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Psychosocial factors related to women's persistent or recurrent vulvovaginal pain: a systematic review and suggestions for future research

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ABSTRACT

Objective: Vulvovaginal pain is a prevalent condition that can be accompanied by psychological and social difficulties. This review summarised studies of vulvovaginal pain as related to women's psychological and social adjustment.

Method and measures: A systematic search identified 35 studies of vulvovaginal pain as related to women's psychological and social adjustment.

Results: Most identified studies investigated anxiety, depression, sexual dissatisfaction, pain catastrophising or sexual abuse as correlates of pain. Experiencing or having more intense pain was associated with increased anxiety (or fear) and depressive symptoms (or distress), decreased sexual satisfaction (or more sexual distress) and experience of sexual or other abuse. Additionally, pain was universally associated with more pain catastrophising when studied. A few studies were located on other topics: pain avoidance behaviours, relationship satisfaction, partner communication, and multiple other psychological and social adjustment indicators (e.g. pain coping self-efficacy). There was mixed evidence that vulvovaginal pain was associated with poorer outcomes across all these other topics.

Conclusions: Vulvovaginal pain tends to be associated with poorer emotional and social adjustment. Research is needed to differentiate covariates (or comorbidities) from precursors or outcomes of pain, and to identify positive resources and adaptive coping strategies to assist to guide recommendations for women's healthcare.

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Psychological;
vulvovaginal pain;
review; fear; avoidance

Introduction

Vulvovaginal pain is often described as burning, itching, stinging, cutting or tightness in the vulva, vagina and pelvic floor (Bornstein et al., 2016), which can be a symptom of many conditions or diseases (Halgin & Krauss-Whitbourne, 2013; Mac Bride et al.,

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2010; Meana et al., 1997; Schneider et al., 2020; Simonelli et al., 2014). Although vulvovaginal pain is a general term that has been used to refer to many forms and aspects of pain for women, the terminology varies substantially across studies. For example, three terms frequently used include *vaginismus*, defined as cutting or tightness in the vulva, vagina and pelvic floor often involving difficulty with vaginal entry of a finger, penis or object, which is accompanied by involuntary contractions of the pelvic floor muscles (Elmerstig and Thomtén, 2016); *vulvodynia*, defined as vulvar pain without a clear identifiable cause (Bornstein et al., 2016); and *dyspareunia*, defined as recurrent or persistent genital pain that occurs before, during or after sexual intercourse (American Psychological Association, 1994).

Fortunately, a review of terms is available, which suggests the use of two broad categories to assist with classification of vulvovaginal pain (Bornstein et al., 2016). One category pertains to vulvar pain that is linked with a physical condition (e.g., infection, inflammation, trauma), whereas the other category captures pain that does not have a clear identifiable cause (Bornstein et al., 2016). In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V; American Psychiatric Association, 2013), the diagnoses and characteristics for vaginismus and dyspareunia are covered in a single diagnosis of *genito-pelvic pain/penetration disorder*. The term *provoked vestibulodynia* (PVD) is used to refer to a localised subtype of vulvodynia and is characterised by pain in the vulva vestibule and is elicited from stimuli pressure in sexual and non-sexual contexts (Bergeron et al., 2001). Due to the variety in terminology and our broad inclusion criteria for this review, the term vulvovaginal pain was used to capture the diversity of this experience for women.

Vulvovaginal pain is prevalent among women. One study reported that 12.5% of 1,795 US women aged between 18 and 65 who completed a survey met the criteria for vulvodynia (Iglesias-Rios et al., 2015). Additionally, 33.9% ($n=609$) of women reported short-term or previous vulvar pain. However, a much higher pain prevalence of 71.7% was found in a US study of dyspareunia among women (18 to 87 years) seeking care from a gynaecological health centre (Nusbaum et al., 2000); this made it the fourth highest concern reported. In addition, general population surveys have found that the highest prevalence of vulvovaginal pain is in young women (Mitchell et al., 2017), with about 34% to 49% of women aged between 12 and 26 (either recruited from clinics or the community) reporting a history of vulvovaginal pain (Berglund et al., 2002; Elmerstig et al., 2009; 2013).

Vulvovaginal pain can manifest as either acute or chronic, and it can be localised to one area of the body or more generalised (Bornstein et al., 2016). It is frequently accompanied by involuntary contractions of the pelvic floor muscles (Basson et al., 2004). This pain can be persistent, lasting 6 months or more, and is often resistant to treatment, or recurrent, meaning it occurs or reappears after a period of remission (American Psychological Association, 2022). Although vulvovaginal pain can be due to medical conditions like endometriosis (Schneider et al., 2020; Simonelli et al., 2014) or vaginal atrophy (Mac Bride et al., 2010), there are multiple other potential causes whereby pain may not have an identifiable physical cause and may be more psychological in nature (Halgin & Krauss-Whitbourne, 2013; Meana et al., 1997). The presentation

of pain varies widely and women can be hesitant to disclose their experience of pain (Danielsson et al., 2003), which may be due to previous or anticipated negative experiences within the healthcare system (Achour et al., 2019; Macey et al., 2015).

This review included studies of women's vulvovaginal pain experience or intensity and associations of pain with psychosocial factors. We focused on studies using any term to refer to vulvovaginal pain without placing restrictions on the sample due to the cause of the pain. Thus, we provide a comprehensive narrative summary of what is known regarding associations of vulvovaginal pain with women's psychosocial adjustment. Psychosocial factors were defined to include variables that pertained to aspects of an individual's psychological and social well-being, such as anxiety, depression and partner communication.

Psychosocial impact and correlates of vulvovaginal pain

Vulvovaginal pain can have negative implications for women's physical health, but it also has the potential to impair women's emotional and social well-being (Boyer & Pukall, 2014; Cheng et al., 2017; Chisari & Chilcot, 2017; Vannier et al., 2017). Vulvovaginal pain has been associated with high negative emotionality and anxiety (Boyer & Pukall, 2014; Chisari & Chilcot, 2017) and with poorer relationship and sexual satisfaction (Cheng et al., 2017; Vannier et al., 2017). Research has shown that women experiencing vulvovaginal pain compared to those who do not, or those who experience more intense pain relative to others, report poorer psychosocial adjustment. For instance, persistent or recurrent vulvovaginal pain has been associated with reduced life satisfaction (Facchin et al., 2021) and has been associated with a decrease in sexual arousal and desire (Verit et al., 2006), lowered self-esteem and confidence (Denny & Mann, 2007), more negative affect (Meana & Lykins, 2009), more feelings of inadequacy and being un-womanly and increased social isolation (Desrochers et al., 2008). In addition, women with vulvovaginal pain report more anxiety and depressive symptoms (Iglesias-Rios et al., 2015; Nowosielski et al., 2013). In one of these studies (Iglesias-Rios et al., 2015), 20.8% of women with vulvodinia screened positive for depression, which was significantly higher than women without vulvodinia (13.1%). It is also known that vulvovaginal pain can interfere with sexual satisfaction (Denny & Mann, 2007) and daily activities of living (Blyth et al., 2001), and it has been linked to increased suicidal ideation (Nicholas, 2007) and engagement in unhelpful coping strategies which may inadvertently continue the pain cycle and increase feelings of hopelessness (Dargie et al., 2017; Oliveira & Nobre, 2013).

Social-relational experiences have also been found to correlate with women's vulvovaginal pain. Much of this research has focused on partner relationships and a history of traumatic sexual experiences (e.g., child sexual abuse). For example, research has found that partner responses can influence the experience of vulvovaginal pain (Bancroft et al., 2003). Specifically, responses of empathy and understanding increase a sense of control over the pain (Rosen et al., 2014). In addition, sexual trauma may play a role. Prior research has suggested that women who have a history of sexual trauma are twice as likely to be diagnosed with vaginismus compared to women who did not experience vulvovaginal pain (Reissing et al., 2003).

