groups had significant reduction in cotton swab test vulvar pain (average of 2 test scores, scale not provided) at posttreatment, 6 mo, and 2.5 y ($P < .01$). Vestibulectomy reduced vulvar pain by 70%, GCBT by 28.6%, and biofeedback by 23.7%. Vestibulectomy reduced vulvar pain significantly from baseline to posttreatment, and through 6-mo follow-up compared with GCBT and to EMG biofeedback ($P < .01$). All 3 groups had significant improvement in pain intensity during intercourse (NRS 0-10) ($P < .01$). Vestibulectomy reduced intercourse pain by 52.5%, GCBT by 37.5%, and biofeedback by 35%. Vestibulectomy significantly improved pain intensity during intercourse from baseline to 6-mo follow-up compared with GCBT and EMG biofeedback ($P <0.01$). Pain (MPQ PRI 0-78) significantly reduced in all treatment groups ($P < .01$). Vestibulectomy reduced pain by 46.8%, GCBT by 27.7%, and biofeedback by 22.8%. Between-group comparison was not reported. 2008: 68% of women participated at 2.5-y follow-up. All groups had a significant reduction in pain at 2.5 y ($P < .01$). Vestibulectomy group had significantly lower cotton swab test vulvar pain from 6 mo to 2.5 y as compared with biofeedback $F(62,75) = 8.96$ ($P < .01$), and GCBT $F(2,75) = 10.38$ ($P < .01$). Vestibulectomy group had significantly lower pain during intercourse than the biofeedback group $F(2,75) = 3.50$ ($P < .05$) but was not compared with the GCBT group. Vestibulectomy group pain (MPQ PRI) was significantly lower than biofeedback ($P < .05$) and GCBT groups ($P < .05$).

(*Continued*)

Table 8. (Continued)

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Cold knife posterior vulvectomy	Tommola et al[78,93] 2011 N = 57 Vulvar vestibulitis	2c	Prospective descriptive cohort study Cold knife posterior vulvectomies performed from 1995 to 2007 Long-term follow-up performed for a median of 36 mo (range 5 to 158 mo) No set time points for data collection	19 (35.2%) of participants reported they were cured by vulvectomy (complete response); 30 (55.6%) had partial response, and 5 (9.3%) had no response. Dyspareunia (VAS 0-10) reduced from 9 to 3 (66.7% decrease; $P < .001$). 7 (13%) women reported dyspareunia that required topical anesthetic postoperatively. Posterior vestibular tenderness measured with the cotton swab test (0-10) was absent in 34 (64.2%) participants, 14 (25.9%) reported some degree of constant vulvar pain, and 21% had complications (bleeding, hematoma, infection, Bartholin's cyst, vulvar fissure). Duration of wound pain was 14 d (range = 0-90 d). Duration of sick leave for postoperative recovery was 10.5 d (range 3-24 d).
Yag laser Multidisciplinary Treatment	Trutnovsky et al[79] 2021 N = 67 Vulvodynia	1c	Case study 2 arms: (1) Yag laser up to 3 sessions with 1 session per mo along with a multidisciplinary treatment program (n = 35) (2) Interprofessional treatment program that did not include Yag laser (n = 32)	Yag laser significantly reduced mean (SD) pain during a vulvar cotton swab test (NRS 0-10) from 6.1 (2.6) to 3.1 (2.6) 1-mo posttreatment ($P < .001$). At 9-12 mo Yag laser group participants reported 26% were a lot better, 17% better, 23% a little better and 34% unchanged. Multidisciplinary group reported 13% a lot better, 41% better, 28% a little better, and 19% unchanged. At 9-12 mo there was 73% overall improvement with no significant difference between groups ($P = .6$).
Fractional CO_2 laser	Murina et al[80] 2016 N = 70 Vestibulodynia, n = 37 Genitourinary syndrome of menopause, n = 33	4	Case series Women underwent 3 fractional CO_2 laser treatments Data collected at baseline, 4, 8, 12 wk, and 4 mo	Using analysis of covariance, there was a statistically significant difference in vulvar pain scores (VAS 0-10) in both groups ($P < .05$) through 4-mo follow-up. No statistical results reported, only discussion of results. 13 (35.2%) of the vestibulodynia group reported dyspareunia (Marinoff dyspareunia scale 0-3) symptoms were very improved, 12 (32.4%) reported symptoms improved, and 12 (32.4%) reported no change in dyspareunia.

(*Continued*)

Table 8. (Continued)

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Arthroscopic surgery	Coady et al[13] 2015 N = 26 Femoral acetabular impingement syndrome and generalized vulvodynia or clitorodynia	4	Case series Uncontrolled observational Arthroscopic surgery to remove impingement between acetabular rim and femoral head	Vulvar pain (NRS 0-10) was reduced from 6.7 to 3 postoperatively in the improvement group. Pain was reduced from 6.7 to 4.8 postoperatively in the non-improvement group. There was a significant reduction in pain between groups ($P = .03$). Only 6 (23%) had significant reduction in pain after arthroscopy, and they were all under 30 y old. 1 woman had worse pain.

Abbreviations: EMG, electromyography; GCBT, group cognitive behavioral therapy; MPQ PRI, McGill Pain Questionnaire Pain Rating Index; NRS, numeric ratings scale; VAS, visual analog scale

Table 9. Cannabis for the Treatment of Vulvodynia

Treatment	Author/ Year/ Sample Size	Level of Evidence	Study Design/Treatment Groups/Dosages	Results
Cannabis	Barach et al[85] 2020 N = 38 Vulvodynia	2c	Online survey Pain relief of vulvodynia symptoms from cannabis use. Average use 17.3 d/mo Route of consumption not stated	Using cannabis significantly improved sharp/stabbing, dyspareunia, soreness, burning, stinging, throbbing, rawness, itching, and pain with sitting, exercise, and tight pants (Likert −2 to 2) ($P = .002$) as well as tampon insertion pain ($P < .001$) using two-tailed t-test.

multiple treatment groups with one another. These design flaws limit validity, rigor, reproducibility, and generalizability, which makes it difficult for clinicians to prescribe therapies for vulvodynia that are evidence-based. Also, measures of pain and dyspareunia are not standardized between studies, making it difficult to compare study results.[86] There is little evidence supporting the efficacy of treatments for vulvodynia, singularly or together. Most vulvodynia studies were performed in a clinical setting with women expecting treatment and not expecting to be randomized to a non-treatment or placebo control group.[2] It is unknown what the effect of a control group would have had on study treatment outcomes for vulvar pain and dyspareunia. For example, several RCTs[21,46,47] found no reduction in dyspareunia compared with placebo controls. Placebo treatments can have a therapeutic effect of up to 58%.[87] Without a control group it cannot be determined if findings are due to the treatment or other influencing factors. Placebo groups allow for the true treatment effect to be determined. Also, in studies testing multiple treatments, the benefit of using multiple modalities compared with individual treatments has not been tested.[2]

Recommended Treatments for Vulvodynia

There is uncertainty as to how to afford relief to women who suffer from the debilitating pain of vulvodynia. Clinicians tend to prescribe empirically, based on treatments that have worked for women or recommendations from colleagues. The authors recommend that once women are diagnosed with vulvodynia, clinicians teach women to evaluate their vulvar pain and dyspareunia on a 0 to 10 NRS, keeping a log of their pain ratings and treatments attempted. Tracking this information will enable the clinician and woman to develop a personalized treatment plan.

Once diagnosed, women can be referred to the National Vulvodynia Association (nva.org), which has resources and listings for local support groups, as well as a quarterly newsletter summarizing the latest research. The National Vulvodynia Association also has clinician resources. There are also support groups on social media, including Facebook and Reddit.

Changes in sexual position, vaginal lubricants, and good hygiene will not reduce the pain of vulvodynia. Suggestions that women need "to just relax" during intercourse or get more

Table 10. Treatment Recommendations for Vulvodynia Based on Level of Evidence

Line	Treatment Recommendation
First line: RCT or comparative effectiveness	
Non-pharmacologic	Multimodal physical therapy[22]
	Acupuncture[64]
	Intravaginal TENS as a single therapy[60]
Pharmacologic	Overnight 5% lidocaine cream applied with gauze to vulvar vestibule[22]
	Oral desipramine with 5% lidocaine cream[21]
	Intravaginal diazepam tablets with intravaginal TENS[48]
Invasive pharmacologic	Botulin toxin type A 50 units[67]
	Enoxaparin sodium (low-molecular-weight heparin) subcutaneous injections[70]
Second line: Non-pharmacologic; pre to posttest or group comparison without a control group	Vaginal dilators as a single therapy[55]
	EMG biofeedback[56–58]
	Hypnotherapy[76]
	Cognitive behavioral therapy[26,56,57,72–75]
Third line: Topical pharmacologic; pre to posttest without a control group	Gabapentin cream[28]
	Amitriptyline cream[30]
	Amitriptyline with baclofen cream[29]
	Ketamine-amitriptyline cream[31]
	Conjugated equine estrogen cream[33]
	Estradiol/testosterone cream[32]
Fourth line: Case studies or prospective descriptive studies or invasive	Milnacipran[50]
	Laser therapy[79,80]
	Cold knife vestibulectomy[56,57,78]

Abbreviations: EMG, electromyography; RCT, randomized controlled trial; TENS, transcutaneous electrical nerve stimulation

"turned on" in response to reports of dyspareunia are patronizing, dismissive, and not therapeutic. It is the authors' opinion that these comments may be offered by the clinician because women may not respond to treatments and clinicians may feel helpless.

There are 8 treatments that have the highest level of evidence for reduction of pain and/or dyspareunia based on either RCTs or a comparative effectiveness trial. The authors recommend clinicians first prescribe these 8 treatments. Therapies that are non-pharmacologic and least or minimally invasive can be attempted first with additional treatments as needed: (1) multimodal physical therapy (education, pelvic floor muscle exercises with biofeedback, manual therapy, and vaginal dilators),[22] (2) acupuncture,[64] (3) intravaginal TENS (as a single therapy),[60] (4) overnight 5% lidocaine ointment soaked in a gauze and applied to the vulvar vestibule,[22] (5) oral desipramine with 5% lidocaine cream,[21] (6) intravaginal diazepam tablets with intravaginal TENS,[48] (7) botulinum toxin type A 50 units,[67] and (8) enoxaparin sodium (low-molecular-weight heparin) subcutaneous injection.[70]

The following non-pharmacologic treatments have shown reduction in pain and/or dyspareunia in pre to posttest studies or group comparisons without a control group. This group includes vaginal dilators (as a single therapy),[55] EMG biofeedback,[56–58] hypnotherapy,[76] and CBT.[26,56,57,72–75]

If further treatment is warranted, there is low-quality evidence for the following topical treatments that were shown to reduce pain in pre to posttest studies (without a control group): gabapentin cream,[28] amitriptyline cream,[30] amitriptyline with baclofen cream,[29] ketamine-amitriptyline cream,[31] conjugated equine estrogen cream,[33] and estradiol/testosterone cream.[32]

There is also low-quality evidence for the use of oral milnacipran (reduced pain pre to posttest studies without a control group)[50] and laser therapy (reduced pain in a case series).[79,80] Because of the invasive nature of cold knife vestibulectomy,[56,57,78] it should be used after other treatment options have been exhausted. See Table 10 for a quick guide to treatment recommendations.

Treatments That Have No Support for Use in Vulvodynia

Cromolyn sodium, a mast cell stabilizer, reduces chronic urticaria, inflammation, and hypersensitivity reactions. A small-sample double-blind study in women with PV showed that cromolyn sodium cream did not reduce vulvar pain compared with placebo.[34] There is no evidence to support prescribing cromolyn sodium for vulvodynia. Nifedipine, a calcium channel blocker, relaxes smooth muscles, decreases inflammatory infiltrates, and reduces hypertonicity of the

Table 11. Level of Evidence for Appraising Research	
Level	**Description**
1a	Systematic review of randomized controlled trials
1b	Randomized controlled trials
1c	Case series
2a	Systematic review of cohort studies
2b	Cohort study or subpar randomized controlled trials
2c	Ecological or outcomes research
3a	Systematic review of case control studies
3b	Case control study
4	Case series and subpar cohort or case control studies

Adapted from the Oxford Centre for Evidence-Based Medicine: Levels of Evidence (2009).[17]

internal anal sphincter in patients with chronic anal fissures.[88] In a double-blind RCT,[35] nifedipine showed no reduction in dyspareunia in women with PV as compared with placebo. Antiepileptics treat vulvodynia by calming the central nervous system and are used to treat neuropathic pain conditions.[89,90] In a multicenter double-blind crossover RCT, oral gabapentin did not reduce dyspareunia.[90] There is no evidence to support the use of oral gabapentin for vulvodynia.

Future of Vulvodynia Treatments

Because the etiology of vulvodynia remains unknown, it has been virtually impossible to develop effective treatments for the 7% of American women suffering from vulvodynia. Vulvodynia treatments are still based largely on case and anecdotal reports. As of late, vulvodynia specialists are beginning to focus more on uncovering the etiologic factors of vulvodynia and their potential associations that may guide future vulvodynia treatments. This scientific progress is reflected in emerging new diagnostic subcategories of vulvodynia based on etiology.[91] These diagnostic subcategories have not been validated. Most are based on either histological findings from vulvar biopsy or response to expensive or invasive testing such as 3 Tesla magnetic resonance imaging and serial pudendal nerve blocks. Currently, expert clinicians have started to use these diagnostic subcategories to guide their management of women with vulvodynia.[91] These subcategories may be subject to change and are based on specific clinical findings. They are (1) hormonally associated vestibulodynia, (2) inflammatory vestibulodynia, (3) congenital neuroproliferative vestibulodynia, (4) acquired neuroproliferative vestibulodynia, and (5) overactive (hypertonic) pelvic floor muscle dysfunction. Other factors associated with vulvodynia that have been identified include (1) pudendal neuralgia, (2) spinal pathology and vulvar dysesthesia, and (3) persistent genital arousal disorder. There are no plans at this time to issue a new set of definitions and guidelines for the diagnosis and treatment of vulvodynia. An NIH-sponsored study, "Vestibulodynia: Understanding Pathophysiology and Determining Appropriate Treatments (VBD UPDATe)," is currently underway.[92] The investigators have identified 2 distinct subtypes of vestibulodynia that may benefit from 2 distinct types of treatments. The subtypes differ based on patient-reported outcomes, physical and mental health, production of cytokines involved with inflammation, and expression of microRNAs that regulate gene expression. The study is in its third of 5 years.

CONCLUSION

It is remarkable how many treatments, including vestibulectomy, women are willing to undergo to obtain relief from the symptoms of vulvodynia.[18] Because current treatments for vulvodynia only focus on symptom amelioration, there is a need for research that focuses on the etiology and characterization of vulvodynia. This article provides a framework for clinicians to understand, diagnose, and treat women with vulvodynia using evidence-based approaches. The authors encourage clinicians to avail themselves of changes in the state of the science when treating women with vulvodynia. Importantly, there is an urgent need to conduct rigorous controlled trials to identify the most effective treatments for this difficult condition.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

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Research Article

Factors that Promote a Positive Childbearing Experience: A Qualitative Study

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Introduction: Experiences of pregnancy and birth are important and have long-term impacts on the well-being of women and their families. Perinatal services should aim for care that promotes a positive childbearing experience, as well as optimizing health outcomes for the woman and newborn. This study aimed to understand the health system factors that promote a positive childbearing experience.

Methods: Women who had a positive experience and had given birth in Australia in the previous 12 months were recruited for individual semistructured interviews. The interview guide focused on health system factors that participants credited with contributing to their positive experience of perinatal care. Interviews were conducted until data saturation was reached. Qualitative data were transcribed verbatim and analyzed using inductive thematic analysis.

Results: Data from 36 interviews were thematically analyzed, and 4 major themes were generated: health care provider attributes, health system attributes, communication and decision-making, and experience of care. The salient factors that promoted positive experiences included care that was respectful and individualized with effective communication, access to midwifery continuity of care models, and good integration between services. Competent and professional health care providers who facilitated shared decision-making were also essential.

Discussion: Although women often sought out care that promoted physiologic birth, they emphasized that the way they were cared for was more important than fulfilling specific birth aspirations. Quality maternity care has the capacity to support a woman's confidence in her own abilities and promote a positive, and sometimes transformative, childbearing experience.
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INTRODUCTION

The Global Strategy for Women's, Children's and Adolescent Health asserts that perinatal services should aim for transformative care that not only optimizes health outcomes but also promotes the opportunity for a positive childbearing experience.[1] A positive childbearing experience is defined as "one that fulfils or exceeds a woman's prior personal and sociocultural beliefs and expectations, including giving birth to a healthy baby in a clinically and psychologically safe environment with continuity of practical and emotional support from a birth companion(s) and kind, technically competent clinical staff."[2]

Experiences of pregnancy and birth are important and have long-term impacts on the well-being of women and their families.[3] There are now multiple studies that confirm women want not only a childbearing experience that ends with the birth of a healthy newborn but one that also fulfils their personal and sociocultural expectations.[4] However, approximately 10% to 30% of women report a negative birth experience.[5–7] This is associated with an increased risk of fear of childbirth,[5,8,9] posttraumatic stress disorder,[10] cesarean birth, and postpartum depression,[11] as well as negative consequences for breast feeding[12] and maternal-child bonding.[13]

The health care system that provides the woman's care has a significant influence on her experience. Seminal work undertaken for the development of the Quality Maternal and Newborn Care Framework reflects the complexity and describes the components within 5 groups: practice categories, organization of care, values, philosophy, and care providers.[14] Identifying the specific health care factors that support good outcomes is important for quality perinatal care[15]; however, the focus of research is often on critical incidents.[16] Furthermore, it is vital to appreciate that the woman's experience of her care has a significant contribution to these outcomes.[2,16–20] Most of the studies in this area examine labor and birth,[21] complex pregnancies,[22] and the negative aspects of care.[23,24] Yet, quality care also requires a thorough understanding of mechanisms that support positive experiences. In addition to its innate value, satisfaction with care is an important measure of quality and correlates with superior adherence, decreased use of services, and better health outcomes.[25]

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Quick Points

- The childbearing experience has long-term impacts on the health and well-being of women and their families.
- Many women report a negative childbearing experience.
- Women who have enjoyed a positive experience provide valuable insights that can inform health service improvements and promote quality care.
- To achieve a positive childbearing experience, the care a woman receives is more important than fulfilling her birth aspirations.
- Respectful, individualized care that is provided by competent health care professionals is essential for a positive childbearing experience.

Women who have enjoyed a positive experience can provide valuable insights about the factors that underpin quality perinatal care, which can inform future improvements.[26] A systematic review reporting on 6 qualitative studies considered multiple factors that contributed to a positive experience.[27] The studies were conducted in 4 Western countries (Norway, Sweden, United States, and the United Kingdom) and included data from 68 women who self-identified as having a positive birth. The findings of the review highlighted the importance of individualized care, and the authentic presence of the birth workers. The authors recommended further research that considers the perceptions of women in a variety of contexts. However, a recently published systematic review that aimed to identify the factors that contribute to a women's subjective account of childbirth confirmed a dearth of literature concerning positive experiences.[24] To address the knowledge gap, this study aimed to understand the health system factors that promote quality perinatal care, according to women who had a positive care experience.

