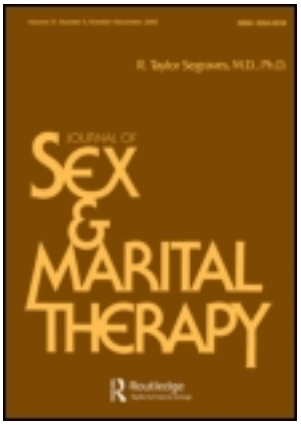

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Do Psychosexual Factors Play a Role in the Etiology of Provoked Vestibulodynia? A Critical Review

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Do Psychosexual Factors Play a Role in the Etiology of Provoked Vestibulodynia? A Critical Review

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The aim of this review was to critically examine published studies concerning the psychosexual aspects of provoked vestibulodynia. Despite the presence of several methodological limitations, some findings were consistently replicated. Overall, women with vestibulodynia demonstrate impaired sexual functioning, namely, lower levels of sexual desire, arousal, and frequency of intercourse. Childhood physical and sexual abuse represent potential risk factors for the development of this condition. Additionally, specific psychological states such as anxiety, fear of pain, hypervigilance, catastrophizing, and depression, are more frequently reported by these women. More rigorous studies are needed to establish which psychosexual variables may exacerbate and/or maintain vestibulodynia.

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Recent epidemiological data suggest that up to 21% of women under the age of 30 complain of recurrent pain during intercourse, or dyspareunia (Laumann, Paik, & Rosen, 1999). Moreover, results from a large-scale study indicate that the incidence of dyspareunia in young women is rising (Danielsson, Sjoberg, Stenlund, & Wikman, 2003). Provoked vestibulodynia (previously known as vulvar vestibulitis syndrome) is considered to be the most frequent cause of premenopausal dyspareunia (Meana & Binik, 1994), affecting up to 12% of women from the general population (Harlow & Stewart, 2003). Vestibulodynia is characterized by cutting and/or burning sensations located at the entry of the vagina, provoked by pressure applied to the vestibular area (Friedrich, 1987).

The etiology of vestibulodynia still remains largely unknown. There are numerous hypotheses regarding its pathogenesis, which for the most part lack strong scientific evidence. Until now, published studies have adopted a one-dimensional model and focused on the biomedical factors that might be involved in the development of pain, while ignoring variables that may indirectly exacerbate or maintain it. This search for causes has often been to the exclusion of the sound investigation of psychosexual factors even though they are considered as probable etiologic correlates (Meana & Binik, 1994; Meana et al., 1997b). Further, in the field of chronic pain, it is now well documented that psychosocial variables significantly contribute to predict pain intensity and associated disability (Gatchel & Turk, 1999; Leeuw et al., 2006). However, these variables have not been until now properly integrated into our conceptualization of vestibulodynia and have tended to be invoked solely in an "either/or" fashion.

Clinically, the absence of identifiable pathology has led some health professionals to convince their patients of the psychosexual origin of their vulvo-vaginal pain. Yet, these conclusions may have little empirical foundation and are often not accompanied by a treatment that would address such factors. For that matter, current classification systems (for example, DSM-IV) encourage this dualistic vision of the problem by characterizing it either as a sexual dysfunction of psychogenic origin or as a purely biomedical problem due to the presence of a specific pathology (Meana & Binik, 1994). The ongoing dichotomy between the psychosexual and the biomedical has slowed progress both on the research and clinical fronts.

Indeed, the contribution of psychosexual factors to the development and maintenance of vestibulodynia is not well understood. Are the purported psychosexual correlates simply a consequence of a persistent recurrent pain that can go undiagnosed for years? Should we search for psychosexual determinants, or rather examine how such factors may modulate the experience of pain and associated sexual dysfunction? It is to address these questions that we have critically reviewed the literature pertaining to the psychosexual aspects of vestibulodynia.

METHOD

The studies included in this review were found through a search performed on MEDLINE and psycINFO, with the aim of compiling articles dealing specifically with psychosocial and sexual factors related to provoked vestibulodynia. Hence, French and English versions of the keywords psychological, psychosocial, or psychosexual were coupled with the words vestibulodynia, vestibulitis, or dyspareunia. Articles that dealt with other types of vulvo-vaginal pain (for example, generalized vulvodynia, chronic pelvic pain) were included only when the described sample comprised a subgroup of women suffering from provoked vestibulodynia, clearly identified by the investigators. The reference section of each article was also examined in order to find other relevant sources. However, our search was limited to articles published between 1987 and 2007 since the operational definition of provoked vestibulodynia (then vulvar vestibulitis) was first published in 1987. Before this publication, existing research entailed important methodological shortcomings and was often limited to case studies.

Overall, very few studies have focused on the psychosexual aspects of vestibulodynia. In fact, results from our literature search yielded 33 papers pertaining to these variables. Furthermore, 25 were published between 2000 and 2007, suggesting that interest in this topic is relatively new and seems to be increasing among investigators in the field. In order to facilitate comprehension, the studies reviewed are divided into two broad categories. First, results concerning the sexual aspects of vestibulodynia are presented (see Table 1). Then, findings relating to psychosocial factors are described (see Table 2).

SEXUAL ASPECTS

Nineteen studies concerning the sexual aspects of vestibulodynia have been published to date. The majority of these studies (15) have focused on the assessment of different dimensions of sexual function, such as desire and arousal, in an effort to determine whether women with vestibulodynia present significant impairments in sexual functioning.

Sexual Function

Initial uncontrolled cross-sectional studies have attempted to identify whether the sexual functioning of women with vestibulodynia differed from available norms. Results show that these women typically report a deterioration of several components of their sexual functioning, sometimes severe enough to be considered a sexual dysfunction from a clinical standpoint

TABLE 1. Sexual Outcome Studies for Vestibulodynia (V)

