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Review

A systematic review of the efficacy of CBT on pain and sexual function of vulvodynia

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ABSTRACT

Vulvodynia is an underdiagnosed pain syndrome with persistent duration, usually without an identifiable organic cause. It negatively affects the quality of life, mental health, and romantic relationships and sexual function of women. This review aimed to systematically appraise the available data on the effectiveness of Cognitive Behavioral Therapy on perceived pain and sexual functioning of women with vulvodynia from randomized clinical trials irrespective of their time of publication. The review was performed following the PRISMA guidelines. The literature search was conducted based on specific eligibility criteria in the PubMed, PsycInfo, and Scopus databases using appropriate keywords. The methodological quality of the included studies was assessed with the Jadad Scale. The search resulted in 10 randomized clinical trials that compared the effectiveness of Cognitive Behavioral Therapy compared to other psychotherapeutic approaches and clinical, pharmaceutical, and surgical interventions on 835 women with vulvodynia. The results, which were synthesized narratively based on intervention type and outcomes assessed, revealed the superiority of Cognitive Behavioral Therapy compared to topical treatments with significant improvements in sexual function and pain management, particularly evident at follow-up assessments. Comparisons with other psychotherapeutic approaches (mindfulness-based cognitive therapy, supportive psychotherapy) resulted in similar results. Compared to physiotherapeutic and surgical protocols, Cognitive Behavioral Therapy resulted in more favorable findings, although the improvement regarding sexual function was significant mostly at the 6-month follow-up measurements. Cognitive Behavioral Therapy appeared to help by restructuring dysfunctional beliefs, reducing pain catastrophizing, and developing alternative pain coping strategies. Despite the encouraging evidence, variations with respect to the cognitive-behavioral interventions, comparison groups, and assessment tools used to assess the variables under investigation, direct comparison of the findings was challenging. The results highlighted Cognitive Behavioral Therapy as a promising, non-pharmacological approach to the management of vulvodynia. Education of psychotherapists and clinicians, particularly gynecologists, would contribute to early diagnosis and effective treatment of vulvodynia.

KEYWORDS: Vulvodynia, cognitive behavioral therapy, vulvar pain, female sexual function, randomized control trial, systematic review.

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Introduction

Vulvodynia refers to vulvar pain with a duration of at least three months and without a specifically identified cause.[1] It can be either localized to one area, generalized to multiple areas, or mixed. It can be provoked (e.g., vaginal penetration), spontaneous, or mixed. The onset of vulvodynia could be classified as either primary (e.g., during the first intercourse) or secondary (occurring later in life). Regarding the pain pattern, this can be either continuous or constant, rhythmic or intermittent, and transient or brief.[2] Its prevalence has been estimated at 8%,[3–5] while its incidence is over 4 cases per 100 person-years, with younger women appearing as more vulnerable (7.6 cases per 100 person-years at 20 years of age, compared with 3.3 cases per 100 person-years at 60 years of age).[6]

Vulvodynia affects women's health-related quality of life,[7] their psychological well-being and romantic relationships,[8] while the pain's chronicity may cause physical disability.[9] One of the main domains affected is sexual health; it increases sexual distress and reduces sexual satisfaction and function.[10] One of the main reasons for its impact is the lack of proper and timely treatment. In the US, 40% of women with relevant symptomatology choose not to seek treatment, while 60% of those who do seek help visit at least three clinicians before receiving the correct diagnosis.[3] Regarding Europe, only 10–25% receive the correct diagnosis as 40–65% of gynecologists have no relevant diagnostic knowledge, and 20% of them support that their specialty is not the one to initiate treatment.[11]

The heterogeneity of vulvodynia patients creates a significant challenge in the identification of a "gold standard" treatment approach. To date, the treatment of choice largely depends on expert opinion. Its treatment includes pharmacological and/or non-pharmacological interventions, while for some cases, surgical procedures are performed. Regarding the pharmacological regimens, these include topical (e.g., lidocaine, gabapentin, or amitriptyline cream, botulinum toxin injections), vaginal (e.g., diazepam suppositories), and oral (e.g., oral amitriptyline or gabapentin, antifungals) medication. However, even under medication, women self-report a 6.7/10 pain intensity in relevant instruments, 60% of them consume alcohol, and 43% combine alcohol and analgesics (including opioids) to reduce pain.[12] Concerning surgical procedures, vulvar vestibulectomy is recommended when typical, non-invasive procedures are ineffective.[13,14] However, when comparing conservative and surgical interventions, pain and sexual function outcomes are similar,[14] implying that the non-invasive treatment is preferable. Among the non-pharmacological treatments, pelvic floor physical therapy,[15] acupuncture,[16] hypnotherapy,[17] and fractional CO_2 laser therapy[18] consists of alternative approaches. Yet, the efficacy of the first three approaches still requires further investigation with RCTs, while the FDA warns against the use of energy devices for vulvodynia due to possible adverse effects.[19]

Given the low efficacy and side-effect profile of medications for vulvodynia, attention has shifted towards psychological interventions, mostly over the past decade. Cognitive behavioral therapy (CBT) aims to challenge maladaptive thoughts regarding pain, disrupt avoidant behaviors, manage catastrophizing, and enhance coping mechanisms.[20] The present study aimed to systematically appraise randomized clinical trials regarding the efficacy of CBT on vulvodynia in terms of pain and sexual function.

