Effectiveness of nonpharmacological conservative therapies for chronic pelvic pain in women: a systematic review and meta-analysis

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OBJECTIVE: To evaluate the effectiveness of nonpharmacological conservative therapies for women with CPP.
DATA SOURCES: A systematic search of electronic databases (Amed, CINAHL, PsycINFO, SportDiscuss, Medline, PubMed, Embase, and Cochrane Central Register of Controlled Trials) was performed in January 2023, and updated in December 2023.
STUDY ELIGIBILITY CRITERIA: Randomized controlled trials comparing a nonpharmacological conservative therapy to inert (eg, placebo, usual care) or nonconservative (eg, surgical, pharmacological) treatment were included. Conservative therapies of interest to this review were: multimodal physical therapy, predominantly psychological approaches, acupuncture, and other tissue-based monotherapies (eg, electrophysical agents, manual stretching).
STUDY APPRAISAL AND SYNTHESIS METHODS: All study data were aggregated, and analyses of the included studies were performed. Effects on pain; sexual measures; psychological and physical function; health-related quality of life; symptom severity/bother; pelvic floor muscle function and morphometry; perceived improvement; and adverse events were analyzed. Meta-analyses (random effects model) were conducted using postintervention scores for data that included similar interventions and outcomes. Standardized mean differences were calculated. A narrative summary of findings that could not be included in the meta-analysis is provided. The quality of the evidence was assessed with the Physiotherapy Evidence Database scale and the certainty of evidence with Grading of Recommendations, Assessment, Development, and Evaluations criteria.
RESULTS: Of 5776 retrieved studies, 38 randomized controlled trials including 2168 women (mean age 35.1±8.6) were included. Meta-analyses revealed that multimodal physical therapy resulted in lower pain intensity compared to inert or nonconservative treatments in both the short (standardized mean difference −1.69, 95% confidence interval −2.54, −0.85; high certainty) and intermediate-terms (standardized mean difference −1.82, 95% confidence interval −3.13, −0.52; moderate certainty), while predominantly psychological approaches resulted in no difference in pain intensity (standardized mean difference −0.18, 95% confidence interval −0.56, 0.20; moderate certainty) and a slight difference in sexual function (standardized mean difference −0.28, 95% confidence interval −0.52, −0.04; moderate certainty). The level of evidence regarding the meta-analysis of the effects of acupuncture on pain intensity (standardized mean difference 1.08, 95% confidence interval −1.38, 3.54, nonstatistically significant results in favor of control treatment) precluded any statement of certainty. A limited number of trials investigated individual tissue-based monotherapies, providing a restricted body of evidence.
CONCLUSION: This systematic review with meta-analysis revealed that multimodal physical therapy is effective in women with chronic pelvic pain with a high certainty of evidence.

Key words: bladder pain syndrome, chronic pelvic pain, conservative management, dyspareunia, persistent pelvic pain, physical therapy, vulvodynia, women's health

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Systematic Review Registration: PROSPERO: CRD42022384450 (date registered: December 26, 2022).

Data sharing statement: The raw data used to support the findings of this study are available from the respective corresponding author upon request.

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AJOG at a Glance

Why was this study conducted?

There was a need for a comprehensive review systematically locating, critically appraising, and synthesizing the evidence on the effectiveness of nonpharmacological conservative therapies in the treatment of women with chronic pelvic pain (CPP).

Key findings

Meta-analyses revealed that multimodal physical therapy results in lower pain intensity compared to inert (eg, waitlist) or nonconservative (eg, pharmacotherapy) treatment in both the short (high certainty) and intermediate terms (moderate certainty), while predominantly psychological approaches likely result in no difference in pain intensity (moderate certainty). The level of certainty regarding the effects of acupuncture precluded any definitive statement.

What does this add to what is known?

The findings of this systematic review and meta-analysis showed that multimodal physical therapy is effective in women with CPP with a high certainty of evidence and regardless of control treatment.

Introduction

Chronic pelvic pain (CPP) (also referred to as persistent pelvic pain[1−3]), defined by the European Association of Urology as pain perceived in structures related to the pelvis,[4] has been described as a neglected condition by the World Health Organization.[5] It is often associated with negative cognitive, behavioral, sexual, and emotional consequences, as well as symptoms related to the lower urinary tract, sexual, pelvic floor muscles (PFMs), or gynecological dysfunction.[4] With prevalence rates up to 25%,[5,6] it results in a significant socioeconomic burden for women and society.[7] Pelvic pain is an umbrella term for conditions that may be associated with a defined pathology, disease or event (eg, cancer), or it can be a persistent pain condition or syndrome on its own, without a clearly defined pathology (eg, vulvodynia).[4,8] This review will address the latter group of conditions.

Surgical, pharmacological, and conservative therapies may be options for the treatment of a range of chronic pain conditions, yet the strength and quality of evidence related to the effectiveness of conservative therapies in populations with CPP is lacking and available guidelines predominantly focus on medical and surgical treatments.[9,10] This contrasts with the current recommendations for other types of chronic pain, where greater emphasis is placed on nonpharmacological conservative and complementary therapies[11,12] than occurs in CPP. These latter approaches are recommended as first-line management as they are low risk and cost-effective interventions.[13−16] Adequate and up-to-date recommendations for nonpharmacological conservative therapies in women with CPP are constrained by a lack of robust review of the available evidence. Indeed, existing reviews fail to offer a comprehensive overview, as they are outdated,[17,18] include not only females,[19−22] conflate pelvic pain conditions in women presenting with a defined pathology/disease with those without a defined pathology,[23,24] or are limited to specific types of conservative therapies,[19−30] preventing a full overview and comparison of available options. Additionally, some of these reviews included study designs other than randomized controlled trials (RCTs),[20,21,25,27,28] hindering the synthesis of the highest quality of evidence. As a consequence, selection of the optimal treatment for CPP in women remains challenging for health professionals and patients.

Currently, there is no review systematically identifying, critically appraising, and synthesizing the evidence on the effectiveness of nonpharmacological conservative therapies in the treatment of women with CPP without an underlying pathology or disease. Such a systematic review with meta-analysis is crucial to provide a comprehensive overview of the available data and support evidence-based decision-making.

Objectives

This review aimed to evaluate the effectiveness of nonpharmacological conservative therapies for women with CPP without a defined pathology or disease in comparison with inert (eg, waitlist, placebo) or nonconservative (eg, pharmacological, surgical) treatment.

Methods

Reporting and conduct

This systematic review was reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines[31] (Appendix A) and registered with the International Prospective Register of the Systematic Reviews (CRD42022384450).[32] The Cochrane Handbook for Systematic Review of Interventions[33] was used for methodological guidance.

Search methods

The search strategy included a combination of keywords and Medical Subject Headings for terms related to the investigated condition (CPP) and design (RCT) (Appendix B). Electronic databases (Amed, CINAHL, PsycINFO, SportDiscuss, Medline, PubMed, Embase, and Cochrane Central Register of Controlled Trials) were searched from inception up to January 16, 2023, and updated on December 20, 2023. No language restrictions were applied.

Eligibility criteria

Trials were eligible if they involved women reporting pelvic pain of at least 3 months' duration (or reported as "chronic"), without a defined underlying pathology, event, or known disease (eg, cancer, infection), and were full publications of an RCT. To be included, 1 trial arm needed to investigate a nonpharmacological conservative intervention intended to affect CPP, compared with inert (eg, no treatment, placebo, usual care) or nonconservative (eg,

surgery, pharmacotherapy) treatment. Nonpharmacological conservative therapies of interest to this review included: multimodal physical therapy (ie, comprehensive approaches within the scope of physical therapy, involving several different modalities such as education, PFM exercises, massage, self-management strategies, etc.), predominantly psychological approaches (eg, cognitive behavioral therapy, mindfulness), acupuncture (eg, traditional acupuncture, electro-acupuncture), and other tissue-based monotherapies (ie, predominantly biomedically focused, tissue-based unimodal treatments such as electrophysical agents, manual stretching). The outcomes of interest included: pain outcomes, sexual measures, physical and psychological function, health-related quality of life, pelvic symptom severity and/or bother, PFM function and morphometry, and perceived improvement. Adverse events were also analyzed. Detailed criteria regarding study inclusion are outlined in Table 1.

Study selection

Following the search, all identified citations were uploaded into EndNote X9 3.3 (Clarivate Analytics, Philadelphia, PA) and duplicates were removed. Titles and abstracts were screened by 2 independent reviewers. If inclusion could not be determined from the title/abstract, the full text was reviewed. Disagreements were resolved through discussion, and a third reviewer was included when needed. Reasons for exclusion were recorded and reported in this review (Appendix C). Reviewers did not screen a study if they had any involvement in the study under consideration.

Data extraction

Data were extracted by one reviewer and the accuracy of information was verified by another reviewer. The following information was extracted: study design, participants' characteristics, primary diagnosis, type of conservative therapy, intervention and control treatment details, outcome measures used (pain, sexual measures, physical function, psychological function, health-related quality of life, pelvic symptom severity and/or bother, PFM function and morphometry, perceived improvement, and adverse events), and results. For meta-analyses, all relevant final value scores for each treatment arm were extracted for posttreatment and follow-ups. When these were missing, the authors of the study were contacted to provide missing data. When unavailable, the final value score was derived from the difference between the group baseline and the mean change value whenever possible. Missing standard deviations (SDs) were imputed using the baseline values. If a standard error was provided instead of SD, the built-in RevMan calculator[34] was used to calculate the missing SD. Posttreatment and follow-up were defined as short-term (first assessment after the end of the treatment), intermediate-term (follow-up assessment closest to 3−9 months posttreatment), and long-term (approximately 12 months posttreatment and over). Further details regarding data curation are available in Appendix F.

Assessment of risk of bias

The Physiotherapy Evidence Database (PEDro) scale was used to critically appraise the individual studies (Appendix E). A score $\geq$6/10 was interpreted as moderate to high quality.[35] Each study was evaluated by 2 reviewers, and a third reviewer was involved if needed, to reach a consensus. None of the review authors assessed the quality for a trial in which they were a researcher.

Data synthesis

All study data were aggregated, and analyses of included studies were performed. A narrative report on the findings that could not be pooled in meta-analyses was provided. Where possible, meta-analyses were performed for data that included similar interventions and outcomes. All analyses were conducted with RevMan Web[34] and a minimum of 5 studies was required to pool data in a meta-analysis and to present a summary estimate together with a certainty of evidence rating. The general approach of inverse variance weighting was used and standardized mean differences (SMD) were calculated for continuous data. One questionnaire included in the meta-analysis (Female Sexual Function Index [FSFI]) was the only instrument in which a higher score meant better outcomes. For this reason, it was inversely scored (multiplied by −1) for meta-analysis data entry in RevMan Web.[34] A random effects model was used for all analyses. Inconsistency among studies was assessed with the visual inspection of point estimates and their 95% confidence intervals (95% CIs) and was supported by the I^2 statistic.[36] Sensitivity analyses were used in order to explain possible sources of heterogeneity between studies and to determine the robustness of the original analyses. They were conducted by excluding low-quality studies (PEDro score 5/10 or less). The trials were collectively analyzed, regardless of the comparator (inert or nonconservative treatment).

Approaches to selecting outcomes for meta-analyses are described in Appendix F. To enhance the interpretability of the results, the obtained SMD values were back-translated and transformed to a typical 0 to 10 scale for pain intensity comparisons and FSFI scale for sexual function comparison,[37] (details in Appendix G). Certainty of evidence was assessed using The Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.[38] The SMD value of 0.65 was assumed as a minimal clinically meaningful threshold for between-group differences in pain intensity comparisons. For sexual function, Cohen's d threshold of 0.20 for small effect was used. Appendix G includes further justification for the chosen thresholds and the criteria to form judgments for each GRADE domain.