METHODS

A qualitative exploratory design, underpinned by a constructivist paradigm, was used to understand women's perceptions of the health system factors that supported their positive care experience. The study was conducted in Australia, where women have access to free universal health care through the public health system, as well as private perinatal care through a user-pays insurance system.[28]

The majority of women in Australia use free perinatal care through the public system in a conventional hospital setting (75%), with a small proportion using birth centers (2.3%) or at home (0.3%).[29] The bulk of their care is provided by midwives, with oversight and intervention from doctors only when deemed necessary.[30] Most midwives and doctors work standard rostered shifts, which can result in fragmented care. However, there are some continuity of care models in the public system, including Midwifery Group Practice (caseload midwifery), which enable the woman to have care from the same midwife (or small team) throughout pregnancy, birth, and the postnatal period. There is also limited access to homebirths with a midwife through some public hospitals.[30]

The eligibility criteria included women who had given birth in the previous 12 months using the public system in Australia. We considered any woman who self-reported a positive experience of her perinatal care, regardless of her mode of birth. Women were excluded if they were younger than 18 years old or unable to read and converse in English. Participants were recruited within the community via advertising on social media sites designed for new mothers and via snowballing.

Table 1. Interview Guide

1	Why did you have a positive maternity care experience?
2	What maternity care practices supported your positive experience?
3	How did organizational factors of the health service influence your experience?
4	How did interactions between you and your health team influence your experience?
5	Was the philosophy of care significant for your experience?

Qualitative data were collected using semistructured interviews (in person or via telephone) between December 2019 and July 2020. The interview guide was developed by authors (H.H. and L.Y.) and based on previous studies (Table 1). Questions explored the women's perceptions of the health system factors that supported her positive experience (pregnancy until day 10 postnatally). Informed consent was obtained from all participants prior to the interview. Interviews took place at a time and location convenient to the participant and lasted up to one hour. With consent, interviews were recorded and later transcribed verbatim. Recruitment proceeded until data saturation was reached. All data were stored in a password-protected computer that was only accessible to the research team.

Transcripts were thematically analyzed by 3 researchers (H.H., J.K., and L.Y.), using the inductive approach as outlined by Braun and Clarke.[31] Using hard copies, the researchers identified initial codes that were organized into potential themes. Each theme was refined to reflect the central characteristics that emerged from the data. Any discrepancies between researchers' interpretations were discussed to reach a consensus. The final themes were then discussed with 2 participants to ensure the findings resonated with their experiences. The trustworthiness of the findings was supported

Table 2. Demographic Characteristics of the Study Participants	
Characteristic	**n (%)**
State of residence	
Victoria	15 (41.7)
Queensland	6 (16.7)
Western Australia	4 (11.1)
New South Wales	3 (8.3)
South Australia	3 (8.3)
Tasmania	3 (8.3)
Northern Territory	1 (2.8)
Australian Capital Territory	1 (2.8)
Education	
Year 12	2 (5.6)
Vocational	4 (11.1)
Diploma	3 (8.3)
Bachelor degree	14 (38.9)
Postgraduate diploma	9 (25)
Master degree	3 (8.3)
PhD	1 (2.8)
Marital status	
Married	27 (75)
De facto	9 (25)
Country of birth	
Australia	34 (94.4)
Germany	1 (2.8)
United Kingdom	1 (2.8)
Location	
Metropolitan	25 (69.4)
Regional/rural/remote	11 (30.6)
Annual household income (AUD)	
25-50,000	4 (11.1)
50-100,000	7 (19.4)
100-200,000	18 (50.0)
>200,000	7 (19.4)
Para	
1	16 (44.4)
2	11 (30.6)
3 or more	9 (25)
Last pregnancy	
Singleton	35 (97.2)
Twins	1 (2.8)
Health service location	
Metropolitan	27 (75)
Regional/remote	9 (25)
Time since last birth	
<3 mo	2 (5.6)
3-5 mo	4 (11.1)
6-9 mo	21 (58.3)
10-12 mo	9 (25)
Mode of last birth	
Spontaneous vaginal	21 (58.4)
Instrumental vaginal	5 (13.9)
Elective (nonurgent) cesarean	3 (8.3)
Emergency cesarean	7 (19.4)
Model of care	
Hospital based midwifery-led care	12 (33.3)
Midwifery group practice	8 (22.2)
Shared care: hospital/primary care (GP)	8 (22.2)
Hospital based medical led care	5 (13.9)
Private obstetrician	1 (2.8)
Home birth (via Public Health system)	2 (5.6)
High-risk pregnancy	
Yes	13 (36.1)

Abbreviations: AUD, Australian dollars; GP, General Practitioner.

through adherence to 4 key criteria: credibility, transferability, dependability, and confirmability.[32]

Approval to conduct the study was received from Monash University Human Research Ethics Committee (16855). The research team comprised one consumer (M.M.) and 7 midwives. Four of the team members (H.H., L.Y., E.F., and S.S.) have a doctoral qualification with expertise in qualitative research. Pseudonyms are used throughout the results to preserve participants' anonymity.

RESULTS

Thirty-six women were interviewed. The mean (SD) age was 32.86 (3.89) years, and the majority were Australian born (94.4%) and metropolitan residing (69.4%) with a higher education qualification (94.4%). One participant was an Aboriginal woman; all others were white Australians or Europeans. Many women were primigravid (44.4%), and most (58.4%) had a spontaneous vaginal birth. The time since last birth was 6 to 9 months in 58.3% of women. All women received their care before coronavirus disease 2019 pandemic restrictions were in place in Australian hospitals. (Table 2). Thematic analysis of the interviews identified 4 major themes: *health care provider attributes*, *health system attributes*, *communication and decision-making*, and *experience of care*.

Health Care Provider Attributes

Staff have a pivotal role in the health care system and had a major impact on the woman's experience of her care. The first theme focuses on the characteristics of health care providers (HCPs) and is categorized into 2 subthemes: personal attributes and professional behaviors.

Personal Attributes

HCPs were typically described as approachable, reassuring, empathetic, and attentive. Women reported that they were treated respectfully and were supported in their decisions. Comments such as those from Stella were common: "I felt

that they were there for me, you know, positively supporting me.… they were really approachable … really warm." Likewise, Leanne said, "…everybody that I worked with including the midwives,… and the doctors … were all just so wonderful and calm and reassuring."

Women expressed how trusting relationships with HCPs supported their confidence and was vital to their positive experience. For example, Josie said "…the most important factor was having an open and trusting relationship with my midwife, that I really trusted her completely." Lydia commented "I found it very positive because … not only they were there for your support, but they also built confidence in you." Similarly, Caroline, who had a history of anxiety, said:

She [midwife] gave me … good information and told me some positive stories … which really helped make me feel confident.… She made me feel very comfortable and I had no fear leading up to the birth, I was very excited about my pregnancy.

Professional Behaviors

Participants highlighted professional behaviors and reported confidence in their HCP clinical expertise. The clinician's abilities were particularly appreciated in an emergency situation. For example, Chloe, who experienced a perinatal emergency, said, "I was just so impressed … I felt like all the staff were very capable at their jobs … I'm in really good hands." Participants also discussed specific behaviors that supported their positive experience. Most typically they highlighted the value of the HCP advocating for them. Charlotte reported her midwife "said, 'I'm your advocate…' she really cared about me and she stood up for me." Another woman who was uncomfortable with the suggestion of an early labor induction said the midwife "…negotiated between me and the doctor … it felt nice to have my midwife like, on my side, them advocating for me." (Josie). Accessibility and responsiveness of the HCP was also emphasized as an important aspect of a positive experience. Lydia's comments were characteristic of many:

I found that connection worthwhile.… I would be able to email or message her [midwife] any questions that I had.… she was just a bit more accessible … also her availability postnatal, she would come and see me every couple of days.

Health System Attributes

The next theme highlights institutional factors that were considered important for a positive care experience. Three subthemes emerged from the data: model of care, philosophy of care, health system resources.

Model of Care

Many participants asserted that continuity of care was pivotal to their positive experience. They repeatedly reflected that consistency of care providers, particularly midwives, was invaluable, as it assisted in building a trusting relationship and navigating the health care system. Bridie stated, "I think continuity of care should be available for everyone … The benefit of having someone involved in your care throughout … it is just invaluable." Likewise, Nancy said, "you feel more … like someone with a voice, like you form a friendship with them, you trust them.… you feel like you can rely on someone." Furthermore, some women who did not have continuity of care believed the lack of consistency undermined their satisfaction, despite an overall positive experience. For example, Joanna said, "I didn't see any of the same people at all through my care. There wasn't a continuity of people that I saw. That was a little bit hard."

Good integration between service providers was also identified as vital. Fatemah's words summarize this point: "I did half my appointments with my GP and then half my appointments with the hospital but I didn't feel like there was a disconnect … it was very consistent." Referral for appropriate postnatal care, which often occurred in the community, was also seen as important. For example, Annie was referred to breastfeeding support service and said "I was struggling to breastfeed.… it was nice to have somebody actually come in and sit with me."

Philosophy of Care

Most participants wanted care that aligned with their aim for a natural childbearing experience. For example, Kamilia stated "I think the midwives that I had were very supportive of that [natural birth], very supportive of trying things.… really engaged in trying to give us a natural birth." Abegail said:

I really wanted a normal birth.… one of the reasons why I wanted to go through MGP [Midwifery Group Practice] in the public system is because … they promote a more natural experience.… they allow women really to be a little bit more control and command of their birth and their pregnancy.

Interestingly, access to care that promoted physiologic childbearing was identified as important, even when natural birth was not obtained.

Health System Resources

This subtheme encompasses the institutional resources women reported to be necessary for a positive care experience, including a variety of physical facilities and services. Many women emphasized that having access to a private space, free from unnecessary interruptions and in a home-like environment, was important. Jennifer explained, "just having that private room and having some space and being able to have your partner stay … That, to me, was really important." When this was not available it detracted from the overall positive experience. For example, Bridie stated, "We had some sensitive medical discussions.… So that was quite stressful, and all those discussions happen in the shared room in front of the [other] family." In contrast, participants did not consider the esthetics of the hospital, such as modernity and décor, to be important. Kamila explained:

I think the hospital facility this time was old rundown compared to a beautiful luxurious private hospital that I had my first daughter, but the midwife care and the GP care this time was so much better and the overall experience was amazing.

Most of the discussion regarding health care services concentrated on accessibility to HCPs, flexibility with appointments, adequate time, and inclusivity of support people. Many participants reported a major factor contributing to their positive experience was their HCP gave them adequate time for

dialogue and informed decision-making. Rachael's comments were reflective of many: "…they were really good with the amount of time they gave as well. I didn't feel rushed." Similarly, Charli said, "She often really took her time, so I really appreciate that … she'd spent so much time talking through things with me." Participants often reported they had easy access to multiple appointments and felt that hospital staff were readily available. Additionally, women who required further assistance, due to varying circumstances, were allowed to prolong their stay and felt that hospital staff had a supportive attitude toward them and their partners. Kamila's words demonstrated service factors that many women thought were most significant: "…flexibility is important because, for me, my husband came to all the appointments, and I think that was a really supportive thing for me."

Shared Decision-Making and Communication

Theme 3 reflects the woman's perception of the approach to communication that was embedded within the organization's workplace culture. This theme encapsulates 2 major concepts that participants asserted were necessary for a positive experience: shared decision-making and effective communication.

Shared Decision-Making

Many women identified opportunity for shared decision-making as fundamental to their positive care experiences. Participants felt they "had a voice" and were well supported in making decisions. Sally explained, "…you know, at the end of the day,… you actually did make your own decision, you thought about it … I didn't feel yeah, pushed into anything." Participants frequently stated that they were well informed about their options and having this knowledge empowered them to make safe choices that aligned with their values and expectations. Kamila said, "I felt like the GP [doctor] and the midwives were really good at giving really good information so that we could choose what we wanted." Significantly, participants reported that respect for their decisions was evident even when they declined recommended treatments. For example, Rachael remarked, "…they explained what the risks were, but we're very happy to support my decision … I felt very supported and respected…. They understood and let me make the choice."

Effective Communication

Open, explicit communication with their HCP was frequently highlighted as important. For example, Charlotte said, "I could ask them anything … the communication was great. Fantastic." Likewise, Rachael commented, "…everything's explained really easily for me so I could understand … what was going on and what I needed to do." A number of participants also discussed how debriefing following their birth was imperative to their positive experience. Annie explained "…afterwards, we had one of the doctors come in and actually did a full debrief with me.… Which was, you know, really important for us." Effective communication between HCPs was also recognized as vital for a positive care experience. Jennifer remarked, "It was very cohesive between our GP and the midwife at the hospital.… I think that's really important. You don't want to be reiterating the same information to multiple people." When integration was lacking, and care became fragmented, the woman's perception of the quality of her care decreased. For example, Chloe said, "The only thing that possibly needed fixing was between my GP and the public system;… information wasn't usually getting back to my GP."

Experience of Care

The final theme captures women's personal experience of the care that they received from the health care system. Three subthemes emerged: a sense of control and safety, transformative and empowering, and individualized.

Sense of Control and Safety

It was evident from the data that participants had received care that supported them to develop a sense of safety and control throughout their childbearing journey. Charlie stated her care "…just felt really safe." Sophie explained; "I felt like my needs were met. I felt included.… I was in control of the situation." Dianne explained "I felt very confident with my midwife … that was part of why I felt so safe." Furthermore, this sense of safety had the power to heal past trauma for some women. For example, Abegail spoke about how the sense of control she experienced with her second child helped her to recover from the trauma of her first birth:

They explained things, they asked how I felt about the situation, they asked what I wanted to do going forward.… it was such a healing experience because I had control, and I didn't have any control with my firstborn.

Transformative and Empowering

Some participants reported a sense of personal autonomy and power as a result of the support and encouragement received from HCPs. Many stated the importance of believing in themselves and their own abilities. Tabetha stated:

I just felt really empowered … from the physical perspective, from an emotional perspective. I think feeling supported … all that kind of came together to set me up for good birth … going into it feeling confident made a big difference.

Sophie's comments highlight that a sense of empowerment achieved through pregnancy and birth had positive consequences for early motherhood:

I had a fantastic birth and I felt like I just went from strength to strength. After that breastfeeding was easy … the sleep deprivation was not that bad because I felt supported. I feel like I was just really set up.… that beginning has just set me up to like, believe in my abilities and just do what needs to be done.

Individualized

A sense of being at the center of care and feeling it was individualized to their specific needs was also described by many participants. Women commonly discussed how they received personalized care that aligned with their specific situation

and expectations. Cecila's words reflect a common sentiment among participants: "I guess because the midwife was so sensitive to you. And they … sort of adapt to how best to fit my situation. I think that's a wonderful skill for them to have." Likewise, Sue said, "I think the reason why I feel that my pregnancy and birth were positive is because I was able to get personalized care."

Importantly, our data indicate that feeling positive about the care received was more related to a sense of being the focus of care, and not dependent on fulfilling specific birth aspirations. Feeling their individual needs and decisions were respected was reported as more significant than any particular birth experience. For example, Amelia, who had an emergency cesarean birth, said, "I wanted a vaginal birth it didn't happen, but still I felt like I was listened to and you know, included in all the decisions.… and I suppose that's why it was a positive experience."

DISCUSSION

Our study sought to capture women's views regarding the health system factors that promoted their positive childbearing experience. These factors interconnect to culminate in the care the woman receives and include HCP behaviors and practices, models of care, resources, and more. Participants explained that although their care was not necessarily perfect, certain factors enabled them to enjoy a positive experience overall. This care enabled them to achieve a sense of safety and control and, for some women, to have a transformative childbearing experience.

The development of a respectful relationship was perceived as imperative for a positive childbearing experience. Our findings are consistent with multiple studies that affirm the relationship built between a woman and her HCP can facilitate either a positive or traumatic childbearing experience.[24] Being treated with respect has been identified as the number one health care priority for women and girls across the globe.[33]

Many participants asserted the importance of midwifery continuity of care and good collaboration across health services. In situations when care was fragmented, or communication was poor, the woman's experience was diminished. Midwifery-led continuity of care provides the opportunity to develop trusting, respectful relationships that participants from our study and others[34] identified as central for a positive childbearing experience. These models also support women to have appropriate time and access to known midwives. Multiple studies exploring the influence of organizational factors have found lack of time and fragmented care act as barriers to quality perinatal care.[35] Our findings are consistent with an abundance of research demonstrating midwife-led continuity of care models not only reduce the likelihood of complications but also contribute to a positive childbearing experience.[36,37]

Women who participated in our study perceived that their HCP were clinically competent and provided care that was individualized to their specific needs and values. Placing the woman at the center of her care and providing services that are responsive to her values, beliefs, and needs has been emphasized as fundamental to quality perinatal care.[4,38] A number of participants also expressed their appreciation for HCPs who included their support person in various aspects of their care. This is consistent with other research that found women value family-focused care.[39]

Good communication is essential for women to have trust and a sense of personal control.[15] Our findings echo earlier research that reports effective communication and decision-making are predictors of a positive birth experience.[6,40–43] Participants maintained that it was vitally important for them to understand their options, be actively involved in decision-making, and have their choices respected. This is in keeping with World Health Organization guidelines for a positive birth experience that assert women living in high-income countries value maintaining their personal agency, even when medical interventions are necessary.[2]

Similar to earlier research,[4] many of the women sought out models that promoted a natural childbearing philosophy. Yet, it is interesting to note that participants in our study clearly articulated their positive experience was not dependent on fulfilling their birth expectations. Even women who were unable to give birth as they had hoped spoke highly of their perinatal care experience. Other studies have also found that a positive experience is related to quality care, with no association to mode of birth.[43] In addition, although participants in our study often aimed for natural birth, they frequently described a sense of safety that emanated from having confidence in the clinical competence of their HCPs should obstetric intervention be necessary. Although it is difficult for consumers to evaluate the clinical competence of their HCP,[25] our findings indicate that having confidence in care givers' abilities is important for a positive experience.

Public health expenditures and access to HCPs play an important role for the patient satisfaction.[25] Participants in our study accessed the free public health system in Australia, and unsurprisingly, the financial aspects of care did not emerge as significant. However, resources, particularly time and space for privacy, were identified as important. Many women discussed the benefits of having adequate time for in-depth discussions with HCPs, which is consistent with previous research.[15] Adequate time provides the opportunity for the development of a trusting relationship and for the appropriate exchange of information, both central tenets of quality care. Privacy was also highlighted as essential, particularly when the provision of a single room was not possible. Maintaining the woman's privacy and confidentiality is fundamental to respectful care[44] and considered important by health care consumers in our study and others.[45,46] However, as with other research,[39] women did not consider the modernity of physical facilities important.

The findings from this qualitative study have important implications for practice, policy, and research. Women benefit when they have access to health systems and models of care that respect their individualized needs and preserve their agency. Midwifery-led continuity of care with good integration across services is an important enabler for a positive perinatal care experience. Expansion of these models should be a priority for policy makers and other key stakeholders. In addition, exploration of the experiences of diverse populations is required to improve outcomes for all women and their families. Future research should target women from different cultural, ethnic, and social circumstances to elicit the health

system factor that are important to them. Similarly, exploration of how HCPs view their ability to deliver factors that lead to a positive experience in light of system constraints would assist to progress the implementation of quality perinatal care.

Strengths and Limitations

A key strength of our study is that we collected data from women who had a variety of pregnancy complexities and modes of birth. The research design enabled women to identify the factors important to them. Furthermore, a perinatal care consumer (M.M.) with lived experience was part of our research team. Including consumers in research is an important strategy to enable women's voices to be included in the discourse surrounding quality care.