Material and Method

The study was designed according to the PRISMA statement guidelines.[21] This systematic review was not registered in any prospective review registry. Stages of research incorporated problem formulation, thorough search of the existing research, data extraction and quality evaluation, and, lastly, data analysis and presentation. Studies included in this review followed specific inclusion/exclusion criteria as indicated below.

Eligibility criteria

The studies had to investigate the efficacy of CBT on vulvodynia in adult women irrespective of its type. For this review, interventions were considered as CBT if they incorporated core cognitive-behavioral principles, including psychoeducation, cognitive restructuring, behavioral strategies for pain management, and skills training. Diagnosis of vulvodynia had to be established by a gynecological examination and not self-reports. The primary outcome of interest had to be perceived pain and sexual function. The comparison interventions and the CBT protocol did not constitute reasons for exclusion, while the studies had to report the protocol's details (duration, number of sessions, etc.). The studies had to be published in the English language by peer-reviewed journals. Research protocols without providing sufficient data were not included. The time of publication did not constitute a criterion of exclusion.

Search strategy

Pubmed, Scopus, and PsycInfo databases were thoroughly searched for relevant studies from the 1st until the 28th of November 2024. Research was conducted

by two reviewing investigators, using the following terms: "vulvodynia" OR "vulvar pain" AND "CBT" OR "cognitive behavior therapy" OR "cognitive behavior treatment" OR "cognitive behavior intervention" AND "efficacy" OR "outcomes", and were adopted accordingly when necessary. Titles, keywords, and abstracts of each study were screened for eligibility. All eligible studies were managed and documented using the Zotero reference management software. A backward search (hand search of reference lists) of included papers was conducted to identify additional studies relevant to the topic. All studies were assessed according to the eligibility criteria.

Data extraction

Summary tables were developed to display key features of the included studies, such as study design, population characteristics, comparator type, CBT format, and reported outcomes related to pain and sexual function. These tables facilitated subgroup comparisons and enhanced the transparency of the synthesis process. In addition, a PRISMA 2020 flow diagram was used to visually represent the study selection process, including the number of records identified, screened, assessed for eligibility, and included in the final synthesis. For each outcome of interest (pain and sexual function), effect measures as reported in the original trials were extracted. These typically included mean differences, standard deviations, and p-values for between-group and within-group comparisons. No data transformation or statistical imputation was required for the synthesis. All included studies reported complete outcome data, and no conversions or estimations of missing summary statistics were necessary. Included studies were grouped for narrative synthesis based on the type of comparator intervention (e.g., pharmaceutical, surgical, psychotherapeutic, or physical therapy) and the format of CBT delivery (individual, group, or couple-based).

Quality evaluation

Methodological quality assessment was performed independently by two researchers with the modified version of the Jadad scale,[22] as described in previous research.[23] The scale evaluates 8 domains regarding the methodological soundness of each study: randomization, blinding, withdrawals, dropouts, inclusion/exclusion criteria, description of possible adverse effects of the implemented interventions, and statistical analyses. The total score is computed by summing the score of each item, with the total score ranging between 0 to 8. A study receiving a total score between 0 to 3 is considered of low quality, whereas total scores between 4 and 8 indicate a methodological approach of high quality.

Results

Study selection process

The initial search yielded 87 potentially eligible studies. After removing duplicates and screening 56 titles and abstracts based on the eligibility criteria, 32 articles were fully assessed. The final step of research resulted in 10 RCTs. The detailed screening procedure is illustrated in figure 1.

Basic characteristics of the included studies

The studies were RCTs, conducted primarily in Canada, with two of them coming from the United States and Sweden, and held between 2001 and 2021. All the included studies evaluated the effectiveness of CBT for adult women with vulvodynia. In total, 835 women with the diagnosis were included. All studies used the diagnostic criterion of a gynecological examination with a cotton swab test. The mean age ranged from 26.4 to 43.0 years. Among the included studies, six implemented group CBT sessions,[24–29] two of them provided individualized sessions,[30,31] while in two couples CBT treatment was implemented.[31,32] In the majority of the studies, CBT involved focusing on psychoeducation, cognitive restructuring techniques, communication techniques, and pain management. Intervention protocols lasted between eight and 13 weeks, and each session had a duration of 60 to 150 minutes. When implemented in group settings, interventions were held in groups of 5–10 people. Concerning the comparison groups, four of them included topical treatments (lidocaine, corticosteroids),[24,29,31,32] one of them applied a physical therapy intervention,[30] three of them implemented mindfulness-based cognitive therapy,[26–28] one of them vestibulectomy and biofeedback,[25] and one supportive psychotherapy session.[30] All of the included studies assessed pain intensity and female sexual functioning and related psychological characteristics, such as pain anxiety,[27] catastrophizing pain,[24,26–30,32] and pain coping strategies.[30] Secondary psychological characteristics, such as pain tolerance,[30] self-efficacy,[29] and personality characteristics[28] were also assessed in a portion of the studies. One of the studies performed measurements that referred to the partner's perception of pain,[31] while one study evaluated both partners' sexual function.[32] Measurements were performed with the use of self-report instruments, while one study used a vulvalgesiometer for pain assessment.[27] The synthesis relied on the statistical information provided