Reference	Sample Characteristics N, age, SES, Pop.	Design	Definition of Vestibulodynia	Other Selection Criteria	Measures	Outcome	Comments
Schover et al. (1992)	N 45; age ?;SES ?; Clin. pop.	Cross-sectionnal uncontrolled normative data comparaison	Cotton-swab test	?	Home-made interview	Sexual dysfunction present	2,3,4,7
De Jong et al. (1995)	N 13; age?;SES?; Clin. Pop.	Cross-sectional uncontrolled	?	?	Home-made interview	Pain started during sexual intercourse without desiresexual function altered	1,3,4,6,7
Van Lankveld et al. (1996)	N 43; age ?; SES? Clin. pop.	Cross-sectional uncontrolled normative data comparaison	Friedrich's criteria	Vulvovaginitis excluded	Self-report standardized questionnaire	Sexual function altered	2,3,7
Jantos and White (1997)	N 50; age 16–64;SES ?; Pop.?	Cross-sectional uncontrolled	Friedrich's criteria	?	Self-report standardized questionnaire	90% of patients sexual functional tered	1,3,7
Meana et al. (1997)	N 210; age ? SES ? Gen. Pop.	Cross-sectional Controlled 2 groups Dyspareunia and controls but subgroup of PV (54)	Pain during intercourse and sbujective distress	Excluded if chronic generalized pelvicor genital pain unrelated to intercourse; pregnancy	Self-report standardized questionnaire and interview	PV more altered sexual function; more eterophobia	3,5,6
Nunns et Mandal (1997)	N 40; age? SES ?; Pop ?	Cross-sectional Controlled 2 groups	Friedrich's criteria	?	Self-report standardized questionnaire	Altered sexual function	3,7
Sarma et al. (1999)	N 78; age ? SES ? Clin. Pop.	Cross-sectional Controlled 2 groups	Diagnostic of PV based on Friedrich's criteria	Others causes of PV excluded	Home-made interview and questionnaires	No difference on sexual abuse	3,4,6,7

(Continued on next page)

TABLE 1. Sexual Outcome Studies for Vestibulodynia (V) *(Continued)*

Reference	Sample Characteristics N, age, SES, Pop.	Design	Definition of Vestibulodynia	Other Selection Criteria	Measures	Outcome	Comments
Daniellson et al. (2000)	N 109; age 18–25; SES ? Clin. pop.	Cross-sectional Controlled 2 groups	Friedrich's criteria	Pain for at least 6 months	Self-report home-made questionnaires	No difference on sexual abuse; PV more often participated in unwanted sexual activity; sexual satisfaction lower for PV	3,6,7
Reed et al. (2000)	N 72; age 18–60; SES?; Clin. pop.	Cross-sectional Controlled 3 groups Vulvodynia chronic pelvic pain and controls	ISSVD definition	?	Questions on seuxal abuse,sexual activities	Sexual activities more impaired for vulvodynia (included PV); no difference on abuse	2,3,4,5,6,7
Gate and Galask (2001)	N 98; age 18–44 SES 79% married, all sexually active; Clin. pop.	Cross-sectional Controlled 2 group	Friedrich's criteria	Premenopausal, heterosexual, sexually active; if had gyneco. surgery, mental or medical seriousl problems excluded	Self-report standardized questionnaires	PV less frequent sexual behavior; less sexual satisfaction; more negative sexual self-concept; more sexual depression; less intimacy foreplay; less preliminary foreplay and less frequent intercourse	7
Hallam-Jones et al. (2001)	N 172; age?; SES?; Clin. pop.	Cross-sectional Controlled 3 groups PV?, essential vulvodynia?, other non-vulval dermatologic condition (controls)	Diagnosis by a clinician	Between 18–60	Self-report standardized questionnaire	Women with vulvodynia (2 patient groups) had more altered sexual function	2,3,4,5,6

Sackett et al. (2001)	N 69; age 19–60 SES 22% married 84% sexually active all caucasian; Clin. pop.	Cross-sectionnal uncontrolled	Friedrich's criteria	?	Self-report home-made questionnaires likert scale	Sexual function altered; sexual satisfaction low; body image and sexual self-esteem low	1,3,6
Dalton et al. (2002)	N 355; age?; SES? Pop.?	Cross-sectional Controlled 2 group	Diagnostic of PV from a medical clinic	?	Self-report home-made questionnaires for sexual abuse	No difference on history of sexual abuse	2,3,4,6
Reed et al. (2003)	N 125; age 18–60;SES ?; Clin. pop.	Cross-sectional Controlled 2 groups	Cotton-swab test	Excluded if pregnant, had vulvar surgery, had genitallesions, others resons for pain, taking medications	Self-report home-made questionnaires	PV more altered sexual function and more negative feelings as a sexual person; lower sexual satisfaction	6
Reissing et al. (2003)	N 87; age 18–43 SES 23% married, 80% with a partner; Gen. pop.	Cross-sectional Controlled 3 groups PV, vaginismus, controls	50% intercourse painful, pain located at vagina entrance for at least 1 year	History of pain not limked to intercourse, current pregnancy	Self-report standardized questionnaires and home-made interview	PV more altered sexual function; less positive sexual self-schema	3,4,7
Gordon et al. (2003)	N 428; age? SES 231 married; Clin. pop.	Cross-sectional uncontrolled web survey	Report of vulvar pain	?	Home-made questionnaire	Sexual function altered	1,3,4,5,6

(Continued on next page)

TABLE 1. Sexual Outcome Studies for Vestibulodynia (V) *(Continued)*

Reference	Sample Characteristics N, age, SES, Pop.	Design	Definition of Vestibulodynia	Other Selection Criteria	Measures	Outcome	Comments
Harlow Stewart (2005)	N 250; age 18–64; SES well defined; Gen. pop.	Cross-sectional Controlled 2 groups	ISSVD definition of vulvodynia	42% confirmed diag. by clinician	Self-report standardized questionnaire	Less support from family as children, severe sexual abuse in childhood and fear of abuse in actual life were associated with higher probability	4
Brauer, Lann et ter Kuile (2006)	N 75; age 18–45 SES well defined Gen. pop.	Cross-sectional Controlled 2 groups dyspareunia (63% PV), controls	Pain 50% intercourse for 6 month, cotton swab test heterosexual relationship for 6 month	Premenopausal. Excluded if pain not related to intercourse, physical pathology, pregnancy, past surgery and psychiatric diagnosis	Self-report standardized questionnaires, home-made interview and physical measure and erotic stimuli	No difference on physical arousal, For women with dyspareunia: less positive feelings toward erotic stimuli, sexual function altered	4,5,6,7
Payne et al. (2007)	N 40; age 18–45 SES well defined Gen. pop.	Cross-sectional Controlled 2 groups PV, controls	Pain 50% intercourse for 6 month, cotton swab test	Pain limited to activity involving pressure. Excluded if pain from another cause, major physical or psychiatric illness, infection, past surgery, pregnancy, vaginal delivery.	Self-report standardized questionnaires, home-made interview and questionnaires, standardized physical measure and erotic stimuli	Sexual function altered, PV reduced level of mental sexual arousal, no difference on physical arousal	7