Our study also has limitations. Most of the participants were well educated, white women who received care in urban settings. As such, our findings may not reflect the experiences of women from diverse backgrounds or those in rural areas.

CONCLUSION

The impact of the health care system on women's experiences of childbearing is often not fully appreciated. Women in our study emphasized the way they were cared for was more significant than fulfilling specific birth aspirations. The salient factors for positive childbearing experience include being treated respectfully, effective communication, individualized care, access to midwifery continuity of care models, and good integration across services. Competent and professional HCPs who facilitate shared decision-making are also essential. These factors promote the woman's confidence in her own abilities and supported a positive, and sometimes transformative, childbearing experience. Future research should focus on the accounts of women from underrepresented groups and the factors that impede HCPs' abilities to deliver care that promotes a positive experience.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

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Review

Toward Optimal Emotional Care During the Experience of Miscarriage: An Integrative Review of the Perspectives of Women, Partners, and Health Care Providers

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Introduction: Miscarriage is frequently associated with significant emotional impact, causing psychological distress, trauma, and grief. Unfortunately, women and partners frequently report dissatisfaction with care around miscarriage, and health care providers report feeling ill-prepared and underequipped to provide emotional support. This integrative review synthesizes the individual perspectives of the woman experiencing the miscarriage, the partner, and the different health care provider roles involved in the care to better understand what future research is necessary to improve the experiences of bereaved parents and their health care providers.

Methods: Electronic databases were searched for studies that covered emotional care around miscarriage from the perspective of women, partners, or health care providers. The review included studies published in English between 2015 and 2022, using either quantitative or qualitative methods. Thematic analysis was carried out, and conclusions from these articles were integrated into themes and subthemes.

Results: A total of 60 studies met the inclusion criteria. Two main themes were identified for women: (1) a need for more information and (2) a need for acknowledgment of their loss. Two main themes were likewise identified for partners: (1) a need for more information and (2) a need for recognition. Three main themes were identified for health care providers: (1) a need for additional training, (2) components of quality care, and (3) perceived barriers to providing care.

Discussion: There is broad overlap in the needs identified by bereaved parents and their health care providers, as well as general agreement regarding the barriers to providing effective care. Five areas of future research priority were identified to understand how best to meet these needs: empirical evaluation of strategies to meet identified needs, investigation of setting-specific needs, integrated consideration of all relevant roles, investigation of the care needs of diverse groups, and an investigation of the predictors of emotional impact.
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Keywords: early pregnancy loss, health care providers, miscarriage, review

INTRODUCTION

Up to 1 in 4 known pregnancies ends in miscarriage. Miscarriage is defined as an unintended loss or interruption of pregnancy up to the 20th week of pregnancy in the United States and Australia[1] or 24th week of pregnancy in the United Kingdom.[2] Miscarriage is distinct from stillbirth, which refers to an intrauterine fetal death after this gestational age. The annual prevalence of miscarriage is approximately 147,000 in Australia,[3] 750,000 to 1,000,000 in the United States,[4] and 200,000 in the United Kingdom.[2]

Despite the high frequency of such loss, there is still considerable stigma around miscarriage.[5] Women are often not expected to disclose they are pregnant until after the first trimester because of fear of early pregnancy loss.[6] As such, friends and family are often not aware of the pregnancy during the early stages. Furthermore, the emotional impact of miscarriage is frequently underestimated, and it can be difficult for women and partners to find acknowledgment from friends, family, or health care providers (HCPs).[6] Importantly, research has shown that women frequently experience significant psychological distress, trauma, and grief as a result of miscarriage, which can last weeks, months, or even years.[7–9] Clinically significant depression, anxiety, and posttraumatic stress disorder are also not uncommon.[10]

Over the past 30 years, there has been a substantial increase in research exploring the psychological impact of miscarriage. In 1996, Lee and Slade[11] identified that in addition to the traumatic aspects of the miscarriage itself, there was a general disappointment among women with many aspects of their care. Issues such as long wait times, insufficient information, a lack of acknowledgment of the loss, and absent psychological care were reported.[11]

Dissatisfaction with care in the initial stages of treatment is an important finding because the quality of he care, emotional support, and interactions with HCPs can positively or negatively influence the experience of miscarriage.[12–15] Evidence has shown that women and their partners who report satisfaction with their care following miscarriage are less likely to experience depression, anxiety, and perinatal grief.[16–17]

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Quick Points

- Many women and partners report dissatisfaction with emotional care during their experience of miscarriage.
- Women and partners who experience miscarriage identify both similar and different needs, most (but not all) of which are also identified by health care providers.
- To improve the experience of bereaved parents and their health care providers, areas for future research include the evaluation of intervention strategies, setting-specific needs, joint consideration of different roles, differences in care needs, and predictors of emotional impact.

Despite a rapidly growing body of scientific research over the past 2 decades, women and their partners continue to report disappointment with the care they received. Recent systematic reviews reported that both bereaved women[18] and their partners[19] felt their miscarriage was not treated as significant, their emotional pain was often not acknowledged, and information and communication weproblematic, with long waiting times exacerbating the traumatic nature of the event. Furthermore, HCPs themselves reported a lack of confidence,[20,21] knowledge,[20,22] and training[23–25] when providing emotional care to women and partners who experience miscarriage.

The primary aim of this integrative review was to provide a synthesis of miscarriage care world literature from the last 7 years (2015-2022), integrating the individual perspectives of (1) the woman experiencing the miscarriage, (2) the partner, and (3) the different HCP roles involved in the care. Subsequently, 5 key areas of future research were identified to improve the provision of emotional care around miscarriage.

METHODS

Literature searches were conducted across EBSCOhost Research Databases that included PubMed, CINAHL Plus, MEDLINE, PsycINFO, Scopus, and JSTOR, as well as Google Scholar. The following search terms were used: *early pregnancy loss*, *miscarriage*, and *perinatal loss*, in combination with one or more of the following terms: *mental health*, *emotional well-being*, *grief*, *psychological impact*, *needs*, *women*, *men*, *lesbian*, *gay*, *LGBT/LGBTQ*, *gender diverse/diversity*, *healthcare professional*, *nurses*, *midwives*, *obstetricians*, *private hospital*, *emergency department*. Search terms were chosen to cover literature from a wide range of fields of research. The search was then supplemented by reference tracking from the initial articles. The final search was conducted on February 8, 2022.

This review was limited to articles that were published in English within international scientific peer-reviewed journals between 2015 and 2022. Both empirical and review articles were included. Review articles published during this period that cited primary sources from before 2015 were included, consistent with recommendations for integrative reviews.[26]

The inclusion criterium was that studies covered the experiences around miscarriage care of any combination of 3 groups: women, partners, and HCPs. Articles using either quantitative or qualitive methods were included. Study titles and abstracts were first screened, and if the article was ineligible based on title or abstract, it was discarded. Otherwise, the full text was reviewed, and eligibility was reassessed. All researchers were involved in this process. Any uncertainty was discussed until consensus was reached.

For each of the 3 groups, articles covering the corresponding perspective were examined by 2 independent researchers. Themes identified by the 2 researchers were then compared and organized into main themes and subthemes. Any differences were resolved by adjudication by a third researcher.

The authors recognize that a person who physically experiences pregnancy loss may have a gender identity other than female. For clarity in this review, the term *woman* is used when referring to the individual who physically experienced the miscarriage. The term *partner* is used when referring to the significant other and is intended to include all self-identified genders.

RESULTS

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement was followed in reporting this review (Figure 1).[27] A total of 60 articles met the inclusion criteria, comprising 17 from the United States, 13 from Australia, 12 from Europe (United Kingdom, Ireland, Denmark, Turkey, Spain, France, Sweden, Belgium), 6 from Canada, 1 study with data from both Sweden and the United States, and 11 international review articles.

The majority of studies (n = 35) used qualitative methodology, with semistructured interviewing as the most common method. There were 9 quantitative studies and 4 that incorporated mixed methods. The remaining articles comprised one priority-setting partnership and 11 review articles. Please see Supplementary Table 1 for a detailed summary of this literature. Themes and subthemes identified for each of the 3 perspectives (women, partners, and HCPs) are depicted in Figure 2.

Experiences of Women

A total of 37 articles covered the perspectives of women who experienced miscarriage. Two main themes were identified: (1) a need for more information and (2) a need for acknowledgment through empathic treatment.

Need for More Information

Some women found the information provided about causes, symptoms, and frequency of miscarriage to be inadequate in helping them navigate through the unfamiliar and sudden circumstance of miscarriage.[18,25,28–31] Some reported

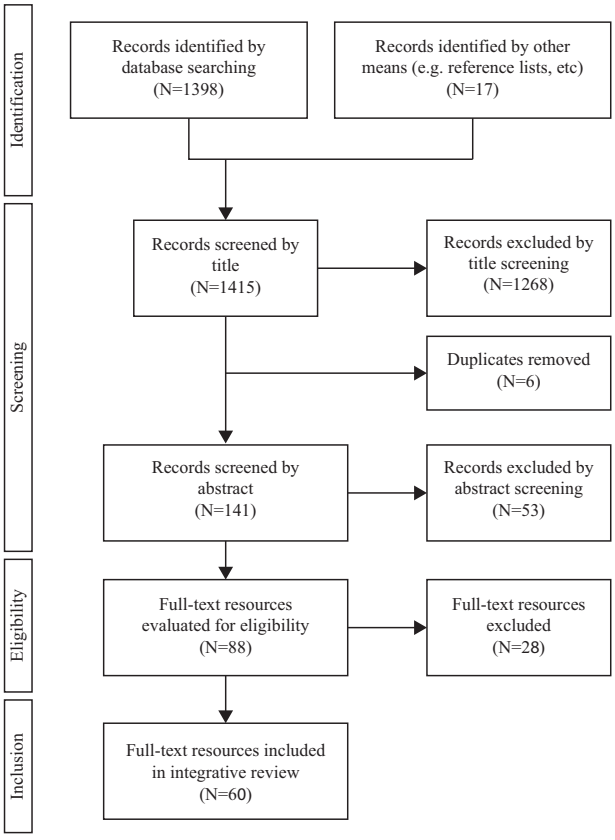

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses Flow Diagram.

seeking out further information regarding causes, symptoms, and frequency of miscarriage to better understand their situation.[14,25,32–34] Others reported needing information about what to expect throughout the miscarriage process, and needing to understand treatment and management options and the associated risks.[14,25,35,36] Many believed this would provide a sense of control and self-determination[15,29,37,38] and that having more information about the causes of the miscarriage would alleviate some of the guilt experienced.[15,29,36–39]

Women also reported desiring information about their physical recovery and possible complications,[25,29,33,40] as well as the emotional journey ahead, including the grieving process and emotions derived from self-blame.[12–14,18,28–31,33,34,41] They reported seeking additional information through helplines, websites, online forums, support groups, grief counselors, and psychological services.[12–14,18,29,34,40,42] Many also indicated wanting to know when they could expect their menstruation to resume,[33] when it would be safe to attempt another pregnancy, and the risks of miscarriage occurring again.[14,15,29,33,35,38,39,41]

Some women reported that their experience of care was strongly affected by how they received information. Information that provided clear, immediate, and reliable answers that were easy to understand and relevant for partners and families was preferred.[12,14,18,28,29,33,34,39,40,43,44] Women appreciated when HCPs gave a clear diagnosis[28,40,41] and checked for understanding when explaining medical processes.[45] Information that was not overly clinical or medicalized[12,28,34] and presented in a way that was not overly "bright" or "melancholy"[34, p.121] was preferred. It was also considered important that information and advice regarding prognosis, follow-up procedures and implications for future pregnancies was consistent across the care team.[12,25,29,30,33,38–40,45,46]

Finally, women expressed limitations in their capacity to process and retain verbal information because of their emotional state, especially for complex medical terminology and processes.[33,44,45] They indicated that it would be helpful to receive supporting written information, including a list of resources or health care services to contact if needed, so they would be able to process the information when ready.[33,39,40,46,47]

Need for Acknowledgment Through Empathic Treatment

Women rated care favorably when they felt that HCPs treated them as individuals experiencing something meaningful and distressing, acknowledging both the emotional and physical components of the loss.[12,13,15,25,28,30,31,33,36,40,41,45] Women reported they were not looking for specialized counseling skills, but rather that HCPs were just present, actively listening to their experience, and taking the time to identify their feelings and needs.[12,30,33,41,44,45] This offered a sense of validation for their thoughts and feelings.[45] Many women further reported empathic communication with their HCPs to be paramount in effective care.[12,28,30,40,41,45] Compassion was recognized through eye contact, open body language, tender tone

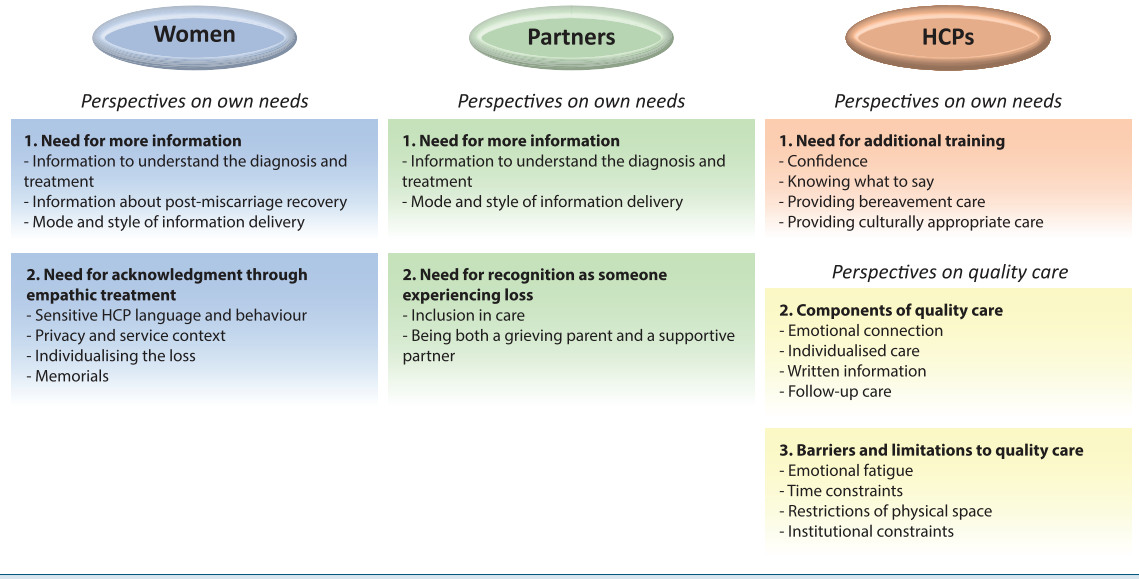

Figure 2. Themes and Subthemes Identified in This Review of Recent Literature Covering Emotional Care Around Miscarriage, from the Perspective of Women, Partners, and Health Care Providers.

Themes of women and partners covered each group's own needs (indicated in blue and green, respectively). For HCPs, one theme covered the needs of HCPs themselves (orange), and 2 further themes (yellow) covered HCPs' perspectives about quality care (components and constraints).
Abbreviation: HCP(s), health care provider(s)

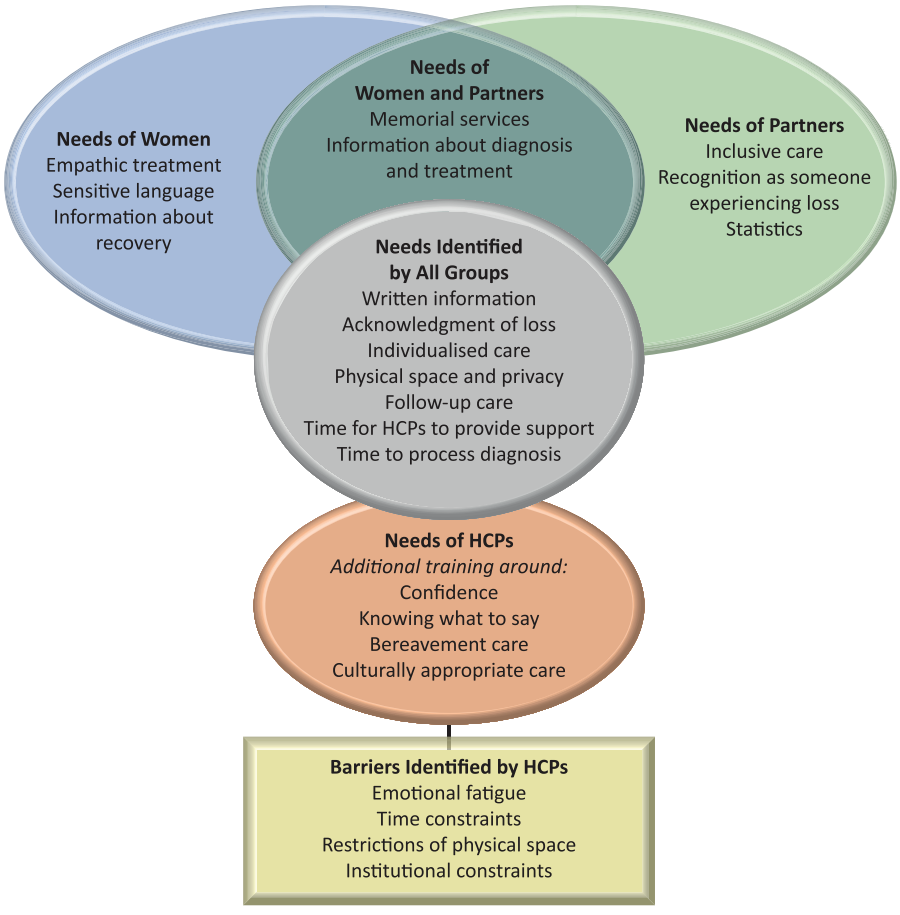

Figure 3. Joint and Disjoint Needs for the Provision of Quality Emotional Care Around Miscarriage, as well as Barriers to Meeting Those Needs, from the Perspectives of Women, Partners, and Health Care Providers

Abbreviation: HCP(s), health care provider(s)

of voice, and use of supportive touch.[18,45] Many women reported being sensitive to comments and behavior that diminished the emotional impact of their loss, including the specific language used to describe their experience. This included referring to their lost child as "tissue," "clots," "failed conception," "products of conception," "missed abortion," "reproductive wastage," or "dead fetus"[12,14,45] and comments such as "it was just a miscarriage," or "you can just have another baby."[13,14,25,28,40,45,48]

Women reported feeling acknowledgment in the hospital when they and their partners were placed in environments that provided privacy to process their situation.[12,18,33,36,40,49] Specifically, women appreciated when HCPs recognized that physical proximity to pregnant women or newborns could amplify their feeling of loss.[12,14] In general, women reported appreciating reduced wait time as an acknowledgment of their bereavement,[14,15,18,40,41] especially in emergency departments (EDs).[33,40] Follow-up appointments addressing emotional and practical needs also provided acknowledgment for the significance of the loss.[12,14,25,30,33,40,42,43]

Many women reported valuing care that was individualized and sensitive to their choices and needs.[12–14,25,30,31,33,40–42] Some reported desiring support and follow-up options tailored to the cultural and spiritual needs of their family.[25] Cultural differences in grief and the perception of motherhood and perinatal loss[50] influenced the individual needs of women and partners.[51] Women from diverse racial and ethnic groups also reported different ways of coping with loss.[51] Furthermore, both heterosexual and LGBTQ (lesbian, gay, bisexual, transgender or queer) couples with histories of infertility or pregnancy loss reported that the experience of grief associated with pregnancy loss was amplified by the additional processes, practices, and time required to achieve pregnancy, as well as the emotional and material investment made in the anticipation of parenthood.[11,52]

Some women reported memorials as a potentially powerful way to validate their loss, and identified such experiences as significant in helping them cope.[14] Remembrance services were often sought out by families who had experienced miscarriage.[34,36] The opportunity to create meaning for the loss resolved some of the ambiguity associated with miscarriage, helping women come to terms with their lost identity as a parent-to-be of this child.[34]

Experiences of Partners

Twenty-one articles were included that explored the experiences of miscarriage in partners. The majority of these studies included and described exclusively male partners, with 2 studies investigating partners in LGBTQ relationships. Two main themes relevant to partners were identified: (1) a need for more information and (2) a need for recognition.