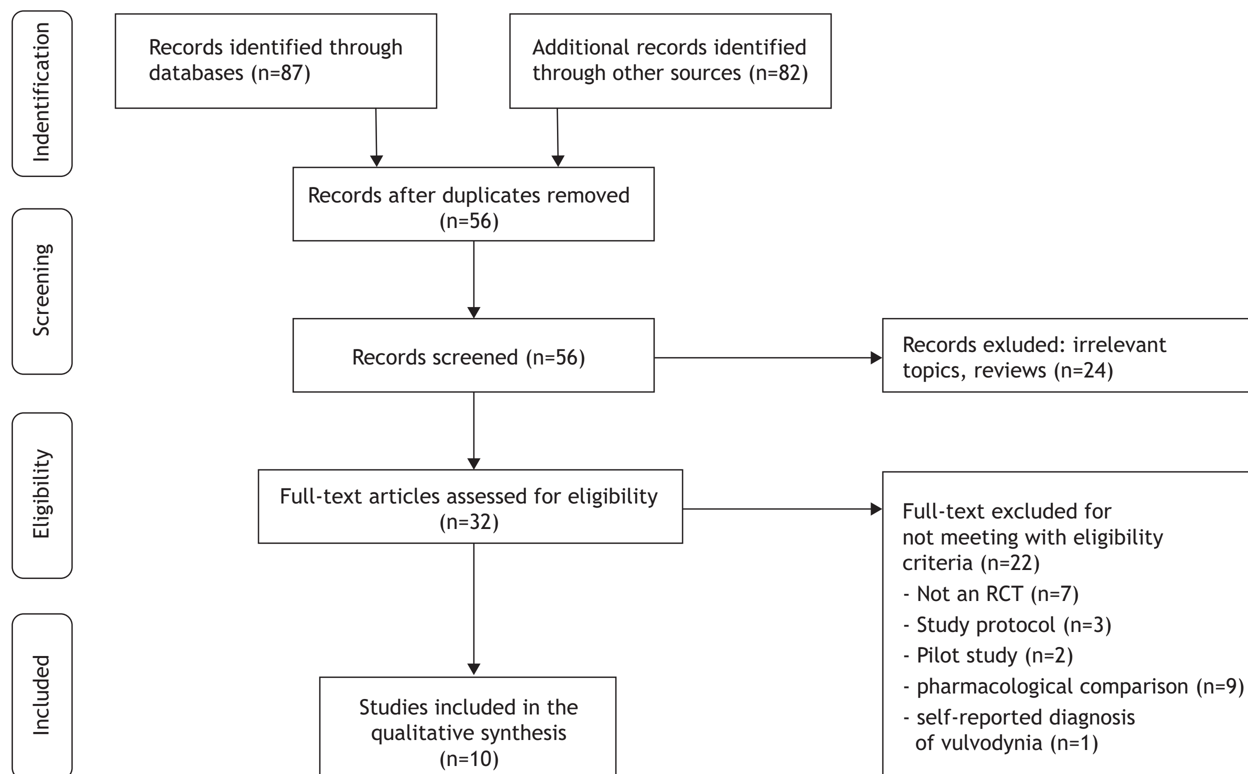

Figure 1. Flow diagram of the study selection process.

in each study. Summary statistics (e.g., p-values) were extracted where available. However, standardized effect estimates (e.g., Cohen's d, confidence intervals) were not consistently reported across studies and were therefore not recalculated. The basic characteristics of the included studies are presented in table 1.

Main results based on research questions

Three of the included studies examined the comparative effectiveness of CBT and mindfulness-based CBT (MBCBT) psychotherapy. Two of these studies reported significant post-treatment improvements in sexual function for both intervention groups ($p < 0.001$).[26,28] However, these effects remained statistically significant at the six-month follow-up in only one study.[26] Furthermore, the same study found comparable improvements between the groups across all other measured outcomes, including psychological functioning and perceived change. Notably, self-reported pain reduction was greater in the mindfulness-based cognitive psychotherapy group.[26] The third RCT comparing CBT and MBCBT found that those with higher baseline pain reported the greater reductions regardless of treatment. However, women with longer relationships, as well as women with primary vulvodynia in the CBT arm, reported greater reduction. It was also reported that the relationship length moderated sexual function ($p<0.01$).[27] Women in shorter relationships improved more with MBCBT, whereas women in longer relationships improved more on sexual function with CBT. Masheb and colleagues compared CBT and supportive psychotherapy. With respect to pain severity during physical examination, this was significantly reduced to a greater degree for the CBT arm ($p=.014$).[33] In addition, results reported a significantly greater improvement in sexual function ($p=.034$) pre- to post-treatment.[33]

Regarding the four studies that compared CBT with topical treatments, results were contradictory, with a tendency in favor of CBT. Three of them reported better sexual function for the CBT group. This improvement was noted only for the CBT group at the post-treatment measurement by one study ($p=0.000$),[31] and this was greater for women whose partner demonstrated higher levels of anxiety ($p<0.01$) and for women with lower sexual goals ($p=0.001$).[31] The second study resulted in a significant difference in sexual function in favor of the CBT groups, but only 6 months post-treatment.[24] The third RCT yielded significantly more improvements for the CBT arm in pain unpleasantness ($p<.001$) at 6-month follow-up, pain anxiety ($p<.001$) and pain catastrophizing at post-treatment and 6-month follow-up, and sexual distress at post-treatment ($p<.001$).[32] The

Table 1. Basic characteristics of the included studies (N=10).

