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REVIEW ARTICLE

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Psychosocial factors associated with pain and sexual function in women with Vulvodynia: A systematic review

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Abstract

Background and objective: Vulvodynia is a prevalent chronic vulval pain condition affecting 10%–28% of women, and significantly impacting their health and quality of life. It is currently poorly understood and biomedical treatments achieve only modest benefits for pain and sexual functioning. A wider psychosocial conceptualization of this condition may improve outcomes. There is currently no coherent understanding of how psychosocial factors may contribute to outcomes in Vulvodynia. The aim of this review is to identify and systematically review psychosocial factors associated with pain and sexual outcomes and to inform a psychosocial model of Vulvodynia.

Databases and data treatment: Observational/experimental studies reporting on the association between psychosocial factors and pain/sexual outcomes in adult women with Vulvodynia were eligible. Two reviewers independently conducted eligibility screening, data extraction and quality assessment. Twenty-one studies were included, all focused on women with Provoked Vestibulodynia (PVD). Most of the studies were low-to-medium quality.

Results/Conclusion: A range of general/pain-related distress and avoidance processes, and sex/intimacy avoidance or engagement processes were significantly associated with pain, sexual functioning or sexual distress and sexual satisfaction, supporting the role of a psychosocial approach to PVD. Depression, anxiety, catastrophizing, pain-anxiety, pain acceptance, body-exposure anxiety, attention to sexual cues, partner hostility and solicitousness, self-efficacy and penetration cognitions are highlighted as potentially important treatment targets in PVD. Due to the limited data available, developing a psychosocial model was not possible. Directions for future research include examining the replicability and generalizability of the factors identified, exploring differences/similarities across Vulvodynia subsets and testing tailored theoretically based treatments.

Significance: The systematic review highlights the role of psychosocial factors associated with pain and sexual functioning in Vulvodynia. The review findings reveal that Vulvodynia presents both similar and unique cognitive, behavioural and interpersonal features compared to other chronic pain conditions. There may be important roles for negative sexual cues, body image–related factors during intercourse, partner factors, self-efficacy beliefs and penetration cognitions, in relation to pain and sexual functioning.

1 | INTRODUCTION

Vulvodynia is a prevalent condition characterized by persistent vulval pain, described as sharp, burning and "knife-like" (Andres et al., 2016). Population-based estimates indicate that the lifetime prevalence of Vulvodynia ranges from 10%–28% (Harlow & Stewart, 2003). Vulvodynia can be categorized based on pain location (generalized to the whole vulva, localized or mixed), situations that elicit the pain (spontaneous, upon contact or mixed), temporal pattern (e.g. intermittent/constant) and onset (primary/secondary) (Bornstein et al., 2016). The most common subtype, 'Provoked Vestibulodynia (PVD)', refers to pain that is elicited when pressure is applied to the vulvar vestibule, representing 80% of cases of Vulvodynia (Wesselmann et al., 2014). To date, Vulvodynia represents the most common form of dyspareunia (Dunkley & Brotto, 2016), and spontaneous pain can occur during daily activities such as walking and sitting (Shallcross et al., 2018), significantly affecting women's quality of life, mental and physical health (Bornstein et al., 2019; Chalmers et al., 2017). The direct and indirect costs of Vulvodynia in the United States range from 31 to 72 billion dollars annually (Xie et al., 2012).

Despite its prevalence, economic burden and personal impact (Xie et al., 2012), the aetiology of Vulvodynia remains unknown and is considered multifactorial (Bornstein et al., 2016). The 2015 consensus terminology and classification of vulvar pain (Bornstein et al., 2016) has highlighted several potential factors associated with Vulvodynia. These include neurologic mechanisms, inflammation, neuroproliferation, musculoskeletal patterns, genetic predisposition, hormonal factors, structural defects and psychosocial factors.

Clearly, the constellation of factors characterizing Vulvodynia suggests that biopsychosocial aetiological pathways are involved in the development and persistence of this condition. However, conceptualizations of Vulvodynia still largely adhere to a coarse dualistic distinction, with pain seen as either medical or psychological in nature. Reflecting this, treatment for Vulvodynia has primarily included pharmacotherapy, surgery or psychotherapy (Flanagan et al., 2015). A recent systematic review of medical treatments for Vulvodynia suggests low success rates in general, and optimal therapies remain elusive (Klann et al., 2018). Thus, a broader approach is needed, and this will particularly require specific evidence around psychosocial factors.