The current review

Despite the growing body of research on associations of vulvovaginal pain with psychosocial adjustment, there has been no systematic review summarising the quantitative study findings. Given that healthcare providers report gaps in their understanding of the comorbidities of vulvovaginal pain (Graziottin et al., 2020), we aimed to conduct a review of the research on the psychosocial correlates of vulvovaginal pain. The general purpose was to contribute to improving the quality of healthcare for women with vulvovaginal pain, anticipating that information about psychosocial comorbidities of vulvovaginal pain could be useful for devising new directions for care and support. Another purpose was to identify gaps in research that could be addressed in the future. The overall aim of this systematic review was to locate and summarise literature on what is known about the association between vulvovaginal pain and women's psychological (e.g., depression, anxiety and other mental health problems) and social adjustment (e.g., in partner relationships, following sexual abuse). Based on these findings, we also aimed to propose future directions for research and healthcare for women. As such, the research question for this study was: Is the experience or intensity of vulvovaginal pain associated with women's psychosocial adjustment?

Methods

This systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009). The protocol of the review was registered on PROSPERO (CRD42022370502). As the study was a systematic review, ethics approval was not required.

Search strategy and data collection

The databases that were accessed in February 2025 for electronic searching were CINAHL Complete (via EBSCOhost), ProQuest, PsychINFO (via Ovid) and PubMed. The search strategy utilised keywords and broke the topic down into three categories (i.e., pain, vulvovaginal terms and focus) to ensure that all aspects of the research question were being addressed. Please see [Supplemental Materials](#) for four tables that summarise keywords and the search strategy for the database searches (see [Tables S1 to S4](#)).

The study inclusion criteria were as follows: (1) reported information about a women's subjective pain experience; (2) included women who reported pain that was persistent or chronic; (3) considered psychosocial factors that may contribute to or follow from women's experience of vulvovaginal pain; (4) reported quantitative findings and (5) peer-reviewed. Studies were excluded that (1) exclusively recruited women with specific medical conditions like endometriosis; (2) exclusively focused on girls under age 18; (3) reported a single case; (4) used a qualitative design or (5) was an intervention study.

Study management and data extraction were completed using Covidence (Covidence, 2025). Study eligibility screening was conducted by two independent reviewers, whereby title and abstract screening was undertaken, following comparison of

screening decisions for 30% of the studies. The agreement was 87% and disagreements were discussed to clarify the inclusion and exclusion criteria before each reviewer independently reviewed the remaining titles and abstracts, with any remaining disagreements reviewed by a third person followed by a discussion and consensus decision. Following the completion of title and abstract screening, full text screening was completed by two reviewers and a third reviewer was involved when disagreements occurred. For included articles, the following data were extracted from each study: (i) publication details (i.e., year of publication and authors); (ii) study design; (iii) sample (i.e., age and size); (iv) focus (e.g., factor/s explored) and (v) results. The Critical Appraisal Tools for use in JBI Systematic Reviews were employed by two independent reviewers to assess the risk of bias and ensure the articles included in the systematic review were trustworthy and relevant to the research question (Moola et al., 2020).

Results

Included studies

As shown in the PRISMA diagram (Figure 1), 1,419 references were retrieved, of which 169 were duplicates. Following title and abstract screening, 154 studies appeared to meet inclusion criteria and underwent full text screening. After full text screening, 35 studies met inclusion criteria and were included in this review.

Study characteristics and quality appraisal

The methodology of each study is detailed in Table 1. Below we use k to indicate the number of studies and n to refer to sample sizes within or across studies. Of the included studies, over one-half ($k=24$) were cross-sectional and collected survey data, with eight of these also collecting longitudinal data. Two studies utilised a mixed-method design (qualitative and quantitative data were collected), and one collected data through chart review. Women's ages ranged from 18 to 85 years in many studies ($k=17$), with one study focusing on young women aged 12 to 19 years. There were 17 studies that did not report age. Three of the 35 studies also collected data from partners. Seven studies recruited clinic patients only, with over half ($k=23$) of the studies collecting data from a convenience sample. The other five studies mixed clinic patients with a convenience sample.

The quality appraisal for each study can be found in Appendix A. The methodological quality of the quantitative studies varied, but the majority were rated as high quality (all criteria met). Specifically, 21 studies were rated as very high quality, five studies were rated high, six studies were rated moderate, two studies were rated low and one study was rated very low quality. The most frequently identified quality issue was the identification and management of confounding variables (17% of studies) and no reporting of inclusion criteria (17% of studies).

Measurement of pain

The measurement of pain varied across the studies. About half of the studies ($k=18$) used a rating scale from 0 to 10 (one study had a rating up to 100) and six studies

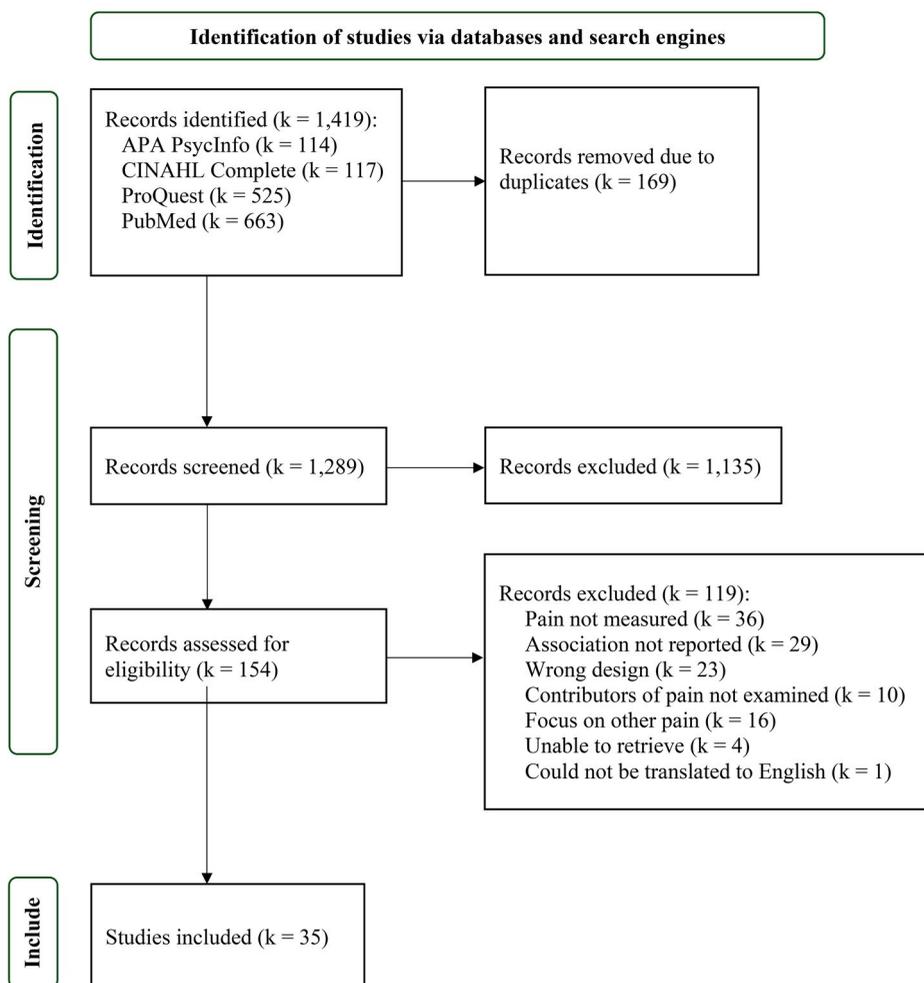


Figure 1. Preferred reporting items for systematic reviews and meta-analyses (PRISMA) flow diagram.

used the pain subscale from Female Sexual Function Index (FSFI, lower score indicates more pain). Other studies used pain questionnaires after asking women to only focus on their vulvovaginal pain: four studies used the McGill/McGill-Melzack Pain Questionnaire, one used the West Haven-Yale Multidimensional Pain Inventory and one used the Brief Pain Inventory Short Form. Two studies utilised a dichotomous measurement of 'yes' or 'no' for the presence of vulvovaginal pain, with one study utilising three different methods to assess vulvovaginal pain (i.e., rating scale, Vulvar Pain questionnaire and Genital Pain Ratings), one study used the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire and one study used the Arizona Sexual Experience Scale. All studies included in the review required women to answer/rate their vulvovaginal pain experience.