Study characteristics	Sample's characteristics [total N, mean age, (SD)]	Intervention (N)	Comparison (N)	Measurements	Main results
Bergeron et al 2016, Canada[25]	N=69, 26.9 (6.09)	N=39, 10 2-hrs group CBT sessions for 13 weeks (7-8 women/group). Psychoeducation, Kegel exercises, communication skills, cognitive restructuring	N=30, twice daily application of 1% hydrocortisone cream for 13 weeks, educational material on vulvodynia	MPQ, FSFI, PCS, PISES	Both groups reported significant improvements post-treatment. The CBT group reported significantly reduced pain (p=0.03) and better sexual function (p = 0.01) at the 6-month follow-up compared to the topical treatment group.
Bergeron et al 2001, Canada[24]	N=78, 26.8 (5.4)	N=24, 8 2 hrs group CBT sessions for 12 weeks. Psychoeducation, Kegel exercises, communication skills, and cognitiverestructuring	N=22,vestibulectomy (30' surgical procedure under general anesthesia-excision of the vestibular area to a 2 mm depth & 1 cm width); N=25, sEMG biofeedback (contractions & rest periods)- training in the use of a portable sEMG home trainer for daily practice sessions.	MPQ, Global Sexual Functioning score (Sexual History Form), FSFI, BSI-GSI	At posttreatment, vestibulectomy participants had significantly lower pain levels than both group CBT, (p<0.01), and biofeedback participants (p<0.01). The significance was maintained at the 6-month follow-up (p<0.01). Participants from all three treatments improved significantly from pre-treatment to 6-month follow-up (p<0.01).
Bergeron et al 2021, Canada[32]	N=108 (& partners) (27.0) (6.2)	N=47, couple CBT, 12 weekly sessions 0f 75 mins. Psychoeducation, impact of provoked vulvodynia on sexuality, multifactorial view of pain, vaginal dilation exercises, cognitive restructuring, expansion of the sexual repertoire, exercises to improve pain and sexuality-relevant couple interactions, partner responses to pain, sexual motivation, and relationship intimacy	N=51, topical lidocaine treatment. 5% lidocaine ointment on the vulvar vestibule nightly for 12 weeks	FSFI, IIEF, PASS, PCS, FSDS-R	Couple CBT yielded significantly more improvements than lidocaine in pain unpleasantness (p<.001) at 6-month follow-up, pain anxiety (p<.001) and pain catastrophizing at post-treatment and 6-month follow-up, and sexual distress at post-treatment (p<.001), and resulted in better treatment satisfaction and global sexuality improvements (p<.001) at both time points. Partners significantly improved in their sexual function, sexual distress, and pain catastrophizing from pre- to post-treatment and pre-treatment to 6-month follow-up, with no significant group differences. At post-treatment and 6-month follow-up, women and partners in CBT were significantly more satisfied with their treatment than those of the lidocaine group (p=0.000).
Brotto et al 2020, Canada[27]	N=87, 32.3 (8.2)	N=45, CBT, 8 2.5hrs group sessions. Psychoeducation, behavioral skills training, cognitive techniques, communication skills training	N=42, MBCBT, 8 2.5 hrs group sessions. Psychoeducation provoked vulvodynia, mindfulness exercises (mindful eating, body scan, mindfulness of breath, mindfulness of sounds and thoughts, self-compassion practice). Provocation of mild (non-genital) pain in session and provoking vestibular pain at home	FFMQ, FSFI, self-report pain intensity, PCS	Those with primary provoked vulvodynia improved more in the CBT condition (p<0.01). Relationship length moderated sexual function (p<0.01). Women in shorter relationships improved more with MBCBT. Women in longer relationships improved more on sexual function with CBT.

Continues

Table 1. Condinued.

Study characteristics	Sample's characteristics [total N, mean age, (SD)]	Intervention (N)	Comparison (N)	Measurements	Main results
Brotto et al 2019, Canada[26]	N=122, 32.35 (8.21)	N=58, 8 2-hour group CBT sessions for 8 weeks. Psychoeducation, behavioral skills training, cognitive techniques, communication skills training, and education on how provoked vulvodynia affects sexual desire, motivation, and function	N=64, MBCBT. Mindfulness exercises (mindful eating, body scan, mindfulness of breath, mindfulness- ness of sounds and thoughts, and self- compassion practice), education on how provoked vulvodynia affects sexual desire, motivation, and function, and exposure techniques.	FSFI, FSDS-R, VAS, vulvalgesiometer for pain assessment, PCS, PVAQ, CPAQ	Between-group comparison revealed insignificant differences in pain improvement (p=0.409) and sexual function (p=0.821). 43% reported moderate or great improvement in pain (51% in the CBT group and 35% in the MBCBT group) at post-treatment and 63% at 6 months' follow-up (68% in CBT group and 58% in MBCBT group). In terms of sexual function, 43% reported moderate or great improvement at post-treatment (48% in the CBT group/38% in the MBCBT group), and, at 6 months' follow-up, 59% of participants reported moderate or great improvement (60% in the CBT group/59% in the MBCBT group).
Desrochers et al 2010, Canada[29]	N=69, 26.5 (6.0)	N=31, ten 90-min group sessions, 5-10 women/group. Psychoeducation, Kegel exercises, communication skills, and cognitive restructuring	N=38, topical treatment (corticosteroid analgesic cream) twice daily application, use of a water-based lubricant during intercourse	FSFI, VAS, MPQ, STAI, PASS-20, PCS, VAQ, PISES	No significant differences were found between groups. Participants of the topical treatment group with higher catastrophe (p=0.04) and lower self-efficacy (p=0.01) at the start tended to have more severe pain after six months. For CBT, higher levels of baseline fear of pain and catastrophizing contributed to higher pain intensity at follow-up, whereas higher levels of pain self-efficacy were significantly associated with less pain (p=0.03).
Brown et al 2021, Canada[28]	N=130, 32.5 (8.3)	N=, 8 weekly 2.25-hr group CBT sessions. Psychoeducation, cessation of sexual activity, and gradual reintroduction of vaginal penetration	N=, 8 weekly MBCBT 2.25 hrs sessions. Mindfulness exercises (body scan, mindfulness of breath, self-compassion practice)	PCS, CPAQ, TIPI, ASI-3, PQICQ	No significant difference between groups was found for vaginal intercourse rates (p=0.384). MBCBT group was more likely to resume vaginal penetration if their chronic pain acceptance at pretreatment was higher (p=0.01). No time for treatment group interaction (p=0.209). For the CBT group, those with lower pretreatment pain acceptance were more likely to resume vaginal penetration (p=0.070), but this was marginally significant.

