

# Attributions About Pain as Predictors of Psychological Symptomatology, Sexual Function, and Dyadic Adjustment in Women with Vestibulodynia

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**Abstract** The present study examined whether attributions for vulvo-vaginal pain predicted pain intensity, sexual function, as well as psychological and dyadic adjustment in women with vestibulodynia. Women with vestibulodynia ( $N=77$ ) completed measures of attributions, pain, psychological distress, sexual functioning, and dyadic adjustment. They also took part in a structured interview and a gynaecological examination for diagnostic purposes. Attributions are represented by: (1) internality (personal responsibility) or externality (cause lies in an external situation); (2) globality (entire life affected by the problem) or specificity (problem affecting only a specific situation); (3) stability (problem will still remain in the future) or instability (weak probability that the problem will be maintained with time); and (4) partner responsibility (partner responsible or not for the problem). Results indicated that attributions were not

significantly correlated with pain outcomes. However, after controlling for pain intensity and relationship duration, internal attributions predicted higher dyadic adjustment, both global and stable attributions predicted lower dyadic adjustment and higher psychological distress, whereas global attributions also predicted increased sexual impairment. Findings suggest that cognitive factors, such as attributions, may be related to psychological distress, sexual functioning, and dyadic adjustment in women with vestibulodynia. Results also highlight the importance of adhering to a biopsychosocial perspective focusing on pain reduction, sexual rehabilitation, and relationship enhancement in the treatment of dyspareunia.

**Keywords** Vestibulodynia · Dyspareunia · Vulvodinia · Attributions · Psychological distress · Sexual functioning

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## Introduction

One out of five women under the age of 30 suffers from painful intercourse (dyspareunia) (Laumann, Paik, & Rosen, 1999). Provoked vestibulodynia, formerly called “vulvar vestibulitis syndrome” (VVS) (Moyal-Barraco & Lynch, 2004), is suspected to be the most prevalent cause of dyspareunia in premenopausal women (Friedrich, 1987; Goetsch, 1991; Meana et al., 1997a; Moyal-Barraco & Lynch, 2004). A population-based study suggests that the lifetime cumulative incidence of vestibulodynia is 12% (Harlow & Stewart, 2003). It is characterized by a burning and/or cutting pain that is elicited via pressure to the vulvar vestibule or attempted vaginal penetration (Bergeron, Binik, Khalifé, Pagidas, & Glazer, 2001). Repercussions of this chronic recurrent pain problem have been reported to be multiple and include an impairment of sexual functioning as well as increases in psychological and marital distress, in addition to diminished quality of life (Arnold,

Bachmann, Rosen, Kelly, & Rhoads, 2006; Bergeron, Binik, Khalife, & Pagidas, 1997; Danielsson, Sjoberg, & Wikman, 2000; Meana, Binik, Khalifé, & Cohen, 1997b; Van Lankveld, Weijenborg, & ter Kuile, 1996; White & Jantos, 1998).

Although biomedical factors are thought to contribute to the pathophysiology of vestibulodynia, current conceptualizations of pain and sexual functioning suggest that these outcomes are multi-determined and hence best explained by multifactorial, biopsychosocial models (Bergeron, Meana, Binik, & Khalifé, 2003; Binik, 2005; Keefe, Rumble, Scipio, Giordano, & Perri, 2004; Melzack & Wall, 1982). More specifically, studies from the chronic pain field show that psychosocial factors explain a great proportion of the variance in the functionality of patients, independent of their pain intensity (Block, Kremer, & Gaylor, 1980; Flor, Kerns, & Turk, 1987; Kielcolt-Glazer & Newton, 2001; Romano et al., 1995; Schiaffino & Revenson, 1995; Turk & Feldman, 1992). However, very few studies have focused on the psychosocial predictors and sequelae of vestibulodynia. The role of cognitive factors in particular has been under-investigated.