Brauer, ter Kuile, Janssen et Laan (2007)	N 96; age 18–45 SES well defined Gen. pop.	Cross-sectional Controlled 2 groups dyspareunia (71% PV), controls	Pain 50% intercourse for 6 month, cotton swab test heterosexual relationship for 6 month	Premenopausal. Excluded if pain not related to intercourse, physical pathology, pregnancy, past surgery and psychiatric diagnosis	Self-report standardized questionnaires, home-made interview and physical measure and erotic stimuli	No difference on physical arousal, For women with dyspareunia: more negative feelings toward erotic stimuli.	4,5,6

N, sample size; age, age range; SES, socio-economic status; Pop, general (gen.) vs. clinical (clin.) population; PV, provoked vestibulodynia.
1, no control/comparaison group at all; 2, invalid comparison group; 3, little information on sample selection or characteristics not well defined; 4, unclear diagnostic criteria; 5, heterogeneous sample; 6, non-validated measures or not reliable; 7, small sample.

(Schover, Youngs, & Cannata, 1992; de Jong, van Lunsen, Robertson, Stam, & Lammes, 1995; van Lankveld, Weijenborg, & Ter Kuile, 1996; Jantos and White, 1997; Sackett, Gates, Heckman, Mee-Ran Kobus & Galask, 2001). More recently, another uncontrolled cross-sectional study, conducted via an online survey, has shown that 24% of women reported not being able to have sexual intercourse because of their pain (Gordon, Panahian-Jand, McComb, Melegari, & Sharp, 2003). Moreover, results suggest a decrease in sexual desire, with 86% of participants reported engaging in intercourse for other reasons other than their sexual desire (for example, a sense of obligation toward their partner) (Gordon et al., 2003).

Meana, Binik, Khalifé, and Cohen (1997b) were the first to publish a controlled study comparing the sexual functioning of women with dyspareunia—of which 51% had provoked vestibulodynia—to that of matched pain-free controls. The investigators recruited a sample 210 women via newspaper articles. Overall, results show that women with vestibulodynia reported a significantly lower frequency of intercourse, a decrease in sexual desire as well as a difficulty reaching orgasm when compared to women from the control group. Moreover, they reported more negative attitudes toward sexuality (erotophobia) than controls. Since then, several other studies involving a control group have confirmed that women with vestibulodynia exhibit a marked deterioration of their sexual functioning, including decreases in sexual satisfaction, desire, and arousal, as well as orgasmic capacity (Nunns & Mandal, 1997; Danielsson, Sjöberg & Wikman, 2000; Reed et al., 2000; Gates & Galask, 2001; Hallam-Jones, Wylie, Osborne-Cribb, Harrington, & Walters, 2001; Dalton, Haefner, Reed, Senapati, & Cook, 2002; Reed, Advincula, Fonde, Gorenflo, & Haefner, 2003; Brauer, Laan, & ter Kuile, 2006; Payne et al., 2007). Finally, a study by Reissing, Binik, Khalifé, Cohen, and Amsel (2003) compared women suffering from vestibulodynia or vaginismus to a group of matched controls and found that women with vestibulodynia showed the most sexual difficulties, more so than those with vaginismus.

Recently, three controlled studies have tested the hypothesis according to which vestibulodynia might stem from a lack of sexual arousal. According to this view, pain would be caused by friction in the absence of the physiological modifications engendered by arousal (for example, lubrication) (Payne et al., 2007). In the context of these studies, levels of physiological and subjective sexual arousal were measured during exposure to neutral and erotic videos (varied sexual activities with and without vaginal penetration). Results show no significant difference between women with vestibulodynia and nonafflicted women relative to their physiological level of sexual arousal when exposed to the erotic stimulus (Brauer et al., 2006; Brauer, ter Kuile, Janssen, & Laan, 2007; Payne et al., 2007). Nonetheless, results from the two studies by Brauer et al. (2006, 2007) indicate that women suffering from dyspareunia (63% and 71% of vestibulodynia in their groups) reported significantly less positive feelings and more negative feelings toward the

erotic stimulus than women from the control group. Lastly, the study by Payne et al. (2007) has demonstrated that women suffering from vestibulodynia show a trend toward lower levels of subjective sexual arousal during an erotic film. This finding needs to be replicated with a larger sample of participants.

However, with the exception of the work by Meana et al. (1997b) and Reed et al. (2003), all the conclusions of studies on sexual functioning are based on small samples. The majority of these also lack specificity regarding how the diagnosis of provoked vestibulodynia was established. For example, they state somewhat vague selection criteria, the diagnosis has often not been confirmed by a gynecologist, exclusion criteria are lacking—foremost for other medical conditions that might cause pain. In addition, few controlled studies involved analyses intended to confirm significant differences between groups pertaining to some important potential covariates such as marital status, age (pre- vs. post-menopausal), education, etc. Despite these limitations, most of the evidence to date suggests that vestibulodynia impacts negatively on self-reported sexual functioning, although laboratory studies have failed to find significant differences between women with vestibulodynia and controls with respect to levels of physiological sexual arousal.

Sexual Self-Schema

Investigators have also begun exploring the role of sexual self-esteem, also termed sexual self-schema, as well as associated negative emotions (four studies). Sackett et al.'s (2001) uncontrolled cross-sectional study was the first to assess this concept. The authors recruited a sample of 69 women suffering from provoked vestibulodynia within a clinical population. They completed a questionnaire designed for the purpose of the study. Results show that the majority of women reported negative changes in their sexual self-esteem and in their body image, such as feeling less sexually desirable (73%), feeling less confident toward sexuality (54%), and feeling less feminine than before (49%). Two studies involving control groups have subsequently corroborated these findings. In the study by Gates and Galask (2001), women with vestibulodynia had lower scores on a standardized self-report questionnaire designed to assess sexual self-schema, which would suggest that these women have a more negative sexual self-concept than nonafflicted women. Similarly, Reed et al. (2003) also showed, with a questionnaire designed for the purpose of the study, that these women reported feeling more negative emotions toward themselves in a sexual context than controls. Furthermore, this difference remained statistically significant when the investigators controlled for age and level of education. However, a recent study was unable to find differences between women

suffering from vestibulodynia and those from a control group regarding their scores on the same standardized questionnaire as the one used by Gates and Galask (Reissing et al., 2003). Contradictory results between studies could, in part, be explained by the differences in sample sizes.