Results

Study selection

The literature search identified 11,529 references; after removing 5753 duplicates, 5776 were available for title and abstract screening. We excluded 5691 records based on the title and abstract and reviewed 85 full-texts for eligibility. We excluded 44 references that did not meet our inclusion criteria

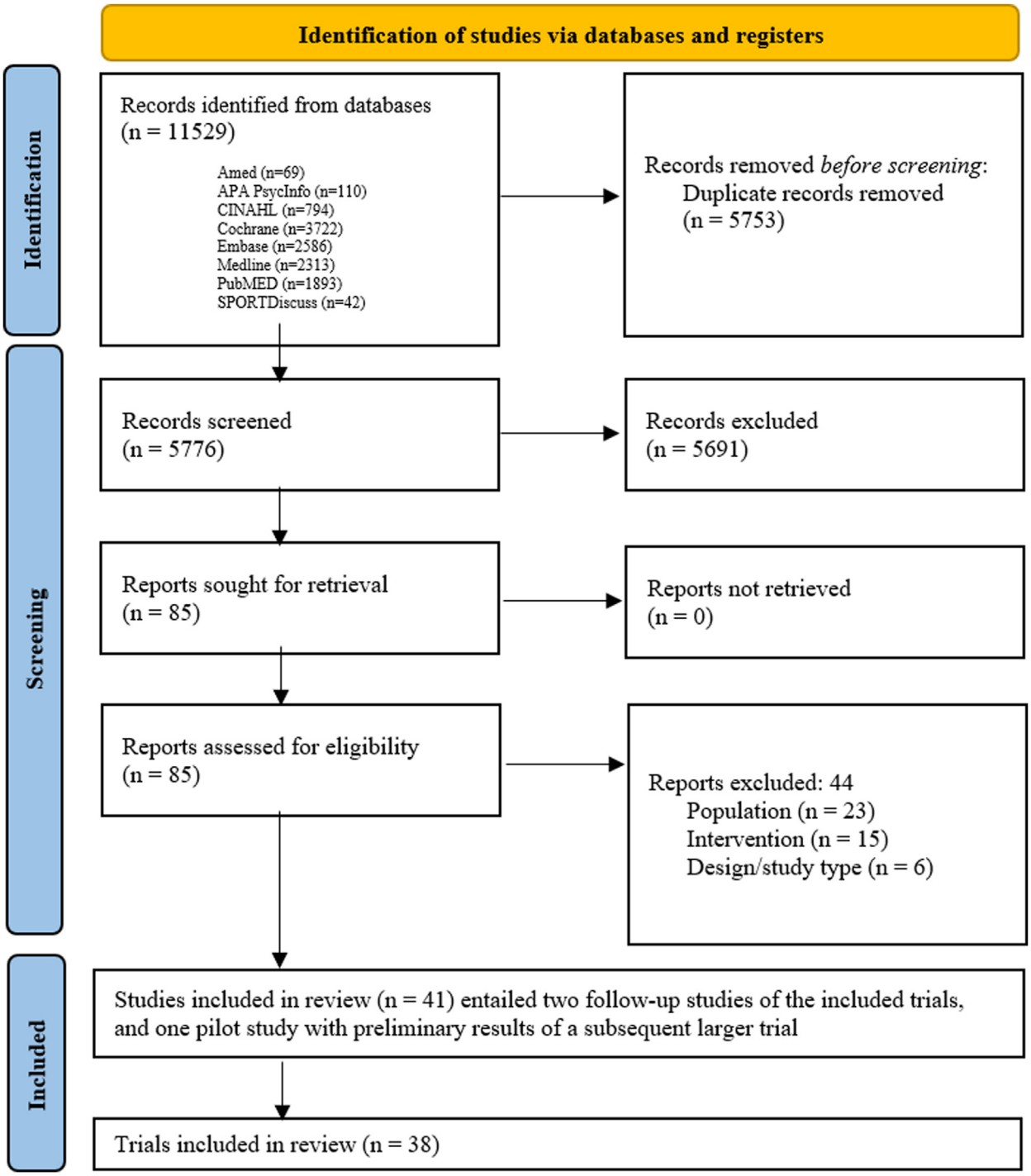
TABLE 1
Eligibility criteria

Variables	Criteria
Population	Inclusion: - Adult women reporting pelvic pain (eg, including but not limited to vulvodynia and bladder pain syndrome) of at least 3 mo' duration (or reported as "chronic"), without a defined underlying pathology, event or known disease (eg, cancer, infection). - Studies involving women with chronic pelvic pain and cooccurrence of other common overlapping pain conditions were included as long as chronic pelvic pain (as defined in this review) was investigated as a primary complaint or main focus of the study.
	Exclusion: This review excluded studies investigating the following conditions as their primary inclusion criteria: - Pelvic girdle pain (as this condition is distinct from pelvic pain investigated in this review); - Endometriosis and endometriosis-associated pain (as there are separate ongoing reviews for these conditions) - Genitourinary syndrome of menopause (as the pain is a symptom of altered physiology); - Irritable bowel syndrome (as this is defined as primarily an abdominal pain condition and pelvic pain may not be present); - Hunner-type interstitial cystitis (as this condition is clinically and pathologically different from other types of IC/BPS). Therefore, studies were excluded if the authors stated that more than 25% of the group had positive cystoscopy findings (eg, confirmed Hunner's lesions).
Intervention	Studies in which 1 trial arm consisted of a conservative intervention (excluding pharmacological or ingestible compounds) applied with the intention to treat pelvic pain. Conservative therapies that were of interest to this review could include (but were not limited to): - Multimodal physical therapy (ie, comprehensive approaches within the scope of physical therapy, involving several different modalities such as education, pelvic floor muscle exercises, massage, self-management strategies, etc.), - Predominantly psychological approaches (eg, cognitive behavioral therapy, mindfulness), - Acupuncture (eg, traditional acupuncture, electro-acupuncture), - Other tissue-based monotherapies (eg, electrophysical agents, pelvic floor biofeedback, massage, manual stretching, and myofascial techniques).If the conservative intervention was combined with another, nonconservative treatment (eg, surgical or pharmacological treatment), then studies were included if this treatment was applied equally to both arms, for example, physiotherapy+pharmacotherapy versus pharmacotherapy; or physiotherapy+surgery vs surgery.
Comparator	Studies comparing a conservative intervention with a comparator arm of inert treatment or nonconservative treatment. **Inert treatment:** for example, no intervention, a placebo condition, waiting list, leaflet, usual care (usual care was considered inert treatment when no additional care was provided to the participants of the study and/or the usual care provided to the participants was not described in detail). **Nonconservative treatment:** for example, pharmacological, surgical See Appendix P for more details regarding comparator division.
Outcomes	1) Pain outcomes (eg, pain severity, temporal characteristics of pain, pain quality) 2) Sexual measures (eg, sexual function) 3) Physical function (eg, bladder/bowel function, general physical function) 4) Psychological function 5) Health-related quality of life 6) Pelvic symptom severity and/or bother 7) Pelvic floor muscle function and morphometry 8) Perceived improvementWe also looked at adverse events (eg, worsening of pain) and dropouts.
Timing	There were no restrictions based on the length of follow-up of outcomes.
Setting	There were no restrictions based on type of setting.
Design	RCTs investigating conservative therapies for persistent pelvic pain in women, meeting the following criteria: - Available as a full publication of an RCT; - Conservative therapy investigated as an active therapy of primary interest; - Published (or electronically prepublished) in a peer-reviewed scientific journal; - Included participants reporting persistent pelvic pain, meeting our prespecified inclusion criteria.
Language	There were no language restrictions.

IC/BPS, interstitial cystitis/bladder pain syndrome; *RCT*, randomized controlled trial.

(Appendix C). A total of 41 studies were finally included. Two of them were follow-up studies of the included trials,[39,40] and one[41] was a pilot study with preliminary results of the subsequent larger study, which resulted in 38 RCTs analyzed in this review (Appendix D). The flowchart of study selection is summarized in Figure 1.

FIGURE 1
Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram



"Studies" refers to individual published reports retrieved in the search. "Trials" refers to the main ("mother") RCT and, where applicable, other related studies with the RCT's results (eg, follow-up studies).

Study characteristics

This review contains 28 RCTs[42–70] (with 2 additional follow-up studies[39,40]), 7 studies described as pilot/feasibility trials[69,71–76] (with 1 additional study[41] evolving to a full RCT[70]) and 3 cross-over studies.[77–79] A total of 2168 females with a mean age of 35.1±8.6 were included in 38 trials. The number of

randomized participants ranged between 15 and 212 (median 40), leaving between 6 and 107 in each arm. The studies were published between 2001 and 2023, with the majority of them (22 RCTs, 58%) since 2018. They were conducted in geographically diverse settings: North America (14 RCTs, 37%), Europe (12 RCTs, 32%), South America (4 RCTs, 11%), the Middle East (4 RCTs, 11%), Asia (2 RCTs, 5%), Oceania (1 RCT, 2.5%), and Africa (1 RCT, 2.5%). Of the included 38 trials, 20 had their protocols registered[41,43,46,47,49,51,52,54,59–63,65,66,70–73,75,76] and of them, only 8 were registered prospectively[41,46,61,63,65,70,73,75] (registration date prior to enrollment of first participants). The appropriateness of registration could not be verified in 3 studies (we could not retrieve the protocol[51] or the data provided were insufficient[47,54]). The vast majority of trials (32 RCTs, 84%) provided sample size justification, but only in half (20 RCTs, 53%) was it adequately reported. In 1 trial[76] the sample size was insufficient according to the calculation provided.

The following conditions were investigated (terms used by authors of the included trials, explained in Table 2): CPP (13 RCTs[40,42,43,48,53,55,58,60,61,65,71,76–78]), vulvodynia (16 RCTs[39,41,44–46,50,52,54,56,62–64,68–70,73,74] and of them, 11 RCTs focused on provoked vestibulodynia [PVD][39,44–46,50,52,54,62–64,69,72,73]), interstitial cystitis/bladder pain syndrome (IC/BPS, 5 RCTs[47,59,67,75,79]), dyspareunia (2 RCTs[51,57]), genito-pelvic pain/penetration disorder (1 RCT[66]), and urogynecological pain (1 RCT[49]). For interpretation of results, studies were grouped according to the type of intervention provided: multimodal physical therapy (7 RCTs[40,41,43,51,53,54,63,70]), predominantly psychological approaches (10 RCTs[39,44–46,49,59,66,68,69,71,75]), acupuncture (5 RCTs[42,47,60,72,74]), and tissue-based monotherapies (18 RCTs, which could be further subdivided into electrophysical agents,[48,52,56–58,62,64,70,73,77–79] massage, manual stretching and myofascial techniques,[55,61,76] PFM biofeedback,[39,44,50] and education on healthy lifestyle modifications[67]). Two trials[39,44,70] had 3 treatment groups (2 groups investigating different conservative treatments and 1 control group) and therefore contributed to more than 1 comparison. Characteristics of the included trials are presented in Table 2. The outcomes assessed in the included trials and presented in this review encompassed pain outcomes (38 trials), sexual measures (19 trials), psychological function (18 trials), health-related quality of life (9 trials), physical function (5 trials), pelvic symptom severity and bother (6 trials), PFM function and morphometry (3 trials), perceived improvements (15 trials) as well as presence or absence of adverse events (23 trials).

Risk of bias of included studies

Of the 38 included trials, 26 RCTs (68%) were assessed to have moderate to high-quality (PEDro score of at least 6/10) and 12 RCTs (33%) to have low-quality (PEDro score 5/10 or less). The median PEDro score was 6/10 (range 1–10) Appendix E summarizes the PEDro assessments.

Synthesis of results

Appendix F encompasses information about trials and outcomes that were included or excluded from the meta-analyses, along with relevant justifications. Trials for which study authors were contacted to provide data are listed in Appendix F as well. GRADE certainty of evidence ratings were conducted for all meta-analyses, and summary of findings tables are available in Appendix G. Appendices H–O present details about the results of each study.

Pain outcomes

Pain outcomes were investigated in all 38 trials. Appendix H contains presentation of the results from each included trial. The available information allowed for the pooling of data in meta-analysis of short-term effectiveness (immediately after treatment) on pain intensity outcomes for multimodal physical therapy, predominantly psychological approaches and acupuncture. Regarding effectiveness assessed in the intermediate-term, the number of trials was sufficient to conduct a meta-analysis for multimodal physical therapy only. All meta-analyses with forest plots are presented in Figures 2–6. To provide readers with additional details, Appendix P presents the forest plots divided into subgroups based on comparators (inert or nonconservative treatment), for visual and informative purposes only.