Findings related to the psychosocial impact of vulvovaginal pain

Table 2 summarises the findings for each study. Table 3 lists the psychosocial factors measured in each study. The findings from the included studies are described for

Table 1. Authors and design details of the 35 included studies.

Study	Country	Design	Sample size/ recruitment	Ethnicity/race/ nationality (Majority)	Age range
Bhandari Randhawa et al. (2024)	United States	Cross-sectional Survey	328/Convenience	Hispanic ($n=266$)	Unspecified
Bourdon et al. (2023)	France	Cross-sectional Survey	271/Clinic	White ($n=224$)	Unspecified
Boyer and Pukall (2014)	Canada	Cross-sectional Survey	90/Convenience	Canadian ($n=43$)	Unspecified
Brauer et al. (2009)	Netherlands	Cross-sectional Survey	142/Convenience	Unspecified	18 to 45
Burri et al. (2017)	United Kingdom	Cross-sectional Survey	1489/ Convenience	Unspecified	25 to 82
Burri et al. (2020)	United Kingdom	Cross-sectional Survey and Longitudinal	979/Convenience	Unspecified	25 to 76
Carey et al. (2014)	United States	Cross-sectional Survey	133/Clinic	White ($n=65$)	18 to 50
Charbonneau-Lefebvre et al. (2019)	Canada	Cross-sectional Survey and Longitudinal	213 couples/ Mixed	French Canadian ($n=187$)	Unspecified
Cheng et al. (2017)	New Zealand	Cross-sectional Survey	98/Clinic	Unspecified	18 to 85
Chisari and Chilcot (2017)	United Kingdom	Cross-sectional Survey	335/Convenience	White ($n=315$)	Unspecified
Chisari et al. (2022)	United Kingdom	Cross-sectional Survey and Longitudinal	349/Convenience	White (92%)	Unspecified
Davis et al. (2015)	Canada	Cross-sectional Survey and Longitudinal	317/Mixed	Unspecified	18 to 68
Demirtaş et al. (2024)	Turkey	Cross-sectional Survey	561/Convenience	Iraq ($n=207$)	18 to 49
Dubé et al. (2024)	Canada	Cross-sectional Survey and Longitudinal	211/Convenience	Canadian ($n=180$)	Unspecified
Jodoin et al. (2011)	Canada	Cross-sectional Survey	77/Clinic	White ($n=71$)	19 to 44
Landry and Bergeron (2011)	Canada	Cross-sectional Survey	84/Convenience	Canadian/Quebec ($n=37$)	12 to 19
Maathz et al. (2020)	Sweden	Cross-sectional Survey and Longitudinal	130/Convenience	Unspecified	18 to 35
Masheb et al. (2005)	United States	Qualitative and Cross-sectional Survey	53/Convenience	White ($n=43$)	21 to 71
Maulitz et al. (2024)	Germany	Cross-sectional Survey	26/Clinic	European (88%)	18 to 44
Meana et al. (1999)	Canada	Cross-sectional Survey	100/Convenience	Canadian ($n=80$)	Unspecified
Mohammadzadeh et al. (2023)	Iran	Cross-sectional Survey	167/Convenience	Unspecified	Unspecified
Nault et al. (2016)	United States	Chart Review	380/Clinic	Unspecified	Unspecified
Pâquet et al. (2016)	Canada	Cross-sectional Survey	50/Convenience	Unspecified	Unspecified
Pâquet et al. (2019)	Canada	Cross-sectional Survey and Longitudinal	173/Mixed	French Canadian ($n=156$)	18 to 63
Pazmany et al. (2013)	Belgium	Cross-sectional Survey	192/Convenience	Belgian (96.9%)	Unspecified
Rancourt et al. (2016)	Canada	Cross-sectional Survey	107/Convenience	Canadian ($n=100$)	18 to 44

(Continued)

Table 1. Continued.

Study	Country	Design	Sample size/ recruitment	Ethnicity/race/ nationality (Majority)	Age range
Reed et al. (2014)	United States	Cross-sectional Survey	2,013/ Convenience	White ($n = 1,334$)	18 to 80
Rosen et al. (2013)	Canada	Cross-sectional Survey	175/Mixed	French Canadian ($n = 157$)	18 to 45
Rosen et al. (2015)	Canada	Cross-sectional Survey and Diary Study	69 couples/Mixed	Unspecified	18 to 44
Santerre-Baillargeon et al. (2018)	United States	Cross-sectional Survey	48 couples/ Convenience	French Canadian ($n = 19$)	Unspecified
Silva et al. (2011)	Brazil	Cross-sectional Survey	147/Convenience	Unspecified	Unspecified
Sutton et al. (2015)	Canada	Cross-sectional Survey	15/Convenience	Unspecified	Unspecified
ter Kuile et al. (2010)	Netherlands	Cross-sectional Survey	154/Convenience	Unspecified	Unspecified
Vannier et al. (2017)	Canada	Cross-sectional Survey, Longitudinal, and Diary Study	70/Convenience	Unspecified	18 to 44
Yosef et al. (2016)	Canada	Cross-sectional Survey	656/Clinic	White ($n = 472$)	Unspecified

Note. Mixed=clinic patients and convenience.

each adjustment indicator related to vulvovaginal pain, and these findings are synthesised in the following section. Findings below are summarised beginning with those that have received the most attention, ending with those that were considered in only one study. While anxiety and pain catastrophising are positively correlated, they have been identified as distinct correlates of pain (Abounader et al., 2025). Thus, for this review they have been addressed separately in order to highlight each of their relationships with vulvovaginal pain.

Anxiety and fear

While anxiety and fear are distinct in their presentations, there are many commonalities, so the results of their associations with women's vulvovaginal pain are jointly summarised here. Specifically, both anxiety and fear are thought to impact on perceptions of pain, with fear exaggerating pain towards an immediate stimulus (Gray & McNaughton, 2000; Philips, 1987), and anxiety contributing to an overactive fight or flight response when experiencing pain (Barlow, 2002). Twenty-one studies investigated the association between vulvovaginal pain and anxiety or fear, with 18 of these studies (86%) reporting a positive association. In addition, one study examined the association of women's pain intensity and general psychological distress (combining depression and anxiety; Jodoin et al., 2011) and one longitudinal study measured *attachment* anxiety, defined as anxiety about trust and closeness with a partner (Charbonneau-Lefebvre et al., 2019).

Significant, positive correlations were found in eight studies of pain intensity and anxiety and/or fear, such that women with more intense pain reported more symptoms of anxiety or more fear (Boyer & Pukall, 2014; Burri et al., 2017; Cheng et al., 2017; Chisari & Chilcot, 2017; Davis et al., 2015; Landry & Bergeron, 2011; Rosen et al., 2015; Yosef et al., 2016). Also, one study found a link between higher intensity of

Table 2. Analyses used and findings for the 35 included studies.