When diagnosed with a disorder, individuals tend to engage in a search for causal attributions in an attempt to maintain a coherent, cohesive, and predictable worldview (Shiloh, Rashuk-Rosenthal, & Yael, 2002). Such causal attributions have been shown to be important cognitive contributors in adjustment to illness and chronic pain (Affleck, Pfeiffer, Tennen, & Fifield, 1987; Benyamini, Leventhal, & Leventhal, 1997; Cope, David, & Mann, 1994; Fortune, Richards, Main, & Griffith, 2000; Mickelson, Wroble, & Helgeson, 1999; Moss-Moris, Petrie, & Weinman, 1996). Causal attributions for illness have been found to be associated with negative health outcomes and poorer adjustment to medical conditions (Agrawal & Dalal, 1993; Bar-On, Gilutz, Maynon, Ziberman, & Cristal, 1994; Billings, Bar-On, & Rehnquist, 1997; Chalder, Power, & Wessely, 1996). Attributions have also been shown to play a major role in the initiation and maintenance of marital distress (Doherty, 1982; Eidelson & Epstein, 1982; Fincham, 1985; Fincham & O'Leary, 1983; Holtzworth-Munroe & Jacobson, 1985; Jacobson, McDonald, Follette, & Berley, 1985). Finally, there is some evidence that they may be involved in the development and maintenance of male sexual dysfunction (Scepkowski et al., 2004; Weisberg, Brown, Wincze, & Barlow, 2001).

Attribution theory suggests that individuals are fairly constant in the causal attribution dimensions that they use in various situations (Weiner, 1986). The first of these dimensions is internality/externality, whereby the individual questions himself as to whether the problem stems from a personal origin (internal) or an external situation (external). The second is the globality dimension, which refers to whether the problem influences other aspects of one's life (global) or is simply related to a specific situation (specific). The last dimension concerns stability/instability, that is, the extent to which there is a strong probability that the cause of the problem is applicable in similar

circumstances (stable) or a weak probability of obtaining the same results in the future (unstable).

Moreover, some studies have shown that partner responsibility (partner attributions) may be a fourth dimension to consider in illness interpretation. Graff-Low, Thoresen, Patillo, and Fleischman (1993) found a relationship between coronary heart disease and attributional style in women, where the largest proportion of recurrences occurred in women attributing their infarctus to marital problems. Another study conducted by Arefjord, Hallaraker, Havik, and Maeland (2002) suggested that in wives of myocardial infarction (MI) patients, attributing the MI to husband personality was associated with worse emotional adjustment for both members of the couple.

In addition to attributions being categorized along the above dimensions, some researchers postulate the existence of positive and negative attributional styles (Alloy, Abramson, Metalsky, & Hartlage, 1988; Seligman, Abramson, Semmel, & Von Baeyer, 1979). A positive attributional style reflects the interpretation of a negative event as being unstable, specific, and external, and the interpretation of a positive one as stable, global, and internal. In an opposite fashion, individuals with a negative attributional style will tend to view negative events as stable, global, and internal, and positive ones as external, specific, and unstable. Such a negative style has been associated with depression and feelings of helplessness (Peterson & Seligman, 1987; Poon & Lau, 1999). It has also been shown to predict poor psychological adjustment to illness and a greater deterioration of physical status during illness (Tennen & Affleck, 1990; Turnquist, Harvey, & Andersen, 1988).

To date, attributions have been the subject of only one study focusing on dyspareunia. Meana, Binik, Khalifé, and Cohen (1999) found that women who made psychosocial attributions for their pain reported higher pain intensity and more psychological, dyadic, and sexual difficulties than women who attributed their pain to biomedical causes. In this study, attributions were more predictive of adjustment than actual diagnosis. However, this study comprised a non-validated measure of attributions (i.e., one single question) and contrasted "physical" versus "psychological" explanations for the pain rather than focusing on the traditional three dimensions of attributions (internality/globality/stability).

Thus, building on the preliminary work of Meana et al. (1999), the main objective of this study was to investigate the correlates of causal attributions of vestibulodynia—the most frequent cause of dyspareunia—on pain intensity as well as psychological distress, sexual functioning, and relationship adjustment of affected women. We hypothesized that negative attributions (internal, stable, global, and partner responsibility) would predict increased pain and poorer psychological adjustment, sexual functioning, and dyadic adjustment. Specifically, we predicted that the more women with vestibulodynia blamed themselves for their condition (internal attributions), blamed their partner (partner attributions), believed that the pain affected all dimensions of their life

(global attributions) and that it would always be present (stable attributions), the worse pain, psychological distress, sexual functioning, and dyadic adjustment outcomes they would report.