Need for More Information

Some male partners reported seeking biological explanations, clear facts, and statistics to rationalize and cope with the distress associated with the loss. Partners valued statistics more than women seemed to need this specific information.[25,36,49,53] Partners often reported feeling helpless while observing the loss, which may explain some partners' increased need to understand the process and etiology of the loss.[49,54] Several indicated that they preferred answers to be "hard, fast, and short"[44,49] and that it was appreciated when additional resources were accessible on mobile devices to maintain privacy from others.[25,49] Some also reported wanting to know where to obtain information about how to support their partners, as well as themselves.[54,55]

Need for Recognition

Some partners reported that being the partner, rather than the person physically experiencing the miscarriage, contributed to making them feel that they should not experience or communicate their emotions.[25,53,55] They expressed that as partners, they needed to be recognized as also experiencing a significant loss.[49] Compassionate and sensitive care from HCPs, such as expressions of personal warmth, empathy for bereavement, and access to follow-up, helped partners cope with their own grief.[25,33,36,49,55,56] It was also reported that memorial items, services, or rituals validated their loss as a partner.[36,49]

Many partners additionally reported significant tension, stress, apprehension, and internal conflict from needing to reconcile being both a grieving parent and a supportive partner.[25,49,57,58] Some reported needing emotional support to negotiate fear, frustration, and disappointment caused by the loss[53] and a need to share experiences with others who could relate to the internal conflict of balancing roles.[49,57] Several male partners particularly valued activities that allowed fathers to support and connect with those who had similar experiences.[36,59]

Some partners indicated that the perceived expectation that they suppress their feelings to support their partner left them feeling isolated in their grief.[49,59,60] Although some male partners reported that they found retreating into perceived gender roles helpful in distracting from grief, other male partners reported that gender role expectations made it difficult to grieve when confronted with a miscarriage[56,57,61] and prevented them from seeking and accessing support.[53] It was therefore particularly helpful when HCPs specifically included them in hospital care and support, instead of implicitly expecting them to take on the role of support for the woman.[59,60] As such, hospital practices that actively provided validation from HCPs and minimized the disenfranchisement of (male) partners' grief were reported to be appreciated.[55]

Experiences of HCPs

Twenty articles examining the perspective of HCPs involved in the provision of care for women and partners who experience miscarriage were analyzed. The majority were nurses and midwives (90%), with obstetricians and general practitioners composing only 6% and 3%, respectively. Three main themes were identified: (1) a need for additional training, (2) components of quality care, and (3) barriers and limitations to providing that care.

Need for Additional Training

In a number of studies, HCPs reported feeling insecure and unprepared when providing emotional care because of a lack of training.[22,62] Many reported that the focus of their training was on physical management[21] and that the provision of emotional care had to be learned through experience.[21,23,24] For example, in one study, only 6% of registered nurses indicated feeling adequately prepared to provide support to parents experiencing a miscarriage.[63] In another study, 88.6% of surveyed midwives wanted extra training on the subject, and 72.4% believed they had insufficient knowledge to provide effective support.[20] Some HCPs indicated that they felt they lacked communication skills and bereavement counseling techniques[24,25] and that they did not know what to say and when to say it, or what information to provide to patients.[20,33] They reported that their perceived inadequacy and lack of clinical experience in emotional miscarriage support translated to a personal sense of incompetence.[20]

Some HCPs also reported a lack of knowledge or formal training on culture-specific needs[24] and that cultural barriers sometimes prevented them from providing appropriate care to women and families with different ethnicities.[63] For example, HCPs working within Asian communities noted that perinatal death was considered taboo as a topic for discussion, and perinatal death was seen as a failure.[50] As a result, they struggled to broach the topic with bereaved families. Likewise in Australia, some HCPs reported feeling unable to provide adequate education for certain populations, such as women from remote Aboriginal communities.[25]

Components of Quality Care

Many HCPs emphasized the importance of providing emotional support to women and their families as part of care.[20,62–64] Specifically, HCPs reported this involved simply being present and taking time to listen and discuss.[22,33,62,65] In general, HCPs believed they should adjust their care according to individual needs.[15,24,44,59,64] Some HCPs mentioned that being empathetic and engaging with parents' individual needs and experiences helped them develop an emotional connection[60] and recommended following the family's lead, not making assumptions, and giving the family opportunities to reconsider and change their decisions.[44] Some HCPs specifically reported that it was important to understand and include partners as individuals with unique styles of grieving.[60]

Many also considered the provision of information in written form to be paramount.[20,23,25,33,63] They believed that written information would help educate women and their families[25] and provide comprehensive information on the physical and medical management of the miscarriage, as well as psychological symptoms[20] such as possible depression and grief.[63] Some HCPs reported that written information helped them circumvent time constraints, because important information could be provided and read at a later time.[23,44] Written information also helped direct patients to other available resources, such as online support networks and discussion groups.[23,33]

Finally, HCPs emphasized the importance of follow-up care. In several studies, HCPs believed that follow-up care should be offered to all women and their families,[63] as either a telephone or outpatient appointment.[33] It was noted that in many cases, follow-up care was currently lacking, particularly in public hospitals.[21]

Perceived Barriers and Limitations to Providing Quality Care

Several HCPs described struggling to be emotionally present when caring for women and their families, because of compassion fatigue or for self-protection.[21,62,65] They reported that they struggled at times to handle patients' emotional reactions such as anxiety, sadness, grief, and fear.[23,24,65] Some believed staying professional by compartmentalizing the grief and remaining task-focused was helpful. They also identified the specific challenge of moving between attending births on labor and delivery and caring for bereaved families back to back. Having to switch between experiences and displays of joy and grief was described as emotionally draining.[22,23,62]

HCPs frequently highlighted staffing deficits[23] and a lack of time as a barrier to building rapport with women and their families and providing adequate psychosocial support,[20,21,64] especially in ED settings.[62] Some midwives reported feeling that they overloaded their patients with information and, because of time constraints, were ultimately unable to provide the continuity of care they felt was crucial.[44]

Furthermore, HCPs felt that privacy and sensitivity around physical space was important for women and partners experiencing miscarriages,[33,64] noting that space constraints, especially in the ED, sometimes prevented them from meeting the privacy needs of grieving families.[25] They also indicated that providing miscarriage treatment alongside other maternal services[23,33] or in proximity to other pregnant women[63] could not always be avoided.

Several HCPs highlighted that policies or relevant guidelines around miscarriage care were unavailable[33,63] or were perceived as prioritizing cost-efficiency, rather than emotional aspects of care.[22] Without standard procedures or guidance for miscarriage care available, some HCPs reported relying on prior personal experience, which they believed resulted in care that was inconsistent across staff.[20] Others highlighted a structural lack of professional counseling and debriefing opportunities for staff involved in providing bereavement support.[24,44,64]

DISCUSSION

Based on the available scientific literature, considerable overlap exists in the needs identified by bereaved parents and their HCPs (Figure 3). There is also general agreement regarding the barriers to providing effective care, such as the constraints imposed by time, space, and other hospital resources. In addition, in several themes, the self-reported needs of women or partners did not align with the components of quality care identified by HCPs. For example, bereaved parents asked for additional information, which was not a need identified by HCPs. Likewise, bereaved parents identified memorial services as a potential way to acknowledge their loss, whereas HCPs did not.

Given the broad consensus on the needs of women and partners who experience miscarriage, the question arises why

these bereaved parents continue to report dissatisfaction with emotional care.[14,18] The reviewed literature suggests that what might be missing is not the identification of needs, but a systematic investigation and evaluation of how those needs can best be met. This distinction was not often made explicit. For example, interventions that might seem intuitive, such as HCPs offering statistics to normalize the loss, could result in feelings of marginalization of the loss for some women. Evidence evaluating such interventions is limited, which supports the need for additional research aimed at quantifying specific outcomes of these strategies.

Limitations

There are a number of limitations to this review. First, none of the included studies differentiated the specific type of miscarriage (eg, spontaneous vs discovery of a nonviable pregnancy at antenatal appointment) or the management approach (expectant, medical, or surgical). Studies also differed widely in the recency of participants' miscarriage experience, ranging from a few weeks[12,66] to many years.[14,34,46] Because the setting and management approach dictate time and space constraints, as well as the HCP roles involved in care, it is therefore unknown to what degree the needs identified here are specific or generalizable to each type of miscarriage or management approach.

Furthermore, there is a potential for bias in the reviewed literature, as a result of both sampling bias and selection bias. Bereaved parents who were especially dissatisfied with the care they received might conceivably be more likely to volunteer to participate in studies investigating satisfaction with care than bereaved parents who were satisfied, potentially resulting in an overrepresentation of dissatisfied participants. In addition, reported dissatisfaction with care in a given hospital or setting might itself be a motivator for research: there is likely to be more incentive to investigate the needs of patients in a hospital or department where patient satisfaction is low rather than where it is high. This too would result in an overrepresentation of dissatisfied participants in the literature.

Implications for Practice and Research

The themes identified in this review suggest 5 promising areas for future research. First, there is a significant lack of research on the effectiveness of interventions and guidelines designed to improve the emotional care of women and partners experiencing miscarriage.[21] Only 3 intervention studies in the past 7 years met the inclusion criteria of this review, and although they report promising results, each had important limitations. Johnson and Langford designed a one-hour bereavement program for women experiencing miscarriage in an obstetric emergency center in the United States. Results indicated the intervention was successful in reducing women's grief at 2 weeks post-loss.[66] Doherty et al investigated the impact of a one-day bereavement care workshop for student midwives in Ireland.[32] Participants reported an increase in confidence providing bereavement care 3 months postworkshop. The absence of a control group, however, makes it difficult to exclude the possibility that the increase in confidence may have been a result of ongoing training. The final intervention study investigated the effect of an intervention designed to help nurses provide individualized care to pregnant women in Turkey who had previously experienced pregnancy loss.[16] This care approach was highly effective in reducing the anxiety and depression among pregnant women, and increased their attachment to the current pregnancy. Women who have recently experienced miscarriage and are not currently pregnant, however, would not have the continued contact with nursing staff necessary to implement this care approach. Although these intervention studies are promising, more research is needed to determine the efficacy of interventions aimed at meeting specific needs. Furthermore, additional research is necessary to determine how the well-being, confidence, and expertise of HCPs translates to bereaved parents' satisfaction with care and subsequent emotional well-being.

Second, the majority of scientific studies investigating miscarriage have done so in the context of the ED. The specific hospital setting dictates procedural limitations, such as time constraints in the ED or a lack of privacy away from other pregnant women on a labor and birth unit. The specific care location will also correlate with the timing of the diagnosis, any preceding symptoms (such as cramping or blood loss), the level of urgency around management, and possible preexisting care relationships with the HCPs involved. Because the needs of women, partners, and HCPs differ by hospital and practice setting, the predominance of literature based on the ED portrays an incomplete picture of needs and care.[30,33,40] Given the joint needs identified in this review around time, space, and privacy, understanding the experiences of women, partners, and HCPs in specific settings is essential. Further research specifically considering the needs of bereaved parents and HCPs in different settings is therefore necessary to develop role- and setting-specific interventions.

Third, both women and HCPs identified the importance of consistency among HCPs across the care team. However, miscarriage care involves a complex interaction between women, partners, and multiple HCP roles. The majority of studies in this review considered either the parents'[18,19,53,56,58] or the HCPs' view[22,50] separately, with few studies considering all parties concurrently in the same setting.[25,33,44] Furthermore, studies in this review primarily described the experiences of nurses and midwives. Acknowledging the specific care practices and experiences of other HCP roles (eg, sonographers and generalist or specialty physicians) might uncover specific challenges these groups face around emotional care. In many healthcare systems, for example, sonographers interact with patients without formally providing a diagnosis, creating the unique dilemma of what and how much to say when a nonviable pregnancy is detected.[67] To ensure consistency of care, it would therefore be valuable for future studies to include the perspectives of the multiple different HCP roles that bereaved partners interact with during their hospital experience.

Fourth, a clear gap exists in the available literature exploring the miscarriage care experiences of individuals from different social, cultural, ethnic, and socioeconomic groups and those who identify as LGBTQ. Most studies have focused solely on the experiences of heterosexual English-speaking families with high incomes.[19,40,53] However, the experiences of low-income families might be compounded by limited

access to educational resources and health care.[68] LGBTQ parents might similarly face specific challenges during their pregnancy and miscarriage journey, creating unique care needs. The 6 studies that included mixed ethnicities in their samples did not discuss the implications of cultural or ethnic backgrounds in depth.[15,28,37,41,45,69] This highlights a need for research exploring the miscarriage care experiences and needs of families from diverse groups.

Finally, a clear joint need evident in the literature was the importance of providing emotional care for women and partners that is tailored to the individual. Given the significant psychological distress, trauma, and grief that can result from miscarriage,[70] and the prevalence of subsequent clinically significant depression, anxiety, and posttraumatic stress disorder, it seems particularly important to identify the factors that determine the emotional impact of miscarriage. Although gestational age is commonly thought to predict the emotional impact of miscarriage, evidence is mixed, with scientific consensus that postmiscarriage grief is independent of gestational age[71] for both women[72,73] and partners.[19,55]

Importantly, The perceived quality of medical care and interactions with HCPs in the initial stages of miscarriage treatment have been reported as vital in shaping women's ongoing health outcomes,[12,13] and satisfaction with care following miscarriage may reduce consequent symptoms of depression, anxiety,[16] and perinatal grief.[17] Satisfaction with care therefore might constitute a predictor for psychological outcomes following miscarriage. However, further research is necessary to quantify this relationship and investigate other potential predictors, such as reproductive history, availability of a social support network, previous mental health challenges, and social and cultural factors. Having a better understanding of the factors that contribute to or predict the emotional impact of miscarriage would not only allow HCPs to better tailor care but also help identify which women and partners are most at risk of developing later mental health problems and would therefore benefit most from additional bereavement care.

CONCLUSION

Overall, there is consensus in the literature that miscarriage can be associated with significant emotional impact for bereaved parents, and satisfaction with care around miscarriage may have short- and long-term consequences for women's and partners' emotional well-being. This review examined 7 years of scientific miscarriage literature (2015-2022), integrating the individual perspectives of women, partners, and HCPs. Based on themes in this literature, 5 areas of future research priority were identified. These 5 areas have the greatest potential to further improve the emotional care for women and partners facing this significant form of bereavement, as well as support and empower the different HCPs who provide that care.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Table S1. Overview of Reviewed Studies

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Research Article

Midwives' and Other Perinatal Health Workers' Perceptions of the Black Maternal Mortality Crisis in the United States

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Introduction: This study aimed to identify how perinatal health workers, especially midwives, explained US Black maternal mortality and morbidity and what ameliorative measures they suggested across categories of primary social determinants, health care access, and provider practices.

Methods: Using a mixed closed-ended and open-ended researcher-designed exploratory survey, 227 perinatal health workers responded to a series of questions probing views of causation and strategies for improvement. The closed-ended responses were summarized. Open-ended responses were analyzed using basic categorical and thematic coding.

Results: Perinatal health workers' responses prominently identified racism as a cause of Black maternal morbidity and mortality, and their recommendations ranged across levels of social determination of health.

Discussion: Results suggest that the views of perinatal health workers, the majority of whom were midwives, are complex and correspond to the problems and solutions identified in the research literature. Midwives and other perinatal health workers are well positioned to help center health equity in perinatal care, through both clinical practice and policy advocacy.
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Keywords: Black maternal mortality, midwives, race, social determinants of health

INTRODUCTION

An extensive literature documents and analyzes excessive Black maternal mortality in the United States. In the United States, the 2020 maternal mortality rate, the number of deaths per 100,000 live births including maternal death during pregnancy or within 42 days of termination of pregnancy from a cause related to or aggravated by pregnancy, was 23.8 per 100,000 live births. The maternal mortality rate for non-Hispanic Black women was 55.3 deaths per 100,000 live births, 2.9 times the rate for non-Hispanic white women (19.1), and higher than the rate for Hispanic women (18.2).[1] Racial and ethnic disparities with particularly alarming outcomes for Black women have persisted over time.[2] Measures of pregnancy-related deaths (pregnancy-related death within one year of the end of the pregnancy) and severe maternal morbidity also reveal stark racial and ethnic disparities.[3,4]

Research on Black maternal morbidity and mortality reflects a shift in health research away from race as a biological determinant toward race as a social construct and away from individual behavior independent of social context toward structural determinants.[5,6] Researchers have attributed high Black maternal death and morbidity rates to the association of race with negative social determinants of health, the environment in which people undertake everyday life activities, and the effects on health and quality of life. The social and economic consequences of racism in everyday life experiences, social structures, and health care institutions have been linked to poor maternal and infant outcomes.[7,8] Researchers have also identified biological pathways through which racism and other forms of toxic stress directly impact maternal and infant health.[9]

No previous studies have broadly explored midwives' and other perinatal health workers' perspectives on Black maternal mortality. Previous studies of US midwives' attitudes, perceptions, and beliefs have focused elsewhere, for example, on newborn screenings,[10] men in midwifery,[11] infant safe sleep,[12] and planned home birth.[13] Almanza et al identified the motivations of 7 midwives of color—their strong commitments to racially concordant care, racial justice, and physically and emotionally safe care—associated with an African American-owned community birth center.[14] Midwives, emphasizing person-centered care to promote healthy pregnancy and reduce medical interventions, are well positioned to understand not only individual clients' health histories and the physiology and management of pregnancy and childbirth but also clients' environmental conditions including racist structures and practices. Although attending only 9.9% of births in the United States,[15] midwives can offer insights into causal factors, attest to current practices, and offer suggestions to improve outcomes. This study, therefore, aimed to identify how midwives and other perinatal health care workers of various ethnicities across a variety of settings explain causes of and remedies for excessive US Black maternal mortality and morbidity.

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Quick Points

- This analysis is one of the first to describe the views of midwives and other perinatal health workers regarding Black maternal mortality, surveying a convenience sample (N = 227).
- Midwives and other perinatal health workers attribute excessive Black maternal mortality to negative primary social determinants of health, compromised access to health care, and problematic provider practices. They correspondingly recommend solutions across these 3 levels of determinants.
- At the level of provider practices, midwives and other perinatal health workers recommend attention to the workforce: more racial and cultural sensitivity training, more recruitment of providers of color, and more midwives in the birth workforce.
- Midwives and other perinatal health workers also suggest increased modes of service delivery (eg, multispecialty provider groups, birth centers), more evidence-based practice, and more careful listening to clients.
- Responses to this survey suggest midwives and others are positioned to become institutional leaders in centering health equity.