Study (Year)	Analysis	Outcomes
Bhandari Randhawa et al. (2024)	Correlation, multivariate analysis	1. Non-significant associations between sexual pain and baseline mental health and one-year postpartum anxiety and depression.
Bourdon et al. (2023)	Correlation, multiple logistic regression	1. Independent positive association between the presence of severe pelvic pain symptoms and a history of sexual abuse.
Boyer and Pukall (2014)	Correlation, hierarchical regression	<ol style="list-style-type: none"> 1. Pain significantly associated with more anxiety when getting a pelvic examination. 2. Women who believed that vaginal penetration would be painful, unsuccessful, and out of their control experienced more difficulty with pain and anxiety when getting a pelvic examination. 3. Women who reported increased pain and anxiety were more likely to prematurely discontinue a pelvic examination. 4. Non-significant correlation between childhood sexual abuse history and vaginal penetration pain intensity. 5. Women's increased reports of pain during intercourse and more negative cognitions about vaginal penetration, reported increased anxiety during their last pelvic examination. 6. Increased pain intensity during vaginal penetration, increased negative cognitions about vaginal penetration reported to experience more pain during their last pelvic examination.
Brauer et al. (2009)	MANOVA	<ol style="list-style-type: none"> 1. Women with dyspareunia reported increased negative sexual attitudes and less positive, and more negative, affect during their most recent sexual experience with their partner, compared to their pain free counterparts. 2. Higher pain catastrophising, anxiety, and depression, and lower relationship satisfaction in the dyspareunia group compared to the pain free controls.
Burri et al. (2017)	Correlation	1. Sexual pain significantly associated with more anxiety sensitivity and depression.
Burri et al. (2020)	Correlation, multiple linear regression	<ol style="list-style-type: none"> 1. Lifelong sexual pain significantly associated with more total pain catastrophising, rumination, and depression. 2. In a multiple regression model, depression but not rumination was independently positively associated with lifelong sexual pain. 3. Non-significant correlations between lifelong sexual pain and magnification, helplessness, anxiety, escape and avoidance, fearful thinking, and physiological anxiety. 3. Moderation showed that only depression moderated the increase in genital pain over 4 years, women with depression showed less change in their reports of pain over the four years.
Carey et al. (2014)	Correlation	<ol style="list-style-type: none"> 1. Affective pain score significantly associated with more pain catastrophising. 2. Non-significant correlation between pain severity and depression. 3. Women who were prescribed anti-depressants reported significantly higher pain intensity than women not on anti-depressants.
Charbonneau-Lefebvre et al. (2019)	Correlation, autoregressive cross-lagged model	<ol style="list-style-type: none"> 1. Pain intensity significantly associated with less coping self-efficacy. 2. Non-significant correlation between pain intensity and avoidance and anxiety. 3. Reports of greater attachment anxiety and avoidance in women at T1 significantly predicted greater pain intensity at T2. 4. Reports of greater pain self-efficacy at T1 significantly predicted lower pain intensity at T2.

(Continued)

Table 2. Continued.

Study (Year)	Analysis	Outcomes
Cheng et al. (2017)	Correlation	<ol style="list-style-type: none"> 1. Pain significantly associated with more anxiety and depression. 2. Pain was significantly associated with less sexual satisfaction.
Chisari and Chilcot (2017)	Correlation, hierarchical regression	<ol style="list-style-type: none"> 1. Pain severity significantly associated with more fear avoidance, catastrophising, and avoidance. 2. In multivariate regression, higher levels of psychological distress, and catastrophising were associated with greater pain severity.
Chisari et al. (2022)	Correlation	<ol style="list-style-type: none"> 1. More baseline perceived injustice and less pain acceptance were associated with more pain severity at 3-month follow-up. 2. No other associations with pain severity reported.
Davis et al. (2015)	Correlation, latent difference score	<ol style="list-style-type: none"> 1. Pain significantly associated with more anxiety, fear, and pain catastrophising. 2. Pain significantly associated with less sexual satisfaction and coping self-efficacy. 3. Women with higher self-efficacy at T1 reported a decrease in pain and an increase in sexual satisfaction by T2.
Demirtaş et al. (2024)	Multiple logistic regression	<ol style="list-style-type: none"> 1. Anxiety was independently positively associated with chronic pelvic pain.
Dubé et al. (2024)	Correlations	<ol style="list-style-type: none"> 1. Genito-pelvic pain significantly associated with more perfectionism across T1, T3, and T4.
Jodoin et al. (2011)	Correlation, hierarchical regression	<ol style="list-style-type: none"> 1. Higher intensity of pain made a significant contribution to the prediction of psychological distress, whereby higher levels of pain intensity were associated with higher levels of psychological distress. 2. Non-significant associations of attributions of pain with pain intensity.
Landry and Bergeron (2011)	Correlation, t-test, Logistic Regression	<ol style="list-style-type: none"> 1. The experience of pain at first tampon insertion, increased the likelihood the avoidance of using tampons regularly compared to pain free girls. Adolescents who avoided tampons were over three times more likely to report chronic painful intercourse than adolescents who regularly used tampons without insertion pain. 2. Individuals who reported chronic painful intercourse reported a higher lifetime occurrence of sexual abuse than pain free adolescents. 3. Chronic painful intercourse was significantly associated with more trait anxiety. 4. Pain during first tampon insertion and trait anxiety significantly predicted more chronic painful intercourse. 5. For every 1 SD increase in trait anxiety, the likelihood of reporting chronic painful intercourse increased by 1.4 times.
Maathz et al. (2020)	Correlation, hierarchical regression	<ol style="list-style-type: none"> 1. Pain severity significantly associated with more psychological inflexibility. 2. Pain severity at baseline was not associated with psychological inflexibility at follow-up, whereas baseline psychological inflexibility at baseline was significantly positively associated with pain intensity at follow-up.
Masheb et al. (2005)	Correlation	<ol style="list-style-type: none"> 1. Pain associated with greater likelihood of Major Depressive Disorder (MDD).
Maulitz et al. (2024)	Correlation, ANOVA	<ol style="list-style-type: none"> 1. Women with chronic pelvic pain reported significantly more rumination and helplessness compared to controls, independent of endometriosis. 2. Women with chronic pelvic pain reported higher state and trait anxiety. 3. Women with chronic pelvic pain, regardless of endometriosis, reported higher depression.

(Continued)

Table 2. Continued.

Study (Year)	Analysis	Outcomes
Meana et al. (1999)	Univariate tests	<ol style="list-style-type: none"> 1. Women who attributed their vulvovaginal pain to psychosocial reasons scored significantly higher on depression, anxiety, and phobia. 2. Women who attributed their vulvovaginal pain to psychosocial reasons reported experiencing sexual assault as an adult; however, there were no differences between psychosocial and physical attributions for reports of childhood sexual abuse.
Mohammadzadeh et al. (2023)	t-tests, multiple logistic regression	<ol style="list-style-type: none"> 1. Association of pain with anxiety, but direction was not reported.
Nault et al. (2016)	Independent samples t-test	<ol style="list-style-type: none"> 1. Women who reported a history of abuse had an increased report of overall pain and vulva pain, compared to individuals who did not experience abuse.
Pâquet et al. (2016)	Correlation, linear regression	<ol style="list-style-type: none"> 1. Pain significantly associated with more perceived injustice for women and partners. 2. Pain significantly associated with more sexual distress for women, although this association was not significant for partner-report of sexual distress. 3. Association between pain and depression was non-significant for women and partners. 4. Pain significantly associated with less sexual satisfaction for women and partners. 5. After controlling for partners age, women's perceived injustice was not associated with greater pain intensity.
Pâquet et al. (2019)	Multivariate analysis	<ol style="list-style-type: none"> 1. Women with PVD who reported more anxiety were more likely to experience persistent pain. 2. Higher anxiety was uniquely positively associated with persistent pain.
Pazmany et al. (2013)	Correlation, MANOVA	<ol style="list-style-type: none"> 1. Women with dyspareunia, compared to their pain-free counterparts, reported increased sexual distress. 2. Women with dyspareunia reported higher levels of trait anxiety compared to the pain free control.
Rancourt et al. (2016)	Correlation	<ol style="list-style-type: none"> 1. Non-significant correlation between women's dyadic sexual communication and pain intensity. 2. Pain intensity significantly associated with lower level of men's dyadic sexual communication. 3. Pain intensity significantly associated with more depressive symptoms. 4. Non-significant correlation between women's sexual satisfaction and women's pain intensity. 5. Pain intensity significantly associated with lower men's sexual satisfaction.
Reed et al. (2014)	Multivariate model	<ol style="list-style-type: none"> 1. Significant associations were found between sleep disturbance, reported pain, and psychological disorders (depression and PTSD) at baseline. 2. Increased reports of sleep dysfunction, reported pain, and PTSD were significantly associated with vulvodynia onset. Depression was not significantly associated in this model.
Rosen et al. (2013)	Correlation, mediation	<ol style="list-style-type: none"> 1. Participant-perceived solicitousness was not significantly associated with pain intensity in women with PVD. 2. Pain intensity significantly associated with less coping self-efficacy and more depression. 3. Pain intensity significantly associated with more depressive symptoms. 4. Path analysis showed that higher participant-perceived solicitousness led to higher catastrophising, which in turn led to greater pain intensity. 5. Greater solicitous responses were associated with higher catastrophising, which was associated with increased pain.