Multimodal physical therapy

All 7 trials contributed data to a meta-analysis of short-term (immediately after treatment) effects on pain intensity (Figure 2). The included data (476 participants) showed lower pain intensity in multimodal physical therapy group when compared to control (inert or nonconservative treatment). The SMD was −1.69 [95% CI −2.54, −0.85], indicating a statistically significant, meaningful effect (SMD≥0.65) with a high certainty of evidence (Appendix G). When SMD was retransformed to a typical 0 to 10 pain scale, the mean difference was −2.87 [95% CI −4.32, −1.45] favoring multimodal physical therapy. All 5 trials[40,51,53,54,63,65] reporting follow-up data (381 participants) on intermediate effectiveness (12–36 weeks posttreatment) also showed statistically significant lower pain scores in the multimodal physical therapy group when compared to inert or nonconservative treatment (Figure 3) with an SMD of −1.82 [95% CI −3.13, −0.52] (meaningful effect, moderate certainty of evidence), which indicated a mean difference of −3.09 [95% CI −5.32, −0.88] on a 0 to 10 pain scale. It is also worthwhile to underline that the choice of comparator (ie, inert or nonconservative treatment) does not appear to influence the results much: meaningful effects (SMD≥0.65) for between group-differences favoring multimodal physical therapy were observed regardless of the comparator (Appendix P) (Figures 2 and 3).

Predominantly psychological approaches

Of 10 trials, 8 contributed to meta-analysis of short-term effects, immediately after treatment (547 participants), showing no important effect on pain intensity when compared to control (inert or nonconservative treatment) with an SMD of −0.18 [95% CI −0.56,

TABLE 2
General information about included trials

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Multimodal physical therapy						
Ariza-Mateos et al 2020	**Chronic pelvic pain** of at least 6 mo duration, not exclusively associated with intercourse, with incomplete relief following previous treatments, and significantly impaired function at home or at work. Age: 43.99±8.94	**Patient-centered intervention based on the model of cumulative complexity in women with chronic pelvic pain** Treatment included self-management techniques, PNE and adaptive coping skills to improve adjustment to pain and was embedded into patient's live to ensure adherence and to prevent workload-capacity imbalances. Main treatment goals were oriented around personal care, mobility, household management, word, and leisure. 45 min/session 1×/wk 6 wk **Treatment provider:** specialized therapists (physical therapist, occupational therapist) with education in pain management and more than 7 y of experience	**Leaflet** information about CPP, physical activity, fear of movement, false beliefs, active lifestyle, and behavioral advice.	Adherence not reported. **Dropouts from baseline to posttreatment:** CTG: 0/22 CG: 0/22	None of the patients reported side effects during the study.	Pain, HRQoL,[b] psychological function
Bardin et al 2020, 2023	**Vulvodynia** of at least 3 mo duration, confirmed by gynecologists and report of severe sexual pain (greater than 5/10) for at least 50% of sexual intercourse episodes. Age: majority 20—29 y old	**CTG1: PFM PT + amitriptyline** HEP including PFMT in different positions and self-performed manual stretching. Manual therapy (stretching) delivered also by physical therapist during individual sessions. 1×/d HEP 8 sessions of physical therapist-assisted manual therapy, 1×/wk 8 wk **Treatment provider:** physical therapist. **CTG2: electrical stimulation+amitriptyline** Interferential current applied on the vulva (2 channels parallel to vaginal introitus). Bipolar application method, carrier frequency 4.000 Hz, amplitude modulated frequency 100%, sweep frequency 200 Hz, pulse duration 40 μs, 1:4:1 s slope, the rest time was turned-off, intensity adjusted according to patient's threshold. 8 sessions of 30 min, 1×/wk 8 wk **Treatment provider:** physical therapist.	**Pharmacotherapy: amitriptyline** 25 mg, 1×/d for 8 wks.	Adherence not reported. **Dropouts from baseline to posttreatment:** CTG1: 7/37 CTG2: 9/38 CG: 9/36	**CTG1:** none of the patients reported side effects; mean reported pain intensity during manual stretching exercises 1.5±0.6. **CTG2:** 10.7% (n=3) reported sensation of vulvar numbness for some hours following stimulation. **CG:** 72.2% reported sedation, 55.5% dry mouth, 22.2% headache, 16.6% dizziness, 11.1% constipation, 5.5% rash.	Pain[b], sexual measures, pelvic symptom severity/bother, PFM function[b] (investigated in 2020 report)

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Ghaderi et al 2019	**Dyspareunia** related to "pelvic floor myalgia" (muscular dysfunction), and not associated with vestibulodynia or IC/BPS, with persistent of recurrent pain in the genital area during or after intercourse greater than 8/10 (VAS). Age: 35.33±8.52	**Multimodal PT** Each session entailed 15–20 min of manual techniques to release trigger points in the pelvic floor using intravaginal myofascial soft tissue release and deep intravaginal massage, and 20–25 min of high frequency TENS using intravaginal electrodes (at 110 Hz for an 80-ms pulse duration and maximal tolerable intensity to relieve pain). The participants were also instructed to perform PFM exercises at home (written instruction with educational video). 1×/wk 12 wk **Treatment provider:** specialized physical therapist	**Waitlist** No treatment.	Assessed (diary checklist for controlling daily exercise), not reported. **Dropouts from baseline to posttreatment:** CTG: 0/32 CG: 0/32	Omitted to report the occurrence or absence of adverse events.	Pain, sexual measures[b] PFM function
Haugstad et al 2006, 2008	**Chronic pelvic pain:** deep pelvic pain lasting between 1 and 10 y, with symptoms not restricted to vulvar area only. Age: 34.3 (SEM 1.97)	**Mensendieck somatocognitive PT+standard gynecological treatment** A cognitive-based approach to increase awareness of body movements, tension, relaxation, posture, gait, respiration combined with manual therapy (manual tension release). 60 min/session 10 sessions 12 wk **Treatment provider:** Mensendieck physical therapist	**Medical treatment** Standard gynecological treatment with hormonal, analgesic treatment as required, dietary and bowel advice, sexological advice (depending on the specific indications). The participants were seen at the time of recruitment, midway in the treatment period, and at the time of final assessment after the treatment period.	NI **Dropouts from baseline to posttreatment:** CTG: 1/20 CG: 1/20	Omitted to report the occurrence or absence of adverse events.	Pain, physical function, psychological function (primary outcome not stated)

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Hess Engstrom et al 2022	**PVD** with symptoms of at least 6 mo, diagnosis confirmed trough a structured telephone screening interview, with no ongoing treatment for the condition. Age 24.5±4.4	**Internet-based, multidisciplinary, ACT-inspired treatment** Online program developed by the team consisting of midwife, physical therapist, gynecologist, and psychologist and based on ACT principles. The covered themes included education and information about the condition, PFMs and PNE, values, thoughts, relationships, and maintenance. The program included 6 self-paced modules and daily exercises (eg, body awareness, mindfulness, PFM exercises, exposure exercises). Participants also received the assistance from eCoaches (written feedback and answers to participants' questions). Around 30 min/d to complete 1 module/wk 6 wk **Treatment provider:** prerecorded modules delivered by midwife and physical therapist; eCoaches—research assistants trained to provide written feedback and to answer participants' questions	**Waitlist** No treatment (participants were not allowed to have any treatment during the waiting period).	NI **Dropouts from baseline to post-treatment:** CTG: 20/52 CG: 16/47	Omitted to report the occurrence or absence of adverse events.	Pain,[b] sexual measures, psychological function
Morin et al 2021	**PVD** of at least 6 mo duration with an average intensity of at least 5/10 (NRS); diagnosis confirmed by the study gynecologist, including cotton-swab test. Age: median 22	**Multimodal PT** Individual sessions entailed education (PNE, PVD pathophysiology, sexual function, relaxation techniques), PFM exercises with biofeedback, manual therapy, and vaginal dilation. 60 min/session 1×/wk 10 wk **Treatment provider:** certified physical therapists with postgraduate qualifications in women's health including courses in pelvic pain	**Pharmacotherapy: topical lidocaine** Overnight application of topical lidocaine (5%) ointment according to the Zolnoun et al 2003 protocol. 1×/d (overnight) 10 wk	CTG: With the exception of the participants who discontinued the intervention, all other women attended all 10 sessions. The overall adherence to home exercises had a median of 85% (IQR 75%–91%). CG: Except for the participants who discontinued the intervention, all other women completed 10 wk of lidocaine application. The overall adherence for lidocaine had a median of 91% (IQR 83%–96%). **Dropouts from baseline to posttreatment:** CTG: 6/105 CG: 5/107	CTG: none of the patients reported side effects during the study. CG: 1% (n=1) discontinued the study due to a dermatitis reaction to lidocaine 15% (n=15) reported minor irritating or burning sensation.	Pain,[b] sexual measures, perceived improvement

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Rodriguez-Torres et al 2020	**Chronic pelvic pain** with significant postural impairment evaluated by the Corbin method (0−18, scores higher than 10 were considered significant). Age: 48.22±7.94	**Multimodal PT** Individualized comprehensive rehabilitation program aimed at improving pain, functionality, postural control, and self-perceived health status and considering patient' preferences. Sessions combined education (PNE, postural control, ergonomics, and advice on daily life activities), massage therapy, stretching, mobilization, postural control exercises (with pressure feedback devices), ergonomics, and functional activities (strategies that could be included in daily life). 60 min/session 2×/wk 16 sessions 8 wk **Treatment provider:** trained physical therapist, with 2−4 y of experience in working with chronic pain.	**Leaflet** Information about lifting weights, sedentary activities, sports, pain-free maximal physical activity level, behavioral advice, and an active lifestyle advice. Women could continue their usual activities.	NI **Dropouts from baseline to posttreatment:** CTG: 1/20 CG: 1/20 (1 participant excluded by researchers as she received other treatment. It is not clear in which group she was.)	Omitted to report the occurrence or absence of adverse events.	Pain, physical function, HRQoL, psychological function (primary outcome not stated)
Predominantly psychological approaches						
Bergeron et al 2001, 2008	**PVD** of at least 6 mo duration and pain intensity of at least 4/10 (VAS) during cotton swab test. Age: 26.80±5.40	**CTG1: Biofeedback** Delivered according to Glazer protocol, performed at home and during supervised sessions. 2×/d home biofeedback 8 sessions of therapist-assisted biofeedback (45 min duration) 12 wk **Treatment provider:** PhD level clinical psychologists, trained in Glazer protocol **CTG2: Group CBT** Education and information about vulvar pain, sexual anatomy, progressive muscle relaxation, abdominal breathing, PFM exercises, vaginal dilation, PNE, distraction techniques focusing on sexual imagery; rehearsal of coping self-statements; communication skills training, and cognitive restructuring. 2 h/session 8 sessions 12 wk **Treatment provider:** PhD level clinical psychologists	**Surgery: vestibulectomy** Procedure of 30 min performed under general anesthesia and involving the excision of the vestibular area to a depth of 2 mm and a width of 1 cm, all the way up to the urethra, with vaginal advancement when necessary.	65% of CTG2 participants complied with treatment, as compared to 57% CTG1 participants (treatment adherence was defined as complying with at least 70% of the homework exercises). **Dropouts from baseline to posttreatment:** CTG1: 3/29 CTG2: 1/29 CG: 7/29	Omitted to report the occurrence or absence of adverse events. However, 9.1% of vestibulectomy participants (n=2) reported being worse at posttreatment as compared to pretreatment.	Pain[b], sexual measures, psychological function, perceived improvement