Continues

Table 1. Condinued.

Study characteristics	Sample's characteristics [total N, mean age, (SD)]	Intervention (N)	Comparison (N)	Measurements	Main results
Goldfinger et al 2015, Canada[30]	N=20, 26.4 (8.7)	N=10, eight 1.5-hour individualized CBT sessions. Psychoeducation, reconceptualization of provoked vulvodynia as a pain condition, desensitization exercises, sexual communication skills training, and cognitive restructuring	N=10, eight 1.5-hour one-on-one physical therapy sessions (exercises, manual techniques, sEMG, progressive vaginal penetration exercises with silicone vaginal dilators	FSFI, PCS, CSQ,MPQ	Both groups demonstrated significant decreases in vulvar pain during sexual intercourse, with 70% and 80% of participants in the CBT and physical therapy groups demonstrating a moderate clinically important decrease in pain (30%) after treatment. No differences between-group were found post-treatment. The CBT demonstrated better sexual functioning at 6-month follow-up (p=0.013).
Rosen et al 2021, Canada[31]	N=108 (& partners), 27.0 (6.2)	N=53, Couple CBT, 12 weekly 75-minute sessions. Psychoeducation, breathing techniques, vaginal dilation exercises. cognitive restructuring, expansion of sexual repertoire	N=55, 5% lidocaine ointment on the vulvar vestibule nightly for 12 weeks	NRS, FSFI, STAI, WHYMP (partner perception of pain), couple's sexual goals (intimacy, avoidance etc.)	Sexual function was significantly improved for the CBT group post-treatment (p=0.000). The improvement was greater for those women whose partner demonstrated higher levels of anxiety (p<0.01) and for women with lower sexual goals (p=0.001).
Masheb et al 2009, USA[33]	N=47, 43.0 (12.1)	N=22, 10 weekly CBT individual 60-minute sessions. Self-management skills regarding thoughts, feelings, and behaviors, pain coping skills, role-playing, and problem-solving.	N=25, 10 weekly individual 60-minute sessions of supportive psychotherapy. Participants' assistance in emotional expression, empathetic understanding, active listening	MPI, MPQ, FSFI, BDI, PASS	CBT reported significantly greater improvement in pain severity (p=.014), and improvement in sexual function (p=.034) (pre- to post-treatment). Participants in the CBT group reported significantly greater improvement and satisfaction in 1-year follow-up than participants in the supportive psychotherapy group (p<.05).

Abbreviations: CBT=Cognitive Behavioral Therapy; MBCBT=Mindfulness Based Cognitive Behavioral Therapy; MPI=Multidimensional Pain Inventory; MPQ=McGill Pain Questionnaire; FSFI=Female Sexual Function Index; IIEF= International Index of Erectile Function; BDI=Beck Depression Inventory; PASS=Pain Anxiety Symptoms Scale; PCS= Pain Catastrophizing Scale; CSQ=Coping Strategies Questionnaire; VAS= Numeric Visual Analogue Scale; STAI=State-Trait Anxiety Inventory; PVAQ=Pain and Vigilance Awareness Questionnaire; PISES=Painful Intercourse Self-Efficacy Scale; SFI= Sexual Functioning Inventory; BSI-GSI=Global Severity Index of the Brief Symptom Inventory; PVAQ=Pain Vigilance and Awareness Questionnaire, CPAQ=Chronic Pain Acceptance Questionnaire, FSDS-R=Female Sexual Distress Scale-Revised; STAI=State-Trait Anxiety Inventory; PASS-20=Pain Anxiety Symptoms Scale; MFSQ=McCoy Female Sexuality Questionnaire; HADS=Hospital Anxiety and Depression Scale; MFSQ=McCoy Female Sexuality Questionnaire; FFMQ= Five-Facet Mindfulness Questionnaire; NRS= Numeric rating scale for pain during intercourse; WHYMP= West Haven-Yale Multidimensional Pain Inventory; TIPI=Ten-Item Personality Inventory, ASI-3=Anxiety Sensitivity Index, PQICQ=Patient Global Impression of Change questionnaire

last study found no significant differences between groups. However, for CBT, higher levels of fear of pain and catastrophizing post-treatment contributed to higher pain intensity at follow-up measurements, whereas higher levels of self-efficacy regarding pain management were associated with less pain post-treatment.[29]

One of the included studies compared CBT and physical therapy. The comparison arm implemented muscle relaxation techniques and progressive vaginal penetration exercises.[30] A decrease in vulvar pain during sexual intercourse was found for both groups. With respect to coping strategies, an improvement was reported for both arms pre- and post-treatment, but this was statistically significant only for the CBT group ($p<0.001$). Sexual function did not differ significantly between pre- and post-treatment for either of the arms, but was significantly improved only for the CBT group at the 6-month follow-up assessment ($p=0.013$).[30]

One study implemented a 3-group comparison, by implementing psychotherapeutic (CBT), surgical (vestibulectomy), and neuromuscular rehabilitation (surface electromyographic biofeedback) interventions.[24] Bergeron and colleagues reported significantly reduced pain ($p<0.01$) for all three interventions, with the greatest reduction being reported by the vestibulectomy group at post-treatment and at 6-month follow-up.[24] Concerning sexual function, a significant improvement was noted for all three groups ($p<0.01$) between post-treatment and 6-month follow-up.