While there are several studies of psychosocial factors in Vulvodynia (Chisari & Chilcot, 2017; Santerre-Baillargeon et al., 2018), and its impactful nature is significantly associated with psychological, emotional and sexual difficulties (Bois et al., 2016; Gates & Galask, 2001; Khandker et al., 2011), there is no coherent understanding of how psychosocial factors impact on outcomes or interact with relevant disease variables.

To date, no systematic reviews exploring the role of psychosocial variables in pain and sexual outcomes in Vulvodynia exist. A comprehensive account of psychosocial factors in Vulvodynia will provide a basis to guide future research and the development of treatments to target potentially modifiable factors.

The aims of this systematic review were (1) to identify psychosocial factors associated with pain and sexual outcomes in women with Vulvodynia, (2) to evaluate the quality of evidence of associations among these factors, (3) to evaluate whether different psychosocial factors apply across Vulvodynia subtypes and (4) to provide a preliminary psychosocial model.

2 | LITERATURE SEARCH METHODS

The protocol for this review was registered on Prospero (ID CRD42019116497).

2.1 | Eligibility criteria

Studies were eligible if they reported on pain intensity, pain-related interference, quality of life, sexual function/sexual distress or sexual satisfaction in adult women with Vulvodynia and measured at least one psychosocial factor. No upper age limit was set as Vulvodynia can affect women of any age (Harlow & Stewart, 2003).

Primary outcomes were pain and sexual functioning or distress. Secondary outcomes were interference, quality of life and sexual satisfaction. Studies were eligible if they reported correlations between psychosocial factors and outcomes to allow a clearer comparison of data across studies.

2.1.1 | Specific requirements regarding Vulvodynia classification and diagnosis

Terminology, definition and classification of vulvodynia and its subsets, such as PVD, have greatly evolved over the years. The first worldwide evidence-based consensus terminology, based on the input from experts experienced in vulvar pain, was achieved in 2003 (Moyal-Barracco and Lynch, 2003). For this reason, studies included in this review were considered eligible if they were conducted following this date. There was an updated consensus on the Vulvodynia terminology in 2015 (Bornstein et al., 2016) but this involved the addition of potential factors associated with Vulvodynia, without changing its definition. As no major changes have been made, studies between 2003 and 2015 were still considered eligible. Additionally, to overcome the issue of misdiagnosis

which has been acknowledged in the literature (Graziottin et al., 2001), studies were considered eligible if Vulvodynia was clinically confirmed during participation through a gynaecological examination.

Studies involving dyads were included if they also included associations of women's psychosocial factors and their own outcomes, in addition to couples' factors. Additionally, while studies examining the role of partners' psychosocial factors on women's outcomes were included, associations of partners' psychosocial factors with the partners' own outcomes were not included. Studies were required to use quantitative, psychometrically validated pain severity, pain interference, quality of life, sexual functioning/distress and sexual satisfaction measures in conjunction with cognitive, emotional, personality, behavioural or social factors. Inclusion and exclusion criteria are presented in Table S1.

2.2 | Search strategy and study selection

Studies were identified by conducting systematic online searches of MEDLINE, EMBASE, PsycINFO, CINAHL, Cochrane Library, Web of Science, contacting key authors to request unpublished or in-press literature and hand-searching reference lists of included studies between February and September 2019. Database searches were conducted using key terms tailored for each database and included terms for "Vulvodynia" and "psychosocial factors" combined using the set operators OR and AND (Table S2). Search terms were discussed with a Dermatology Consultant and researcher specialized in Vulvodynia. MeSH and exploded terms were utilized to maximize search results. Publication date limits were applied to studies, published in English, conducted from 2003 onwards. References from each database search were collated in RefWorks and uploaded on Rayyan. Duplicates were removed, and titles and abstracts and full-text screening were carried out by C.C. and M. M. independently using predetermined criteria. Disagreements on inclusion/exclusion criteria were discussed to reach consensus. If a consensus could not be reached, a third reviewer was consulted.