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Bergeron et al 2016	**PVD** with pain duration of at least 6 mo, experienced on at least 75% of vaginal penetration attempts; pain limited to vaginal intercourse or other activities involving vestibular pressure; moderate or severe pain on cotton swab test. Age: 26.99±6.09	**Group CBT** Education and information about vulvar pain, sexual anatomy, progressive muscle relaxation, abdominal breathing, PFM exercises, vaginal dilation, PNE, distraction techniques focusing on sexual imagery; rehearsal of coping self-statements; communication skills training, and cognitive restructuring. 2 h/session 10 sessions 13 wk **Treatment provider:** psychologists specialized in sex and couple therapy	**Pharmacotherapy: topical corticosteroid** 1% hydrocortisone cream, twice daily, 13 wk; written education materials (daily management including mild soap and cotton underwear); instruction to use water-based lubricant.	Participants in the CTG attended, on average, 82% of therapy sessions, and completed 62% of their homework exercises. Participants in CG completed, on average, 88% of the 13-wk treatment, and applied the cream 75% of the time during those wk. **Dropouts from baseline to posttreatment:** CTG:13/52 drop-outs CG: 15/45 drop-outs	Omitted to report the occurrence or absence of adverse events (measured in CG by weekly phone calls but not stated).	Pain[b], sexual measures, psychological function, perceived improvement
Bergeron et al 2021	**PVD** with pain duration of at least 6 mo, experienced on at least 80% of vaginal penetration attempts; pain limited to vaginal intercourse or other activities involving vestibular pressure. Age: 27.06±6.26	**Couple CBT** The treatment included: education about PVD and CBT, PNE, mindfulness exercises, vaginal dilatation exercises, cognitive defusion, expansion of the sexual repertoire, exercises to improve pain, and sexuality relevant couple interactions. 75 min/session 1×/wk 12 wk **Treatment provider:** clinical psychology PhD students or junior clinicians who received training on delivering the CBT interventions, PVD, and sex end couple therapy	**Pharmacotherapy: overnight topical lidocaine** 5% lidocaine ointment on the vulvar vestibule nightly, 12 wk.	Overall, 88% (n=95) of couples completed treatment with no significant differences by treatment condition. Couples in CTG attended 10.6 out of 12 (88.7%) sessions and women completed 67.7% of homework exercises. **Dropouts from baseline to posttreatment:** CTG:7/53 CG: 3/55	Measured (weekly phone calls to monitor potential adverse events) but not reported.	Pain[b], sexual measures, psychological function, perceived improvement
Brooks et al 2022	**Persistent pelvic pain** of more than 3 mo duration, not attributable to an identified biological cause. Age: 34.00±10.84	**Online hypnosis intervention** Online recordings (15—20 min) with direct and indirect suggestions, PFM retraining and relaxation exercises, CBT techniques for pain management. Intervention included also an education session with information about pelvic region and PNE. 1 recording released per wk (participant could access it numerous times) 7 wk **Treatment provider:** PFM and relaxation-related hypnosis scripts developed by expert pelvic physical therapist; CBT techniques scripts—psychologists	**Waitlist** No further details.	On average, CTG participants listened to each of the weekly recordings, twice per wk across the 7 wk. Participant weekly use varied across participants and weeks. Recording use varied each week, with 90% of participants listening to recordings 2 times or more on weeks 1, 2, and 4, but only 40%—50% listening to 2 or more recordings on wk 3, 5, 6, and 7. **Dropouts from baseline to posttreatment:** CTG: 3/10 CG: 3/10	None of the patients reported side effects during the study.	Pain[b], psychological function, physical function

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Carty et al 2019	**Chronic urogenital pain disorder** (eg, IC/BPS, dyspareunia). Age: 46.03±15.10	**Life stress emotional awareness and expression interview** A single, 90 min psychological intervention with the goal to provide awareness of physical and psychological health and the role stress plays in urogenital symptoms. **Treatment provider:** PhD students in clinical psychology	**Usual care** Participants continued their usual medical, behavioral, or psychiatric care.	N/A **Dropouts from baseline to posttreatment** assessment, 6 wk after the session: CTG: 8/45 CG: 4/25	Omitted to report the occurrence or absence of adverse events.	Pain[b], psychological function, pelvic symptom severity/ bother
Kanter et al 2016	**IC/BPS** defined as an unpleasant sensation (pain, pressure, discomfort) perceived to be related to the bladder, associated with lower urinary tract symptoms, of at least 6 wk. duration, in the absence of infection or other identifiable causes; OSPI score at least 8. Age: 45.26±14.11 -mean pain duration in included sample: 8.9—9.6 y	**MBSR+continuation of current care regimen, if any** The group course was based upon MBSR workshops designed by Jon Kabat-Zinn. Sessions taught meditation, yoga, and other relaxation techniques. In addition to the classroom training, MBSR participants were given a 4-CD guide to meditation based on the previous work of Jon Kabat-Zinn and a book to assist with home meditation practice. 2 h group sessions (7) 1× all day retreat (in the 5th wk) 8 wK 1×/wk **Treatment provider:** certified MBSR instructor who had completed specialized MBSR training and had 12 y' experience	**Usual care** Continuation of current treatment, if any (37% bladder instillations, 9% physical therapy).	100% of CTG participants completed at least 50% of the classes. 63% of CTG participants completed at least 75% of the classes. NI about adherence to home meditation practice. **Dropouts from baseline to posttreatment:** CTG: 1/9 CG: 0/11	Omitted to report the occurrence or absence of adverse events.	Pain, sexual measures, psychological function, pelvic symptom severity/ bother, HRQoL, perceived improvement[b]

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Maathz et al 2023	**PVD** of at least 6 m duration, diagnosis confirmed by structured phone interview. Age: 26.90±4.92	**Online acceptance and commitment therapy with therapist support** 6 modules containing text and assignments, informational videos, and audio files including guided experiential and mindfulness exercises. The first module contained information about PVD, pelvic floor function, and ACT. The remaining modules pertained to the following themes: control and willingness, values, thoughts and feelings, willingness and acceptance, and maintenance of achieved treatment gains. All modules contained mindfulness exercises. Therapists provided weekly written feedback, motivation for exercise and assignment completion, and developed a supportive alliance (eg, validation). 1 module/wk+assignments 6 wk **Treatment provider:** the therapists were students in their last term of clinical psychology program, trained in CBT	**Waitlist** Participants in the control group received the treatment after the study was completed.	81.3% of participants in the treatment group completed 3 of the 6 treatment modules. On average, they completed 4.31±1.60 modules. **Dropouts from baseline to posttreatment:** CTG: 9/22 (6 of them were lost before commencing the treatment) CG: 1/22	Omitted to report the occurrence or absence of adverse events.	Pain, sexual measures, psychological function (primary outcome not stated)
Moravek et al 2023	**Vulvodynia** diagnosed at the vulvovaginal university clinic. Age: 40.7±15.00	**Psychosocial counseling session+leaflet** 30–45 min session with psychosexual component including: general psychosocial and psychosexual information, education and sexual counseling focused on enhancing coping skills, and illness perceptions. Participants received also a leaflet that included information on vulvodynia-related publications and websites, as well as information on lubricants, vaginal dilators and condoms. **Treatment provider:** licensed social worker certified in sex therapy	**Leaflet** Participants received the same leaflet as CTG.	Adherence reported in relation to the leaflet with resources: Of the 57.7% (15/26) women who reported reading the leaflet (resource list), 66.7% (10/15) reported looking up at least one of the provided references. **Dropouts from baseline to posttreatment** (6 wk following the intervention): CTG: 2/16 CG: 3/15	Omitted to report the occurrence or absence of adverse events.	Pain, sexual measures (primary outcome not stated)

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Soriano et al 2021	**BPS/IC** with a score of at least 8 on OSPI. Age: 42.42±18.17	**Hypnosis** 1) Individual, 3 hypnosis sessions, delivered on site or via an online platform (following COVID-19 restrictions). 2) A web tool for daily home self-hypnosis practice. The 1st and 2nd sessions were 1 wk apart while the 2nd and 3rd session were 2 wk apart. 18 min/individual session 4 wk Participants were allowed to continue their usual BPS/IC medications. **Treatment provider:** trained hypnotist	**Usual care** The participants were instructed to continue routine appointments and treatment with the provider managing their symptoms. At the completion of the study, CG were offered an access to the web tool.	NI **Dropouts from baseline to posttreatment:** CTG: 3/15 CG: 1/14	Omitted to report the occurrence or absence of adverse events.	Pain, pelvic symptom severity/ bother, HRQoL, perceived improvement (primary outcome not clinical - randomization rate)
Zarski et al 2021	**GPP/PD** in accordance with the DSM-5 criteria and symptoms precluding intercourse. Age: 28.75±18.17	**Internet-based, CBT-inspired treatment** 8 self-paced online modules with home exercises+a booster session 4 wk after the end of the program. Online modules included psychoeducation, communication exercises, cognitive restructuring, nonjudgemental awareness, relaxation, pain management, graded exposure with dilators, sensate focus, sexual intercourse exercises, preparation for intercourse, relapse prevention. Booster session was optional (the participant could revisit the letter they wrote to themselves in the last session, reassess their goals, and make plans concerning insertion exercises or sexual activities). Each participant got access to online contact with eCoach for adherence support and feedback. 1×/wk 8 wk (12 with booster session) **Treatment provider:** eCoaches were psychologists or trained and supervised psychology students	**Waitlist** No further information.	Participants completed, on average, 6.32±2.58 of the 8 core sessions (79% of the intervention). Adherence rates declined over the course of the intervention (100% at session 1%−43% at session 8). 36% completed the booster session. Participants made, on average, 4.95±5.92 diary entries. 38.89% (n=28) practiced 1−3 d/wk 37.50% (n=27) reported less than once a week 23.61% (n=17) reported 3−5 d a wk. **Dropouts from baseline to posttreatment:** CTG: 22/100 CG: 8/100	15-item Inventory for the Assessment of Negative Effects in Psychotherapy were used. 67.19% (43/64) at posttreatment and 65.38% (34/52) at follow-up reported at least 1 negative side effect or experience since the start of the intervention. Of the 77 instances of a negative effect at posttreatment, and 88 instances of a negative effect at follow-up, 30 (38.96%) and 29 (32.95%) instances, respectively, were attributed to the intervention. They were related to stigmatization (eg, fear of others finding out about the participation in the study), symptoms (eg, increased suffering), relationship (eg, partner jealous of eCoach), intrapersonal change (eg, feeling dependent on eCoach), financial consequences (worries about increasing insurance fees).	Pain, sexual measures[b], psychological function

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Acupuncture						
Amin et al 2015	**Chronic pelvic pain** of at least 6 mo duration, no pelvic, or abdominal pathological findings. Age: 34.10±5.94	**Electro-acupuncture** Standardized set of acupuncture points with electrical stimulation based on traditional Chinese medicine and meridian theory. 30 min/session 2×/wk 6 wk **Treatment provider:** not stated	**Inferior hypogastric plexus blockade** Trans-sacral approach, a mixture of 10 ml of 2% lidocaine and 10 mg of triamcinolone was injected. 1-time procedure	Adherence not reported. **Dropouts from baseline to 12 wk follow-up:** CTG: 8/63 CG: 2/63 (posttreatment data on dropouts not provided)	Omitted to report the occurrence or absence of adverse events.	Pain,[b] perceived improvement
Bresler et al 2022	**IC/BPS** with the absence of infection or other identifiable pathology, with more than 6 mo duration and average pain intensity of at least 3/10 (NRS). Age: 49.9±13.1	**Electro-acupuncture** Sessions included administration of curious meridian Chong Mo paired with Yang Ming. Low level electrical stimulation was applied (4 Hz). 1×/wk 6 wk **Treatment provider:** certified urologist double boarded in medical acupuncture	**Sham/placebo:** "Minimal acupuncture" with superficial needle insertion at body locations not recognized as true acupoints and wired for electrical stimulation that was not actually applied. 1×/wk 6 wk	NI **Drop-outs from baseline to posttreatment:** CTG: 0/12 CG: 2/10	None of the patients reported side effects during the study.	Pain,[b] PFM function, psychological function
Hullender Rubin et al 2019	**PVD** With pain of at least 3 mo duration confirmed by tampon test and cotton swab test with pain intensity at least 4/10 (VAS). Age: 29.18±7.43	**Traditional acupuncture+topical lidocaine** Treatment delivered in supine (acupuncture on 3 core points indicated for genital pain and with potential for 2 additional points based on traditional Chinese medicine diagnosis) and prone lying (standardized treatment using mixed stimulation methods of manual and electroacupuncture: 100 Hz continuous milliamps, mild intensity, and localized over the pudendal nerve and intended to treat pain in the genitals). Fifteen min after insertion, needles were manually stimulated using rotation or lifting/thrusting method to evoke mild "de qi" sensation (supine) or adjustment of electroacupuncture intensity (prone). 18 sessions 12 wk (2×/wk for 6 wk, followed by 1×/wk for the next 6 wk) Lidocaine 5% cream for self-application to the vestibule 4 times daily. **Treatment provider:** licensed acupuncturists with at least 15 y' experience	**Sham/placebo+pharmacotherapy: topical lidocaine** "Nontraditional acupuncture" — standardized intervention of 4 needles on nonspecific points with superficial needling and without stimulation to limit influence on the tissues. During prone treatment the eletro-acupuncture device was taped to the needles with the device turned on but emitting no electricity. Lidocaine 5% cream for self-application to the vestibule 4 times daily.	Attendance to sessions: CTG: 96% CG: 97% **Drop-outs from baseline to last assessment (follow-up):** CTG: 3/10 CG: 2/9 (posttreatment data on drop-outs not provided)	A total of 32 adverse events were reported in the CTG and 36 in the CG. Of all the adverse events, 7 were related to the study drug and 5 related to acupuncture. All adverse events related to acupuncture were mild, and no one discontinued the study because of acupuncture. There were no serious adverse events.	Pain,[b] sexual measures, psychological function