Quality evaluation results based on the modified Jadad Scale

The assessment of the studies' methodological assessment was conducted with the modified Jadad Scale.[22] All of the included RCTs were of high quality, with an overall score between 5 and 7 (on a scale of 0–8). All studies used randomization, ensuring a high level of internal validity. Variations in the adequacy of the randomization process were noted, as some studies were not double-blinded. However, the nature of the CBT intervention constitutes double-blind protocols difficult to implement. All studies clearly described their eligibility criteria, improving sample comparability. However, only one study reported adverse events or potential side effects of the applied interventions. Lastly, most studies used appropriate statistical methods, increasing the reliability of the findings. Results of the quality evaluation are being provided as supplementary material (S1). A quantitative synthesis was conducted due to heterogeneity in interventions and outcomes.

Discussion

Vulvodynia is a chronic condition with a significant impact on sexual function, psychological well-being, and interpersonal relationships.[10] Despite its high prevalence, the lack of early diagnosis and the absence of a universally accepted treatment protocol make its management difficult.[34] Existing pharmacological and surgical approaches often do not produce satisfactory results, leading patients to seek alternative interventions. To the authors' knowledge, this is the first systematic review investigating the effectiveness of CBT as a non-pharmacological option, focusing on its role in reducing perceived pain and improving sexual function.

Given the methodological and clinical heterogeneity of the included studies, the discussion is thematically organized based on two main axes: the type of comparator intervention (e.g., pharmaceutical, psychotherapeutic, etc.) and the delivery format of CBT (e.g., group-based, individual, or couple therapy). This subgroup-oriented structure aimed to clarify the interpretability of findings across diverse clinical contexts and intervention settings.

Concerning pharmaceutical interventions, even though the findings were slightly contradictory, the four studies that compared CBT and topical treatments underscored the superiority of CBT, particularly over time. Regarding sexual function, CBT yielded significantly better outcomes for three of them,24,25,31 and no significant differences post-treatment regarding pain.[25,29,31,32] However, for two of them, the 6-month follow-up measurements revealed improvements in pain for the CBT arms.[25,32] A plausible explanation for the lack of difference immediately post-treatment could be related to the impact of expectation and immediate response to treatment, regardless of the method.[35] It is known that pharmacological approaches can influence the individual's short-term experience through mechanisms such as enhancing self-confidence in symptom management and general attention to health care.[36] However, the maintenance of benefits over time, as seen in the results of the studies after 6 months, may reflect more stable changes achieved through CBT. As shown by literature regarding chronic pain, CBT helps individuals identify and reframe dysfunctional thoughts about pain, thereby reducing catastrophizing – a factor that often increases the subjective perception of pain.[37] Through techniques such as selective attention regulation and cognitive restructuring,[38] participants may have learned to cope with pain in more adaptive ways, reducing the stress response and passive avoidant behavior. This finding could also be ex-

amined from a neurobiological perspective. Chronic pain is associated with increased activity in brain areas involved in emotional regulation and pain processing, such as the amygdala and the prefrontal cortex.[39] CBT has been shown to contribute to neuroplasticity by remodeling these networks, reducing pain hypersensitivity, and enhancing emotional regulation.[40] After all, empirical and theoretical evidence substantiate the long-term efficacy of CBT, as it enables individuals to develop the skills necessary to function as their own therapist.[41]

Four of the included studies compared CBT with other psychotherapeutic approaches. Three of them compared CBT with MBCBT, and the comparison groups concluded with similar findings. Even though the percentages of women who reported improvements in terms of pain intensity and sexual function were greater for the CBT group,[26] especially for those in longer relationships,[27] no significant differences between groups were found for both variables.[26–28] The similar effectiveness of CBT and MBCBT may be explained by the similarities in the protocols applied in the studies. Both treatments included common techniques, such as psychoeducation, relaxation exercises, and pain management strategies,[26–28] which are key mechanisms of improvement for both pain intensity and sexual function.[42,43] Also, MBCBT incorporates CBT elements,[44] probably offering similar benefits, even if the mechanisms of action differ. As far as the fourth study is concerned, this compared CBT with supportive psychotherapy.[33] Results highlighted the efficacy of CBT, with participants reporting significant improvements in pain severity as well as sexual function, with these changes being maintained even one year later. CBT directly targets the cognitive and behavioral mechanisms that maintain pain and difficulties in sexual functioning.[45,46] Through the identification and modification of dysfunctional thoughts, exposure, and training in coping techniques, CBT offers more structured strategies compared to supportive psychotherapy. Empathy and active listening are core principles of every psychotherapeutic intervention, including CBT. Thereby, the additional targeted techniques for symptom relief may explain why participants who received CBT sessions reported better outcomes, a finding that is in line with previous research comparing the two approaches.[8,47]