METHODS

This exploratory descriptive research, approved by the University of Michigan-Flint Institutional Review Board, posed closed-ended and open-ended questions to perinatal health workers in 2019 to ascertain their assessment of factors contributing to excessive Black maternal mortality and recommendations for reducing poor perinatal outcomes. The survey elicited descriptive and qualitative information.

Two Black perinatal health nurses, a certified nurse-midwife (CNM) and a certified women's health nurse practitioner, each with a doctoral degree, developed the survey. The survey questions were informed by their own urban maternal nursing experiences and conversations in professional networks and by their reading of the nursing and biomedical literature. The survey was not piloted or reviewed by additional parties. The questionnaire did not force responses and was structured to discover midwives' and other perinatal health workers' awareness of excessive Black maternal mortality, their general views of factors contributing to high Black maternal mortality, their direct professional observations regarding perinatal care, and their suggestions for improving perinatal outcomes, especially those of Black women.

The survey included 7 initial questions eliciting respondents' characteristics: race and ethnicity, gender, age, professional position and years of experience, ethnicity of clients, and type of practice community (urban, rural, suburban) (see Table 1); 1 closed-ended question about awareness of maternal mortality rates (see Table 2); 3 closed-ended questions about Black maternal mortality (Table 3); 7 closed-ended questions about clinical practices with a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) (Table 4); and 7 open-ended questions probing participants' general perceptions about Black maternal mortality (Table 5).

The Qualtrics online survey was placed on social media group sites of perinatal health field workers, including midwives, doulas, and lactation consultants. The group sites were not specifically oriented toward Black women or perinatal health care workers of color. Additionally, an internet link was sent to deans of 50 schools of nursing with nurse practitioner programs and clinical faculty in maternal health, encouraging further distribution to maternal health colleagues and students. Researchers cast a wide net, aware that Black people giving birth were served not only by midwives but also by doulas, nurse practitioners, and other perinatal professionals. Sample recruitment and survey completion occurred from May 2019 until December 2019.

Prior to beginning the survey, respondents were notified of the purposes of the study, institutional review board approval, and likely time for survey completion. The survey provided the contact information of the principal investigator. Informed consent was implied by survey commencement. Survey results included responses of 227 perinatal health workers. Survey responses were automatically stored on a secure password-protected Qualtrics account. Participants were not reimbursed.

Data Analysis

For closed-ended and questions employing 7-point Likert scales, number and percentage of response values for each item were calculated.

Open-ended responses were initially coded using preexisting categories (primary social determinants, access to health care, provider practices) employing Miller and Crabtree's template qualitative analysis procedure.[16] Primary social determinants of health, also referred to as upstream factors, were understood to refer to broad structural and community characteristics.[17] Health care access is an intermediate determinant of health outcomes because it can mediate the impact of social determinants (and together with health care quality is critical to health outcomes). Provider practices are social constructions downstream from policy and community determinants and access to health care. Additional emerging subthemes within those preexisting categories were identified during the analysis. The 2 authors independently reviewed and analyzed the data, compared codes, and discussed the patterns and themes that emerged. The 2 authors corroborated each other's coding, the frequency with which phrases and ideas appeared, and the interpretation of phrases and sentences in the context of health care practice, to increase dependability.[18,19]

Table 1. Demographic and Other Characteristics of Participants

Characteristic	n[a] (%)
Race and ethnicity	194
Asian American	4 (2.06)
Black or African American	29 (14.95)
Hispanic or Latinx American	2 (1.03)
Middle Eastern	1 (0.52)
American Indian	1 (0.52)
Pacific Islander	0
White or European American	150 (77.32)
Other	5 (2.58)
Prefer not to answer	2 (1.03)
Gender	191
Female	189 (98.95)
Other	2 (1.05)
Profession	193
Certified nurse-midwife	129 (66.84)
Nurse practitioner	12 (6.22)
Certified professional midwife	9 (4.66)
Student midwife	9 (4.66)
Doula	8 (4.15)
Direct entry midwife	3 (1.55)
Certified midwife	1 (.52)
Obstetrician-gynecologist	1 (.52)
Other	21 (10.88)
Years of practice	193
0-4	66 (34.19)
5-10	38 (19.69)
11-15	17 (8.81)
>15	72 (37.31)
Age	192
20-26	3 (1.56)
27-39	63 (32.81)
40-49	55 (28.65)
50-59	29 (15.10)
60+	42 (21.86)
Area of practice	188
Urban	69 (36.70)
Suburban	45 (23.94)
Equal mixture (urban and suburban)	40 (21.28)
Rural >50%	34 (18.09)

[a] The variable number of responses reflects uneven responses to survey questions.

RESULTS

A total of 229 participants opened the survey online, and 227 participated. One hundred sixty-eight respondents progressed through the entire survey. Reported results include not only responses of the 168 completers but usable data from all 227 participants. Not every respondent counted as completing the survey answered every question, as the survey instrument did not force responses. CNMs comprised 66.8% of the 193 respondents identifying their profession. Other perinatal health workers comprised smaller percentages of respondents. Of 194 participants identifying their race and ethnicity, 15% were Black, and a majority identified as white. Table 1 details demographic and other characteristics of participants.

Table 2. Awareness of Increasing Maternal Mortality Rates in the United States

Total (N = 195)	n (%)
Very aware	175 (90)
Somewhat aware	20 (10)
Not at all aware	0

Table 3. Awareness of Black Maternal Mortality (Yes, No Questions)

Question[a]	Yes n (%)	No n (%)
Do you think the maternal mortality/morbidity rate is relatively the same between white/European American women and women of color? (n = 195)	2 (1.03)	193 (98.97)
Should Black maternal mortality/morbidity be addressed on a practitioner level? (n = 174)	160 (91.95)	14 (8.05)
Senate Bill 3363 supports states using evidence-based practices and quality improvement practices. Do you think this is a good action to address this problem? (n = 166)	152 (91.57)	14 (8.43)

[a] The variable number of responses reflects uneven responses to survey questions.

Of 195 responses to each of the 2 questions about levels of maternal mortality, 195 (100%) indicated awareness of the increasing maternal mortality rate in the United States (Table 2), and 193 indicated knowledge that Black maternal mortality exceeded that of white women (Table 3). Most participants had witnessed implicit bias toward women of color and women insured through Medicaid within their professional experiences, with respondents evenly divided about whether all women in their practice received the same level of care from all maternity team members. Ninety five percent or more of respondents indicated that it was important for practitioners to respect people's diverse social identities, attend to clients' physical and emotional health, and allow women to have meaningful input into decisions about their care and childbirth. A majority (91.95%) of respondents indicated that

Table 4. Clinical Practices (Likert Scale Questions)

Question [a]	Strongly Disagree n (%)	Disagree n (%)	Somewhat disagree n (%)	Neither agree or disagree n (%)	Somewhat agree n (%)	Strongly agree n (%)	Agree n (%)
As a health practitioner, I have never witnessed implicit bias during maternity care toward a woman of color (n = 172)	77 (44.77)	43 (25.00)	16 (9.30)	8 (4.65)	4 (2.33)	10 (5.81)	14 (8.14)
As a health practitioner, I sometimes notice women with Medicaid receiving a different level of care in the office and/or hospital (n = 172)	12 (6.98)	20 (11.63)	12 (6.98)	12 (6.98)	30 (17.44)	33 (19.19)	53 (30.81)
As a health care provider, I believe all women in my practice receive the same level of care from all the maternity team members (n = 172)	20 (11.63)	22 (12.79)	26 (15.11)	10 (5.81)	19 (11.05)	29 (16.86)	46 (26.74)
It is important to respect and appreciate people's diverse social identities (n = 173)	7 (4.05)	0	0	0	0	143 (82.66)	23 (13.29)
It is important that maternity care promote physical and emotional health (n = 173)	3 (1.73)	0	0	0	0	156 (90.17)	14 (8.09)
Women should have meaningful input into their decisions surrounding childbirth (n = 173)	2 (1.16)	0	0	0	0	157 (90.7)	14 (8.09)

[a] The variable number of responses reflects uneven responses to survey questions.

Table 5. Responses to Open-Ended Questions

Question	Number of Responses
What are examples of how practitioners can address the Black maternal mortality rate?	144
Why can this rate not be addressed at the personal practitioner level?	14
What would you say to your client about the Black mortality/morbidity rate?	136
Why do you think the Black mortality/morbidity rate is high?	145
What methods would you suggest/explore to decrease the Black mortality/morbidity rate?	141
Why do you think Senate Bill 3363 is a good measure?	117
Why do you think Senate Bill 3363 is not a good measure?	13

the Black maternal mortality rate should be addressed with their clients, and 14 (8.05%) indicated it should not (Table 3).

Each open-ended question yielded a range of 14 to 145 responses (Table 3), allowing for robust coding according to the template categories and emerging themes. Template categories included primary social determinants, health care access, and provider practices. Several subthemes related to provider practices emerged in responses to these questions: the perinatal workforce, modes of perinatal service delivery, interpersonal listening and attention to individual clients, evidence-based perinatal practices, and midwives' and other perinatal practitioners' roles in the clinical setting.

Primary Social Determinants

Respondents named structural racism, white supremacy, overall socioeconomic oppression, and systemic racism as causes of excessive Black maternal mortality. While noting that socioeconomic factors were often related to race, they also identified racism as operating across the class structure to the detriment of Black women. They suggested that childbearing-aged Black women are more likely than childbearing-aged white women to have a low income and reside in impoverished neighborhoods that challenge their

access to secure and safe housing, good jobs, good education, nutritious food, and safety. Respondents also indicated that Black women endured more daily stress resulting from structural discrimination in a variety of areas and interpersonal interactions.

Most respondents noted that problematic health-related behaviors (nutritionally poor food choices, missed appointments) were rooted in social conditions and the debilitating effects of racism. However, 3 respondents attributed poor outcomes to genetic makeup or hereditary traits, and one respondent emphasized the nonadherence of individuals without noting contextual factors:

In my personal experience, the population I serve will not follow provider instructions on how to care for themselves while pregnant. I have had clients refuse to go to the hospital for treatment, they do not come to their appointments, and they will not change their diets. I serve a predominantly African American population on public assistance. There are resources in the area that they will not utilize. They want to be unhealthy and pregnant but then wonder why they get so sick.

Fifteen respondents argued that to decrease Black maternal mortality, society had to end white supremacy or structural racism. Others named specific social policy changes: safe and affordable housing, better education, better access to nutritious food, better working conditions, higher pay, and family and medical leave.

Access to Health Care

Respondents attributed high Black maternal mortality and morbidity to lack of access to health care, including primary care. Several respondents suggested a system of universal health insurance, with one explicitly arguing that this should take the form of single-payer public health insurance, with expansion of Medicaid and Special Supplemental Nutrition Program for Women, Infants, and Children until policymakers implement a single-payer system. Many recommended Medicaid expansion to cover pre- and postnatal periods, care sites outside of hospitals, and more types of practitioners. Respondents emphasized preconception access and prenatal care. Others addressed better reimbursement for prenatal care and for more racially and occupationally diverse birth practitioners. Respondents noted that one cause of heightened Black maternal mortality and morbidity is conditions untreated before pregnancy.

Ensure they get health care earlier to identify any health issues that could impact a future pregnancy. Identify diabetes, high blood pressure, obesity, and infections prior to pregnancy, and focus on improving the health of women prior to conception. Educate women before pregnancy about risks and ways to reduce their risk.

Responses also captured the difficulty of timely and satisfactory entry into, and continued attendance at, prenatal care during pregnancy.

Provider Practices

Respondents focused on deficiencies in the provision of health care for Black women, citing poor quality of care, disrespect of Black women, and poor communication between patient and provider. One respondent summarized the problems within the health care system:

Inequitable care given to women on Medicaid, poorer quality hospitals in poorer neighborhoods and in communities of color, judgement of women of color who have kids but aren't married, judgement of women of color who have kids but are young, poor treatment of childbearing women of color overall, the perception that women of color don't care about their health or the health of their babies, the assumption that women of color do drugs, drink and engage in risky behavior, the assumption that women of color don't get prenatal care, the assumption that women of color are all in ill health anyway, so they are going to have sicker babies. People don't listen or act when women of color express their concerns!!

Five subthemes related to improvements in provider practices emerged from the open-ended questions: the perinatal workforce, modes of perinatal service delivery, interpersonal listening, evidence-based perinatal practices, and midwives' and other perinatal practitioners' roles in the clinical setting.

The Perinatal Workforce

The greatest number of responses to the open-ended question about how to decrease Black maternal mortality named more training of providers to increase cultural sensitivity and reduce implicit racial bias. Many respondents urged more racial and ethnic diversity in the provider workforce. They commented about the cultural sensitivity and identity of the workforce and also identified the need for more midwives, particularly Black midwives, and doulas as a proportion of the perinatal care workforce.

We need active enrollment and encouragement of practitioners of color and community initiatives to increase brown and Black success. White practitioners should continue to discuss and explore implicit bias, discard the anti-racism means being color blind paradigm, and recognize the unique health concerns and cultural approaches to health care in different communities.

Modes of Perinatal Service Delivery

Respondents recommended reforming traditional models of perinatal health care and expanding innovative modes of care. They recommended slowing down conventional perinatal practice in traditional settings, with longer appointments allowing for whole person care. They recommended team-based, multispecialty provider groups that would include not only midwives but also social workers, mental health workers, and nutritionists. Respondents recommended clinic-based navigators to help patients make and keep appointments and ensure access to and regular use of prescribed medications.

Respondents also recommended innovative care models involving more midwife and doula care or new geographic locations and care institutions. Several recommended care teams or doula programs specifically directed toward Black

women, like Birthing Beautiful in Cleveland, a grassroots organization that provides services for pregnant Black women living in underserved communities.[20] Several respondents recommended improving geographic accessibility, through such measures as home visits and group prenatal care in centrally located public buildings like libraries, churches, and municipal buildings. Respondents also suggested more freestanding community-based birth centers in or close to Federally Qualified Health Centers and friendly to low-income women of color.

Respondents noted the importance of Medicaid coverage and adequate reimbursement for innovative forms of care. They pointed out, for example, that despite data from Strong Start showing that birth center care is highly effective at lowering the morbidity rate for African American women,[21] birth center care may not be available in some states and localities.

Increase insurance reimbursement for prenatal care so that providers can spend more time with patients and so more RNs can be hired for care coordination. Obstetrics has historically been a very challenging financial picture, and providers are constantly being pressured to do more with less time and funds. This is in contrast to other disciplines; for example, an anesthesiologist may bill more for one epidural analgesia placement than we receive for our global package of all prenatal care plus birth plus postpartum care combined.

Interpersonal Listening and Attention to Individual Clients

Responses highlighted the importance of increased respect for and listening to women from all perinatal health practitioners. Respondents thought that deeper listening and more individual attention would result if there were higher nurse-to-patient ratios, an emphasis on quality of care not number of encounters, and longer appointments that allowed for whole person care.

Evidence-Based Perinatal Practices

Many respondents called for better national and local data about maternity outcomes and racial disparities. They recommended national standards of care based on evidence. Few references were made to the already existing patient safety bundles issued by the National Partnership for Maternal Safety under the guidance of the Council on Patient Safety in Women's Health Care.

Standardized care practices in maternity care would leave less room for implicit bias in care decisions. There must then also be feedback and quality improvement initiatives to assess how a given institution is doing. Hold health institutions accountable to evidence-based care practices and protocols.

Midwives' and Other Perinatal Practitioners' Roles in the Clinical Setting

Respondents identified ways in which they, through their own clinical practices, could address Black maternal mortality. They noted their own roles within their institutions in creating wraparound services for transportation, peer support, and mental health services and in improving clinic scheduling flexibility to facilitate access. One cited the importance of establishing basic social needs screening and subsequent referral and monitoring: "Early intervention to look at social factors for individual client, including housing, family support, food access, providing referrals and follow-ups." Respondents noted they could work to mandate safety bundles, establish and serve on maternal review boards, create community teams of physicians, CNMs/certified midwives (CMs), and doulas. Respondents noted that they themselves could undergo implicit bias training and encourage awareness among provider colleagues. They encouraged midwifery clinical practices, including listening to and believing clients as they reported symptoms, educating clients about warning signs, supporting stress reduction, and generally explaining healthy pregnancy. Respondents suggested that midwives need to be advocates and activists within health care institutions and communities to increase awareness, promote change, and develop programs to support women in general and particularly women of color. A few respondents talked about building support groups and networks for women to seek the resources they needed.

Midwives and others who address maternal mortality with patients noted that this conversation did and could address both social and health factors influencing pregnancy outcomes, create a communication partnership, acknowledge burdens imposed by racism, and empower the patient to ask questions and express concerns. Practitioners who did not address maternal mortality with patients said that conversations with individual patients could not alter the powerful institutional and social systems affecting patient health and health care. One participant wrote: "Individual practitioners don't make the practices rules. If practices don't make an effort to accept and help patients with financial challenges, then the mortality and morbidity will continue to climb." Additional quotes are available online in Supporting Information: Appendix S1.

DISCUSSION

This exploratory study offers important information about midwives' and other perinatal health providers' analysis of, experience of, and recommendations regarding Black maternal mortality, areas not yet explored in the research literature. Although existing work on midwives' perceptions has looked at discrete perinatal practices, this project identified midwives' perspectives on a critical social and health issue—excessive Black maternal mortality—using concepts of social determination of health, increasingly used to examine racial and class health disparities and health outcomes generally. Both in naming causes and proposing solutions, perinatal health workers addressed all 3 levels of determination: primary social determinants, health care access, and provider practices.

A large majority of respondents, most of whom were white midwives, were aware of excessive Black maternal mortality. Although a majority said they had witnessed discrimination based on race and class in their professional setting, the majority held that it was important for practitioners to respect people's diverse social identities, attend to all clients' physical

and emotional health, and allow all women to have meaningful input into decisions about their care and childbirth.

Responses paralleled the existing literature in emphasizing primary social determinants of Black maternal morbidity and mortality, not only in erecting social barriers[7,8] but also in creating physiologic impacts through elevated allostatic load due to institutional exclusion and interpersonal discrimination.[9,22] Responses mirrored the literature in noting that Black maternal morbidity and mortality are related not only to primary social determinants but also to lack of access to primary and prenatal care. The health status of minority women with low income contributes to persistent, and sometimes increasing, disparities in birth outcomes.[23,24] Research has shown that expansion of general Medicaid, Medicaid pregnancy coverage, or coverage generally could improve some chronic conditions and maternal health.[25–28] However, respondents, unlike much recent literature, did not emphasize the importance of postpartum processes, ideally integrated into prenatal counseling and facilitated by extended postpartum insurance coverage and paid family leave.[29,30] Postpartum coverage is particularly important for perinatal mental health conditions.[31,32] The research literature, similar to the respondents, also identifies other access barriers: challenges of getting to clinics, receiving reasonably prompt attention in clinics, and adhering to prenatal visits and best practices while coping with everyday life stresses and lack of access to health care providers of choice.[33–36]

Racialized practices inside health care institutions and corresponding improvement measures are also well documented in the research literature. The majority of CNMs/CMs in the United States identify as white (84.9%). Midwives identifying as Black or African American make up 7.3%, and those who identifying as Latino make up 5%.[37] Research has documented the low proportion of midwives among perinatal health workers in the United States, a lower proportion than in other high income democracies, despite positive outcomes of midwifery care.[38] The problem of racial incongruence between patients and providers is twofold: a predominantly white workforce engenders mistrust among many Black women, impeding health care use, and white practitioners may not fully respect or understand women of color.[39,40] Survey responses indicated complex thinking about the personnel mix that might reduce Black maternal mortality. Although respondents note midwifery's approach to the whole person is essential and that racial and ethnic identity may be critical to deep understanding of and trust by patients, they maintain that all providers have the potential to provide high quality care to Black women. Additionally, survey responses were consistent with research noting that practitioners often fail to listen to women; insufficiently rigorous health protocols allow discretionary inequitable treatment; practitioners fail to attend to more complex social and medical cases; and Black women receive care at sites delivering lower quality care.[41–44]

Implications for Practice, Policy, and Research

In referring to their own roles as perinatal health workers, respondents cite a range of care roles addressing both social determinants and biological determinants of maternal health. These correspond to those roles identified in *The Future of Nursing 2020-2030*, which focuses upon centering health and health care equity.[45] Thus, many midwives and other perinatal health workers, focused on holistic patient health and therefore their social context as well as their medical needs, seem to already be practicing for health equity in the ways recommended by the National Academy.