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Mitidieri et al 2020	**Chronic pelvic pain** with abdominal myofascial pain syndrome (presence of an active "trigger point"), without suspicion of endometriosis, interstitial cystitis, or other diseases contributing to chronic pelvic pain. Age: 43.46±9.92	**Trigger point acupuncture** Ashi acupuncture treatment involved palpation and needling of painful points ("trigger points"). Needles remained in situ for 25 min, without manual stimuli. 1×/wk 10 wk **Treatment provider:** researcher with professional qualification and specialization in acupuncture	**"Trigger point" anesthetic injection** Injection of local anesthetic (2 ml of 1% lidocaine without vasoconstrictor) using a 22-gauge needle, applied directly and perpendicularly to the active trigger point. 1×/wk 4 wk	NI **Drop-outs from baseline to last follow-up:** 7/35 (NI about dropouts at posttreatment and number of participants randomized to each group)	Adverse events were noted with both interventions, but none of them caused serious harm to the patients in this study. CTG: 50% (n=8) ecchymosis episode 6% (n=1) headache (only after 1st application) 6% (n=1) abdominal bloating (only after 1st application). CG: 37% (n=7) ecchymosis episode 16% (n=3) headache 5% (n=1) loss of sensation in the abdominal region 21% (n=4) dizziness after the injection.	Pain[b]
Schlaeger et al 2014	**Vulvodynia** based on self-report. Age: 35±7.64	**Acupuncture** A lifting and thrusting technique was used to stimulate the needles and therefore the *qi* in the meridian. It was performed 3 separate times: at 10 and 20 min after insertion, and just prior to removal, at 30 min after insertion. Participants were allowed to continue medications prescribed to treat vulvodynia as well as other health conditions. 30 min/session 2×/wk 10 sessions 5 wk **Treatment provider:** acupuncturist	**Waitlist** Continuation of usual care during the waiting period (5 wk).	NI **Drop-outs from baseline to posttreatment:** CTG: 0/18 CG: 0/18	Omitted to report the occurrence or absence of adverse events.	Pain,[b] sexual measures
Other, tissue-based monotherapies: electrophysical agents						
Bardin et al 2023	See section: multimodal physical therapy					
Brown et al 2002	**Chronic pelvic pain** with abdominal "trigger point" and no structural anatomic abnormalities on examination. Duration of symptoms at least 6 mo with pain persistent despite the treatment and significantly affecting daily functioning at work and home. Age: 35.75±7.08	**Static magnetic field therapy** Concentric bipolar configuration magnets with magnetic field intensity 500 G. NI about the number of sessions per wk 2 wk (4 wk for those who wanted to continue after 2 wk) **Treatment provider:** not stated	**Sham/placebo** Same protocol as CTG, but with identical-appearing placebo magnets.	NI **Dropouts from baseline to posttreatment1, (after 2 wk of treatment):** CTG: 1/16 CG: 0/17 **Dropouts from baseline to posttreatment2, (after 4 wk of treatment):** CTG: 8/16 CG: 6/17	Treatment-related adverse events were common in both groups (CTG 46%, CG 54%), but none necessitated withdrawal from the study. There were no significant differences between the frequency of adverse events among treatment groups or treatment cycles. Adverse events included irritation from the adhesive tape (43%), bruising (14%), and erythema (7%) around the site.	Pain,[b] physical function, perceived improvement

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Cervigni et al 2018	**IC/BPS** resistant to common treatment and persistent for more than 6 wk- with pain intensity at least 40/100 (VAS). Age: 52.6±12.6 -mean pain duration in included sample 19.1±9.4 y	**Repetitive transcranial magnetic stimulation** 30 consecutive trains of 50 stimuli delivered at 20 Hz at 110% of the resting motor threshold. 20 min/d 1×/d 5×/wk 2 wk of treatment (delivered over the span of 5 wk, with 3 wk of break between the treatment wk) **Treatment provider:** physicians (no further information)	**Sham/placebo** Performed using different coil producing an acoustic artefact ad facial muscle activation similar to that produced by the active coil but inducing a negligible electric field.	NI **Dropouts from baseline to posttreatment:** 2/13 (no information about the within-group dropouts)	CTG: Two patients complained of a mild headache in the hours following the rTMS. One patient presented with a lipothymic episode during the first session of stimulation due to psychophysical discomfort, though she resumed and completed the study without any further problems.	Pain, HRQoL, pelvic symptom severity/ bother, psychological function (primary outcome not stated)
de Bernardes et al 2010	**Chronic pelvic pain** of at least 6 mo duration and with pain intensity more than 3/10 (VAS). Age: 40±12.3	**Intravaginal electrical stimulation** 16.5 cm long electrode applied with the gel and positioned in contact with posterior, right, and left walls of vagina. Frequency of 8 Hz, variation in intensity and frequency of 1milisec. 30 min/session 2×/wk 5 wk **Treatment provider:** physical therapist	**Sham/placebo** The same device as in CTG, however, with disconnected electricity. 30 min/session 2×/wk 5 wk (10 sessions)	NI **Dropouts from baseline to posttreatment:** 1/26 (no information about the within-group drop-outs)	No complaints related to electrical stimulation were reported in CTG.	Pain[b]
Divandari et al 2019	**Chronic pelvic pain** with no medication for pain reduction. Age range: 21–50	**Transcranial direct stimulation** One session of a 20-min 0.3 mA stimulation with a current density of 0.1 mA/ cm^2. **Treatment provider:** not stated	**Sham/placebo** The same device as in CTG; however, only 30 s of stimulation was applied to mimic the itching associated with actual stimulation. Then, the device remained silent on the patient's head until the end of the 20-min treatment.	N/A **Dropouts from baseline to posttreatment:** CTG: 0/8 CG: 0/8	The most frequent reported side effects were mild tingling and itching without any sense of burning and pain beneath the anode electrodes after active or sham treatment only immediately after treatment, compared with 1 wk later.	Pain, physical function, HRQoL, psychological function (primary outcome not stated)
Gruenwald et al 2021	**PVD** based on pain description and a positive cotton-swab test. Age: 26.41±8.48	**Extracorporeal shockwave therapy** Each treatment consisted of 500 pulses of low-intensity shockwaves (0.09 mJ/mm^2). 2×/wk 6 wk **Treatment provider:** not stated	**Sham/placebo** The same treatment protocol as CTG but without shockwave generator activation.	NI **Dropouts from baseline to 12 wk follow-up:** CTG: 1/24 CG: 1/10 (posttreatment data on drop-outs not provided)	CTG: One patient in reported self-limited low abdominal pain; no other side effects were reported.	Pain,[b] sexual measures, perceived improvement

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Hurt et al 2020	**Vulvodynia** of at least 3 mo duration during the last 6 mo. Age range: 24–27	**Extracorporeal shockwave therapy** Treatment applied perineally—3000 pulses each session. The position of the shock wave transducer was changed after every 500 pulses. Six areas, covering the whole vulva and perineum, were treated. The energy flux density was 0.25 mJ/mm2, frequency 4 Hz, focus zone 0–30 mm, and therapeutic efficiency 0–90 mm, stand-off II). 1×/wk 5 wk **Treatment provider:** not stated	**Sham/placebo** The same treatment procedure as CTG, but the handpiece was fitted with a placebo stand-off containing shock wave absorbing material, a layer of air and air-filled microspheres, which disabled the energy transmission but enabled generation of the sound and shaking mimicking treatment.	NI **Dropouts from baseline to posttreatment:** CTG: 0/31 CG: 0/31	CTG: There were no side effects (eg, bleeding, hematoma, bruising, blistering) associated with the treatment.	Pain[b]
Hurt et al 2021	**Dyspareunia** of at least 3 mo duration during the last 6 mo and score over 0 on the Marinoff Dyspareunia Scale and VAS, with symptoms refractory to previous treatment and not related to pelvic organic reasons. Age range: 20–51	**Extracorporeal shockwave therapy** Treatment applied perineally—4000 pulses each session. Eight areas, covering the entire vulva and perineum, were treated. The energy flux density was set at 0.35 mJ/mm2, frequency 4 Hz, focus zone 0–30 mm, therapeutic efficiency 0–90 mm and stand-off II. The position of the shock wave transducer was changed after every 500 pulses. 1×/wk 4 wk **Treatment provider:** not stated	**Sham/placebo** The same treatment procedure as CTG, but the handpiece was fitted with a placebo stand-off containing shock wave absorbing material, a layer of air and air-filled microspheres, which disabled the energy transmission but enabled generation of the sound and shaking mimicking treatment.	NI **Dropouts from baseline to posttreatment:** CTG: 1/31 CG: 0/31	CTG: There were no side effects (eg, bleeding, hematoma, bruising, blistering) associated with the treatment.	Pain[b]
Istek et al 2014	**Chronic pelvic pain** noncyclic pain of at least 6 mo duration; localized to the pelvis, infraumbilical anterior abdominal wall, or lumbosacral back or buttocks; and leading to degrees of functional disability. Age: 41.68±7.18	**Percutaneous tibial nerve stimulation** The frequency was 20 Hz, pulse duration 200 μs and the amplitude of current was between 0.5 and 10 mA. A 34-gauge needle was placed on the point 1 cm posterior and 3 cm proximal to the medial malleolus. The stimulation amplitude was set at a maximum tolerable level according to the subject under investigation. Plantar flexion was accepted as proof of effectiveness. 3 min/session 1×/wk 12 wk **Treatment provider:** not stated	**Pharmacotherapy: oral analgesics** No further details.	NI **Dropouts from baseline to posttreatment:** CTG: 0/16 CG: 0/17	No major complications were encountered during the study (authors stated that the percutaneous tibial nerve stimulation was a minimally invasive treatment with minor side effects. The nature of these minor side effects was not reported).	Pain, HRQoL, perceived improvement (primary outcome not stated)

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Lev-Sagie et al 2017	**PVD** of at least 3 mo duration, with pain provoked by sexual intercourse and/or tampon insertion; confirmed by cotton swab test. Age: 26.46±5.19	**Low level laser therapy** Pen-size probe transmitting irradiation applied to the vestibule for 20 s at each point. The irradiation parameters were wavelength of 820 nm, energy density of 32 J/cm^2, and pulsed light (alternating 73, 146, and 700 Hz). Number of treatment points was defined according to each woman's physical examination. 2×/wk 6 wk **Treatment provider:** certified pelvic floor physical therapist	**Sham/placebo** Same protocol as CTG, but with probe not emitting irradiation.	NI **Dropouts from baseline to posttreatment:** CTG: 0/18 CG: 1/17	None of the participants reported any side effects.	Pain,[b] sexual measures, perceived improvement
Morin et al 2017	**PVD** of at least 6 mo duration, with moderate to severe pain (more than 5/10) in at least 90% of attempted sexual intercourse; diagnosis conformed by gynecologist and cotton swab test; included participants needed to have a stable sexual partner. Age: median 22 (IQR 20–24)	**Transcranial direct stimulation** Procedure performed with an intensity of 2 mA. 20 min/session 10 sessions over 14 d (1×/d, on weekdays) **Treatment provider:** research professional experienced in tDCS	**Sham/placebo** The electrodes were positioned in the same areas as for the CTG. The intensity was set at 2 mA for the first 30 s of treatment, after which the stimulation stopped automatically.	NI **Dropouts from baseline to posttreatment:** CTG: 1/20 CG: 0/20	Mild and transitory side effects were commonly reported in both groups. They included: tingling, pinching, itching and burning sensation, fatigue, headache, scalp tenderness, dizziness, nausea, stomach aches, eye flashes, gastric reflux, and hot face. There were no statistically significant differences in reported of adverse events between the groups with exception for: Cathodal tingling (CTG 47% vs CG 85%), cathodal burning sensation (CTG 63% vs CG 30%), cathodal redness (CTG 63% vs CG 30%), and anodal itching sensation (CTG 21% vs CG 0%)	Pain,[b] sexual measures, psychological function, perceived improvement
Murina et al 2008	**PVD** of at least 6 mo duration with pain during intercourse or tampon insertion; symptoms confirmed with cotton swab test. Age: mean 26–30 (range 21–44)	**TENS** The electrical stimulation (symmetrical biphasic wave) was delivered through a commercially available plastic intravaginal probe. The protocol included low and high frequency stimulation: 15 min of 10-Hz frequency and pulse duration of 50 microseconds followed by 15 min of 50-Hz frequency and pulse duration of 100 microseconds. The intensity was set to as high as the woman could bear without discomfort (ranging between 10 and 100 mA peak to peak, pp). 2×/wk 20 sessions 10 wk **Treatment provider:** not stated	**Sham/placebo** An electrical stimulation considered to be nonactive, which consisted of 2 sets of 3-s stimulation (frequency 2 Hz, pulse duration 2 microseconds) followed by a 15-min pause. 2×/wk 20 sessions 10 wk	NI **Dropouts from baseline to posttreatment:** CTG: 0/20 CG: 0/20	Omitted to report the occurrence or absence of adverse events.	Pain, sexual measures (primary outcome not stated)