2.3 | Data extraction and synthesis

Predefined data extraction criteria, based on the PICOS-PRISMA guidelines (Liberati et al., 2009), were conducted by two authors (C.C and M.M). Extracted information included (1) study design; (2) the number of participants; (3) characteristics of patient sample (age, diagnosis of Vulvodynia and subtype if applicable); (4) comparator group (if applicable); (5) recruitment source; (6) type of (correlate) psychosocial measure; (7) type of (outcome) pain, sexual function and quality of life measures; (8) key findings; (9) key quantitative data and (10) additional clinical/ demographic correlates with pain, pain interference, sexual function, sexual distress, sexual satisfaction and quality of life. Due to the wide variety of pain and psychosocial measures used, meta-analyses were not possible and so a narrative review was conducted. Where possible bivariate correlations between psychosocial factors and outcomes are reported and interpreted as small medium and large. In the event that correlation analyses were described but the data were not reported in the study results, the authors of the review planned to contact the authors of the study of interest to obtain the data.

2.4 | Quality assessment

Eligible full-text articles were assessed for methodological quality and risk of bias according to the Critical Appraisal Skills Programme (CASP) guidelines (Sanderson et al., 2007), selected by the specific methodological design of included studies. The same criteria have been applied in previous reviews on chronic pain populations (Artom et al., 2016; Czuber-Dochan et al., 2013). Studies were independently assessed by C.C. and M.M and points were deducted for a lack of defined objectives and hypothesis; nonvalidated measurement tools; inappropriateness or limited data regarding methodological design and statistical analysis; selective reporting of results and limitations not addressed. Assessment of studies yielded a low-, medium- or high-quality rating. Any disagreement between reviewers was resolved through consensus of a third party. Studies were classified as High ($n = 10$), Medium ($n = 4$) and Low quality ($n = 1$), totalling up points for the quality assessment items. For studies that also included partners and looked at correlates of women's factors with their own outcomes as well as correlates of partners' factors with women's outcomes, the authors conducted two separate ratings. This was done to reflect the different sample sizes of each group and therefore their differences in power (Cohen, 1988), thus, ensuring the quality rating differences for both groups is accurately displayed.

2.5 | Additional analysis

Where possible, differences between psychosocial factors in women with primary versus secondary Vulvodynia (primary refers to Vulvodynia since the first attempt at penetration, whereas secondary refers to Vulvodynia experienced after a period of pain-free penetration) as well as in women with Generalized versus Provoked Vulvodynia will be investigated. In the event that analyses of Vulvodynia subtypes were described in the included papers, but the data were not reported in the study results, the authors of the review planned to contact the authors of the study of interest to obtain the data.

3 | RESULTS

Combined database and manual searches identified 2,529 references. After removing duplicates and undertaking title and abstract screening, full texts of 164 studies were assessed for eligibility by C.C and M.M. A total of 21 studies were included in this review (Figure S1).

3.1 | Overview of studies

The 21 studies included a total of 1592 women with PVD, 1,114 Partners and 71 control participants.

All 21 studies were conducted in Canada. All studies reported bivariate correlations of psychosocial factors and outcomes. Multivariate regressions were not comparable across studies since they controlled for different illness and predictor variables. The heterogeneity of data for the bivariate correlations precluded meta-analysis of findings. Participants were primarily recruited through multifaceted strategies such as media announcements and vulvar pain clinics. The clinical samples included only women with PVD and the majority of studies were cross-sectional. Across all studies, participants, irrespective of whether they already had a PVD diagnosis, underwent a gynaecological examination to confirm the diagnosis. There were no instances in which correlation data were missing from the relevant papers and, therefore, the authors of the included studies did not need to be contacted. Furthermore, no studies included in this review explored differences between psychosocial factors in women with primary versus secondary PVD.