(Continued)

Table 2. Continued.

Study (Year)	Analysis	Outcomes
Rosen et al. (2015)	Correlation, regression	<ol style="list-style-type: none"> 1. Pain intensity significantly associated with more perceived negative partner responses. 2. Non-significant correlation between women's perceived facilitative partner responses and pain intensity. 3. Pain intensity significantly associated with more perceived solicitous partner responses. 4. Pain intensity significantly associated with more anxiety. 5. Reports of pain increased on days of sexual intercourse when women perceived greater solicitous and negative responses.
Santerre-Baillargeon et al. (2018)	Correlation, linear regression	<ol style="list-style-type: none"> 1. Non-significant correlations between pain intensity and self-compassion, anxiety, depression, sexual distress, relationship satisfaction for women with PVD. 2. Self-compassion was not related to women's reported pain intensity in a regression model.
Silva et al. (2011)	Logistic regression	<ol style="list-style-type: none"> 1. More chronic pelvic pain significantly associated with more depression and anxiety.
Sutton et al. (2015)	t-tests	<ol style="list-style-type: none"> 1. Vulva pain experienced in women with primary PVD reported higher levels of overall pain anxiety and cognitive anxiety. 2. Increased reports of pain catastrophising was significant in the experience of vulva pain for women who had primary PVD.
ter Kuile et al. (2010)	Correlation	<ol style="list-style-type: none"> 1. Pain severity significantly associated with more sexual avoidance and sexual dissatisfaction.
Vannier et al. (2017)	Correlation	<ol style="list-style-type: none"> 1. Pain intensity significantly associated with less sexual and relationship satisfaction.
Yosef et al. (2016)	Correlation, linear regression	<ol style="list-style-type: none"> 1. Severity of chronic pelvic pain significantly associated with more anxiety and depression. 2. Severity of chronic pelvic pain significantly associated with sexual abuse in childhood and adulthood. 3. A linear regression model found that adult sexual assault was independently associated with more severe chronic pelvic pain.

Note. *= FSFI-Pain Subscale, lower score means more pain; PVD=Provoked Vestibulodynia; PTSD=Post Traumatic Stress Disorder.

pain and more general psychological distress (Jodoin et al., 2011). Three studies (Landry & Bergeron, 2011; Maulitz et al., 2024; Pazmany et al., 2013) found positive associations of pain with trait anxiety (i.e., increased appraisal of situations as threatening and possessing high physiological arousal; Elwood et al., 2012). Landry and Bergeron (2011) found that for every standard deviation (SD) increase in an adolescents' trait anxiety, increased the likelihood that painful intercourse was reported. Pazmany et al. (2013) found that women with dyspareunia reported higher levels of trait anxiety, compared to the pain free controls, which was previously reported by Brauer et al. (2009). Maulitz et al. (2024) found that women with chronic pelvic pain reported higher state and trait anxiety. Additionally, Pâquet et al. (2019) and Sutton et al. (2015) found that women with PVD who reported more persistent pain reported higher overall anxiety.

Three studies used regression modelling to determine if anxiety was a unique correlate of women's pain after controlling for other factors (Demirtaş et al., 2024; Pâquet et al., 2019; Silva et al., 2011). In these studies, anxiety was uniquely associated with more chronic pain. Finally, in a study comparing women who attributed their pain to psychosocial versus physical (e.g., anatomical) causes, women who attributed

Table 3. Measurement of pain and outcome variables for the 35 included studies.

Study (Year)	Measurement of pain	Outcome variables
Bhandari Randhawa et al. (2024)	Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (Question 5)	Anxiety Depression
Bourdon et al. (2023)	Visual Analogue Scale	Abuse
Boyer and Pukall (2014)	FSFI pain subscale (<i>Lower score is higher pain</i>) ^a	Anxiety Sexual abuse
Brauer et al. (2009)	Visual Analogue Scale FSFI pain subscale (<i>Lower score is higher pain</i>) ^a Vulvar Pain Questionnaire Genital Pain Ratings	Vaginal penetration cognitions Anxiety Depression Pain catastrophising Relationship satisfaction Sex attitudes
Burri et al. (2017)	FSFI pain subscale (<i>Lower score is higher pain</i>) ^a	Anxiety Depression
Burri et al. (2020)	FSFI pain subscale (<i>Lower score is higher pain</i>) ^a	Anxiety Depression Pain catastrophising Rumination and magnification Fear of pain
Carey et al. (2014)	McGill Pain Questionnaire – short form	Depression Pain catastrophising
Charbonneau-Lefebvre et al. (2019)	Horizontal Rating Scale	Attachment anxiety and avoidance Pain coping self-efficacy
Cheng et al. (2017)	FSFI pain subscale (<i>Lower score is higher pain</i>) ^a	Anxiety Depression Sexual satisfaction
Chisari and Chilcot (2017)	Numeric Pain Rating Scale	Psychological distress (measured by depression and anxiety symptoms) Pain catastrophising
Chisari et al. (2022)	Brief Pain Inventory – short form	Avoidance Depression Sexual satisfaction Pain acceptance Perceived injustice (only associations of pain severity with perceived injustice and pain acceptance were reported)
Davis et al. (2015)	Visual Analogue Scale	Anxiety Fear Sexual satisfaction Pain catastrophising Pain coping self-efficacy
Demirtaş et al. (2024)	Visual Analogue Scale	Anxiety
Dubé et al. (2024)	Arizona Sexual Experience Scale	Perfectionism
Jodoïn et al. (2011)	Visual Analogue Scale	Anxiety and depression combined
Landry and Bergeron (2011)	Visual Analogue Scale	Anxiety Avoidance Sexual abuse
Maathz et al. (2020)	FSFI pain subscale (<i>Lower score is higher pain</i>) ^a	Psychological inflexibility
Masheb et al. (2005)	West Haven-Yale Multidimensional Pain Inventory	Depression Major depressive disorder
Maulitz et al. (2024)	McGill Pain Questionnaire	Anxiety Depression Rumination Helplessness
Meana et al. (1999)	McGill-Melzack Pain Questionnaire	Anxiety Depression Sexual abuse
Mohammadzadeh et al. (2023)	Asked 'yes' or 'no' to the experience of pain	Anxiety
Nault et al. (2016)	Visual Analogue Scale	Abuse

(Continued)

Table 3. Continued.

Study (Year)	Measurement of pain	Outcome variables
Pâquet et al. (2016)	McGill-Melzack Pain Questionnaire	Depression Sexual satisfaction Sexual distress Perceived injustice
Pâquet et al. (2019)	Numerical Rating Scale	Anxiety
Pazmany et al. (2013)	Visual Analogue Scale	Anxiety Sexual distress
Rancourt et al. (2016)	Numerical Rating Scale	Depression Sexual satisfaction Sexual communication
Reed et al. (2014)	Asked 'yes' or 'no' to the experience of pain	Depression
Rosen et al. (2013)	Horizontal Analogue Scale	Anxiety Depression Pain catastrophising Pain coping self-efficacy Partner communication and responses
Rosen et al. (2015)	Horizontal Numerical Rating	Partner responses
Santerre-Baillargeon et al. (2018)	Numerical Rating Scale	Anxiety Depression Sexual distress Relationship satisfaction Self-compassion
Silva et al. (2011)	Visual Analogue Scale	Anxiety Depression
Sutton et al. (2015)	FSFI pain subscale (<i>Lower score is higher pain</i>) ^a	Anxiety Pain catastrophising
ter Kuile et al. (2010)	Visual Analogue Scale	Sexual dissatisfaction Avoidance
Vannier et al. (2017)	Numerical Rating Scale	Sexual satisfaction Relationship satisfaction
Yosef et al. (2016)	Numeric Rating Scale	Anxiety Depression Sexual abuse

Note. FSFI=Female Sexual Function Index – Pain Subscale.