## Method

### Participants

The present research was part of a larger study which aimed to evaluate the efficacy of cognitive-behavioral group treatment for vestibulodynia. This research was approved by our institution's ethics review board as well as by the two review boards of the university hospitals in which we conducted the study. Participants were recruited by gynecologists working in two university hospitals of a large metropolitan area and advertisements placed in various newspapers and women's magazines. Data collection took place over a 2-year period and 77 participants were selected from a pool of 93 women suffering from vestibulodynia. Inclusion criteria were the following: (1) pain during sexual intercourse for at least 6 months, during 75% or more of penetration attempts and causing subjective distress; (2) pain limited to vaginal penetration and to activities with localized pressure on the vulvar vestibule (e.g., bicycle); (3) severe pain ( $\geq 5$  on a scale from 0 to 10) at one or more locations in the vulvar vestibule during a gynecological examination involving the cotton swab test. Exclusion criteria were: (1) vulvar pain not occurring during vaginal penetration or pressure applied to the vulvar vestibule; (2) presence of one of the following problems: psychiatric illness or severe medical condition, major infection, deep dyspareunia, vaginismus (as defined by DSM-IV-TR), and dermatological lesion; (3) currently undergoing treatment for vestibulodynia; (4) pregnancy; (5) less than 18 years or more than 45 years. These selection criteria were intended to secure as homogeneous a participant pool of women with dyspareunia as possible for the purposes of this study.

### Procedure

Women interested in participating in the study first contacted the research coordinator for an initial telephone screening. If a woman was not eligible to take part in the study, she was referred immediately to the gynecologists on our team. Eligible women took part in a gynecological examination, a structured interview, and completed questionnaires. All interviews were conducted by trained Ph.D. level research assistants and standardized gynecological examinations were performed by one of the two gynecologists on our team.

### Structured Interview

Sociodemographic information was collected via a structured interview. This interview also focused on the history of vulvar/

pelvic pain and its associated medical aspects. Participants were asked to subjectively evaluate their pain during intercourse on a scale of 0–10 (Visual Analogue Scale-VAS) and estimate the frequency of sexual intercourse per month.

### Gynecological Examination

A complete gynecological examination was performed according to a standardized protocol. This exam included the following procedures: (1) cervico-vaginal cultures in order to evaluate the presence of *Candida*, *Gardnerella*, and *Trichomonas*; (2) short interview about obstetric and gynecological history, medication, and pain during intercourse; (3) palpation with a finger of the following areas: vagina, uterus, and ovaries; (4) a regular bimanual palpation of the uterus and ovaries. Participants were also asked to evaluate their pain on a scale of 0–10 (cotton swab test). Any other physical anomaly was noted, as well as the final diagnosis of the gynecologist. The main goal of this protocol was the assessment of gynecological health and the detection of exclusion criteria such as vaginismus, infections, and other vulvar/pelvic pains.

### Measures

#### Attributions

The Extended Attributional Style Questionnaire (EASQ) by Metalsky, Halberstadt, and Abramson (1987) consists of 12 hypothetical negative life events. Similarly to the original ASQ (Peterson et al., 1982), participants write down the one major cause of a given event, in an open-ended manner, and they rate the cause separately for degree of internality, globality and stability. The EASQ has an excellent internal consistency, which ranges from .80 to .90, and is as strongly validated as the original version (Blaney, Behar, & Head, 1980; Eaves & Rush, 1984; Peterson & Seligman, 1987; Peterson, Villanova, & Raps, 1985; Zullow, Oettingen, Peterson, & Seligman, 1988). We adapted the EASQ for pain during intercourse with 12 hypothetical negative situations describing a genital pain context.<sup>1</sup> This measure required participants to evaluate the main cause of these situations. Four scores were derived from this scale: (1) Internality: "I'm responsible for my pain"; (2) Partner responsibility: "My partner is responsible for my pain"; (3) Globality: "Pain is affecting my entire life"; and (4) Stability: "Pain will always be a part of my life." Each subscale was measured on a 7-point Likert scale (e.g., 1 = externality, 7 = internality). High scores on this questionnaire indicate more internality, globality, stability, and partner responsibility. As for reliability, we found good internal consistency estimates ( $\alpha = 0.84\text{--}0.86$ ) for each subscale and for the total score. Lastly, examination of the factor structure confirmed that

<sup>1</sup> A copy of the questionnaire is available from the corresponding author upon request.

the structure of the dyspareunia version was similar to that of the original EASQ version.