Women's mean age was 27 years and with a range of ages between 18 and 45 as this was one of the inclusion criteria across most studies, explaining the low mean age. Since all the women in this review have PVD, the pain outcome always refers to pain provoked through pressure such as intercourse, tampon insertion and so on, and not spontaneous pain. The average intercourse pain duration for women was 5.11 years, with one study reporting percentages of women with a pain duration over 5 years in their sample instead (58%). The average intercourse pain was also calculated for those studies that used 0–10 scales and could be therefore compared. These represented 14 of 21 studies, and women's average pain was 6.33 (0–10 range). While all women in this review had PVD, only four studies also reported the type of PVD (whether primary or secondary).

With regards to the pain outcome, all studies used either a 0–10 pain scale or the McGill Pain Questionnaire, except for two studies which used a psychophysical measure (tampon insertion pain and vestibular testing pain rating, both judged on a 0–10 scale). A summary of included studies with pain as an outcome is provided in Table S3.

All studies also utilized similar measures for sexual function such as the Female Sexual Function Index or the Female Sexual Distress Scale (Derogatis et al., 2002; Rosen et al., 2000), with only two studies using different measures. Similarly, all studies used the Global measure for Sexual satisfaction (Lawrance et al., 1998) to measure sexual satisfaction. Tables S4 and S5 provide a summary of included studies with sexual function and sexual satisfaction as outcomes respectively.

3.2 | Quality assessment

The quality rating was calculated twice: for studies that only examined women's psychosocial factors with their own outcomes and for dyadic studies that examined partners' factors in relation to women's outcomes. The quality rating for women's correlates only was as follows: 1 High-, 8 Medium- and 12 Low-quality studies. The quality rating for studies looking at dyadic correlates was six Medium- and six High-quality studies (Appendix S1).

The identified psychosocial factors are presented and reviewed below under the following headings: general mental health (e.g. general depression, anxiety, etc.); pain-specific cognitive, affective and behavioural factors (e.g. catastrophizing, pain self-efficacy, etc.); Vulvodynia/sexual-specific cognitive, affective, behavioural factors (e.g. body-exposure anxiety, etc.) and dyadic factors (e.g. sexual intimacy, dyadic communication).

3.3 | General mental health

3.3.1 | Depression

Ten of twenty-one studies explored depression in relation to pain, 7 in relation to sexual function/distress and 6 in relation to sexual satisfaction. Six of ten studies found that depression symptoms were significantly associated with higher pain intensity and lower sexual functioning respectively, while 6 found that greater depression was associated with women's lower sexual satisfaction. Four studies also looked at the associations between partners' depression in relation to women's pain, 5 in relation to sexual functioning/distress and 2 in relation to sexual satisfaction. Of these, one fourth found that partners' depression is significantly positively associated with women's pain intensity and 2 studies found that greater partners' depression was associated with women's lower sexual function and lower sexual satisfaction respectively.

3.3.2 | Anxiety

Seven studies explored general anxiety in relation to pain, 8 studies investigated the associations between general anxiety

symptoms and sexual function/distress, while 1 study investigated general anxiety in relation to sexual satisfaction. Overall, only 1/7 studies found that greater general anxiety symptoms were associated with higher pain intensity, 5/8 found that greater general anxiety was significantly associated with lower sexual function/greater sexual distress and one found that greater women's general anxiety had a significant association with lower sexual satisfaction. Furthermore, three studies investigated the associations between partners' general anxiety and women's sexual satisfaction/distress, of which three found that greater partners' general anxiety was associated with women's greater sexual distress and lower sexual satisfaction.

3.3.3 | Body image

One study investigated the association between body image and sexual function and satisfaction, finding that better body image was significantly associated with greater sexual function and sexual satisfaction.

3.4 | Pain-specific cognitive, affective and behavioural factors

3.4.1 | Pain catastrophizing

Four studies investigated pain catastrophizing in relation to pain; in all of these, greater pain catastrophizing was associated with greater pain. Three studies explored pain catastrophizing in relation to sexual function, of which one found that greater catastrophizing (specifically penetration pain catastrophizing) was significantly related to lower sexual function. One study explored pain catastrophizing in relation to sexual satisfaction, finding that greater penetration pain catastrophizing was significantly related to lower sexual satisfaction.