Based upon their holistic approaches to patients and understanding of their clients' everyday lives, midwives may be positioned to exercise leadership in health care teams to improve provider practices, including adoption of more client-centered practices and safety bundles. The clinical practice of screening for social determinants and connecting clients to community resources should be consistently implemented. Midwives and other perinatal health workers may want to seek additional ways to integrate mental health screening and interventions, as well as postpartum planning, into prenatal care.

Few respondents explicitly embrace public advocacy roles in working to improve perinatal health, but this may be in part an effect of the framing of the research in terms of practitioner roles or because practitioner responsibilities are already overwhelming. However, midwives may also want to think of themselves as midwife-citizens and engage in politics and policy advocacy that extend beyond clinical practice issues to the intermediary social determinant of health care access. Perinatal health workers can support the expansion of Medicaid to all low-income adults or the expansion of Medicaid pregnancy coverage from 60 days to one year postpartum. In addition, they can advocate for public policies that improve primary social determinants of health: systemic racism, social inequality, poverty, housing insecurity, and more.

This research employed a one-time online survey with numerous limitations. This exploratory survey was launched without tests to define reliability or validity. It did not employ a stratified sampling technique and used convenience sampling. It was an initial attempt to explore a broad set of questions about perinatal health workers' awareness, analysis, observations, and recommendations regarding excessive Black maternal mortality. The survey explicitly named excess Black maternal mortality as its topic and invited voluntary participants, who may have been more informed and engaged in this problem than other midwives and perinatal health workers who did not participate. Unfolding public events (a series of police killings of Black men, a disputed election, and media representations of these events) may have affected survey responses, recorded in late 2019. In addition, the survey did not associate responses with the racial and ethnic identity or other specific characteristics of respondents. Because perceptions of racism vary by race,[46] maternity care policies such as insurance and family leave vary by state, pregnancy and birth resources vary by location,[47] and institutional settings vary, such identifiers in future research might be helpful. In addition, it would be interesting to compare the responses of midwives to those of other perinatal health providers, especially obstetricians. Further quantitative and qualitative research might also explore the discrete themes that emerged in the analysis.

Overall, the research findings confirm that midwives and other perinatal health practitioners have a comprehensive view of causes and potential remedies for excessive Black

maternal mortality. The responses show that midwives and others, positioned between health care institutions and their clients' everyday lives in communities, see the Black maternal mortality crisis as generated both by broad social and political factors, including structural racism, and by problematic and often racialized practices in health care institutions. Similarly, to reduce Black maternal mortality, perinatal health workers recommend actions ranging from policies addressing broad social determinants to specific steps perinatal health workers could take as providers. Midwives and others see both causes and solutions as complex and multidimensional, matching recognition of plural causality in the research literature.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to disclose.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix S1. Emerging themes and supporting quotations: Attributes across levels of determinants.

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Review

Influence of Laboring People's Mobility and Positional Changes on Birth Outcomes in Low-Dose Epidural Analgesia Labor: A Systematic Review with Meta-Analysis

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Introduction: Freedom of movement has been identified as a key issue for pregnant individuals during the birthing process, even if they opt for epidural analgesia, which has relegated people to more static positions during birth for many years. The aims of this systematic review were to evaluate the influence of mobility and positional changes on perinatal and neonatal outcomes in people in labor with epidural analgesia, describe the range of movement interventions used during the first and second stage of labor, and describe the level of motor blockade among people with low-dose epidural analgesia.

Methods: Bibliographic databases (Web of Science, Cochrane, CINAHL) were consulted from December 2020 to January 2021. The articles selected were clinical trials and observational or analytical studies, the subject of which was mobilization during labor in people with epidural analgesia. The outcome measures were mode of birth, duration of labor, and extrauterine adaptation after birth. A narrative synthesis was used to describe the types of movements interventions employed during the stages of labor and the level of motor blockade among people with low-dose epidural analgesia.

Results: Ten articles were selected (8 clinical trials, one cross-sectional study, and one quasiexperimental study), with a total sample of 6086 individuals. A meta-analysis showed nonsignificant results between groups for mode of birth (relative risk [RR], 1.00; 95% CI, 0.87-1.14), duration of labor (RR, 1.64; 95% CI, -34.57 to 37.86), and extrauterine adaptation after birth (RR, 0.86; 95% CI, 0.39-1.93). There was heterogeneity among studies in the type of movement interventions used during the first and second stage of labor.

Discussion: Although no clear benefit was observed for mobilization in epidural labor, no detrimental effects were found either, so perinatal care providers should encourage mobilization if the laboring person so desires, throughout the entire childbirth process.
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Keywords: movement, walking, posture, epidural analgesia, labor, pregnant individuals, systematic review

INTRODUCTION

Pain relief enhances physical and emotional well-being and is at the forefront of care during the birthing process. Although there are many methods for managing intrapartum pain, the technique most demanded by people in labor and the most effective is epidural analgesia.[1]

Despite its high effectiveness, when compared with labors without epidural analgesia, this pain relief method has been associated with a longer second stage of labor, increased use of exogenous oxytocin, and episodes of severe hypotension, urine retention, and fever.[2,3] In addition, the strong motor blockade achieved following the administration of traditional epidural analgesia could be one of the factors prolonging the second stage of labor, increasing the risk of instrumental birth.[4,5] Motor blockade following epidural analgesia has been directly associated with the concentration of local anesthetic used; the higher the concentration of local anesthetic, the greater the motor blockade in the pelvic floor and lower limb muscles.[1,5–7]

In recent years, a new approach to epidural analgesia has emerged, known as *low-dose epidural analgesia* or *walking epidural analgesia*. It uses lower doses of local anesthetics in combination with opioids, as opposed to traditional regimens that only use local anesthetics at higher doses.[1,3,8] Low-dose epidural analgesia has been shown to result in a lower degree of motor blockade[9] and lower rates of urinary retention and bladder catheterization,[9,10] and it provides effective pain relief while reducing motor blockade,[6,9] in comparison with traditional epidural analgesia. However, it is also associated with increased pruritus in laboring people[9] and lower Apgar scores at one minute of life in newborns.[6,9] A greater need for pain rescue boluses has also been reported, albeit with no effect on laboring people's satisfaction.[7]

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Quick Points

- Laboring people's movement and positional changes do not have a significant impact on mode of birth, duration of labor, or Apgar score at birth, compared with more static positions.
- Health care professionals should not contraindicate movement in low-dose epidural analgesia births, as there have been no negative effects on perinatal and neonatal outcomes.
- Low-dose epidural analgesia allows people in labor to have freedom of movement throughout all the stages of labor, so movement should be studied throughout the birthing process in its entirety.

Despite these drawbacks, the evidence provides support that the benefits outweigh the risks, because the likelihood of instrumental births is lower in laboring people with low-dose epidural analgesia.[6,11,12] This may also be due to the fact that laboring people have a greater capacity for movement and can adopt different positions throughout labor,[6,13] which facilitates the widening of the pelvic diameters and the descent of the fetus, when compared with more static positions.[14]

Adopting upright positions, such as sitting or walking, favors effective uterine action,[11] the descent of the fetal head through the birth canal, the preservation of the pushing sensation,[6] and improved uterine blood flow.[11] In addition, upright positions have been shown to shorten labor duration,[15–17] have a higher probability of vaginal birth,[11] and have lower probability of instrumental[15,17] or cesarean birth,[15,16] in comparison with recumbent positions. In these upright positions, gravity encourages the fetal head to bear down on the cervix and activate Ferguson's reflex,[11] which promotes oxytocin secretion and thus uterine contractions, with maximum effect while the laboring person is pushing the fetus out at birth.[18]

Some studies of people in labor with epidural analgesia have concluded that ambulation or positional changes shorten labor duration,[19,20] or at least the second stage.[21] In addition, it has been observed that laboring people who ambulated during the second stage of labor were more likely to give birth spontaneously.[11] However, other studies question whether there is any clear benefit with respect to the duration[22,23] or mode of birth.[19,23] In fact, one study concluded that the supine position was associated with a greater number of spontaneous births compared with the upright position in laboring people with epidural analgesia.[24]

Despite the disparity in conclusions, there is no contraindication for people in labor to walk or change positions if they wish,[19,22,23,25] as no adverse outcomes have been demonstrated[12,23,26] In fact, the World Health Organization notes that freedom of movement during childbirth is a key consideration and recommends encouraging mobility and the adoption of upright positions during this process.[27] Furthermore, in line with these recommendations, a Clinical Practice Guideline drawn up by the Spanish Ministry of Health highly recommends that laboring people who opt for epidural analgesia should be encouraged and helped to adopt comfortable positions and move throughout the first stage.[8] This systematic review is the first to analyze laboring people's movement, rather than specific positions, with low-dose epidural analgesia throughout first and second stage of labor, viewing labor as a continuous and dynamic process during which what happens in both stages can affect the overall outcome.

The main objective of this systematic review was to analyze the influence of laboring people's movement on mode of birth, duration of labor, and extrauterine adaptation of the neonate in pregnant individuals who choose low-dose epidural analgesia as a method of intrapartum pain relief. The secondary objective was to describe the different types of movement used during the first and second stages of labor and the degree of motor blockade for laboring persons with low-dose epidural analgesia.

METHODOLOGY

A systematic review was conducted from December 2020 to January 2021 and is reported following the guidelines from the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Statement.[28] The protocol was first registered in PROSPERO (International Prospective Register of Ongoing Systematic Reviews) under registration number CRD42021232319.

Inclusion and Exclusion Criteria

The inclusion criteria were as follows: (1) language: Spanish, English, or French; (2) no limit for publication date; (3) methodology: experimental, observational, or analytical; (4) study objective: to analyze the relationship between movement/positional changes on birth outcomes; (5) study population: pregnant individuals with epidural analgesia during labor.

Articles were excluded if (1) 2 or more of the primary outcome measures (mode of birth, duration of labor, or Apgar score) did not appear in the articles or (2) the intervention studied was freedom of movement and positional changes during labor.

The outcomes measured were mode of birth, duration of labor, postnatal extrauterine adaptation, type of movement throughout the different stages of labor, and degree of motor blockade.

Search Strategy

The following databases were consulted: Web of Science, Cochrane, and CINAHL (EBSCOhost). The last database access was on January 15, 2021.

The search strategy included the following keywords: (analgesia, epidural OR anaesthesia, epidural OR low-dose epidural OR walking epidural OR combined spinal-epidural) AND (movement OR position OR mobility OR patient

positioning) AND (labo$r, obstetric OR delivery, obstetric OR parturition OR obstetric). More details on the search strategy can be found in Supporting Information: Appendix S1.

Selection of Articles

First, 2 reviewers independently screened potentially eligible studies by reading the titles and abstracts and then agreed upon the list of preselected articles. Second, 2 reviewers independently read the full text and selected those that met the established inclusion criteria (Supporting Information: Appendix S2). In both cases, discrepancies were resolved by discussion and any remaining disagreements were settled by the intervention of a third reviewer. After reading the full text, 2 researchers independently traced citations forwards and backwards from the selected recent articles, from 2015 onwards.

Analysis of Risk of Bias

Two researchers independently assessed the quality of each study using the STROBE[29] (for observational studies) and CONSORT[30] (for experimental studies) assessment scales.

To be included as a final article, each one had to exceed 50% of the items on its corresponding scale, with a total of 25 items on the CONSORT scale and 22 items on the STROBE scale. One point was awarded for each compliant item, 0.5 points if partially compliant, and no points if not compliant at all. In case of any discrepancy, a third reviewer was consulted.

Finally, interrater reliability was assessed by means of an intraclass correlation (ICC) analysis of the studies selected.

Tabulation and Data Extraction

A table of results was generated specifying author, year of publication, nationality, objective, design, intervention, results, and conclusions (Table 1). When data were not available, they were requested from the authors of the studies.

Data Synthesis

A meta-analysis was performed for quantitative and statistically comparable outcome measures. As the data for motor blockade and types of movement in labor were too heterogeneous, a narrative analysis was performed.

The interventions to be compared were active mobilization and positional changes during the labor of pregnant people with epidural analgesia (experimental group) versus static positions of pregnant people with epidural analgesia (control group), throughout the whole labor or at least one of its stages. Random-effects statistical models were applied, because they are the most appropriate method for the integration of results from empirical studies, given the variability that is usually observed.[31]

For binary results such as mode of birth and neonatal extrauterine adaptation, the risk ratios and 95% CIs were calculated. The differences in means and 95% CIs were calculated for continuous results such as duration of labor in minutes.

To determine the influence of each of the studies on the overall effect a sensitivity analysis was performed. For this, the results of the meta-analysis were replicated, excluding one of the studies included at every step. For each comparison, the heterogeneity of the results was found using the χ^2 test with a significance level of .05, and the I^2 index was also calculated. If heterogeneity was significant, a subgroup analysis was performed. Finally, a publication bias study was conducted using a funnel plot to verify if it could be detrimental to the validity of the results (Supplemental Information: Appendix S3). RevMan 5.3 was used to perform the calculations.

RESULTS

Studies Included in the Systematic Review

A total of 675 articles were identified: 320 in Web of Science, 187 in Cochrane, and 168 in EBSCOhost.

After reading the titles and abstracts, 624 articles were excluded because they did not match the study objectives and 27 were excluded as duplicates, leaving a total of 24 articles. In the second phase, 12 articles were eliminated because they did not meet the inclusion criteria, and one was then added from the reverse search. Finally, 13 articles were subjected to risk of bias analysis, after which 3 were excluded because they did not meet the specified methodological quality criteria.

The ICC interval showed high interrater reliability in the bias analysis (ICC = 0.810), so 10 articles were finally included: 8 randomized clinical trials, one quasiexperimental study, and one cross-sectional descriptive study (Figure 1). Please see Supplemental Information: Appendix S4 for the risk of bias assessments for each included study.

Characteristics of Included Studies

The included studies were published between 1997 and 2019. Participants were people in labor with epidural analgesia, between 16 and 45 years of age, in spontaneous or induced labor, and between 36 and 42 weeks' gestation. The minimum and maximum sample sizes were 61 and 3093 individuals. A total sample of 6086 people was analyzed (Table 1). The included studies used a variety of movement interventions during labor; these are described more fully in the Narrative Synthesis below.

Meta-Analysis

Of the 10 articles, only 9 were considered for the meta-analysis, as the cross-sectional study was excluded for methodological reasons.

The population studied included people in labor, most of whom were nulliparous. The total sample size was 5403 individuals in the posttest. Meta-analyses were performed for each outcome to obtain a measurement of the mean effect size and a CI of 95%. To analyze heterogeneity, the χ^2 and I^2 index were calculated (Table 2).

Mode of Birth

Nine articles[11,19,21–25,32,33] included mode of birth as an outcome. Initially, this was analyzed as a dichotomous variable, considering vaginal (spontaneous + instrumental) versus cesarean births in a total of 5403 participants. The meta-analysis shows that freedom of movement was not significantly associated with an increased likelihood of having a vaginal versus a cesarean birth in comparison with static positions

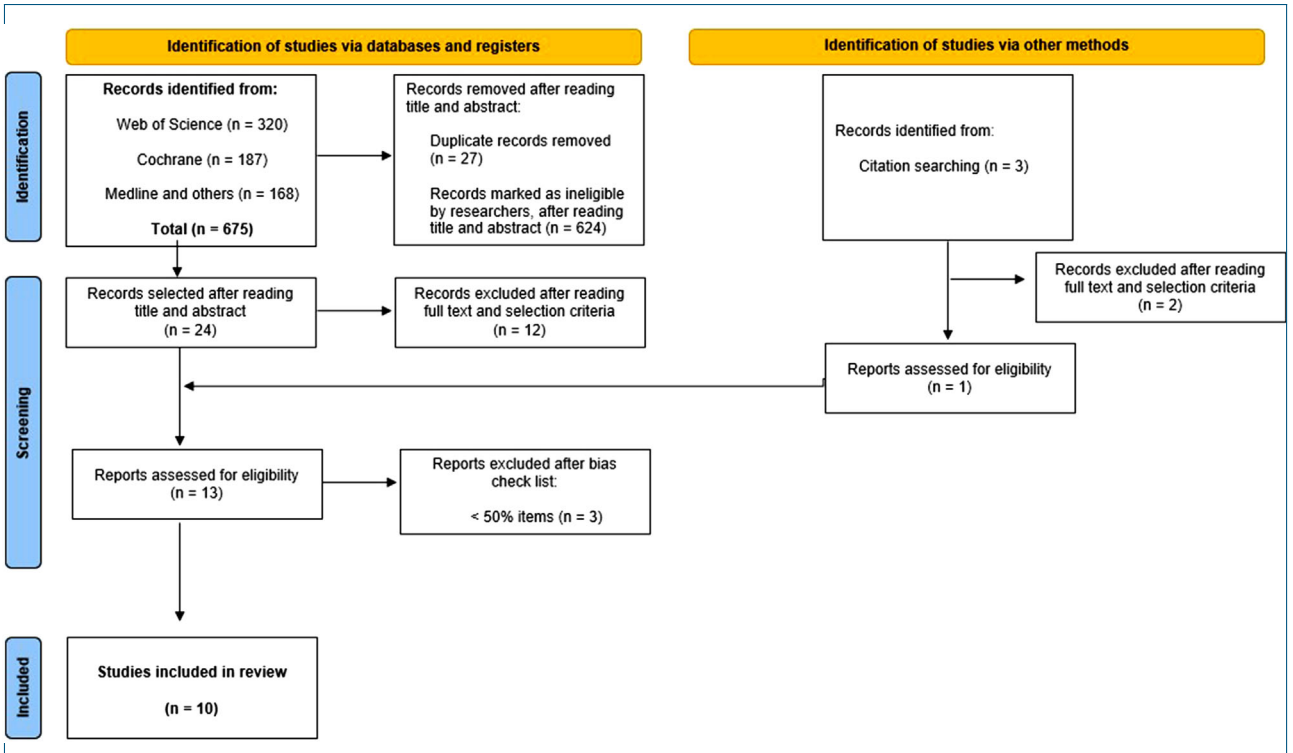

Figure 1. Flow Diagram of the Selection Criteria According to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Statement Guidelines

(relative risk [RR], 1.00; 95% CI, 0.87-1.14). These results had a low heterogeneity index ($X^2 = 8.31$; $P = .40$; $I^2 = 4\%$).