Physical and Sexual Abuse

Finally, five studies tested the clinical hypothesis according to which sexual abuse during childhood or adulthood may play a role in the development of vestibulodynia. In the uncontrolled cross-sectional study by de Jong et al. (1995), 8 of the 18 women interviewed about the conditions surrounding the onset of vestibulodynia reported that their first pain symptoms appeared during unwanted intercourse. However, the controlled studies that tried to assess history of sexual abuse within this population were unsuccessful at finding significant differences between women suffering from vestibulodynia and nonafflicted women (Meana et al., 1997b; Danielsson et al., 2000; Reed et al., 2000; Dalton et al., 2002). Although these studies were controlled, with the exception of the study by Meana et al. (1997b), they all had important methodological weaknesses (see Table 1), including nonvalidated measures of sexual abuse and samples from clinical populations—both vestibulodynia and control groups. Interestingly, previous research focusing on chronic pain has shown that sexually abused women in general tend to consult less, probably because of the gynecological examination involved (Bergmark, Avall-Lundqvist, Dickman, Henningsohn, & Steineck, 2005; Harlow & Stewart, 2005). Thus, the lack of difference might be attributable to an underrepresentation of sexually abused women in both groups. In a recent epidemiological study, Harlow and Stewart (2005) used a standardized questionnaire measuring several forms of abuse in order to determine whether these variables could predict the development of vulvodynia (defined in this study as vulvo-vaginal pain unexplained by a specific pathology) in participants (N = 125 vulvodynia participants and 125 controls). Results show that women who experienced severe childhood physical or sexual abuse were four to six times more likely to report vulvodynia symptoms, regardless of their current and past demographic characteristics. Nevertheless, this relation between abuse and vulvodynia was mostly limited to women who were afraid of being abused once again and to those who were abused by a member of their immediate family. Unfortunately, investigators were not able to confirm a diagnosis of provoked vestibulodynia for the entire group of participants. In fact, the diagnosis was confirmed by a physician for only 42% of the participants, while the remaining 58% were evaluated on the basis of their verbal description of their symptoms. However, 73% of the women from their sample reported vestibulodynia-like symptoms, such as pain during intercourse, insertion of a tampon, or gynecological examinations.

Conclusion

In sum, studies regarding the sexual aspects of vestibulodynia show that afflicted women demonstrated a marked alteration in self-reported desire, arousal, ability to reach orgasm, and frequency of intercourse, whereas results concerning their sexual self-schema were conflicting. Childhood physical and sexual abuse, in particular, fear of sexual abuse, also seems to be potential risk factors for the development of vestibulodynia. However, the validity of these results is limited by the methodological shortcomings of the studies reviewed (see Table 1). Conceptually, apart from the work pertaining to antecedents of sexual abuse, most of the published research focused mainly on sexual impairment as a consequence of vestibulodynia, and neglected to examine how sexual variables, such as lack of desire and arousal, might influence the experience of pain.

PSYCHOSOCIAL ASPECTS

The literature search yielded 30 studies pertaining to the psychosocial aspects of vestibulodynia. The following variables were investigated: global psychological distress, depression, anxiety, dyadic adjustment, attributions, personality traits, catastrophizing, fear of pain, and hypervigilance.

Global Psychological Distress

Nine studies have attempted to assess the presence of psychological distress in samples of women with provoked vestibulodynia. The uncontrolled cross-sectional studies report contradictory results. Studies that did not include the use of standardized measures found that women suffering from vestibulodynia reported deterioration in their general well-being (de Jong et al., 1995), with 26% of them reporting a clinically significant level of psychological distress (Brotto, Basson, & Gehring, 2003). However, studies that measured distress with standardized questionnaires rather showed that the level of distress of afflicted women was within norms, with the exception of somatization (van Lankveld et al., 1996; Schmidt et al., 2001). This finding concerning lack of global psychological distress is supported by several controlled studies (Meana et al., 1997b; Daniellson et al., 2000; Reed et al., 2000; Reissing et al., 2003). Further, in a correlational study by Meana, Binik, Khalifé and Cohen (1998), level of psychological distress, as assessed by a standardized questionnaire, was not a predictor of pain intensity. Only one controlled study, which was more rigorous in terms of selection criteria, has demonstrated that women with vestibulodynia reported more psychological distress than controls on two standardized questionnaires (Brief Symptom Inventory (BSI) and Symptoms Check List (SCL 90) (Gates & Galask, 2001).

TABLE 2. Psychological Outcome Studies for Provoked Vestibulodynia (PV)

Reference	Sample Characteristics N, age, SES, Pop.	Design	Definition of Vestibulodynia	Other Selection Criteria	Psychosocial Measures	Outcome	Comments
Schover et al. (1992)	N 45; age ?;SES ?; Clin. pop.	Cross-sectionnal uncontrolled normative data comparaison	Cotton-swab test	?	Home-made interview	Depressive symptoms common; no difference if compare to norms	2,3,4,7
De Jong et al. (1995)	N 18; age?; SES?; Clin. pop.	Cross-sectional uncontrolled	?	?	Home-made interview	Detrioration of generalwell-being; lower self-esteem and feeling of being depressed	1,3,4,6,7
Van Lankveld et al. (1996)	N 43; age ?; SES? Clin. Pop.	Cross-sectional uncontrolled normative data comparaison	Friedrich's criteria	Vulvovaginitis excluded	Self-report standardized questionnaires	Somatization higher for PV; no difference for other variables	2,3,7
Jantos and White (1997)	N 50; age 16-64; SES ?; Pop.?	Cross-sectional uncontrolled	Friedrich's criteria	?	Self-report standardized questionnaires	60% depressed; 50% anxiety; nosomatization	1,3,7
Meana et al. (1997)	N 210; age? YES? Gen. pop.	Cross-sectional controlled 2 groups	Pain during intercourse and sbujective distress	Excluded if chronic generalized pelvicor genital pain unrelated to intercourse; pregnancy	Self-report standardized questionnaires	Dyspareunia group more anxious, depressed; worse relation adjustment; no difference for PV subgroup	3,5
Nunns et Mandal (1997)	N 40; age? SES ?; Pop ?	Cross-sectional controlled 2 groups	Friedrich's criteria	?	Self-report standardized questionnaire	PV more anxious both state and trait	3,7