3.4.2 | Pain-related fear and hypervigilance

Pain-related fear includes fear of injury or activities that increase pain, while pain-specific hypervigilance is defined as an enhanced state of sensory sensitivity accompanied by an exaggerated scanning or searching to detect painful sensations and other pain-related information (Asghari & Nicholas, 2001). Pain-related fear was measured in three studies in relation to pain and once in relation to sexual functioning. Two studies found that greater pain-related fear was significantly associated with greater pain and one found that greater pain fear was related to lower sexual functioning. Furthermore, one study investigating pain hypervigilance reported a significant positive association with pain severity.

3.4.3 | Pain self-efficacy

Pain self-efficacy is referred to as one's confidence in one's ability to engage in a range of activities despite pain (Asghari & Nicholas, 2001). Two studies examined this construct, showing that greater pain self-efficacy was significantly associated with lower intercourse pain and higher sexual function.

3.4.4 | Pain acceptance

Acceptance of chronic pain refers to (1) acting with openness to experiencing pain sensations in the pursuit of goals (activity engagement) and (2) refraining from ineffective attempts to control pain (pain willingness) (McCracken, 1998). One study explored acceptance in PVD and found that greater pain acceptance was significantly associated with lower intercourse pain and higher sexual satisfaction.

3.4.5 | Perceived injustice

Perceived injustice is a multidimensional construct, comprising elements pertaining to the severity and irreparability of loss, blame and a sense of unfairness primarily investigated in the context of a musculoskeletal injury (Sullivan et al., 2009). One study investigated this variable, in which women's higher levels of perceived injustice were significantly associated with higher pain, greater sexual distress and lower sexual satisfaction. Furthermore, partners' higher levels of perceived injustice were significantly associated with women's lower sexual satisfaction and greater pain.

3.5 | Vulvodynia/sexual-specific cognitive, affective, behavioural factors

3.5.1 | Body exposure anxiety/avoidance during intercourse

Body image in the context of sexual activities, also referred to as body exposure anxiety/avoidance, includes anxious attentional focus and avoidance regarding exposure of the body during sexual activities (Cash et al., 2004). One study examined this variable and found that greater body exposure anxiety was associated with greater intercourse pain, lower sexual function and lower sexual satisfaction.

3.5.2 | Positive penetration cognitions

Positive penetration cognitions refer to positive cognitions about vaginal penetration (e.g. "penetration is a moment of

intimacy with my partner") (Anderson et al., 2016). One study examined positive penetration cognitions and found that higher positive penetration cognitions were significantly associated with women's lower pain, higher sexual functioning and greater sexual satisfaction.

3.5.3 | Sexual contingent self-worth

Sexual contingent self-worth refers to self-esteem that is dependent on maintaining what one perceives to be a successful sexual relationship (Glowacka et al., 2017). This was investigated in two studies, in which greater sexual contingent self-worth was significantly associated with greater pain, greater sexual satisfaction and sexual distress.

3.5.4 | Negative sexual cues during intercourse

Attending to positive or negative sexual cues promotes more or less focus on the pleasurable aspects of the sexual experience as well as a more positive or negative environment for sexual interaction (Rosen et al., 2018). This variable was explored in one study, in which more attention to negative sexual cues was associated with greater intercourse pain and worse sexual functioning.

3.5.5 | Attitudes towards women's genitalia

This variable refers to women's personal attitudes towards women's genitalia (Rosen et al., 2017). One study investigated this factor and found that more positive attitudes towards women's genitalia were associated with higher sexual function and satisfaction.

3.5.6 | Approach and avoidance of sexual goals

Sexual goals are conceptualized as reasons for engaging in sex that include wanting to pursue desirable ("approach goals"; e.g. feeling close to one's partner) and avert negative ("avoidance goals"; e.g. losing one's partner) outcomes (Rosen et al., 2018). These were both explored in relation to sexual functioning in one study, in which higher approach goals and lower avoidance goals were significantly related to better sexual functioning.

3.5.7 | Sexual self-efficacy

Sexual self-efficacy refers to the personal conviction and perceived competence in the behavioural, cognitive and affective dimensions of female sexual response (Reissing et al., 2005). This construct has been investigated in one study in which more sexual self-efficacy was positively significantly associated with better sexual functioning.