^aResults were adjusted in Table 2 to reflect this scoring.

their pain to psychosocial causes were higher in anxiety and phobia than women who attributed it to a physical cause (Meana et al., 1999).

Pain and anxiety were not significantly associated in three studies (Bhandari Randhawa et al., 2024, USA; Burri et al., 2020, UK; Santerre-Baillargeon et al., 2018, USA), and one study did not report the direction of the association between pain and anxiety (Mohammadzadeh et al., 2023). Finally, regarding the study of *attachment* anxiety, Charbonneau-Lefebvre et al. (2019) followed women over time and found that women who reported more attachment anxiety at baseline showed a greater increase in pain intensity over the following 2 years.

Depression and psychological distress

Depression and psychological distress are shown by a lack of energy and functional impairment, among other symptoms, with depression affecting an individual's daily life and impacting on various cognitive and social factors (American Psychological Association, 2022). Psychological distress involves negative affect and reactivity to perceived threats (American Psychological Association, 2022). Eighteen of the included

studies incorporated a measure of depression (with two measuring more general emotional distress including depression; Chisari & Chilcot, 2017; Jodoin et al., 2011) and reported on associations with pain, with 13 of these studies (72%) reporting that vulvovaginal pain and symptoms were positively associated. Eleven of the studies had also measured anxiety (findings reported above).

A positive correlation between pain and depression or distress was found in six studies (Burri et al., 2017; Cheng et al., 2017; Chisari & Chilcot, 2017; Rancourt et al., 2016; Rosen et al., 2013; Yosef et al., 2016) and three studies controlled for other potential correlates of pain and found that depressive symptoms had significant, unique associations with having more intense pain (Brauer et al., 2009; Maulitz et al., 2024; Silva et al., 2011). Furthermore, in a longitudinal study (Reed et al., 2014), depression was significantly associated with a higher baseline level of reported pain. There is also evidence that women who attribute their pain to psychological conditions often scored higher on depression, compared to women who attributed their pain to physical conditions (Meana et al., 1999). In addition, Burri et al. (2020) found that depression was uniquely positively associated with lifelong sexual pain, after controlling for other factors, like rumination.

Three cross-sectional studies, one recruiting a clinical sample (Carey et al., 2014) and two recruiting convenience samples (Pâquet et al., 2016; Santerre-Baillargeon et al., 2018), reported no association between recent depression (in the past 2 weeks) and women's pain. Another study, which explored women's baseline and 1-year postpartum depression score, did not find a significant association between sexual pain and depression (Bhandari Randhawa et al., 2024). One study did not report the direction of the association between depression and pain (Masheb et al., 2005).

Sexual satisfaction and sexual distress

Sexual satisfaction refers to mutual pleasure and positive sexual experiences (Pascoal et al., 2014), and sexual distress captures an individual's frustration or worry experienced in association with their sexual function (Stephenson & Meston, 2010). Women's pain was investigated as a correlate of sexual satisfaction or distress in nine studies and seven of these studies (78%) found an association between vulvovaginal pain and lower sexual satisfaction or more sexual distress. Four of these studies reported a significant, negative association between pain intensity and sexual satisfaction (Cheng et al., 2017; Davis et al., 2015; Pâquet et al., 2016; Vannier et al., 2017), and one study measured sexual dissatisfaction and reported a significant, positive association with pain intensity (ter Kuile et al., 2010). Pâquet et al. (2016) also reported a significant positive association between women's pain and sexual distress. Similar findings emerged in a study that examined the association of dyspareunia with sexual distress, whereby women diagnosed with dyspareunia scored higher in sexual distress, compared to their pain-free counterparts (Pazmany et al., 2013). Finally, Brauer et al. (2009) reported increased negative sexual attitudes and less positive, and more negative, affect during the most recent sexual intercourse in women with dyspareunia compared to their pain free counterparts.

In contrast to the above studies, one study did not find a significant correlation between pain intensity and sexual satisfaction (Rancourt et al., 2016). Additionally, one study (Santerre-Baillargeon et al., 2018) did not find a significant association between pain and sexual distress.

Pain catastrophising

Pain catastrophising refers to extreme negative thinking about pain, particularly towards the capacity to cope and manage the outcomes of symptoms (Okifuji & Turk, 2016). In the seven studies that included a measure of pain catastrophising, it was universally found that pain intensity and pain catastrophising are positively related, whereby individuals who reported greater pain intensity also more strongly endorsed scale items such as 'There is nothing I can do to reduce the intensity of my pain' (Sullivan et al., 1995). Five studies reported a significant correlation between pain intensity and catastrophising (Burri et al., 2020; Carey et al., 2014; Chisari & Chilcot, 2017; Davis et al., 2015; Sutton et al., 2015). One study also controlled for other potential influences on pain, still finding that higher levels of catastrophising were associated with increased pain severity (Chisari & Chilcot, 2017). Moreover, Rosen et al. (2013) found an association of pain intensity with more catastrophising, but expanded this using mediation analysis to find that higher participant-perceived solicitousness responses from their partner led to higher catastrophising, which then led to more intense pain. Finally, Brauer et al. (2009) reported that women with dyspareunia reported more pain catastrophising, compared to women who were pain free.

Sexual abuse and assault

Six studies considered pain as a correlate of historical sexual abuse/assault, with five studies reporting an association between abuse and the experience or severity of pain. One study found that women who reported sexual abuse in childhood and adulthood also reported more severe chronic pelvic pain (Yosef et al., 2016). In another study, women with chronic painful intercourse reported a higher lifetime occurrence of sexual abuse than their pain-free counterparts (Landry & Bergeron, 2011) and women with a history of abuse reported more vulva pain compared to women with no history of abuse (Nault et al., 2016). Similarly, Bourdon et al. (2023) found an independent association between severe pelvic pain and a history of sexual abuse. Meana et al. (1999) suggested that increased reports of vulvovaginal pain that were attributed to psychosocial reasons were associated with the higher reports of adult sexual assault; however, there were no differences between psychosocial or physical attributions in relation to reports of childhood sexual abuse. Finally, one study (Boyer & Pukall, 2014) did not find a significant correlation between childhood sexual abuse history and vaginal penetration pain intensity.

Pain avoidance

Pain avoidance is often linked to anxiety or fear, which influences situational avoidance; for those with pain, this can be specific to avoiding activities that may cause pain (Hasenbring, 2000). Of the four studies that included some marker of pain avoidant behaviours, two studies (50%) reported significant positive associations between women's vulvovaginal pain intensity and more avoidance (Chisari & Chilcot, 2017; ter Kuile et al., 2010). Interestingly, Landry and Bergeron (2011) focused on

avoidance of tampon use and found that the experience of pain at first tampon insertion increased the likelihood of avoiding tampon use in the future, with this avoidance of tampons increasing the possibility of reports of chronic painful intercourse. Conversely, in a longitudinal study conducted over 4 years, the association between lifelong sexual pain and avoidance was not significantly associated (Burri et al., 2020).

Finally, in a longitudinal study, Charbonneau-Lefebvre et al. (2019) measured attachment avoidance, which assesses avoidance of close relationships rather than pain or pain triggers. They did not find a significant concurrent association between pain intensity and attachment avoidance, but greater avoidance at baseline significantly predicted increased pain intensity 2 years later.