Two of the studies compared CBT with non-pharmaceutical and non-psychotherapeutic interventions, with their findings being contradictory.[24] One of them made a three-way comparison by examining the efficacy of vestibulectomy, sEMG biofeedback, and CBT on pain and sexual function. All three interventions resulted in significant improvements for their participants post-treatment, and gains were maintained at 6-month follow-up for all conditions.[24] These results appear encouraging; however, when carefully examining the study's characteristics, interesting findings occur. For example, many participants in the vestibulectomy refused to go on with the procedure, and some of the analyses were conducted based on estimated and not collected data. In addition, there was a statistically significant dropout rate for the sEMG biofeedback group, possibly implying that the time needed to be invested in this approach and the repetitive exercises may discourage patients from complying with the protocol. The fact that the CBT group did not improve sexual function in a greater way compared to sEMG and vestibulectomy could be characterized as puzzling. This may be because improved sexual function is dependent on the degree of pain that one experiences, as at the baseline measurements, women in the CBT group reported lower pain levels and better sexual function compared to the other groups. With respect to the other study, this compared CBT with a physiotherapy protocol. Again, outcomes were significantly improved for both groups, but the important difference was at the 6-month follow-up measurement. The CBT group maintained the improvement for sexual function, complementing its effect on the overall psychological well-being, reduction in anxiety related to sexual activity, and sustained improvements in pain management.[30]

One notable aspect of the included studies is their differentiation regarding the way CBT was delivered. In addition to the comparator type, the mode of CBT delivery (group, individual, or couple-based) was also considered as a qualitative axis for interpretation, as it may influence both therapeutic outcomes and patient engagement. Six of them applied to group CBT, whereas two of them couple CBT and two individualized sessions. Even though a direct comparison would probably be unfounded due to the different number of studies, when comparing the group and the individualized interventions, group-level interventions appeared as more efficient. They enhanced the sense of support and sharing of experiences, while individual sessions provided more targeted intervention on individual problems. Desrochers et al. reported that individual CBT sessions showed slightly better results in pain management and reductions.[29] In contrast, Brotto et al. demonstrated that group CBT sessions were beneficial, particularly for women in long-term relationships, highlighting that group dynamics can act as an additional factor enhancing therapeutic outcomes. Concerning the couple's CBT, the interesting finding lies in the fact that the partner's perceptions affected the outcomes regarding pain and sexual

function,[31] and when the woman improved in terms of pain and sexual function, so did the partner's pain catastrophizing and sexual anxiety and function.[32] This finding confirms results from a pilot study highlighting that, following CBT, partners reduced pain catastrophizing.[48] The fact that partner pain catastrophizing contributes to women's pain in vulvodynia samples and that partners also endure sexual difficulties due to the diagnosis emphasizes the importance of the relationship's intimacy, underlining how the perception and management of pain by the partner can directly affect the other's experience.

The present review demonstrates specific strengths, such as adherence to the PRISMA guidelines, inclusion of only RCTs, and thorough assessment of the studies' methodological quality. To further clarify the interpretability and practical relevance of our findings, the following two sections discuss key methodological limitations of the included studies, followed by the clinical implications and potential applications of CBT in vulvodynia management.

Despite its strengths, this review bears certain limitations that must be acknowledged. The first concerns the heterogeneity of CBT protocols; some focused-on restructuring dysfunctional thoughts and pain management, while others included self-efficacy training or communication skills. In addition, the comparator interventions varied widely (e.g., medication, physical therapy, surgery), making direct comparisons more complex. There was also an inconsistency in outcome measures; most were based on self-report, with only one study using an objective tool for pain measurement. An additional methodological issue that arises concerns the absence of sample size calculation (power analysis) in several of the included studies. This omission limits the internal validity of their results, as the adequacy of the sample to detect statistically significant differences is not ensured. Furthermore, it makes it difficult to draw firm conclusions and reduces the generalizability of the review findings.[49] Although the available data did not allow the conduction of a meta-analysis and thus a formal quantitative assessment of publication bias (e.g., funnel plot, Egger's test) was not feasible, the possibility of publication bias remains a notable limitation of the present review. To minimize this risk, a comprehensive search strategy was employed across multiple databases, along with a backward reference search of included studies. Nonetheless, it is possible that unpublished trials or studies with non-significant results were omitted, which could have affected the completeness and objectivity of the findings.

From a clinical standpoint, CBT emerges as a promising non-pharmacological treatment for vulvodynia. Considering the high rates of misdiagnosis or delayed diagnosis, clinician education —particularly among gynecologists— is crucial. Additionally, couple-based CBT appears especially beneficial, not only for improving individual outcomes but also for addressing dyadic dynamics that influence pain perception and sexual satisfaction. Findings from a couple of interventions highlight the importance of partner involvement in the therapeutic process, as changes in their attitudes and perceptions directly affect the woman's pain experience and sexual functioning. Future interventions could systematically incorporate the partner to jointly manage the problem, enhancing empathy and preventing catastrophe on both sides. Assessing the quality of the relationship, sexual communication, and the partner's beliefs about pain can guide individualized interventions and improve the overall effectiveness of treatment.