3.6 | Dyadic factors

3.6.1 | Dyadic sexual communication

Dyadic sexual communication refers to couples' perceptions of their joint communication concerning sexual matters (e.g. disclosures of sexual preferences or discussions of sexual problems) (Rancourt et al., 2016). Two studies examined this factor in PVD, of which 1 found that greater partners' dyadic sexual communication was associated with lower pain. Greater dyadic sexual communication was also significantly associated with better sexual functioning and satisfaction. Additionally, greater partners' dyadic sexual communication was associated with lower pain, better sexual functioning and greater sexual satisfaction.

3.6.2 | Unmitigated sexual communion

The construct of unmitigated sexual communion – the motivation to meet a partner's sexual needs to the exclusion of a person's own need (Muise et al., 2017) – was explored in two studies, once in relation to sexual functioning and sexual satisfaction, and once in relation to pain intensity, pain unpleasantness and sexual distress. Higher unmitigated sexual communion was significantly associated with greater pain intensity, greater pain unpleasantness, greater sexual distress, lower sexual satisfaction and lower sexual functioning.

3.6.3 | Sexual intimacy

Sexual intimacy refers to self and partner disclosure about sexuality and partner responsiveness and empathy during and following sexual interactions (Bois et al., 2013). This was explored in one study in which greater women's sexual intimacy was significantly related to women's greater sexual functioning and sexual satisfaction.

3.6.4 | Sexual communal motivation

Sexual communal strength refers to the extent to which people are motivated to be responsive to their partner's sexual needs without neglecting their own (Muise et al., 2013). This was explored once in relation to pain intensity and

unpleasantness; higher sexual communal strength was significantly associated with greater pain intensity and greater pain unpleasantness. Sexual communal strength was also examined once in relation to sexual distress, once in relation to sexual functioning and once in relation to sexual satisfaction. Greater sexual communal strength was significantly associated only with greater sexual distress.

3.6.5 | Relationship satisfaction

Relationship satisfaction and sexual functioning have been investigated in three studies, in which greater relationship satisfaction was significantly associated with women's greater sexual satisfaction and functioning.

3.6.6 | Partner support

One study examined partner support and found that greater women's perceived partner support was associated with higher pain intensity.

3.6.7 | Partner solicitousness and hostility

These two constructs were examined in one study, in which women's reports of positive/solicitous partner reactions and general expressions of hostility from the male partner (aggression, irritability, rage and resentment) (Desrosiers et al., 2008) were both associated with higher pain intensity.

3.6.8 | Relationship intimacy

Relationship intimacy has been described as a dynamic process composed of two key components: (1) disclosure (self and partner-perceived disclosure) and (2) partner responsiveness and empathy (Rancourt et al., 2016). Its association with sexual functioning has been explored in one study, in which greater relationship intimacy was associated with greater sexual functioning.

3.6.9 | Relationship approach goals

Relationship approach goals are defined as goals focusing on the pursuit of positive experiences in one's relationship, such as closeness, growth and intimacy (Corsini-Munt et al., 2017). These have been explored in relation to sexual satisfaction in one study of this review, and higher approach goals and lower avoidance goals were significantly related to greater sexual satisfaction.

3.6.10 | Relationship contingent self-worth

Relationship contingent self-worth refers to the extent to which self-worth is based on one's romantic relationship (Knee et al., 2008). This was explored in relation to pain, sexual satisfaction and sexual distress in one study; higher relationship contingent self-worth was significantly related to higher sexual distress.

4 | DISCUSSION

The purpose of this systematic review was to investigate psychosocial factors associated with pain and sexual outcomes in Vulvodynia. Emotional factors, pain-specific and sexual-specific cognitive, affective, behavioural factors, and dyadic factors were associated with these outcomes. This review provides support for the role of a psychosocial approach to conceptualizing and managing Vulvodynia. All studies in this review included women with PVD and not Generalized Vulvodynia; thus, pain refers only to provoked pain through pressure such as intercourse, tampon insertion, etc. All the studies were conducted in Canada, resulting in limited cross-cultural applicability of findings. Similarly, many of the psychosocial factors identified were not explored in relation to a wider psychological theory and were often only researched once. Most studies examining women's psychosocial correlates with their own outcomes had low-to-moderate quality with small-to-moderate sample size. In contrast, studies examining partners' correlates with women's outcomes had a medium-to-high quality and moderate-to-large sample size, lending more certainty to the partner conclusions of this review. While the development of a theoretical model was not possible due to the aforementioned limitations of the available data in PVD, the psychosocial variables identified were categorized based on psychological processes that share conceptual/measurement similarities, thus, providing a starting point to help organize future work and advance our understanding of psychosocial factors in PVD.