Relationship satisfaction

Relationship satisfaction was examined in four studies. Relationship satisfaction was measured to capture an individual's attitudes and feelings towards their partner and if their needs are met by their partner (Fincham & Rogge, 2010). Three studies found significant associations of pain with less relationship satisfaction, with women reporting more intense vulvovaginal pain found to be lower in relationship satisfaction (Vannier et al., 2017) and women with dyspareunia reported lower relationship satisfaction compared to women without dyspareunia (Brauer et al., 2009). However, one study found no significant correlation between pain intensity and relationship satisfaction (Santerre-Baillargeon et al., 2018).

Partner communication

Three studies considered partner communication, which can encompass empathic and facilitative responses towards vulvovaginal pain, along with negative and solicitous responses. One study found that there was a significant, negative association between women's pain intensity and male partners' dyadic sexual communication (Rancourt et al., 2016). This same study found a non-significant correlation between pain intensity and women's dyadic sexual communication. One study found a significant, positive relationship between women's pain intensity and perceived negative and solicitous partner responses (Rosen et al., 2015), but an earlier study by Rosen et al. (2013) did not find this association to be significant among women with PVD. Also, women's pain intensity was not significantly associated with their reports of facilitative partner responses.

Pain coping self-efficacy

Pain coping self-efficacy, considered in three studies, referred to confidence in coping and reducing pain (Edwards et al., 2016). All studies found that pain severity was associated with women's lower perceptions of self-efficacy to manage their pain (Charbonneau-Lefebvre et al., 2019; Davis et al., 2015; Rosen et al., 2013). Moreover, self-efficacy may help to reduce pain. In a longitudinal study, Charbonneau-Lefebvre et al. (2019) found that women who reported greater pain self-efficacy at the first time point had lower pain intensity at follow-up.

Perceived injustice

Perceived injustice, considered in two studies, referred to cognitive appraisal of loss as a consequence of unfairness (Roose et al., 2023). Greater pain intensity was positively correlated with an increase in a woman's perceived injustice in both studies (Chisari et al., 2022; Pâquet et al., 2016). Chisari et al. (2022) also reported that increased perceived injustice from baseline resulted in increased depression and lower sexual satisfaction at the 3-month follow-up.

Psychological inflexibility

Psychological inflexibility, considered in two studies, is defined as a rigid response to one's inner experience that may interfere with an individual's well-being (Hayes et al., 2012). Both studies reported a significant, positive association of pain intensity with psychological inflexibility and negative cognitions about vaginal penetration (Boyer & Pukall, 2014; Maathz et al., 2020). For example, Boyer and Pukall (2014) used a hierarchical regression analysis which showed that increased reports of pain during intercourse or vaginal penetration were associated with higher reports of negative cognitions about vaginal penetration, which either led to increased anxiety or more pain during women's last pelvic examination.

Other thoughts and beliefs

A number of other thoughts or beliefs were considered in one study each, including pain acceptance, self-compassion, perfectionism, penetration cognitions, rumination, magnification and helplessness. Pain acceptance was operationalised as the acceptance or openness to the experience of pain, without letting the pain disrupt daily activities (McCracken & Velleman, 2010). In a longitudinal study (Chisari et al., 2022), women who reported more pain acceptance at baseline had less pain severity at a 3-month follow-up (as well as less depression and more sexual satisfaction).

Self-compassion referred to the ability to hold a healthy attitude towards ourselves, which can build resilience in the face of negative situations (Leary et al., 2007; Neff, 2003). The only study on self-compassion found no significant associations of pain intensity with self-compassion (Santerre-Baillargeon et al., 2018). In one study (Dubé et al., 2024), perfectionism referred to a personality disposition that comprises of high standards which exceeds expectations, with individuals often being overly critical of themselves; genito-pelvic pain had a significant, positive correlation with perfectionism.

One study explored rumination and magnification (Burri et al., 2020). In a multiple regression, rumination was not uniquely associated with short-lived sexual pain when magnification, fear of pain and depression were also considered. Another study explored rumination and helplessness, when compared to the control group, and found that women with chronic pelvic pain were higher in rumination and helplessness, independent of endometriosis diagnosis (Maulitz et al., 2024).

Discussion

This review summarised 35 studies across 25 years that had investigated the association of women's experiences of vulvovaginal pain with measures of psychosocial

adjustment. Studies were largely of high to very high quality, with issues concerning quality relating to not controlling for confounding variables or not reporting inclusion criteria. Studies primarily collected survey data at one point in time (i.e., cross-sectional study designs). Thus, all findings must be viewed as correlational. Furthermore, we conclude the risk of bias in these studies was low, but we also highlight multiple notable study limitations to address in future research.

The most commonly studied psychosocial adjustment indicators (with more than five studies each) were anxiety (or fear), depressive symptoms (or psychological distress), sexual dissatisfaction/distress and pain catastrophising. Pain catastrophising was the only one of these that was universally associated with having experienced vulvovaginal pain or reporting more intense pain. In addition, the majority of studies found that women with pain or more intense pain were more anxious and less sexually satisfied (or more sexually distressed). Furthermore, just over one-half of the studies of depressive symptoms found that women who experience pain or report more intense pain have more symptoms. Thus, in these areas, the findings suggest that women who have experienced vulvovaginal pain or report more intense pain have more symptoms of anxiety and more fear, less sexual satisfaction, and are more likely to catastrophise their pain. Women who experience or report more intense pain may also report more depressive symptoms or show more signs of psychological distress.

Other than studies of anxiety, depression, sexual satisfaction and pain catastrophising, all the other possible psychosocial adjustment correlates of pain described in this review have attracted sparse research attention. Nevertheless, the findings did suggest a range of other adjustment problems that may co-occur with vulvovaginal pain. More specifically, in other areas that had been considered in more than two studies, vulvovaginal pain was associated in at least one study with more pain avoidance (e.g., changing behaviours to reduce the possibility of pain), lower relationship satisfaction, poorer partner communication, past sexual abuse or assault and less coping self-efficacy. A range of other measures of adjustment had also been considered in one or two studies, finding associations between vulvovaginal pain and more perceived injustice, perfectionism, and various other cognitions (i.e., psychological inflexibility, negative penetration cognitions and rumination), as well as less pain acceptance. The one study of self-compassion found no association with pain. Thus, overall, the findings are mixed for almost all aspects of psychosocial adjustment that have been studied, but the most prominent of the other correlates of women's vulvovaginal pain were the use of pain avoidance behaviours, poorer relationship satisfaction and partner communication, a history of sexual abuse, and low coping self-efficacy. Moreover, the results identified within this study are similar to studies of psychosocial correlates of back pain (Ramond et al., 2011) and pain associated with inflammatory bowel disease (Sweeney et al., 2018), which suggest that the psychosocial correlates identified are not unique to vulvovaginal pain and are a more widespread issue for chronic pain generally.

Research gaps, future research directions and limitations of studies

Despite the high quality of almost all studies included in this review, including good samples sizes and the use of reliable and valid measures, the findings are limited in

multiple ways. Most notably, the majority of studies focused on correlates that would be expected to relate to more pain intensity, rather than focusing on positive coping strategies or other responses (or the aspects of relationships) that could help to reduce or manage pain. Notably, pain acceptance was examined in one study, and it was associated with less pain, but in another study the possible positive coping strategy of self-compassion was not associated with women's reported pain intensity. Future research is needed that concentrates on potentially adaptive and beneficial responses to pain, as they need more attention to guide support for women. It would be beneficial to have more studies that consider the many ways of coping with pain, given that neuroscience education seems to address coping and fear perception as key mechanisms for supporting women with pain (Louw & Riera-Gilley, 2024).

Most of the studies were conducted in high-income Western countries (i.e., 39% Canada, 17% United States and 11% United Kingdom), therefore limiting generalisability to countries which may have more reduced access to healthcare and health literacy. Furthermore, a few of the reviewed studies were limited by not explicitly examining pain intensity, but rather they identified women with pain based on whether a specific diagnostic criterion was met and some studies focused on sexual pain or insertion pain specifically. Moreover, very few studies had a sample of clinic only patients. These approaches and methodological issues could limit understanding of the variability of pain and its intensity, and some findings may have overlooked the experiences and healthcare needs of some women who experience pain. As such, there is a need for future studies to examine vulvovaginal pain and psychosocial factors, as they present for all women, that either do or do not meet a diagnostic criterion for study inclusion.