Meana et al. (1998)	N 76; age ?SES live with partners, 63% married, Gen. pop.	Correlationnal 4 groups PV, vaginal atrophy, mixed, diagnosis no physical cause	Friedrich's criteria	?	Self-report standardized questionnaires and questions in interview	Only marital adjustment predictpain rating for PV group	1,5
Meana et al. (1999)	N 120; age? SES 85% regular sexual partner; 70% catholic, Gen. Pop.	Correlationnal 4 groups PV, vaginal atrophy, mixed, diagnosis no physical cause	Friedrich's criteria	?	Self-report standardized questionnaires and questions in interview	Psychosocial attribution predict pain; more psychological distress; more sexual dysfunction; moresexual assault in adulhood	1, 5
Danielsson et al. (2000)	N 109; age 18–25 SES ? Clin. pop.	Cross-sectional controlled 2 groups	Friedrich's criteria	Pain for at least 6 months	Self-report home-made questionnaires	No difference on the overall psychological profile (social support, distress)	3,6, 7
Reed et al. (2000)	N 72; age 18–60;SES ?; Clin. pop.	Cross-sectional controlled 3 groups Vulvodynia chronic pelvic pain and controls	ISSVD definition	?	Self-report standardized questionnaires	No diffrence on depression, marital adjustment and psychological distress	2,3,4,5,6,7
Sackett et al. (2001)	N 69; age 19–60 SES 22% married 84% sexually active all caucasian; Clin. pop.	Cross-sectionnal uncontrolled	Friedrich's criteria	?	Self-report home-made questionnaires likert scale	39% reported depressed mood, 32% anxiety	1,3,6

(Continued on next page)

TABLE 2. Psychological Outcome Studies for Provoked Vestibulodynia (PV) *(Continued)*

Reference	Sample Characteristics N, age, SES, Pop.	Design	Definition of Vestibulodynia	Other Selection Criteria	Psychosocial Measures	Outcome	Comments
Danielsson et al. (2001)	N 108; age 18–25 SES ? Clin. pop.	Cross-sectional controlled 2 groups	Friedrich's criteria	Pain for at least 6 months	Self-report standardized questionnaires	No difference on personnality except forharm-avoidance trait morepresent for PV	3,7
Gate and Galask (2001)	N 98; age 18–44 SES 79% married, all sexually active; Clin. pop.	Cross-sectional controlled 2 group	Friedrich's criteria	Premenopausal; heterosexual; sexually active; if had gyneco. surgery; mental or medical seriousl problems excluded	Self-report standardized questionnaires	PV more depressed, more distressed on depression subscale	7
Hallam-Jones et al. (2001)	N 172; age 18–60; SES ?; Clin. pop.	Cross-sectional controlled 3 groups PV?, essential vulvodynia?, other non-vulval dermatologic condition (controls)	Diagnosis by aclinician	Between 18–60	Self-report standardized questionnaires	Women with vulvodynia (2 patients groups) had more relationship difficulties and higher level of depression and anxiety	2,3,4,5,6
Schmidt et al. (2001)	N 53; age ?; SES ?; Clin. pop.	Cross-sectional uncontrolled 3 groups PV, vulvar dermatose, vulvodynia; normative data comparaison	ISSVD definition	?	Self-report standardized questionnaires	No difference on psychological distress	
Granot et al. (2002)	N 81; age ?; SES ?, Clin. pop.	Cross-sectional controlled 2 group	Friedrich's criteria	?	Self-report standardized questionnaires	PV more anxious	3,7

Pukall et al. (2002)	N 26; age 21–44; SES well defined; Gen. pop.	Cross-sectional controlled 2 groups	Pain during intercourse most ofthe time and for at least 6 months with subjective distress limited to vaginal insertion; report of pain of 4/10+ during cotton-swab test	Excluded if pelvicor vaginal pain unrelated to intercourse; history of remitted dyspareunia; majormedi-cal/psychatric illness; active vaginal infection; vaginismus; gyneco. surgery; pregnancy	Self-report standardized questionnaires	PV reported more catastrophizing toughts related to pain during intercourse	7
Brotto et al. (2003)	N 50; age 19–54; SES ?; Clin. pop.	Cross-sectional uncontrolled normative data comparaison	?	?	Self-report standardized questionniares and home-made questionnaires	More phobic anxiety, 26% clinically distressed	1,3,4,6,7
Lundq vist and Bergdahl (2003)	N 30; age 17-29; SES ?; Clin pop.	Cross-sectional controlled 2 groups	Friedrich's criteria	?	Self-report standardized questionnaires	PV more depressed andmore anxious	2,3,7
Reissing et al. (2003)	N 87; age 18–43 SES 23% married, 80% with a partner; Gen. pop.	Cross-sectional controlled 3 groups PV, vaginismus, controls	50% of intercourse painful, pain located at vagina entrance for at least 1 year	?	Self-report standardized questionnaires and home made interview	No difference for psychological distress and marital adjustment	3,4,5,7

(Continued on next page)

TABLE 2. Psychological Outcome Studies for Provoked Vestibulodynia (PV) *(Continued)*

Reference	Sample Characteristics N, age, SES, Pop.	Design	Definition of Vestibulodynia	Other Selection Criteria	Psychosocial Measures	Outcome	Comments
Aikens et al. (2003)	N 32; age 18–60; SES?; Clin. pop.	Cross-sectional controlled 2 groups	Cotton-swab test ISSVD definition	Pain for at least 3 months; between 18–60 years. Excluded if pregnant; had vulvar surgery; taking medication	Self-report standardized questionnaires	PV more depressed only for somatic subscale	3,4,5?,7
Gordon et al. (2003)	N 428; age ? SES 231 married; Gen. pop.	Cross-sectional uncontrolled web survey	Report of vulvar pain	?	Home-made questionnaire	Marital relationship altered; 65% report that partner understanding help them to cope with pain	1,3,4,5,6
Granot et al. (2004)	N 89; age?; SES ?; Clin. pop.	Cross-sectional uncontrolled compare primary vs secondary PV	Friedrich's criteria	Excluded if other diseases or taking madication	Self-report standardized questionnaires	Higher level of trait anxiety for primary PV	2,3,7
Payne et al. (2005)	N 34; age ?; SES ?; Gen. pop.	Cross-sectional controlled 2 groups	50% of intercourse, pain limited to activities that involve vaginal insertion	Excluded if organic cause; pregnant; history of remitted dyspareunia; majormedical/ psychiatric disorder; taking medication and previous experience on Stroop task	Self-report standardized questionnaires; Stroop task	PV more hyper vigilant; higher level of state and trait anxiety for PV	3,7