(continued)

TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Other, tissue-based monotherapies: massage, manual stretching, and myofascial techniques						
Heyman et al 2006	**Chronic pelvic pain** of at least 6 mo duration, with continuous or intermittent pain at least 2 d/wk, with painful symptoms evoked on firm palpation on PFMs during vaginal or rectal exam. Age: median 31–36 (19–54)	**Manual stretching** "Forceful" distension of PFMs via per rectal digital palpation. Pressure applied against the sacrotuberous/ spinal ligament for 15 s to elicit pain, Then, the "forceful distention" was applied to the PFMs and sacrococcygeal joint for 60 s; Every woman was given an explanation for the pain (tension in the PFM). 2 procedures with 2–3 wk interval between them **Treatment provider:** physician, primary investigator	**"Casual care"** Counseling (no further details) + explanation for the pain origin (tension in the PFMs).	NI **Dropouts from baseline to posttreatment:** CTG: 3/25 CG: 3/25	CTG: The only observed side effect of the treatment was mild temporary increased local pain, which resulted in 2 dropouts.	Pain,[b] psychological function
Montenegro et al 2015	**Chronic pelvic pain** with the presence of "trigger point" of the inferior abdominal wall and without endometriosis, IBS, IC/BPS. Age: 37.65±2.95	**Ischemic compression** Ischemic compression was applied by sustained pressure on "trigger point", evoking the referred pain pattern. 3×60 s during each session, with a rest period of 30 s between applications. TENS (used for initial analgesia before the procedure and was not considered by the authors as a part of studied intervention), 30 min, 100 Hz, pulse of 250 μs, and intensity according to the pain threshold of the patient in order to promote initial analgesia. 4 sessions 1×/wk **Treatment provider:** not stated	**Vaginal anesthetic injections** Local anesthetic injection of 2-mL 0.5% lidocaine without a vasoconstrictor, directly and perpendicularly applied into the trigger point. 1×/wk 4 wk	NI **Dropouts from baseline to posttreatment:** CTG: 1/15 CG: 1/15	There were no important harmful or unintended effects. CG: 13% (n=2) presented with ecchymoses.	Pain[b]
Zoorob et al 2015	**"Chronic pelvic floor myalgia"** Self-reported chronic pelvic pain with pain during intercourse and evidence of myofascial "trigger points." Age: 41.5±14.0	**PFM manual therapy** The intravaginal manual therapy included trigger point release techniques, massage, and stretching. 60 min/session average of 7.3±2.8 sessions **Treatment provider:** licensed pelvic floor therapists	**Vaginal injections** Vaginal injection of 1 ml of triamcinolone (40 mg/ml) as well as 9 ml of bupivacaine 0.5%. A minimum of 5 ml solution was injected per site with up to 4 sites injected per patient. average of 4.4±1.6 sessions	Only patients who completed at least one CG treatment or at least 3 PT sessions were included in the analysis. **Dropouts from baseline to posttreatment:** CTG: 0/17 CG: 5/17	Omitted to report the occurrence or absence of adverse events.	Pain,[b] sexual measures, perceived improvement

(continued)

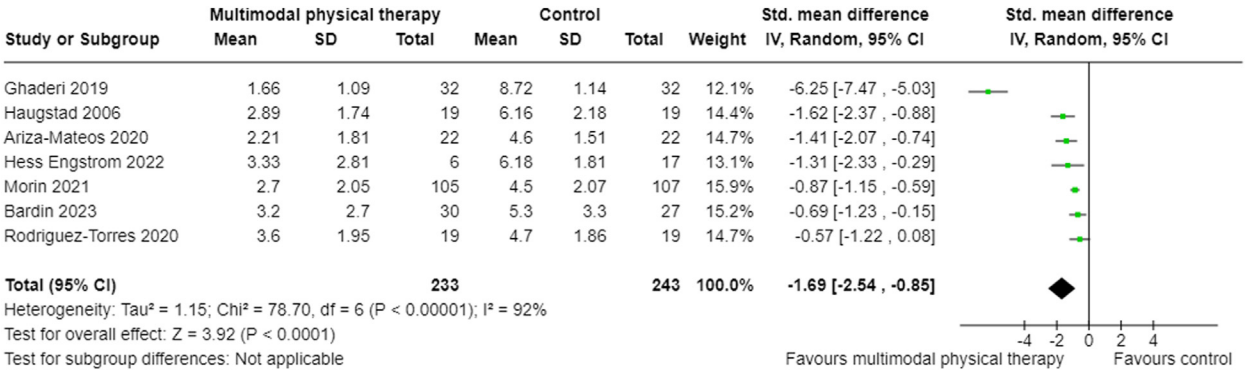
TABLE 2
General information about included trials *(continued)*

Author	Participants: condition, Age	Conservative treatment (CTG)	Control treatment (CG)	Adherence to conservative treatment/Treatment drop-outs	Adverse events	Outcomes assessed[a]
Other, tissue-based monotherapies: PFM biofeedback						
Bergeron et al 2001, 2008	See section: approaches within the scope of psychotherapy					
Danielsson et al 2006	**PVD** (vulvar vestibulitis) with introital pain, severe vestibular tenderness on cotton-swab test, at least moderate pain during most intercourse attempts and duration of symptoms at least 6 mo. Age: mean 23.3−25.8 (range 18−36)	**PFM biofeedback** Home training performed according to Glazer protocol. 10 min/session 1×/d 16 wk **Treatment provider:** not stated	**Pharmacotherapy: topical lidocaine** 2% gel applied in the painful area of the vestibule 5-7×/d for 8 wk and then 5% ointment applied similarly for the next 8 wk.	CTG: None of the women allocated to EMG biofeedback practiced for 10 min 3 times per day as instructed. Ten out of 18 women (56%) completed 2 training sessions per day while the rest completed only 1. CG: 18/19 (95%) women had used an average number of 5 applications or more per d. Approximately 50% switched to the 5% ointment after 2 mo, while the rest continued with the gel. Most women used about 40-g gel/ointment per mo. **Drop-outs from baseline to posttreatment:** CTG: 5/23 CG: 4/23	CTG: A few women complained about pain on insertion of the vaginal probe, but it did not prevent them from using it. One woman reported problems with candida infections. No other side effects were reported. CG: The only reported side effect was a slight stinging pain at application, which was more pronounced for the ointment than the gel.	Pain, HRQoL,[b] sexual measures, psychological function, perceived improvement
Other, tissue-based monotherapies: healthy lifestyle modification						
Lee et al 2018	**IC/BPS** Meeting the diagnostic criteria of American Urology Association. Age: 44.6±12.34	**E-health intervention accompanied with usual care (regular treatments)** Video clips promoting healthy lifestyle (fluid intake, dietary advice, regular exercise, avoidance of tight-fitting clothes) and symptom self-management (suggestion for the practice of yoga or meditation, warm baths, genital hygiene), delivered through smartphone app. 21 brief videos (13 for promoting healthy lifestyles, 8 for self-managing symptom flares) 8 wk **Treatment provider:** urologist	**Usual care** Regular treatments in the outpatient clinics.	NI **Dropouts from baseline to posttreatment:** CTG: 1/30 CG: 3/30	Omitted to report the occurrence or absence of adverse events.	Pain, HRQoL,[b] symptom severity/bother

ACT, acceptance and commitment therapy; *CBT*, cognitive behavioral therapy; *CD: CD-ROM*, compact discs; *CPP*, chronic pelvic pain; *DSM-5*, The Diagnostic and Statistical Manual of Mental Illnesses-5; *EMG*, electromyography; *G*, gauss; *GPP/PD*, genito-pelvic pain/penetration disorder; *HEP*, home exercise program; *HRQoL*, health-related quality of life; *IBS*, irritable bowel syndrome; *IQR*, interquartile range; *IC/BPS*, interstitial cystitis/bladder pain syndrome; *mA*, mili Amper; *MBSR*, mindfulness-based stress reduction; *N/A*, not applicable; *NI*, no information; *NRS*, Numerical Rating Scale; *OSPI*, O'Leary-Sant Symptom and Problem Index; *PFM*, pelvic floor muscles; *PFMT*, pelvic floor muscles training; *PNE*, pain neuroscience education; *PT*, physical therapy; *PVD*, provoked vestibulodynia; *SEM*, standard error of the mean; *tDCS*, transcranial direct-current stimulation; *TENS*, transcutaneous electrical nerve stimulation; *VAS*, Visual Analog Scale.

[a] For the results see the relevant table in the respective Appendices H–O (pain-related outcomes—table H.1, physical function—table L.1, psychological outcomes—table J.1, sexual measures—table I.1, HRQoL—table K.1, pelvic symptom severity and/or bother—table M.1, Pelvic floor muscle function and morphometry outcomes—table N.1, perceived improvement—table O.1).;
[b] Primary outcome or outcome for which sample size calculation was provided.

FIGURE 2
Forest plot of short-term pain intensity outcomes for multimodal physical therapy vs inert or nonconservative control



Green squares indicate a point estimates with respective confidence intervals (*black lines*). *Diamond shape* indicates a summary estimate. *CI*, confidence interval; RCT, randomized controlled trial; *SD*, standard deviation.

0.20] and a moderate certainty of evidence (Appendix G) which could be translated to a mean difference of −0.31 [95% CI −0.95, 0.34] on a 0 to 10 pain scale. The comparator under study did not appear to influence the results much (Appendix P) (Figure 4).

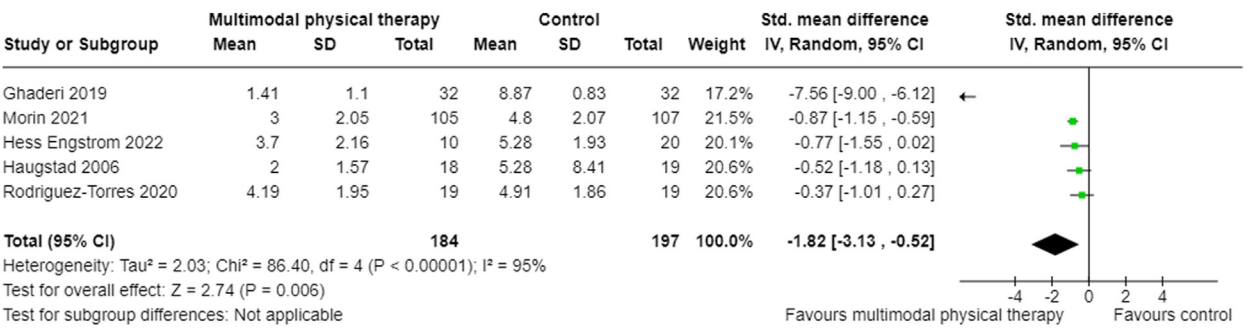
Acupuncture

All 5 RCTs contributed data to a meta-analysis of short-term effects, immediately after treatment (221 participants), indicating a statistically nonsignificant effect on pain intensity favoring the control (inert or nonconservative intervention) when compared to acupuncture. The SMD of 1.08 [95% CI −1.38, 3.54] could be retransformed to mean difference of 1.83 [95% CI −2.35, 6.02], favoring the control treatment. The level of certainty was so low that it precluded any conclusion (Appendix G) (Figure 5).