Given the cross-sectional survey design of most studies included in this review, our review findings cannot address causality or the direction of effects. Thus, additional longitudinal studies and randomised controlled trials (RCTs) are needed to better untangle the possibly complicated pathways linking psychosocial factors with women's vulvovaginal pain (or vice versa). Some studies have started to address this, finding that depression, and not rumination, was independently associated with pain intensity (Burri et al., 2020) or that solicitous responses from partners towards women's pain led to higher catastrophising, which in turn led to increased pain (Rosen et al., 2013). Additionally, increased reports of pain during intercourse or vaginal penetration were associated with higher reports of negative cognitions about vaginal penetration, which led to more pain (Boyer & Pukall, 2014). As such, these findings further progress the notion that there is a psychosocial component to the aetiology of vulvovaginal pain among women, but that the role of these factors may not always be direct and may or may not be causal. Understandably, longitudinal designs and RCTs are more difficult to carry out than the cross-sectional designs of most studies included in this review. However, the preliminary findings here demonstrate a compelling argument for using these methodological approaches to better understand the mechanisms involved, longer term effects and the trajectory of pain over time. Ideally, such a study would include many of the measures covered in this review, including mental health, coping responses, sexual and relationship factors and beliefs about pain.

Another area for attention is the consideration of the impact of measures on study findings. A range of different measures were used to capture the experience of pain,

which means fewer study replications and more complexity when interpreting the findings as a whole. While the measures across studies appeared similar in content and format, they were not uniform. Thus, there is a need for uniformity amongst the research to ensure consistency, aid replicability and increase the comparability of findings. In addition, research in this area should make the consideration of confounders and covariates (e.g., relationship status, age) a high priority to more precisely estimate the unique relations of psychosocial factors with vulvovaginal pain.

Finally, all studies were limited by their reliance on self-report from women regarding their psychosocial and pain experiences. We would argue that there is little alternative way to collect these data other than using self-report. However, the use of self-report should be kept in mind when interpreting all study findings. For example, some women may be more hesitant to report their pain levels, sexual experiences or negative feelings than others, and this may have had an influence on the results of some or all studies.

Clinical implications

There are also clinical and practical implications from this review. These implications include assisting clinicians in tailoring interventions to better address potential psychosocial mechanisms associated with vulvovaginal pain. These could include restructuring cognitions about pain, increasing coping self-efficacy when experiencing pain and increasing women's knowledge of the impact of pain avoidance. Further, this review has highlighted the multiple psychosocial factors associated with vulvovaginal pain and suggests the importance of psychological interventions, such as cognitive behavioural therapy or acceptance and commitment therapy, for addressing concerns related to vulvovaginal pain. These findings will be useful for policy development that aims at assisting women with vulvovaginal pain at any intensity, but they may be especially relevant for women who experience pain without an identifiable physical contributor. Lastly, this review can aid in information campaigns, which may assist in health literacy and raising awareness of the prevalence and psychosocial implications of vulvovaginal pain.

Review limitations

The limitations that are present within this review are not uncommon among systematic reviews. Specifically, there were problems with procuring a few studies due to access and availability and one study could not be included because of lack of access to translation. Additionally, there was some variety in methodological approaches used across the studies, making direct comparison of findings within areas or across areas difficult. Specifically, some studies did not explicitly measure pain intensity but had instead included women with a diagnosis where the pain was experienced at least 50% of the time or more Brauer et al., 2009; Pazmany et al., 2013). For this review, and synthesising with other research, these results were incorporated and interpreted as if they were similar in their focus. As such, as the number of studies grows, future reviews could review a more homogeneous set of studies, such as those that include a continuous measure of pain intensity.

Conclusions

This systematic review identified many psychosocial factors associated with women's reports of their experience or the intensity of their vulvovaginal pain. Notably, when studied, pain catastrophising was always associated with more intense (or the experience) of vulvovaginal pain. In addition, anxiety (along with fear) and depression (or psychological distress) were the most researched psychosocial correlates of women's pain, with evidence suggesting that women who report more intense pain experience more anxiety and fear, and they may also experience more depressive symptoms and psychological distress. Although studied much less frequently than anxiety and depression, women who report more intense vulvovaginal pain also experience a range of other adjustment difficulties that can impact their daily lives and social relationships, such as avoiding activities linked with pain and experiencing less sexual satisfaction. In comparison with studying these problems associated with pain, the psychosocial factors that could help manage pain were given less attention. However, when studied, the positive factors that stood out included accepting the pain, communication with partners and self-efficacy beliefs regarding coping with pain. By identifying these associations, assessing the quality of the research and pinpointing future research gaps, it is hoped that the review findings will be useful for the development of future recommendations for researchers, policymakers, clinicians and healthcare providers regarding how to assess for, address, and manage psychosocial factors that are comorbid with vulvovaginal pain among women.

Registration and protocol

Amendments made to the protocol prospectively registered on PROSPERO (CRD42022370502) were minor. The amendments were done to maximise the quality of the produced synthesis. Eligibility criteria were refined to exclude qualitative designs and studies which only provided information on a diagnosis and not the pain threshold.

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Author contributions (CRediT)

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Availability of materials

Any supplementary material to do with this review can be requested from the corresponding author using the contact details provided.

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Appendix A

Critical appraisal of quantitative studies using JBI critical appraisal tool

Study (Year)	Criteria for Inclusion	Subjects and Setting Described	Pain Measured	Objective and Standard Measurement	Identification of Confounding Variables	Strategies Used for Confounding Variables	Outcomes Measured Reliably and Validly	Appropriate Statistical Analysis	Quality %
Bhandari Randhawa et al. (2024)	Y	Y	Y	Y	C	C	Y	Y	75%
Bourdon et al. (2023)	C	Y	C	C	Y	Y	Y	Y	62%
Boyer and Pukall (2014)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Brauer et al. (2009)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Burri et al. (2017)	C	Y	Y	Y	C	C	Y	Y	62%
Burri et al. (2020)	Y	Y	Y	Y	C	C	Y	Y	75%
Carey et al. (2014)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Charbonneau-Lefebvre et al. (2019)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Cheng et al. (2017)	C	C	Y	Y	C	C	Y	Y	50%
Chisari and Chilcot (2017)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Chisari et al. (2022)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Davis et al. (2015)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Demirtaş et al. (2024)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Dubé et al. (2024)	Y	Y	Y	Y	C	C	Y	Y	75%
Jodoin et al. (2011)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Landry and Bergeron (2011)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Maathz et al. (2020)	Y	Y	Y	Y	Y	Y	Y	Y	75%
Masheb et al. (2005)	Y	Y	C	Y	Y	Y	Y	Y	87.5%
Maulitz et al. (2024)	C	Y	Y	Y	Y	Y	Y	Y	87.5%
Meana et al. (1999)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Mohammadzadeh et al. (2023)	Y	C	Y	Y	Y	Y	Y	Y	87.5%
Nault et al. (2016)	C	Y	Y	C	Y	Y	Y	Y	75%
Pâquet et al. (2016)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Pâquet et al. (2019)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Pazmany et al. (2013)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Rancourt et al. (2016)	Y	Y	C	Y	Y	Y	Y	Y	87.5%
Reed et al. (2014)	Y	Y	Y	Y	Y	Y	C	Y	87.5%
Rosen et al. (2013)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Rosen et al. (2015)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Santerre-Baillargeon et al. (2018)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Silva et al. (2011)	C	Y	Y	C	Y	Y	Y	Y	75%
Sutton et al. (2015)	Y	Y	Y	Y	Y	Y	Y	Y	100%
ter Kuile et al. (2010)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Vannier et al. (2017)	Y	Y	Y	Y	Y	Y	Y	Y	100%
Yosef et al. (2016)	Y	Y	Y	Y	Y	Y	Y	Y	100%

Note. C = unsure/cannot tell; Y = present.