Granot (2005)	N 233; age 18–36; SES ?; Clin. pop. case and gen. for controls	Cross-sectional controlled 2 groups	Pain during intercourse for at leat 6 months; cotton-swab test	Between 18-40; Excluded if history of vaginal surgery; others forms of vulvodynia; taking medication	Self-report standardized questionnaires	No difference on personnality except for harm-avoidance and reward dependent more present for PV; higher score on HA and RD was associated with lower pain threshold	2,3
Lundvist et Bergdahl (2005)	N 30; age 18–28 SES not well defined Clin. pop.	Cross-sectional uncontrolled 2 groups V, normative data	Friedrich's criteria	None	Self-report standardized questionnaires	V higher on harm-avoidance, reward dependance and self-directedness Self-directedness associate with depresion and anxiety	2,3,4,5,7
Granot et Lavee (2005)	N 78; age 18–40 SES not well defined Clin. Pop. for PV and Gen. Pop. for controls	Cross-sectional controlled 2 groups PV, controls	Pain during intercourse for at leat 6 months; cotton-swab test	Excluded if vaginismus or vulvodynia	Self-report standardized questionnaires and physical measures	PV higher trait anxiety and somatization No difference on state anxiety and catastrophizing	2,3,4,5,7
Brauer, Lann & ter Kuile (2006)	N 75; age 18–45 SES well defined Gen. pop. (63% PV), controls	Cross-sectional Controlled 2 groups dyspareunia heterosexual relationship for 6 month	Pain 50% intercourse for 6 month, cottons wab test physical pathology, pregnancy, past surgery and psychiatric diagnosis	Premenopausal. Excluded if pain not related to intercourse, Interview, physical measure and erotic stimuli	Self-report standardized questionnaires, home-made intercourse scene	No difference on subjective anxiety when exposed to	4, 5, 6, 7

(Continued on next page)

TABLE 2. Psychological Outcome Studies for Provoked Vestibulodynia (PV) *(Continued)*

Reference	Sample Characteristics N, age, SES, Pop.	Design	Definition of Vestibulodynia	Other Selection Criteria	Psychosocial Measures	Outcome	Comments
Payne et al. (2007)	N 40; age 18–45 SES well defined Gen. pop.	Cross-sectional Controlled 2 groups PV, controls	Pain 50% intercourse for 6 month, cottons wab test	Pain limited to activity involving pressure. Excluded if pain fromanother cause, major physical or psychiatric illness, infection, past surgery, pregnancy, vaginal delivery.	Self-report standardized questionnaires, home-made interview and questionnaires, standardized physical measure and erotic stimuli	No difference on depression and state-trait anxiety PV report higher catastrophization, fear of pain and hypervigilance for intercourse pain and non-intercourse pain, level of subjective anxiety before stimuli was associate with physical arousal and enjoyement	7
Brauer, ter Kuile, Janssen et Laan (2007)	N 96; age 18–45 SES well defined Gen. pop.	Cross-sectional Controlled 2 groups dyspareunia (71% PV), controls	Pain 50% intercourse for 6 month, cotton swab test heterosexual relationship for 6 month	Premenopausal. Excluded if pain not related to intercourse, physical pathology, pregnancy, past surgery and psychiatric diagnosis	Self-report standardized questionnaires, home-made interview and physical measure and pain stimuli	Women with dyspareunia report more subjective threat, subjective treat was associate with lower physical arousal in both groups	4, 5, 6

N, sample size; age, age range; SES, socio-economic status; Pop, general (gen.) vs. clinical (clin.) population; PV, provoked vestibulodynia.
1, no control/comparaison group at all; 2, comparison group invalid; 3, little information on sample selection or characteristics not well defined;
4, unclear diagnostic criteria; 5, heterogeneous sample; 6, nonvalidated measures or not reliable; 7, small sample.

In summary, results from controlled studies using standardized measures indicate that women with vestibulodynia do not appear to suffer from greater global psychological distress than women from control groups. However, the design of theses studies does not allow the determination of whether psychological distress is a precursor or a consequence of vulvo-vaginal pain.

Depression

Twenty eight studies included more specific psychosocial variables. Among those, 10 focused on depression. Uncontrolled cross-sectional studies have established that women suffering from vestibulodynia typically report feeling more depressed (39–60%) and having low self-esteem (Schover et al., 1992; de Jong et al., 1995; Jantos & White, 1997; Sackett et al., 2001). Further, several controlled studies with clinical samples that used a wide variety of measures for depression (unique question vs. standardized questionnaire; for example, Beck Depression Inventory) have also shown that women suffering from vestibulodynia have higher depression scores than nonafflicted women (Reed et al., 2000; Gates & Galask, 2001; Hallam-Jones et al., 2001; Lundqvist & Bergdahl, 2003), although three controlled studies were unable to detect such a difference (Meana et al., 1997b; Aikens, Reed, Gorenflo, & Haefner, 2003; Payne et al., 2007). However, the study by Aikens et al. (1997) had multiple exclusion criteria, including taking medication, which could partly explain this lack of difference between the groups. In addition, the studies by Meana et al. (1997) and Payne et al. (2007) involved samples from the general population rather than clinical ones, which could explain their results—women from the general population generally experience less distress than those from clinical populations.

Anxiety

Thirteen studies focused on anxiety, which is thought to be an important factor in the etiology of vestibulodynia (Meana & Binik, 1994). The first uncontrolled cross-sectional studies showed that the majority of women suffering from vestibulodynia (32–50%) reported experiencing anxiety (Jantos & White, 1997; Sackett et al., 2001). Moreover, according to a study by Brotto et al. (2003), these women report more phobic anxiety comparative to norms. These results have been corroborated by several studies involving a separate control group of pain-free women and using measures of psychological distress entailing an anxiety subscale, as well as standardized measures of anxiety (for example, the Spielberger State Trait Anxiety Inventory) (Meana et al., 1997; Nunns & Mandal, 1997; Hallam-Jones et al., 2001; Granot, Friedman, Yarnitsky, & Zimmer, 2002; Lundqvist & Bergdahl, 2003; Granot & Lavee, 2005; Payne, Binik, Amsel, & Khalife, 2005). A recent controlled

study also revealed that women suffering from primary vestibulodynia (since first intercourse) have higher state and trait anxiety scores than women with secondary vestibulodynia (Granot, Friedman, Yarnitsky, Tamir, and Zimmer, 2004). Yet more recently, a controlled study by Payne et al. (2007) failed to find any significant difference between vestibulodynia participants and controls regarding state and trait anxiety. However, lack of statistical power due to a small sample size could, in part, explain this result. Overall, anxiety has been repeatedly shown to be greater in women with vestibulodynia, independent of the methodological quality of the studies.