4.1 | Factors reflecting general and pain-related distress and avoidance

The review found a set of variables that can be broadly grouped in terms of features that promote and support distress and avoidance in PVD. These include factors such as depression, anxiety, perceived injustice as well as more pain-specific factors such as pain catastrophizing, pain-related fear and hypervigilance and low pain acceptance. Among these, depression and anxiety were the most commonly explored psychosocial factors, associated with worse pain and sexual function. Studies in Vulvodynia suggest that anxiety and

depression are risk factors for pain (Khandker et al., 2011; Reed et al., 2000), consistent with the wider pain literature (McWilliams et al., 2003; Thieme et al., 2004). Similarly, partner and women's anxiety and depression were negatively associated with women's sexual functioning and satisfaction; this is consistent with studies in women from different populations, such as arterial hypertension and nonclinical samples (Nascimento et al., 2015; Kalmbach et al., 2014).

Findings regarding pain-specific factors in PVD are also consistent with the wider pain literature. Among these, greater catastrophizing, pain-anxiety and pain acceptance were the most strong factors with pain and sexual outcomes in PVD (see Anderson et al., 2016; Gracely et al., 2004). According to the Fear-Avoidance model (Vlaeyen and Linton 2002), catastrophic cognitions following pain can lead to pain anxiety, hypervigilance, avoidance and ultimately increasing disability. It is possible that catastrophizing and pain-fear, in combination with low acceptance of pain, create a pattern of disengagement from activities that might increase pain and disturb sexual functioning. While pain acceptance was found to be significantly associated with pain and sexual satisfaction in this review, it was only researched once. Further studies can determine whether it is a potentially important psychosocial factor to target in treatment.

4.2 | Factors that promote avoidance of sex or intimacy

The findings of this review highlight a set of psychosocial factors that appear to promote distress and avoidance specifically around sex or intimacy in PVD. These factors may play a role in PVD that is unique from other pain conditions. These variables include body-exposure anxiety/avoidance during intercourse, body-image factors such as attitudes towards genitalia and body-esteem, negative sexual cues during intercourse, sexual contingent self-worth, unmitigated sexual communion, interpersonally oriented avoidance goals, partner solicitousness and hostility and relationship contingent self-worth. This highlights that interpersonal and sex-related factors are particularly relevant because of the nature and location of pain in PVD. Among these, body-exposure anxiety/avoidance during intercourse was the factor yielding the strongest association with pain, functioning and sexual satisfaction based on the magnitude of association in correlation analyses, consistent with growing literature highlighting the importance of this construct to sexual functioning (Maillé et al., 2015; Cash et al., 2004; Wilson, 2020).

In PVD, it is plausible that catastrophizing and pain-anxiety do not only lead to avoidance of pain and intercourse per se but also the avoidance of women's body exposure and the involvement of maladaptive attentional processes/cognitions during intercourse. Such experiences may potentially narrow the focus during sex, altering how one engages. Research has shown that more than 80% of women with PVD continue to attempt intercourse regularly despite their pain (Elmerstig et al., 2008; Reed et al., 2012), possibly with the goal of maintaining intimacy or avoiding relationship conflict (approach and avoidance goals). Since women with PVD continue to have intercourse, how they perceive their body and how they attend to sex may affect their sexual adjustment.

Additional interpersonal factors such as partner hostility and solicitousness were strongly associated with greater pain and lower sexual outcomes in PVD. It is possible that solicitous reactions from partners could contribute to reinforcing women's catastrophic thinking concerning their pain condition (Sullivan, 2012). Hostility could compromise the psychological adjustment of women with Vestibulodynia by increasing depressive symptoms, which in turn may impact on women's pain and sexual outcomes. As this construct was only investigated once, future research is needed to examine the replicability of findings on partner responses and the mechanisms through which they impact on women's outcomes in PVD.