A second analysis, which included 8 articles,[11,19,21–24,32] was performed to compare the likelihood of having an eutocic (spontaneous) or a dystocic (cesarean or instrumental) birth. Hickey's study[33] was excluded from this analysis because it grouped births into only vaginal (spontaneous and instrumental) or cesarean birth. No significant association was observed (RR, 0.97; 95% CI, 0.89-1.06), although the analysis showed a moderate heterogeneity index ($X^2 = 13.64$; $P = .06$; $I^2 = 49\%$).

Because the Bick et al study[24] had a much larger study sample than the others, it was also excluded in a third analysis. A total sample of 1928 participants was considered. No significant differences were found for eutocic versus dystocic births in either group (RR, 1.01; 95% CI, 0.93-1.09), although the homogeneity of the studies substantially improved ($X^2 = 5.76$; $P = .45$; $I^2 = 0\%$).

All these analyses can be seen in Figure 2.

Postnatal Extrauterine Adaptation

Five studies were included[22–25,32] assessing the extrauterine adaptation of the newborn with the Apgar scale and using the common indicator number of neonates with Apgar score less than 7 points at minute 5 of life.

Data from 4039 neonates were analyzed, and no significant differences were found between the 2 groups (RR, 0.86; 95% CI, 0.39-1.93). The heterogeneity index was low ($X^2 = 1.11$; $P = .89$; $I^2 = 0\%$) (Figure 3).

Duration of Labor

Five articles,[19,22–25] including a sample of 3749 participants, measured the duration of labor (minutes) as a mean and SD. The meta-analysis indicated no significant differences between the 2 groups (RR, 1.64; 95% CI, −34.57 to 37.86), with a high heterogeneity index ($X^2 = 22.72$; $P = .0001$; $I^2 = 82\%$)

Once again, a sensitivity analysis was performed, this time excluding the Karraz study[19] and including a population of 3534 participants. Although the heterogeneity observed was reduced ($X^2 = 6.84$; $P = .08$; $I^2 = 56\%$), significant differences were not obtained between groups (RR, 17.50; 95% CI, −10.31 to 45.30).

All these analyses can be seen in Figure 4.

Narrative Synthesis

Type of Movement and Stages of Labor

Although all studies compared a mobile group with a nonmobile group, each study defined the experimental group's movement intervention differently and implemented it at different stages of labor.

One study[19] included movements such as ambulation, sitting position in a chair, and sitting upright on the bed during the entire labor process.

Three studies[11,22,32] considered *movement* only as ambulation. One of these defined ambulation as walking for at least one hour after epidural analgesia insertion in the first stage and 20 minutes in the second stage of labor.[11] A second defined ambulation as walking for 15 minutes each hour during

Table 1. Characteristics of Included Studies

Author (Year) Country	Objective	Sample	Design, Duration, Intervention	Key Findings
Wilson et al[11] (2009) United Kingdom	To determine the effect of mobile epidural techniques on the woman's motor capacity and ambulation during labor. To determine the effect of ambulation on the mode of birth.	N = 701 (261 in EG and 440 in CG) Nulliparous Women of all ages and weeks of gestation Spontaneous or induced labor	RCT EG: women who spent at least 1 h walking in the first stage after the epidural, and at least 20 min in the second stage of labor. CG: Women who stayed in bed	The ratio of women with normal motor capacity decreased as labor progressed. There were no significant differences in the mode of birth in the first stage. Only 10.8% of the women who reached the second stage of labor decided to ambulate in this phase. The EG that moved in the second stage was more likely than the CG to have a spontaneous vaginal birth: 69.76% vs 56% ($P = .03$).
Karraz [19] (2003) France	To determine if ambulatory epidural analgesia, using low concentration local anesthetics, has an effect on the mode of birth, the doses of oxytocin, and the duration of labor.	N = 215 (141 in EG and 74 in CG) Nulliparous Mean age: 27 y Weeks' gestation: 36-42 Spontaneous labor or induced during a low-risk pregnancy	RCT February, 1999 to April, 2001 EG: freedom to move (walk, sit on a chair, or upright in bed) CG: movement limited to the supine, semiupright, or lateral positions	No significant differences for instrumental births, 7.8% (EG) vs 8.1% (CG) ($P = .93$), or cesarean birth, 9.2% (EG) vs 16.2% (CG) ($P = .15$), or Apgar score after birth (data not provided). The mean duration of labor was shorter in the EG, significantly: 173 (110) min vs 236 (131) min ($P = .001$).
Golara et al [21] (2002) United Kingdom	To determine if ambulation in the second stage of labor, before the active pushing phase, is feasible and if it has any effect on the duration of labor.	N = 66 (25 in EG and 41 in CG) Nulliparous Mean age: 30 y Weeks' gestation: ≥37 Spontaneous labor or induced labor	RCT EG: Women moving at least 30 min of every h CG: Women who remained lying in bed or sitting in a chair	EG women had a significantly shorter second stage of labor (median [range]): 109 (40-165) min (EG) vs 133 (62-232) min (CG); ($P = .02$). The active pushing phase was particularly shorter in the EG (median [range]): 51 (9-90) min (EG) vs 73 (17-152) min (CG); $P = .01$. There were fewer instrumental/cesarean births: 36% in EG vs 54% in CG, but without statistical significance. There were more spontaneous vaginal births in the EG (64%) vs the CG (46%), but without statistical significance.

(*Continued*)

Table 1. (Continued)

Author (Year) Country	Objective	Sample	Design, Duration, Intervention	Key Findings
Frenea et al [22] (2004) France	To analyze the duration of labor and the level of pain by comparing ambulation with the static position of decubitus in women receiving epidural analgesia.	N = 61 (30 in EG and 31 in CG) Nulliparous or multiparous Mean age: 28.3 (4.3) y (EG) and 29.7 (4.1) y (CG) Weeks' gestation: 37-42 Spontaneous birth or induction of labor in low-risk pregnancy Have 3-5 cm of cervical dilatation at the time of the epidural insertion	Prospective RCT February 1998 to March 1999 EG: Freedom of movement. Ambulation = walking at least 15 min every h CG: Lying down	The duration of labor was not significantly different between the 2 groups: Mean time from the epidural to the end of labor: 304 (137) min (EG) vs 289 (164) min (CG) ($P = .70$). Mean time of first stage (from epidural to full cervical dilatation): 239 (125) min (EG) vs 199 (111) min (CG) ($P = .23$). Mean time of second stage: 56 (42) min (EG) vs 62 (59) min (CG) ($P = .65$). 93% of the women in the ambulatory group would choose to be able to ambulate again in a future labor.
Collis et al[23] (1999) United Kingdom	To study the effect of ambulation on the duration of labor, the need for epidural rescue boluses, the mode of birth, and the condition of the newborn.	N = 229 (110 in EG and 119 in CG) Nulliparous Mean age: 29 (4.6) y (EG) and 30 (5.3) y (CG) Weeks' gestation: 36-42 Spontaneous labor or induced during a low-risk pregnancy	RCT EG: They were able to walk, stand, or sit in a chair. Ambulation = being out of bed (walking, standing, or sitting in a chair) for at least 20 min every hour CG: Sitting in bed or lying down	There were no significant differences in mean duration of labor from administration of epidural to the end of labor: 414 (185) min (EG) vs 434 (194) min (CG) (95% CI, −70 to 30). There were no significant differences in mode of birth: spontaneous vaginal birth: 54% (EG) vs 54% (CG) (95% CI, −2 to 1.3); instrumental vaginal birth A: 28% (EG) vs 26% (CG) (95% CI, −9 to 14); instrumental vaginal birth B: 4% (EG) vs 7% (CG) (95% CI, −8 to 4); cesarean birth: 14% (EG) vs 13% (CG) (95% CI, −9 to 9). In the ambulatory group, only 44% of women who started labor spontaneously and 51% of women who started induced labor met the goal of being out of bed for at least 30% of the time in first stage.

(*Continued*)

Table 1. (Continued)

Author (Year) Country	Objective	Sample	Design, Duration, Intervention	Key Findings
Bick et al[24] (2017) United Kingdom	To determine, in nulliparous women with a low dose of epidural analgesia, whether standing in the second stage of labor increases the chance of spontaneous vaginal birth compared to a lying position.	N = 3093 (1556 in EG and 1537 in CG) Nulliparous Age: ≥16 y Weeks' gestation: ≥37 Spontaneous or induced labor	RCT October 2010 to January 2014 EG: Women in an upright position (walking, standing, sitting, kneeling, or any upright position) CG: Women lying down (left or right side, inclined up to 30° in bed).	Significant differences were found for: Spontaneous vaginal births: 35.2% (EG) vs 41.1% (CG). (RR, 0.86; 95% CI, 0.78-0.94). Duration of the active phase of the second stage of labor: difference of medians of 7 (0-13) in favor of the CG. Significant differences were not found for: Instrumental births: 54.6% (EG) vs 50.6% (CG) (RR, 1.08; 95% CI, 0.99-1.18) Cesarean births: 10.2% (EG) vs 8.3% (CG) (RR, 1.23; 95% CI, 0.92 – 1.64) Number of neonates with Apgar score <4 points at 5 min: 0.1% (EG) vs 0.2% (CG) (RR, 0.66; 95% CI, 0.06-6.88).
Vallejo et al[25] (2001) United States	To determine whether ambulation with epidural analgesia shortens the duration of labor from the administration of epidural analgesia to full cervical dilatation.	N = 151 (75 in EG and 76 in CG) Unknown parity Mean age: 26.72 (5.18) y (EG) and 27.18 (6.48) y (CG) Weeks' gestation: 36-42 Spontaneous labor or induced during a low-risk pregnancy	RCT March 1998 to January 2000. EG: Continuous epidural infusion with ambulation, sitting in a chair, or both. Ambulation = at least 5 min walking every h CG: Continuous epidural infusion without allowing ambulation or sitting in a chair	In the ambulatory group, 46.7% of the women decided to walk, 53.3% remained seated in a chair, and 26.7% did both. Mean time only walking: 25.0 (23.3) min. Mean time only sitting: 40.3 (29.7) min. Mean time walking and sitting: 28.2 (24.7) and 41.4 (30.7), respectively. There were no significant differences in the mean duration of labor from administration of the epidural to complete cervical dilatation: 240.9 (146.1) min (EG) vs 211.9 (133.9) (CG) ($P = .21$). There were no significant differences in the mean duration of the second stage: 97.3 (76.0) min (EG) vs 89.1 (67.3) min (CG) ($P = 0.49$). There were no significant differences in the mode of birth: spontaneous vaginal: 68% (EG) vs 73.7% (CG) ($P = .56$); vaginal forceps: 6.7% (EG) vs 5.3% (CG) ($P = .98$); vaginal suction cup: 6.7% (EG) vs 1.3% (CG) ($P = .20$); cesarean birth: 18.7% (EG) vs 19.7% (CG) ($P = .97$). There were no significant differences in the number of neonates with Apgar score <7 points in minute 1: 6.7% (EG) vs 6.6% (CG) ($P = .76$)

(*Continued*)

Table 1. (Continued)

Author (Year) Country	Objective	Sample	Design, Duration, Intervention	Key Findings
Nageotte et al[32] (1997) United States	To compare the use of "conventional" analgesia and "combined" intrapartum analgesia, allowing ambulation in the intervention group and not allowing it in the control group, with respect to safety, efficacy and patient satisfaction. To assess the relationship with cesarean birth.	N = 761 (253 in EG1, 252 in EG2, and 256 in CG) Nulliparous Mean age: 23 (2) y Weeks' gestation: ≥36 Spontaneous birth or premature rupture of membranes	RCT July 1995 to September 1996 EG1: Received combined epidural analgesia and ambulation was allowed. Ambulation = minimum of 5 min walking per h EG2: Received combined epidural anesthesia and free movement was not allowed CG: Received "conventional" epidural analgesia and ambulation was not allowed	Both EGs showed a lower rate of instrumental births, although in the EG where movement was encouraged, a higher rate was found: 33% (EG1) vs 28% (EG2) vs 40% (CG) ($P = .03$). Both EGs showed a higher rate of spontaneous vaginal births, although in the EG where movement was encouraged, a higher rate was found: 67% (EG1) vs 72% (EG2) vs 60% (CG) ($P = .03$). 3 risk factors were found for cesarean birth: (1) Administration of the epidural with the fetal head in a negative plane of the birth canal (RR, 2.0; 95% CI, 1.3-3.9); (2) Initiation of epidural analgesia with <4 cm of cervical dilatation (RR, 1.8; 95% CI, 1.1-3.7); (3) Absence of ambulation (RR, 1.6; 95% CI, 0.9-3.3)
Hickey et al[33] (2019) United States	To determine the effect of the use of the peanut ball and changes in position on the duration of labor, and the incidence of cesarean birth, in women who received epidural analgesia.	N = 382 (203 in EG and 179 in CG) Independent parity Age: ≥18 y Weeks' gestation: ≥ 37 Spontaneous or induced labor	Quasiexperimental November 2015 to October 2017 EG: changes in position with peanut ball. Positions: on one's side, in a fetal position and semisitting. Participants were repositioned at least every 1-2 h CG: Limited mobility without use of peanut ball	The vaginal birth rate was 42% (EG) vs 34% (CG). The cesarean rate was 11% (EG) and 13% (CG). It was significantly measured that the OR for cesarean birth was 50% less in the EG than in the CG (95% CI, 0.303-0.843). Labor induction was significant between the groups: 66.83% (EG) vs 52.25% (CG) ($P = .005$).

(*Continued*)

Table 1. (Continued)

Author (Year) Country	Objective	Sample	Design, Duration, Intervention	Key Findings
Mayberry et al [34] (2003) United States	Study questions: (1) Are women receiving low-dose epidural analgesia able to assume upright positions in the expulsive phase? (2) Which vertical positions do women prefer? (3) Were there any adverse effects in women or neonates from adopting vertical positions during the expulsive phase?	N = 74 Nulliparous Age: ≥16 y Weeks' gestation: >37 Low-risk spontaneous labor	Cross-sectional descriptive Study group: 10 different positions were proposed for adoption during the expulsion phase: sitting on the edge of the bed; standing; squatting with the help of a partner; sitting on a chair; sitting in a "throne" position; squat using a bar; upright and sitting sideways; quadruped; lateral decubitus; lithotomy	79% of the participants had a spontaneous vaginal birth, 13.5% had a instrumental birth, and 4% had cesarean birth. 80% of the participants obtained motor blockade figures measured with the Bromage scale of 4, 5, or 6. More than 10% had a score of 6. Therefore, the majority of women were able to adopt the proposed positions. 32% of the women spent >90 min of the second stage of labor in one of the proposed positions.67% of the women adopted 2 or more positions, 43% adopted 3 or more, and 21.6% adopted 4 or more. However, 85% delivered in the lithotomy position. The mean duration of the second stage of labor was 98.5 (66.48) min, and the mean duration of pushing phase was 71.91 (48.55) min. The preferred positions were sitting in the "throne" position (61.6%), upright and sitting sideways (30.2%), and quadruped position (12.8%). There were no adverse effects in the women or neonates.

Abbreviations: CG, control group; EG, experimental group; OR, odds ratio; RCT, randomized clinical trial; RR, relative risk.

Table 2. Analysis of Outcome Heterogeneity

Outcomes	Studies, n	CI	Z (*P*)	I^2, %
Mode of birth				
Vaginal birth vs cesarean birth	9	1.00 (0.87-1.14)[a]	0.02 (.98)	4
Eutocic birth vs dystocic birth	8	0.97 (0.89-1.06)[a]	0.64 (.53)	49
Eutocic birth vs dystocic birth (without Bick et al [24])	7	1.01 (0.93-1.09)[a]	0.20 (.84)	0
Extrauterine adaptation[c]	5	0.86 (0.37-1.97)[a]	0.37 (.71)	0
Duration of labor				
Length, min	5	1.64 (−34.57 to 37.86)[b]	0.09 (.93)	82
Length, min (without Karraz[19])	4	17.50 (−10.31 to 45.30)[b]	1.23 (.22)	56

[a] Relative risk.
[b] Difference in means.
[c] Number of neonates with Apgar score <7 in minute 5 of life.

the first stage,[22] and another as walking a minimum of 5 minutes every hour until the end of labor.[32]

In another study,[25] laboring people assigned to the ambulatory group walked at least 5 minutes per hour, were sitting on a chair, or both during the first stage labor. The intervention group in another study[23] was composed of laboring people who ambulated, were standing, or were sitting on a chair for at least 20 minutes every hour during both stages.

Another of the studies[33] examined movement using a peanut ball to assist in positional changes (on one's side, fetal position, and semisitting) during both stages.

Finally, 3 studies[21,24,34] included only the second stage of labor in the movement intervention. One of them encouraged laboring women assigned to the upright group to walk during the hour between diagnosis of complete dilatation and the onset of pushing. They considered participants mobile if they walked for at least 30 minutes. Laboring people assigned to the recumbent group remained in bed or sat in a chair.[21] Another study considered movement to be standing, ambulation, sitting, hand and knees position, or any other upright position,[24] whereas the cross-sectional study included up to 10 position changes (sitting on the edge of the bed, standing, squatting with the help of a partner, sitting on a chair, sitting in the throne position, squatting using a bar, upright and sitting sideways, kneeling, lateral decubitus, and lithotomy positions).[34]

Motor Blockade

Five studies[11,19,25,32,34] used the Bromage scale modified by Breen (Supplemental Information: Appendix S5) to measure the degree of motor blockade as a qualitative assessment. Ambulation was considered safe if this qualitative assessment was grade 5 or 6, but grade 6 could only be obtained in the ambulatory group, as it has to be assessed in a standing participant. Three studies[11,19,25] assessed this scale in both the ambulatory and control group, obtaining grade 5, 4, and 5 in the control group and grade 6, 6, and 5 in the experimental group, respectively. One study[32] only assessed motor blockade in the participants assigned to the ambulatory group. They allowed ambulation for participants with grade 5 and 6, with only 66% of the group walking at least 5 minutes per hour. The cross-sectional study[34] indicated that 80% of the participants obtained scores between 4 and 6 and that approximately 10% obtained a score of 6.

The Romberg test was used by 2 studies[22,25] to assess proprioception as a complement to safety mobilization. Participants in both studies had a negative Romberg test, ensuring stability in mobilization. Other studies[21,23,24] used the straight leg raise test to assess motor blockade. Two of these[21,23] did not publish results about this test, and another[24] indicated that 80% of the experimental group participants were able to walk safely after passing the test.