The effect of anxiety on the sexual response cycle, more specifically sexual arousal—which a lack thereof has been suspected of increasing pain during intercourse—has also been examined. In a study conducted by Brauer et al. (2006), women with dyspareunia (63% vestibulodynia) and controls were not significantly different regarding the level of subjective anxiety during the screening of a scene involving sexual activity with penetration. In the study by Payne et al. (2007), women suffering from vestibulodynia were also compared with nonafflicted women on their subjective anxiety before exposure to an erotic film. Correlational analyses showed that the more women suffering from vestibulodynia reported feeling subjective anxiety before the screening of an erotic film, the lower was their level of physiological sexual arousal. Finally, a recent study attempted to experimentally induce a fear of pain with the help of instructions mentioning the possibility of receiving painful stimuli (on the elbow) during the screening of an erotic film. Results show that women suffering from dyspareunia (71% vestibulodynia) reported higher levels of perceived threat than women from a control group. Moreover, subsequent correlational analyses indicated that higher levels of perceived threat were associated with lower levels of physiological sexual arousal for women from both groups (Brauer et al., 2007). In sum, even though women suffering from vestibulodynia did not distinguish themselves by their subjective level of anxiety induced in the laboratory, anxiety was nonetheless associated with a decrease in the level of physiological sexual arousal. Future research should include standardized measures of anxiety, more homogeneous and larger samples, as well as pain stimuli that better reproduce the real life experiences of women with vestibulodynia.

Dyadic Adjustment

Seven studies have focused on the social factors that might be involved in the etiology of vestibulodynia. Among those, a controlled study revealed that women suffering from generalized or localized vulvodynia (vestibulodynia) report more important difficulties regarding relationship adjustment than women without pain problems (Hallam-Jones et al., 2001). However, the use of a clinical sample comprised of women with generalized vulvodynia—a more pervasive condition—may have biased these results (see Table 2). In

contrast, three controlled studies failed to show significant differences between groups of women with and without vestibulodynia concerning dyadic adjustment (Meana et al., 1997b; Reed et al., 2000; Reissing et al., 2003). Interestingly, results from an uncontrolled cross-sectional study done via the Internet among 428 women showed that 65% of them reported that support and understanding from their partner facilitated pain management (Gordon et al., 2004). It thus appears that women suffering from vestibulodynia do not report more relationship distress than nonafflicted women. However, more controlled studies involving larger samples are needed before we can draw definite conclusions concerning dyadic adjustment.

Lastly, one correlational study by Meana, Binik, Khalifé, and Cohen (1998) has investigated the presence of associations between dyadic adjustment and pain. This study was conducted with a sample of 76 women suffering from several types of dyspareunia (vestibulodynia: N = 33) and the use of standardized questionnaires. Results revealed that higher dyadic adjustment significantly predicted lower pain scores. These preliminary findings point toward the importance of conducting additional studies to clarify the role of dyadic variables in the experience of vestibulodynia. Future work should aim to expand the scope of factors investigated thus far and include, for example, attachment style, intimacy, and expression of emotions in romantic relationships.

Attributions

To date, only one study focused on the attributions of women with vestibulodynia regarding their pain (Meana, Binik, Khalife, & Cohen, 1999), using a sample of 120 women suffering from different types of dyspareunia (vestibulodynia: N = 49). Results indicated that when women attributed their pain to psychosocial causes (for example, anxiety, relationship problems, history of abuse), they reported more psychological distress, greater alterations in sexual functioning as well as more episodes of adulthood sexual aggression. More research is needed to further elucidate how cognitive factors might contribute to predict pain and associated sexual dysfunction.

Personality Traits

More recently, investigators have examined whether specific personality traits might predispose some women to experience more vulvo-vaginal pain. In a study by Danielsson, Eisemann, Sjoberg, and Wikman (2001), 70 women with vestibulodynia were compared to 38 nonafflicted women on the basis of their answers to a standardized questionnaire measuring several personality traits according to Cloninger's model (e.g., Cloninger, Svrakic, & Przybeck, 1993). Results indicated that women from the vestibulodynia group did not differ from controls in terms of personality, except concerning

the harm-avoidance trait (HA) (tendency to avoid danger). Two other controlled studies using larger samples and appropriate diagnostic and exclusion criteria replicated these results and also found that these women obtained higher scores than controls concerning HA but also on subscales measuring the personality traits reward dependent (reinforcement dependence (RD) (Granot, 2005) and self-directedness (SD) (tendency to attribute behaviors or events to external causes out of our control) (Lundvist & Bergdahl, 2005). Additionally, subsequent correlational analyses indicated that higher scores on personality traits HA and RD were associated with lower pain thresholds in these women (Granot, 2005), while the SD trait was associated with higher levels of depression and anxiety (Lundvist & Bergdahl, 2005). These findings suggest that the tendency to avoid threat represents a more frequent personality trait in women with vestibulodynia. Still, these studies are based on a rather general model of personality for which the definitions of specific traits remain somewhat vague. Furthermore, it is difficult to determine whether the scores obtained by the women truly reflect a personality trait or are simply the result of their exposure to repeated pain experiences in a context where a cause has generally not been identified and a diagnosis not always established (e.g., Harlow, Wise, & Stewart, 2001).