Tissue-based monotherapies

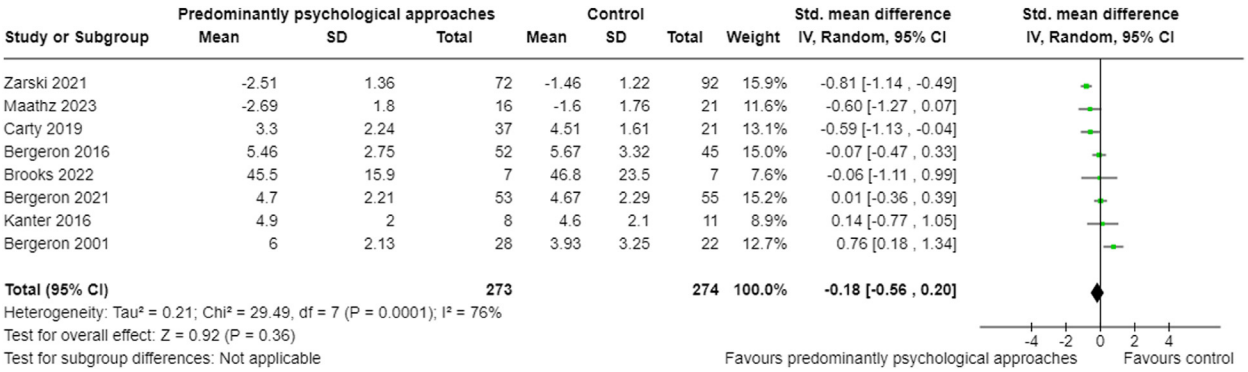
This comparison involved clinically diverse interventions (distinct electrophysical agents; massage, manual stretching, and myofascial techniques; PFM biofeedback; and education on lifestyle modifications), thus pooling them altogether was neither clinically sound nor relevant. Consequently, they were presented based on the tested intervention (ie, in subgroups) for informative and visual purposes, without presenting a summary estimate or certainty rating. A limited number of trials investigated specific interventions, providing a restricted body of evidence for drawing conclusions on any specific therapy. However, based on available data, it appears that electrophysical agents like magnetic field stimulation, transcranial direct current stimulation, and low-level laser therapy offered little to no benefit when compared to sham/placebo controls. Shockwave therapy (compared to sham/placebo) and electrical stimulation (compared to sham/placebo or nonconservative treatment) may have some benefit, but the evidence is very limited. The available data on massage, manual stretching, and myofascial techniques seemed inconsistent, making any narrative summary challenging. PFM biofeedback did not appear to be beneficial in the short term when compared to surgery. Also,

FIGURE 3
Forest plot of intermediate term pain intensity outcomes for multimodal physical therapy vs inert or nonconservative control



Green squares indicate a point estimates with respective confidence intervals (*black lines*). *Diamond shape* indicates a summary estimate. *CI*, confidence interval; *SD*, standard deviation.

FIGURE 4
Forest plot of short-term pain intensity outcomes for psychological approaches vs inert or nonconservative control



Green squares indicate a point estimates with respective confidence intervals (*black lines*). *Diamond shape* indicates a summary estimate. *CI*, confidence interval; *SD*, standard deviation.

education on modifications to daily activities, in addition to usual care, did not yield any further benefits in the included trial (Figure 6).

Sexual measures

Sexual measures were investigated in 19 trials. Appendix I contains a detailed presentation of the results from each trial. The available information allowed for the pooling of data on sexual function in a meta-analysis for short-term effectiveness for predominantly psychological approaches only.

Multimodal physical therapy

Sexual measures were investigated in 4 trials[41,51,54,63,70] but 3[51,63,70] used validated outcomes assessing sexual function and/or sexual distress. These showed superiority of multimodal physical therapy over control (inert or nonconservative) treatment. The remaining study[54] used measures that are more challenging to interpret, such as attempts at intercourse/nonpenetrative sexual activity. The conservative therapy group reported fewer attempts at intercourse than controls which was interpreted as a result of a more flexible approach towards sex following therapy, enabling participants to continue with those sexual activities that worked well for them.[54]

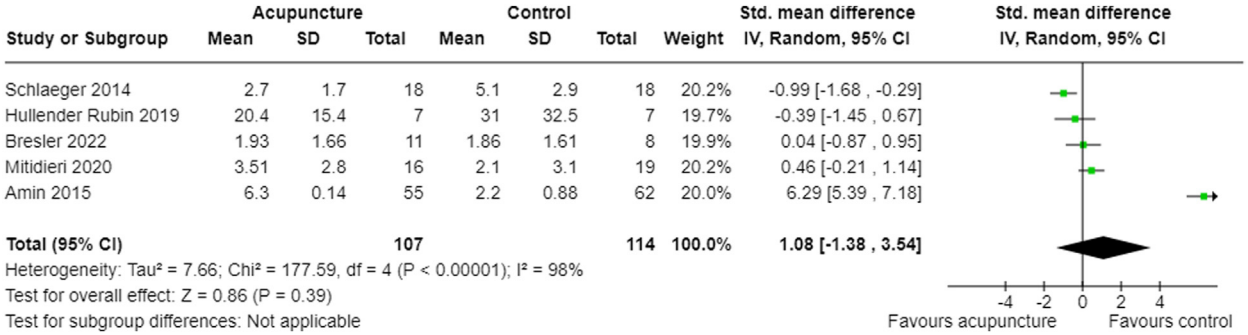
Predominantly psychological approaches

Of the 10 RCTs included, 7 investigated sexual function and 6 contributed data to meta-analysis of short-term effects, immediately after treatment (511 participants). A statistically significant, small effect with moderate certainty was shown (Appendix G) with an SMD of −0.28 [95% CI −0.52, −0.04] which could be interpreted as a mean difference of −1.95 [95% CI −3.63, −0.28] on the FSFI score, favoring psychological approaches (Figure 7).

Acupuncture

Two trials investigated sexual measures.[72,74] In the study by Schlaeger et al[74] statistically significant between-group differences in the change in sexual function from baseline to posttreatment were observed in the acupuncture group when compared to waitlist (continuation of regular treatments); these changes were mainly attributed to lower pain scores. In the second study, by Hullender-Rubin et al[72] no statistics were provided for between-group comparisons. However, visual inspection of data

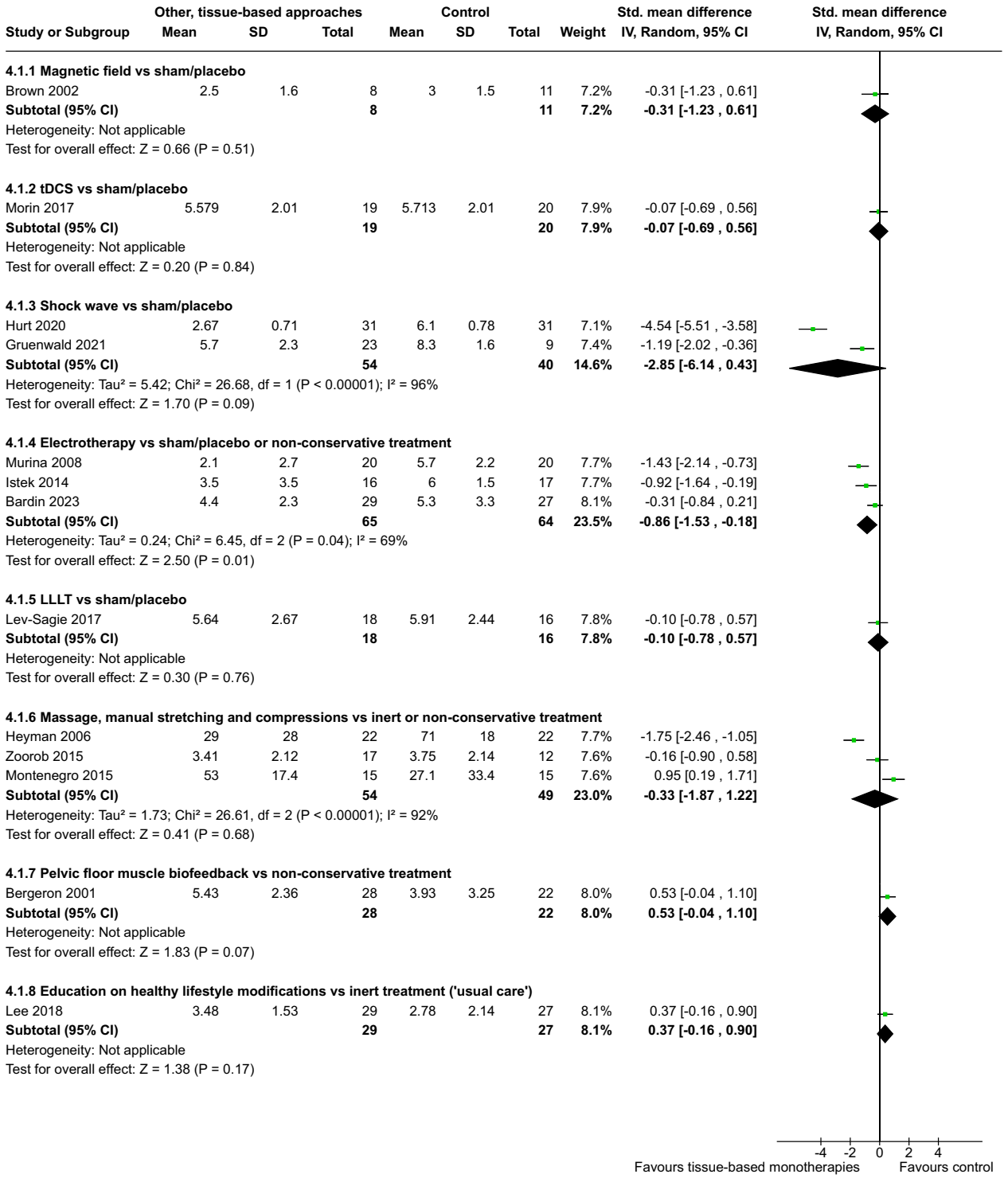
FIGURE 5
Forest plot of short-term pain intensity outcomes for acupuncture vs inert or nonconservative control



Green squares indicate a point estimates with respective confidence intervals (*black lines*). *Diamond shape* indicates a summary estimate. *CI*, confidence interval; *SD*, standard deviation.

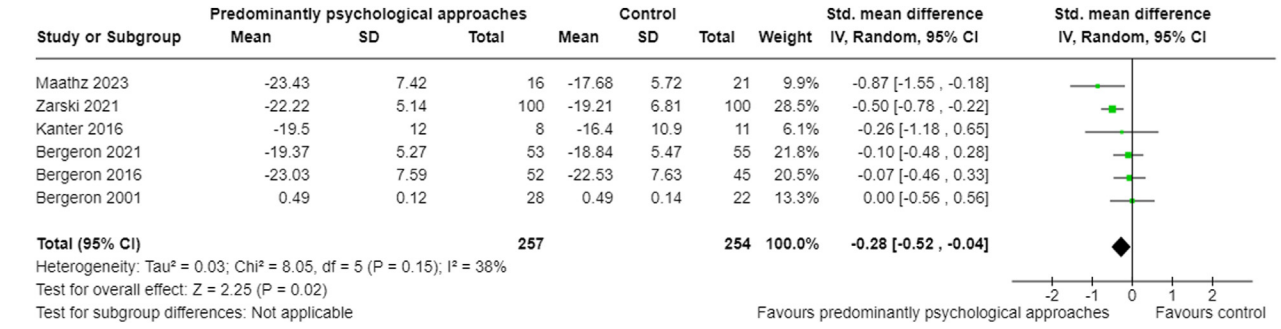
FIGURE 6

Forest plot of short-term pain intensity outcomes for tissue-based monotherapies vs inert or nonconservative control (subgroups division according to tested intervention for informative and visual purposes only)



Green squares indicate a point estimates with respective confidence intervals (*black lines*). *Diamond shape* indicates a summary estimate. *CI*, confidence interval; *SD*, standard deviation; *tDCS*, transcranial direct-current stimulation.

FIGURE 7
Forest plot of short-term effects on sexual function for predominantly psychological approaches vs inert or active control



CI, confidence interval; *SD*, standard deviation.

may suggest higher satisfaction and interest in sexual activity in the group receiving acupuncture with lidocaine, compared to the group receiving sham ("nontraditional") acupuncture and lidocaine.

Tissue-based monotherapies

Among the trials investigating electrophysical agents, 4 assessed sexual measures: 3 used validated measures to evaluate sexual function, distress or satisfaction,[52,62,64] and 1 used a nonvalidated questionnaire assessing pain interference with sexual desire, intercourse frequency, and difficulties with lubrication.[73] No statistically significant differences in between-group comparisons were reported.[62,64,73] In one study,[52] a statistically significant improvement in sexual function from baseline to posttreatment and follow-up was observed in only the conservative therapy group; however, between-group comparisons were not reported. Among the studies investigating manual stretching and myofascial techniques, one study[76] assessed sexual function, showing a statistically significant difference in the change from baseline to posttreatment favoring intravaginal manual therapy over vaginal injections (with steroid and anesthetic). There was also one study comparing PFM biofeedback to surgical treatment in terms of sexual function and frequency of intercourse, showing no statistically significant differences between the groups.[39,44]

Psychological function

Eighteen RCTs reported data on psychological outcomes. The heterogeneity of measured outcomes and studied conservative therapies did not allow for a meta-analysis to be conducted. Details regarding the results of each study are reported in Appendix J.