DISCUSSION

It seems logical that laboring people's mobility and positional changes should improve birthing outcomes in people with low-dose epidural analgesia because great benefits have been observed in those without this type of analgesia.[16,17] However, this meta-analysis showed no significant differences for the outcome measures studied. It should be noted that no detrimental effects were observed, so freedom of movement of people in labor with epidural analgesia should be supported as a safe choice. These results on mode of birth add to the findings of the Cochrane review published by Kibuka and Thornton in 2017 and its 2018 update, which focused on positions and not on mobility.[13,35] Although in 2018 the authors demonstrated no clear benefit of upright positions versus lying down in the second stage of labor, they did highlight the usefulness and benefit of positional changes in both lateral decubitus position compared with the supine posture.[13] Other studies agreed that ambulation had no effect on the rate of instrumental and cesarean births.[16,26] By contrast, one study found a decrease in the rate of instrumental births linked to mobility during labor,[36] whereas the COMET study[6], which compared the traditional epidural with 2 different low-dose epidural techniques, indicated that 1 in 4 instrumental births could be prevented with the use of low doses of epidural analgesia,[6] probably due to motor function preservation.[11]

On the other hand, the Bick et al study[24] found fewer vaginal births in people who labored in upright positions compared with those who were lying down. They speculated that there may have been greater motor blockade in upright positions because of the effect of gravity causing less effective pushing in this position.[24] However, 2 important

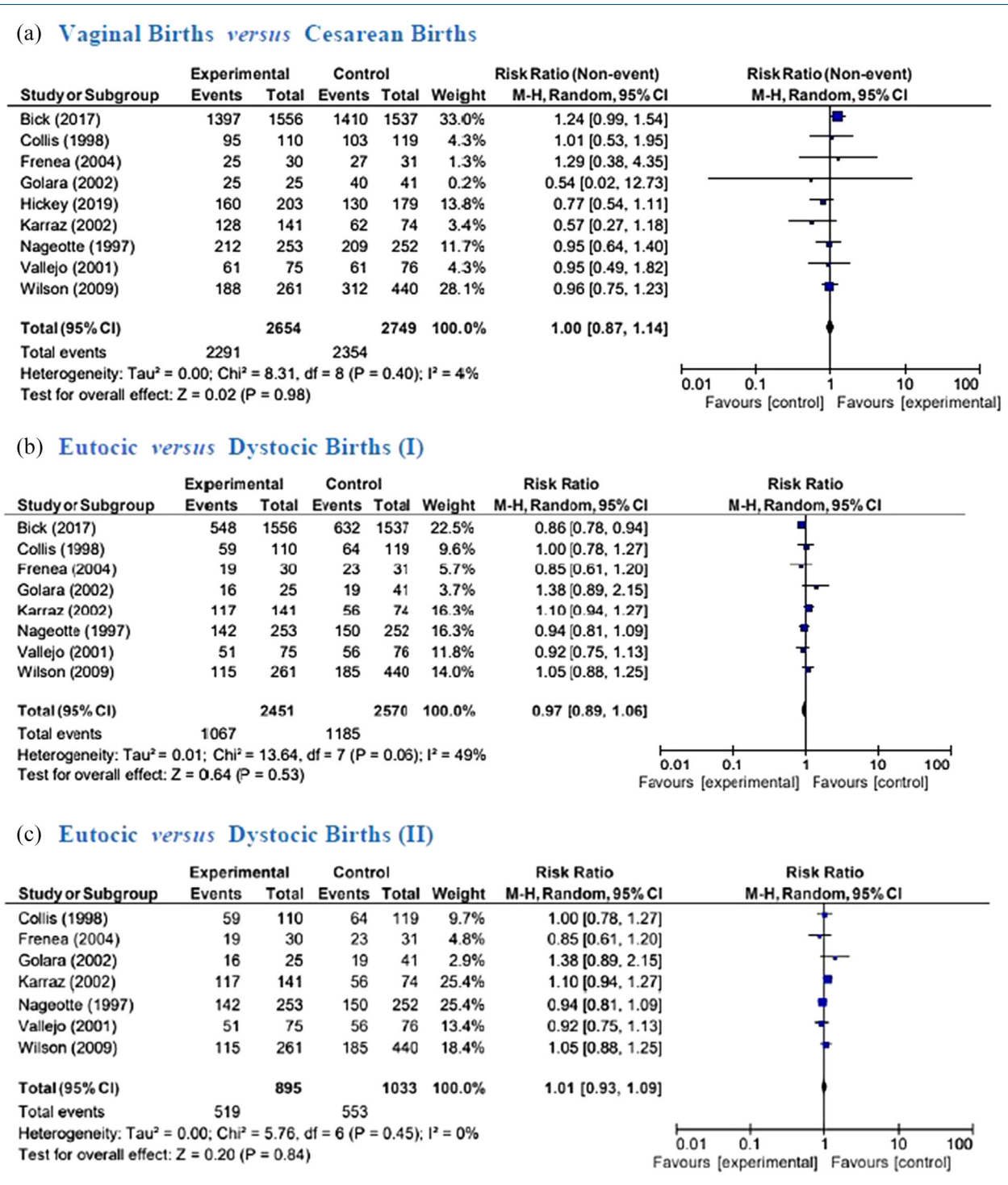

Figure 2. Forest Plots Showing Estimates of the Relationships between Movement and Mode of Birth

(A) Vaginal vs cesarean births. (B) Eutocic vs dystocic births (I). (C) Eutocic vs dystocic births (II).
Outcome reference: A value >1 implies an increase in risk, a value = 1 would indicate a null effect, and a value <1 would indicate a reduction in risk.
Abbreviation: M-H, Random: Mantel-Haenzael random-effects model.

factors could explain these results. First, the individuals in the experimental group were in an upright position during the second stage of labor but not the first, and the influence of one stage on the other could have been a determining factor, if the biomechanics of the labor process in continuous interaction are taken into account.[37] Second, the lying down positions in the control group were lateral decubitus, which has previously been shown to be beneficial in the second stage of labor,[13] as it allows free movement of the sacrum.[38]

Although it has previously been described that upright positions and movement during labor in people with epidural analgesia may decrease the duration of labor because of pelvic mobility,[19,38] in the present study, this outcome was not

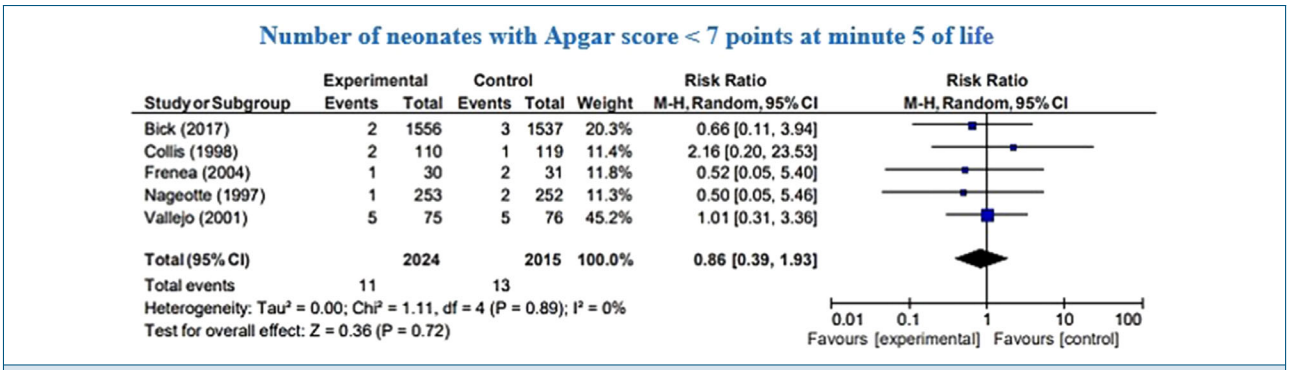

Figure 3. Forest Plots Showing Estimates of the Relationships between Movement and Extrauterine Adaptation at Birth

Number of neonates with Apgar score <7 points at minute 5 of life.
Outcome reference: A value >1 implies an increase in risk, a value = 1 would indicate a null effect, and a value <1 would indicate a reduction in risk.
Abbreviation: M-H, Random: Random: Mantel-Haenzael random-effects model.

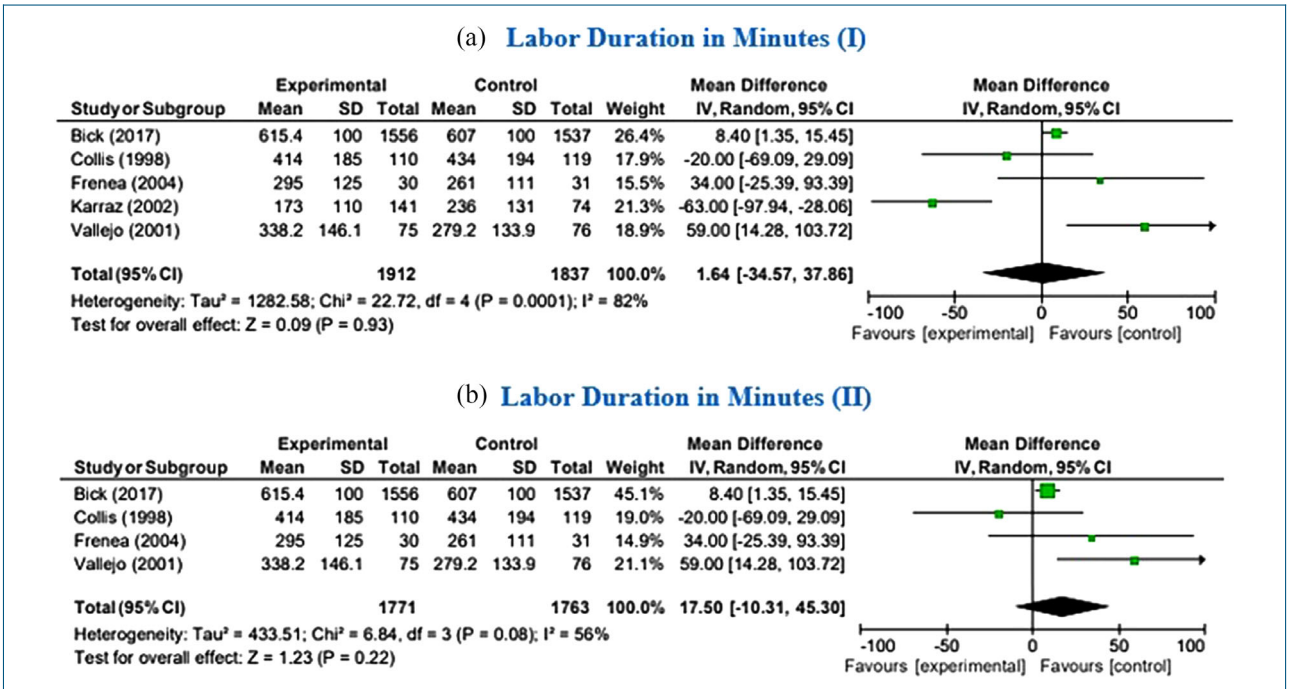

Figure 4. Forest Plots Showing Estimates of the Relationships between Movement and Duration of Labor in Minutes

(A) Labor duration in minutes (I). (B) Labor duration in minutes (II).
Outcome reference: MD = 0 would indicate that there is no difference between the experimental group and the control group, a negative value would be in favor of the intervention (experimental group), because it would indicate a reduction in the duration of labor, and a positive value would be in favor of the control group.

significantly different between groups. In this review, the duration of labor was considered as the time from epidural catheter insertion to the end of labor. It is noted that this definition does not consider any type of movement during the early stage of labor, during which people in labor tend to mobilize instinctively and naturally without epidural analgesia. This could favor the course of labor from the beginning, helping to optimize the fetal head position in relation to the pelvis. We must not forget that childbirth is a continuous and dynamic process,[37] so the stages of labor will influence each other as the process progresses.

In this review, the number of neonates with an Apgar score less than 7 points in the fifth minute of life was not statistically significant between groups, a finding consistent with other studies.[26,32,39] Although the COMET study[6] was consistent with this finding, the groups that received low-dose epidural analgesia had a higher number of neonates with low Apgar score in comparison with the group that received traditional epidural analgesia. It was hypothesized that low-dose epidural analgesia techniques use fentanyl as an adjuvant opioid, a drug that crosses the placental barrier and reaches the fetus, resulting in the need for higher level resuscitation measures at the time of birth.[6] The authors associated this with the drug and not with the laboring people's mobility, further specifying that the risk/benefit ratio should be considered if low-dose epidural analgesia techniques are to allow freedom of movement and decrease instrumental births, which are associated with greater neonatal morbidity.[6]

Low-dose epidural analgesia techniques minimize motor blockade while providing effective pain relief, which has

demonstrated a high degree of laboring people's satisfaction in many studies.[7,10,23,39,40] It would be interesting to specifically analyze laboring people's satisfaction in relation to freedom of movement and sense of autonomy in labors with low-dose epidural analgesia regardless of the dose or medications used. It is also important to assess the possible barriers to freedom of movement for people in labor resulting from hospital protocols. Continuous electronic fetal monitoring, intravenous perfusion of medication, and blood pressure monitoring when the epidural analgesia is applied do not facilitate comfort or freedom of movement.

Finally, there would be value in investigating the psychological impact that nonmobilization versus free mobilization may have on people in labor, with or without epidural analgesia. Laboring people's movement is also considered an analgesic and can alter the experience of pain, even in births in which epidural analgesia does not provide complete pain relief.

Limitations and Strengths

The main strength of this study is that it is probably the first to try to analyze mobility during labor from an overall point of view, considering a variety of positions rather than focusing on a specific one.

The scarcity of articles included in the systematic review and the heterogeneity of the outcome measures (different indicators used) are the main limitations for extrapolating the data and performing a complete meta-analysis. Although the search could not be restricted to recent articles (which could be seen as a disadvantage), it nevertheless highlights the need to study intrapartum movement in the present day, using the new epidural analgesia techniques.

Moreover, it would have been useful to obtain a more homogeneous sample because a variety of ages and parity, as well as spontaneous and induced labors, were included in the studies. Induction of labor may influence birth outcomes in a different way than spontaneous labor because it is not a wholly physiologic process and could be a confounding factor.

In addition, some included studies poorly monitored or documented the positions adopted during labor or mobilization times.[19,23,32] Other studies focused on the type of low-dose analgesia but not on the movement capacity permitted by the analgesia.[11,32] There were studies in which the participants from the experimental group were not excluded even though they had not been sufficiently mobilized, remaining lying down in bed,[21,23] and studies that focused on a specific position during one stage of labor, without considering the process as a whole.[21,24]

Implications for Clinical Practice and Future Research

Future research should measure movement or freedom of movement in labor, to encompass the wide variety of positions that could be appropriate for each individual, fetus, and stage of labor; it should be studied as a whole and not just at separate stages, because labor is a continuous process.

Furthermore, research ought to consider that encouraging movement during epidural labor should be accompanied by prior perinatal education programs in which the importance of physiology and the natural biomechanics of childbirth are highlighted,[34] to mentally prepare pregnant individuals for moving with epidural analgesia. Midwives should also be responsible for encouraging freedom of movement and positional changes to favor the progress of epidural analgesia labor.

CONCLUSIONS

This systematic review shows that laboring people's movement and positional changes do not have a significant impact on the mode of birth, duration of labor, or Apgar score, compared with more static positions. However, no detrimental effects were found, either. Motor blockade was found to be minimal with low doses of epidural analgesia, and a variety of positions could be adopted in both stages of labor.

Perinatal care providers who accompany people in labor with epidural analgesia should offer them the opportunity to move freely and should consider labor as a whole when they encourage mobility, meaning the wide variety of positions that people in labor can adopt throughout the entire labor process. New studies analyzing people's movement during labor with epidural analgesia from this perspective are needed to clarify the effect it may have on perinatal and neonatal outcomes.

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All the data generated or analyzed during this study are available at each database using the same search strategy included in this published article and its supplementary information files.

CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix S1. Search Strategy
Appendix S2. Article Selection Checklist
Appendix S3. Funnel Plots for Publication Bias
Appendix S4. Assessment of Risk of Bias for Included Studies
Appendix S5. Bromage Scale Modified by Breen

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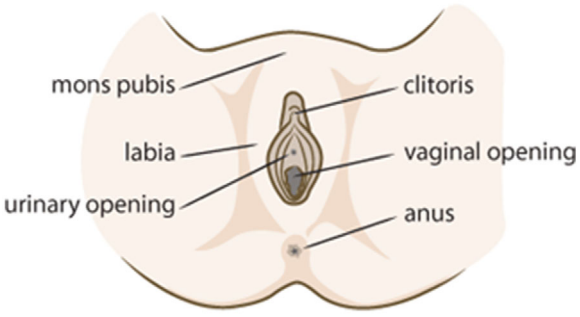
Vulvodynia

What is my vulva and why is it important?

The vulva is the area between your thighs and is the outside female genitals. The vulva has five parts: the mons pubis, labia majora and labia minora, clitoris, urinary opening, and vaginal opening. The mons pubis is the area that is covered in pubic hair. It protects the pubic bone and the rest of the vulva. The labia majora and labia minora are the outer and inner lips that cover the vaginal opening and the urinary opening. The clitoris, which intensifies sexual pleasure, is just above the urinary opening.



What is vulvodynia?

Vulvodynia is chronic pain of the vulva when no cause is found and it lasts for at least 3 months. This pain can feel like itching, burning, stabbing, stinging, aching, or irritation and is often brought on by having sex. Each woman feels the pain differently. For some women, the pain is in just one area of the vulva. Others have pain in several areas of the vulva. Still others have pain in the vulva that may spread to the inner thighs, and the area between the vagina and the anus. Some women have pain in the vulva that is only triggered by touch like when underclothing or tight jeans come in contact with the vulva, or by sitting too long. You can also have pain at the opening of the vagina if you put anything in (tampon, fingers, sex toy) or have penis/vagina sex. Others just have pain that happens on its own.

What causes vulvodynia?

We don't know for sure what causes vulvodynia. We know certain things are connected with it. Some women start to get pain in the vulva when they take birth control pills. Others can have a strong reaction to having a yeast infection, like an allergic reaction, and the feeling sometimes never goes away. Many may have a problem with how their pelvic muscles function that causes pain. Some believe it is a problem with the nerves around the vulva which may influence how your body responds to pain. Researchers continue to search for the exact cause.

What should I do if I think I have vulvodynia?

If you have pain in your vulvar area, you should see a health care provider to discuss this. Your provider will ask about your medical history and the pain you are having. A detailed pelvic examination will be done to check the health of your vulva and try to find a cause of your pain. Your provider may perform a test where a cotton swab is used to put gentle pressure on different areas of your vulva. If you have pain from the cotton swab, which should normally not be painful, you may have vulvodynia. Your provider will also check for pelvic muscle tenderness which also could be a sign of vulvodynia.

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What lifestyle changes can I make to help with my vulvodynia?

Some changes in the way you care for your vulva may help you have less pain:

- Avoid things that may irritate your vulva like soaps, shampoo, perfumes, douches, bubble baths, vaginal lubricants, certain condoms, and scented sanitary pads or tampons.
- Wear 100% cotton underwear with loose fitting pants or skirts.

For more details on how to care for your vulva and keep it healthy, see the Ask the Midwife handout on vulvar care.

What is the treatment for vulvodynia?

Unfortunately, there is no cure for vulvodynia. However, midwives and other health care providers can provide treatments that can help you have less pain. Some of the treatments that help reduce the pain of vulvodynia include:

- Physical therapy programs
- Acupuncture
- Transcutaneous Electrical Nerve Stimulation (TENS) in the vagina. TENS is a handheld unit that blocks pain signals to the area and helps release of the body's natural pain killers.
- Lidocaine ointment or cream is used to numb the area. It is put on a gauze and placed between the inner lips of the vulva overnight. Lidocaine can cause stinging and numbness if your partner has a penis. You should not use lidocaine before having oral sex.
- There are other treatments that can be used. Talk with your provider to see if they are right for you.

How do I cope with the pain?

Having vulvodynia pain can be very stressful and can cause anxiety because it could be difficult to find a cause or a treatment that works for you.

Talk with your provider and they can suggest ways to help your pain and sexual function, and your relationship with your partner.

For More Information

National Vulvodynia Association
http://nva.org

Vulval Pain Society
http://www.vulvalpainsociety.org

American Physical Therapy Association
http://www.apta.org/

The "Find a PT" tab will allow you to search for a women's health physical therapist.

Flesch Kincaid Reading Level 7.6