Catastrophizing, Fear of Pain, and Hypervigilance

A small portion of published studies has focused on variables that have been shown to be important psychosocial predictors of chronic pain and associated disability (e.g. Keefe, Rumble, Scipio, Giodano, & Perri, 2004; Leeuw et al., 2006). Two controlled studies examined whether women with vestibulodynia have more catastrophic thoughts toward pain than women from a control group—catastrophizing being considered as the best predictor of pain intensity in several chronic pain problems (Keefe et al., 2004). Results demonstrate that women from the vestibulodynia group reported more catastrophizing toward their pain than women from the control group reported toward other types of pain (Pukall, Binik, Khalifé, Amsel, & Abbott, 2000; Payne et al., 2007). Likewise, in two other recent studies, investigators examined the impact of the fear of pain (form of anxiety specific to pain) and the tendency to be hypervigilant toward pain. In the first study, women with vestibulodynia first completed different standardized questionnaires. A Stroop task was also used in order to assess the presence of hypervigilance toward pain stimuli, compared to neutral stimuli. Results revealed that women with vestibulodynia reported more state and trait anxiety as well as more hypervigilance toward pain when assessed by a standardized questionnaire. Results concerning hypervigilance were confirmed by the scores on the Stroop task, since these women showed more cognitive interference toward pain stimuli than those of the control group. However, no statistical difference was found concerning

fear of pain. Finally, additional correlational analyses showed that the scores from the Stroop task were modulated by levels of state and trait anxiety as well as by fear of pain (Payne et al., 2005). The second study by Payne et al. (2007) replicated the finding concerning hypervigilance and also revealed a significant difference between groups regarding fear of pain. Although still in its preliminary stages, research involving psychosocial variables from the chronic pain field is promising and warrants further scientific attention.

Conclusion

Globally, the studies involving psychosocial factors show that in spite of an apparent lack of general psychological distress, some specific psychological states such as anxiety, fear of pain, hypervigilance, catastrophizing, and depression, seem to be more frequently reported by women suffering from provoked vestibulodynia than by normal controls. However, the majority of the studies published to date have been descriptive, which prevents reaching any conclusion regarding the etiologic implication of the above variables. It would be interesting to pursue the exploration of psychological (for example, trait anxiety, fear of pain, catastrophizing, depression, hypervigilance) and social factors (for example, dyadic adjustment, social support, etc.) via prospective designs geared toward establishing their contribution to the exacerbation or maintenance of pain and associated sexual dysfunction. Finally, studying the partner's perspective as well as his/her reactions concerning pain might also contribute to a greater understanding of vestibulodynia.

SUMMARY AND RECOMMENDATIONS

It is clear from the findings of several controlled studies that women with vestibulodynia suffer from impairments in their sexual as well as psychosocial functioning. Indeed, results confirm that they report a marked alteration of several facets of their sexual functioning, including a decrease in sexual arousal and desire, a lower frequency of intercourse, difficulty achieving orgasm, and a decrease in sexual satisfaction. In addition, childhood physical and sexual abuse may be potential risk factors for the development of vestibulodynia. As for psychosocial factors, studies have consistently found that women with vestibulodynia have higher anxiety levels than controls. The picture is slightly different concerning depression: the majority of studies conclude that women with vestibulodynia who seek professional help for their problem report more depressive symptoms than normal women, yet this finding does not seem to apply to women recruited in the general population. Further, studies have failed to demonstrate higher rates of global psychological distress in women with vestibulodynia. However, personality traits such as harm-avoidance as well as cognitive/affective factors such as

the tendency to catastrophize, to fear pain, and to be hypervigilant toward pain, seem to be important features of their psychological functioning. Finally, certain psychosocial variables, such as dyadic adjustment, appear to constitute potential predictors of pain and psychosexual functioning in these women, although the search for predictors is now at a very preliminary stage.

As a whole, the studies reviewed do not yet allow to formally identify sexual and psychosocial variables that might play a role in the etiology of vestibulodynia, since most of the research has been descriptive in nature or has not been replicated. Moreover, the current state of the literature precludes drawing any conclusion concerning causal inferences about the different aforementioned factors due to the important methodological shortcomings of many of the studies. In fact, the majority of studies based their conclusions on small, heterogeneous samples, in which the lack of descriptive details regarding the participants makes it difficult to assess even the main characteristics of the sample—such as the pain diagnosis—and prevents comparability across groups and/or studies. More specifically, the absence of exclusion criteria in the majority of the publications introduces important biases (for example, pain caused by other problems like yeast infections, menopause, etc.). In addition, with the exception of a few studies (Brauer et al., 2006, 2007; Gordon et al., 2003; Meana et al., 1997, 1998; Payne et al., 2005, 2007; Pukall et al., 2002; Reissing et al., 2003; Harlow & Steward, 2005), women from control groups were recruited within clinical populations, that is to say, among women who have other types of health problems, which could also have brought upon considerable bias in the results. The same can be said about the choice of measures used, which varies greatly in quality and in specificity throughout the different studies reviewed, ranging from simple questions inserted in a nonstructured interview to standardized and validated questionnaires. Lastly, the cross-sectional designs of most studies do not address the question of whether the psychosocial and sexual characteristics found in women with vestibulodynia preceded or followed the onset of the pain. In short, with the exception of a few studies that require replication (e.g., Harlow et al., 2005; Nunns & Mandal, 1997; Danielsson et al., 2001; Granot et al., 2004; Payne et al., 2005; Granot, 2005; Lundvist & Bergdahl, 2005; Granot & Lavee, 2005; Payne et al., 2007), it is generally not possible to determine whether psychosexual factors are involved in the development or maintenance of vestibulodynia, or are simply the consequence of an undiagnosed, persistent, recurrent pain. Thus, more prospective studies using larger samples, appropriate diagnostic and exclusion criteria, as well as standardized measures are needed to determine causal inferences.

From a theoretical perspective, the studies reviewed shed light on some conceptual issues that warrant further attention in upcoming research. As a whole, the types of variables included in the different studies reflect the dualistic conceptualization that still prevails in the field, despite the efforts made by some authors to adopt an integrated biopsychosocial model (e.g., Binik,

2005). Indeed, only one study focused both on medical and psychosexual variables (Meana et al., 1997b). Furthermore, although some of the studies aimed to identify psychosexual causes that may explain the pain that these women experience, the methodologies used did not reflect this objective. In addition, the current empirical work in the field of pain shows that psychosocial variables rather have an impact on the exacerbation and maintenance of pain problems, and consequently, that the ceaseless search for psychosocial causes should be relegated to second place (see Gatchel & Turk, 1999). Hence, future studies should conceptualize sexual and psychosocial variables as potential modulators of pain and associated impairment. In this view, the next step would be to investigate the relative contribution of specific psychological variables considered as important in current biopsychosocial models of pain, such as fear of pain, hypervigilance toward pain, catastrophizing, self-efficacy, and partners' responses to pain. This shift in focus, in addition to enriching our theoretical understanding of vestibulodynia, might have a more positive impact on treatment by expanding women's options and increasing their control over this misunderstood genital pain problem.

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