Multimodal physical therapy

Four RCTs[40,43,53,54,65] investigated psychological outcomes. Of the 3 studies that provided between-group comparisons,[43,54,65] multimodal physical therapy showed superior results over the control group for at least 1 psychological outcome measured (eg, anxiety, depression).

Predominantly psychological approaches

Psychological function was assessed in 8 RCTs.[39,44–46,49,59,69,71] Of them, 6[25,45,46,59,66,69] showed superior results over the control group for at least 1 psychological outcome measured (eg, pain catastrophizing, pain anxiety).

Acupuncture

Two trials investigated psychological functioning.[47,72] However, only 1 of them[47] provided statistical analysis for between-group comparisons, showing no between-group differences in the change from baseline to posttreatment and from baseline to follow-up.

Tissue-based monotherapies

Among the trials investigating electrophysical agents, 3 evaluated psychological function.[62,78,79] Statistically significant between-group differences were observed in only 1 trial,[62] and only for pain catastrophizing and pain anxiety. Statistically significant between-group differences favoring the electrophysical agent (transcranial direct current stimulation) were observed only at posttreatment and not at follow-up.[62]

Health-related quality of life

Nine trials assessed health-related quality of life. For the same reasons as those mentioned in previous outcomes, we could not conduct a meta-analysis. Details regarding each study are reported in Appendix K.

Multimodal physical therapy

Two trials[43,65] assessed health-related quality of life with the same tool (EuroQoL 5D [EQ-5D]), showing statistically significant superiority of multimodal physical therapy for improving self-evaluated health status over a leaflet control. Statistically significant differences between the groups were also noted in several other EQ-5D domains.

Predominantly psychological approaches

Two RCTs (both investigating women with IC/BPS) showed conflicting results. In the study by Kanter et al[59] investigating mindfulness intervention, no statistically significant between-group differences were observed. However, Soriano et al,[75] reported statistically significant between-group differences in the change from baseline to posttreatment, favoring hypnosis over usual care.

Tissue-based monotherapies

Five studies reported measuring health-related quality of life. Of the 3 investigating

electrophysical agents,[58,78,79] 2 provided between-group comparisons. Both used 36-item Short Form Health Survey (SF-36) to evaluate quality of life showing statistically significant changes in 2 out of 8 measured domains (social functioning and energy[58] or emotional status and bodily pain[79]). One study assessed PFM biofeedback[50] and showed no statistically significant differences between the groups at 1-year posttreatment when compared to topical lidocaine. The trial by Lee at al[67] investigating lifestyle intervention versus usual care, reported statistically significant between-group differences in the change from baseline to posttreatment, in almost all subscales of SF-36 (except for mental health), favoring lifestyle education.

Physical function

Physical function, such as pain-related disability, posture and movement patterns, was assessed in 5 trials investigating different conservative therapies[40,48,53,65,71,78] which prevented pooling of data in a meta-analysis. Detailed information with the results of individual trials and their narrative summaries are presented in Appendix L.

Pelvic symptom severity and/or bother

Six trials assessed outcomes related to symptom severity and/or bother (eg, severity of genitourinary symptoms, lower urinary tract symptoms and impact).[41,49,59,67,70,75,79] Pooling data in a meta-analysis was not possible. Details regarding the results of each study and their narrative summaries are reported in Appendix M.

PFM function and morphometry

Only 3 trials evaluated outcomes related PFM function and morphometry[41,47,51] thus a meta-analysis could not be performed. Of these studies, 1 used ultrasound measurements[41] and remaining 2 used palpatory examination.[47,51] In the study by Bardin et al[41] variables assessed with 4D transperineal ultrasound showed greater excursion of the levator plate and increased symphysis-levator distance (suggesting normalization of PFM tone) following conservative therapy (multimodal physical therapy). Similar observations were confirmed in the studies by Ghaderi et al[51] and Bresler et al[47] Details regarding the results are reported in Appendix N.

Perceived improvement

Participants' perceived improvement was evaluated in 15 RCTs. However different outcome measures were used, results were presented in diverse formats (by category; as a continuous measure, etc.), and statistical analysis was not always available. For further details, we refer readers to Appendix O.

Adverse events

Of the 39 trials, 23 (59%) reported on the occurrence or absence of adverse events. Of these, 11 reported that conservative treatment was not related to any side effects. In the remaining 12 studies, minor and temporary side effects were reported (eg, slight, transient increase in pain, skin irritation, mild tingling/itching during the procedure with no pain), resulting in dropouts (n=2) only in 1 trial.[55] With the exception of 1 trial,[66] these side effects were all associated with predominantly tissue-based approaches (manual stretches,[55] electrophysical agents,[48,52,58,62,70,78,79] and PFM biofeedback[50]) and acupuncture.[60,72] In the study by Zarski et al,[66] adverse events related to internet-based cognitive-behavioral treatment were thoroughly studied with the use of a dedicated outcome measure (the Inventory for the Assessment of Negative Effects in Psychotherapy). In this study, around 30% (29%−33%, depending on the time-point) of participants undergoing the conservative therapy reported at least 1 negative side effect linked to the intervention, such as increased stigmatization or heightened suffering. However, participants who reported these adverse events did not exhibit differences in the primary outcome or overall treatment satisfaction when compared to those who did not report any side effects. In summary, no serious adverse events were reported in connection with the investigated nonpharmacological conservative therapies. Details related to adverse events are presented in Table 2.

Sensitivity analyses

To assess the robustness of the presented results, sensitivity analyses were conducted. These analyses were performed for all meta-analyses in which the pooled, summary estimate was analyzed together with the certainty of evidence. Overall, the exclusion of low-quality studies (PEDro score 5/10 or less) did not affect the robustness of the evidence (certainty ratings). Changes in pooled estimates values and their respective CIs following sensitivity analyses are presented in Appendix R.

Comment

Principal findings

To our knowledge, this is the first review and meta-analysis providing a comprehensive investigation of the effectiveness of a wide array of nonpharmacological conservative therapies for women experiencing CPP without a defined pathology or disease. Meta-analyses conducted revealed that multimodal physical therapy resulted in significantly lower pain intensity posttreatment compared to inert or nonconservative treatment, with a high certainty of evidence for short-term effects (immediately posttreatment) and a moderate certainty for intermediate-term effects (12−36 weeks follow-up). Meta-analyses also showed that predominantly psychological approaches likely result in no difference in pain intensity and only slightly better sexual function (of uncertain clinical importance) when compared to inert or nonconservative treatment (moderate certainty). For acupuncture, the level of certainty for pain intensity was so low that it precluded any conclusion. There may be some beneficial effects related to tissue-based monotherapies (eg, electrophysical agents); however, a limited number of trials investigated specific treatments and a meta-analysis could not be performed.

Of the conducted meta-analyses, only multimodal physical therapy provided data to assess effects extending beyond the immediate posttreatment period. Furthermore, meta-analyses on pain intensity for multimodal physical therapy yielded consistent results regardless of

the comparator and different CPP types studied. Additionally, benefits of multimodal physical therapy were demonstrated across a range of domains, such as sexual function/distress, psychological function, health-related quality of life, physical function, PFM morphometry/function, and perceived improvement. Importantly, no adverse effects were observed.

Comparison with existing literature

The results of this review and meta-analysis regarding the effectiveness of multimodal physical therapy concur with current literature on other chronic pain conditions where multimodal treatment approaches addressing biopsychosocial dimensions are emphasized.[80,81] The multimodal physical therapy studies included in this review used a combination of various physical interventions usually integrated with education and self-management skills, pain neuroscience education, graded exposure and other cognitive-behavioral-based approaches, acceptance and coping skills, or patient-centered frameworks, thereby delivering a comprehensive, whole-person intervention to women with CPP. Previous reviews in other chronic pain populations have shown that combining physical interventions with psychological and social components in pain management produces better outcomes compared to single modality approaches.[82] Multimodal physical therapy, incorporating various therapies that enable the integration of the whole person, biopsychosocial interventions,[83–85] is therefore well-suited to address these challenges. Its efficacy in the management of CPP has been demonstrated by this review and meta-analysis and should be considered when making recommendations for women with these conditions.

Psychological therapies are more commonly recommended in the available clinical practice guidelines for CPP than physical therapy.[9] However, this review has shown that when delivered as a single modality, psychological therapies likely provide no clinically important benefits regarding pain intensity for women with CPP. This finding is consistent with the review by Bohm-Starke et al[86] on PVD where most of the included studies investigated that psychological approaches did not result in improvements in pain intensity compared to the control. Similar results were obtained by Ho et al[87] in their review on chronic nonspecific low back pain, where psychological approaches (with the exception of pain neuroscience education) delivered alone showed little to no benefits for pain intensity compared to physical therapy care (mainly exercises). This does not mean that psychological approaches should no longer be recommended to women with CPP. However, it seems that instead of directly affecting pain intensity, they may primarily help with pain-related distress and/or comorbidities, such as depression or anxiety. This aspect may be relevant for shared decision-making when adapting treatment to individual patient needs.

While acupuncture appears as a recommended treatment in some guidelines, such as those for chronic primary pain,[88] the results of this meta-analysis do not allow for any recommendations regarding CPP management in women. The same guideline noted considerable uncertainty regarding the efficacy of electrophysical agents, recommending against modalities such as electrical stimulation and therapeutic ultrasound.[88] While certain electrophysical agents (ie, shockwave therapy or electrical stimulation) may offer some benefits for women with CPP, the current evidence is limited.

Strengths and limitations

The strength of this review lies in its comprehensive examination of various nonpharmacological therapies and outcomes, which has never been attempted for CPP. Nevertheless, some limitations should be acknowledged and among them are those related mainly to the available data. Merging several CPP conditions could be perceived as a limitation, particularly as emerging evidence suggests that the differences between subtypes of CPP may be important in clinical phenotyping.[89] However, several trials included in this review provided limited information on the specific subtypes of CPP studied, often using the umbrella term 'CPP,' without further details on the location or subtype of pain. Furthermore, given the number of trials on CPP, splitting the data by subtypes would prevent the possibility of conducting meta-analyses. By noting this, it is important to highlight that our carefully selected eligibility criteria (excluding trials such as those focused on CPP in cancer survivors or women with endometriosis) allowed for the integration of data from multiple CPP diagnoses while avoiding excessive heterogeneity that could hinder drawing conclusions. Future RCTs may build on this work by exploring the effectiveness of studied conservative therapies in various pelvic pain subtypes/syndromes. Another limitation is that due to limited data, inert and active comparators were merged, and meta-analyses were performed for a limited number of outcomes (mainly pain intensity). All mentioned limitations are to be expected as CPP remains an understudied field with emerging data on conservative therapies. Some technical limitations of this review should be mentioned as well. Due to the use of keywords pertaining to study design (RCT) in the Cochrane Library portion of our search, some records may have been missed. However, while the search in this particular database might have been overly narrow, it is unlikely to have significantly affected the results of our review. Since we conducted a thorough and broad search across several major databases, our search should have captured all relevant records, including those potentially missed in the Cochrane Library. It should also be mentioned that, while it is preferred for the extraction of included studies to be conducted independently by 2 reviewers, we decided that each study would be extracted by 1 reviewer, with the accuracy then verified by another. This decision was made for pragmatic reasons to ensure our review was as current as possible, given its extensive nature and the time frames associated with the preparation and publishing processes.

Conclusions and implications

This systematic review and meta-analysis provide a much-needed overview of the available data supporting the use of nonpharmacological conservative therapies in the management of CPP in women without an underlying pathology or disease. Meta-analyses revealed that only multimodal physical therapy was effective for pain intensity, providing high-certainty evidence for short-term (immediately posttreatment) effects and moderate certainty for intermediate (12−36 weeks follow-up) treatment effects, with no observed adverse effects. Other studied conservative therapies, such as psychological approaches, acupuncture and tissue-based monotherapies were not effective and/or provided limited evidence for drawing conclusions regarding their effects on pain intensity. Healthcare practitioners and guideline authors should consider these results when making evidence-based management recommendations for women with CPP. Additionally, by highlighting current research gaps, this review directs future studies towards areas requiring further data. ■

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