4.3 | Sex or intimacy engagement promoting factors

The review identified thinking and behaviour patterns that promote engagement in sex and foster intimacy: pain self-efficacy, positive penetration cognitions, sexual self-efficacy, sexual intimacy, sexual communal motivation, approach of sexual goals, dyadic sexual communication, relationship satisfaction, partner support, relationship intimacy and relationship approach goals. So-called “positive” factors/helpful coping appraisals were related to better outcomes in women with PVD (Anderson et al., 2016; Desrochers et al., 2009; Rosen et al., 2018), possibly acting as a buffer against pain and sexual dysfunction. Among these factors, painful intercourse self-efficacy and positive penetration cognitions were the most strongly related factors, based on the magnitude of correlations, with pain and sexual outcomes in PVD. These may counter unhelpful coping strategies, such as avoidance, and override negative or fearful interpretations of pain promoting successful engagement. In turn, this could lead to higher confidence, including increased pain self-efficacy and positive cognitions regarding the feasibility of penetration (Crombez et al., 2012; Goubert and Trompetter, 2017; McCracken & Morley, 2014). Importantly, while pain cognitions such as pain self-efficacy were related to outcomes in both Vulvodynia and other chronic pain conditions (Arnstein et al., 1999; Desrochers et al., 2009), sex cognitions such as penetration cognitions (Anderson et al., 2016) were

specific to this population and may be an important variable to further explore in future studies of PVD.

4.4 | Clinical implications

The consistent association identified between anxiety and depression with pain and sexual functioning suggests that tackling such factors may impact on women's symptoms. Relatedly, PVD appears to be associated with some unique cognitive, behavioural and interpersonal features compared to other chronic conditions. Therefore, it may be that current psychological treatments may not equally translate to improved outcomes in PVD without appropriate tailoring to address these. This has implications for treatment goals, thus, aiding the development of effective and disease-specific treatment approaches.

4.5 | Limitations

There are several limitations that warrant consideration. First, available data of psychosocial correlates were only present in women with PVD and not Generalized Vulvodynia. Therefore, psychosocial factors in Generalized Vulvodynia represent an important avenue for future research. Second, many of the review studies are cross-sectional, so the direction of the relationships among factors is unclear. Third, caution is warranted regarding the cross-cultural applicability of the finding because all the studies were conducted in Canada. It may be that different psychosocial factors are present in different sociocultural contexts. In light of this, findings from this review should be interpreted cautiously. Fourth, the study samples were limited in age, including women aged 18–45. Fifth, many studies did not refer to a psychological theory as a rationale for selecting psychosocial factors, making it difficult to derive a consistent picture of how constructs are theoretically related, and which may be most important. Finally, the quality of the studies looking at only women's correlates was low-to-medium, while dyadic studies had medium-to-high quality, suggesting more high-quality work is needed of women's factors, including prospective designs. To evaluate the studies' quality, we used an adapted version of a reliable tool for observational studies. Tailoring the quality assessment tool is advised in the Cochrane handbook (Higgins et al., 2011) but the adapted tool has not undergone its own validation.

5 | CONCLUSION

This is the first systematic review to explore the role of psychosocial factors related to pain and sexual functioning in PVD. While some distress and avoidance-related processes identified here are consistent with other systematic reviews on chronic pain, specific intimacy and intercourse-related processes are highlighted here as important factors in PVD. Further research in the area guided by theory and a focus on tailored interventions are vital to building a better understanding of this condition and to achieving better clinical outcomes.

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CONFLICTS OF INTERESTS

There are no conflicts of interests.

AUTHOR CONTRIBUTIONS

Claudia Chisari: draft protocol, develop search strategy, obtain full-text reports, carry out and interpret findings and draft final review. Lance McCracken: draft protocol, develop search strategy, interpret analyses and draft final review; Whitney Scott: draft protocol, develop search strategy, interpret analyses and draft final review; Rona Moss-Morris: draft protocol, develop search strategy, interpret analyses and draft final review; Mani B. Monajemi: obtain full-text reports, carry out and interpret analyses; All authors commented, discussed the results and commented on the manuscript.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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