In summary, CBT appears to be an effective non-pharmacological intervention for reducing pain and improving sexual function in women with vulvodynia. Despite heterogeneity in study designs and outcome measures, the findings indicate promising and sustained benefits, particularly when interventions are tailored to individual or couple dynamics. Future research with standardized methodologies and partner-inclusive approaches may further strengthen the evidence base and inform clinical practice.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi: https://doi.org/10.22365/jpsych.2025.013

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Ανασκόπηση

Συστηματική ανασκόπηση της αποτελεσματικότητας της Γνωσιακής Συμπεριφορικής Θεραπείας για τον πόνο και τη σεξουαλική λειτουργία στην αιδοιοδυνία

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ΠΕΡΙΛΗΨΗ

Η αιδοιοδυνία αποτελεί ένα υποδιαγνωσμένο σύνδρομο πόνου με επίμονη διάρκεια συνήθως χωρίς αναγνωρίσιμη οργανική αιτία. Επηρεάζει αρνητικά την ποιότητα ζωής, την ψυχική υγεία, τις ρομαντικές σχέσεις και τη σεξουαλική λειτουργικότητα των γυναικών. Σκοπός της παρούσας ανασκόπησης ήταν η συστηματική προσέγγιση των ερευνητικών δεδομένων που έχουν προκύψει από τυχαιοποιημένες κλινικές δοκιμές σχετικά με την αποτελεσματικότητα της Γνωσιακής Συμπεριφορικής Θεραπείας στον αντιλαμβανόμενο πόνο και τη σεξουαλική λειτουργικότητα γυναικών με αιδοιοδυνία, ασχέτως χρονικής στιγμής δημοσίευσης. Η ανασκόπηση πραγματοποιήθηκε σύμφωνα με τις κατευθυντήριες οδηγίες PRISMA. Η αναζήτηση της βιβλιογραφίας πραγματοποιήθηκε βάσει συγκεκριμένων κριτηρίων καταλληλότητας στις βάσεις δεδομένων Pubmed, PsycInfo και Scopus με τη χρήση των κατάλληλων λέξεων-κλειδιά. Η μεθοδολογική ποιότητα των συμπεριλαμβανομένων μελετών αξιολογήθηκε με το Jadad Scale. Η αναζήτηση κατέληξε σε 10 μελέτες που συνέκριναν την αποτελεσματικότητα της Γνωσιακής Συμπεριφορικής Θεραπείας εν συγκρίσει με άλλες ψυχοθεραπευτικές προσεγγίσεις και κλινικές, φαρμακευτικές και χειρουργικές παρεμβάσεις σε 835 γυναίκες με αιδοιοδυνία. Τα αποτελέσματα ανάδειξαν την υπεροχή της Γνωσιακής Συμπεριφορικής Θεραπείας σε σχέση με τοπικές φαρμακευτικές θεραπείες με σημαντικές βελτιώσεις στη σεξουαλική λειτουργία και τη διαχείριση του πόνου, κυρίως σε βάθος χρόνου. Οι συγκρίσεις με άλλες ψυχοθεραπευτικές προσεγγίσεις (γνωσιακή θεραπεία βασισμένη στην ενσυνειδητότητα, υποστηρικτική ψυχοθεραπεία) κατέληξαν σε παρόμοια αποτελέσματα. Εν συγκρίσει με φυσικοθεραπευτικά και χειρουργικά πρωτόκολλα, η Γνωσιακή Συμπεριφορική Θεραπεία κατέληξε σε ευνοϊκότερα αποτελέσματα, αν και η βελτίωση της σεξουαλικής λειτουργίας ήταν σημαντική κυρίως κατά την παρακολούθηση 6 μήνες μετά την ολοκλήρωση των παρεμβάσεων. Η Γνωσιακή Συμπεριφορική Θεραπεία φάνηκε να βοηθά μέσω της αμφισβήτησης δυσλειτουργικών σκέψεων, της μείωσης της καταστροφολογικής ερμηνείας γύρω από τον πόνο, και την ανάπτυξη εναλλακτικών στρατηγικών αντιμετώπισής του. Παρά τις ενθαρρυντικές ενδείξεις, υπήρχαν διαφοροποιήσεις σε επίπεδο γνωσιακών-συμπεριφορικών παρεμβάσεων, των ομάδων σύγκρισης και των εργαλείων αξιολόγησης των υπό διερεύνηση μεταβλητών, γεγονός που καθιστά δύσκολη την άμεση σύγκριση των ευρημάτων. Τα αποτελέσματα, τα οποία παρουσιάζονται αφηγηματικά βάσει τύπου παρέμβασης και ευρημάτων, ανάδειξαν τη Γνωσιακή Συμπεριφορική Θεραπεία ως μια υποσχόμενη, μη φαρμακευτική προσέγγιση για τη διαχείριση της αιδοιοδυνίας. Η εκπαίδευση των κλινικών γιατρών και των ψυχοθεραπευτών θα συμβάλει στην ενίσχυση της έγκαιρης διάγνωσης και την αποτελεσματική θεραπεία αυτής της διάγνωσης.

ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ: Αιδοιοδυνία, γνωσιακή συμπεριφορική θεραπεία, πόνος, σεξουαλική λειτουργία, τυχαιοποιημένη κλινική δοκιμή, συστηματική ανασκόπηση.

Συγγραφέας επικοινωνίας: Ιουλία Κόκκα, Α΄ Ψυχιατρική Κλινική, Ιατρική Σχολή, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Ειδικό Ιατρείο Σεξουαλικής Υγείας, Αιγινήτειο Νοσοκομείο, Λεωφ. Βασ. Σοφίας 72–74, 115 28 Αθήνα, Διεύθυνση e-mail: Kokka.ioulia@gmail.com, Iouliakok@med.uoa.gr