### Pain

Pain assessment was conducted using three measures:

- (1) Vestibular Pain Index (VPI), consisting of women's ratings of their pain intensity on a scale of 0–10 (0 = no pain and 10 = the worst pain) during random palpation of three locations within the vulvar vestibule (3–6–9 o'clock sites) with a cotton swab. Random palpation is a way to avoid the sensitization of the vulvar vestibule resulting from palpation at adjacent sites (Bergeron et al., 2001; Pukall, Payne, Binik, & Khalifé, 2003). Random combinations of the three locations were computer generated prior to gynaecological examinations. The average of these three points was computed in order to obtain an index of vestibular pain. This exam constitutes the "cotton swab test" and represents a judicious tool in the diagnosis of vestibulodynia. The agreement between the two gynecologists varied between 93.8% ( $\kappa = 0.68$ ) to 98% ( $\kappa = 0.66$ ) and the percentage for test–retest reliability for time one was 96.4% ( $\kappa = 0.49$ ) and 93.9% ( $\kappa = 0.54$ ) for time two (Bergeron et al., 2001).
- (2) A "Visual Analogue Scale" (VAS) was included in the structured interview, with which the women indicated the intensity of their pain during intercourse. Pain intensity was thus indicated on a horizontal scale from 0 to 10, where 0 represented an absence of pain and 10 constituted the worst pain ever experienced. It has excellent validity as indicated by studies with chronic pain populations (Jensen, Karoly, & Braver, 1986; Melzack, Katz, & Coderre, 1992).
- (3) The McGill–Melzack Pain Questionnaire (MPQ) (Melzack, 1975) is both a qualitative and quantitative measure of pain which includes 77 adjectives, three scales (sensory, evaluative, and affective) and three indices (pain rating index, number of words chosen, and present pain index). High scores on this questionnaire indicate a more severe pain experience. This questionnaire has an excellent internal validity (Melzack, 1975) and also very good discriminant validity (Turk, Rudy, & Salovey, 1985). It has good test–retest reliability for each measured dimension (Love, Leboeuf, & Crisp, 1989). In the present study, we used the French version of this questionnaire, which was validated by Boureau, Doubrère, and Gay (1984).

### Psychological Distress

Overall psychological distress was measured using the Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983), a self-report measure with 53 items and nine dimensions of primary symptoms, including anxiety and depression, and three

total indices of well-being used to evaluate general degree of psychological distress. High scores on this questionnaire indicate increased psychological distress. The reliability and validity of this inventory have been demonstrated with various populations (Derogatis, 1992) and also with a French-speaking population (Tatu, Pellet, Lang, & Pichon, 1994).

### Sexual Functioning

Global sexual functioning was measured by the Female Sexual Function Index (FSFI) (Rosen et al., 2000), which consists of 19 items focusing on five dimensions of sexual function: desire and arousal, lubrication, orgasm, satisfaction, and pain/discomfort. High scores on this questionnaire indicate a better functioning. This index has very good psychometric qualities, is easy to administer, and discriminates clinical from non-clinical populations (Daker-White, 2002). Finally, this questionnaire was translated from English to French. Factor analysis confirmed that the factorial structure of the French version was similar to that of the original English version. In addition, internal consistency was excellent ( $\alpha = 0.92$ ).

### Dyadic Adjustment

The Dyadic Adjustment Scale (DAS) (Spanier, 1976) was used to evaluate relationship adjustment according to the following dimensions: cohesion, consensus, satisfaction, and affectional expression. High scores on this questionnaire indicate a better dyadic adjustment. This questionnaire is frequently used and many studies have demonstrated its reliability, validity and its capacity to distinguish distressed from non-distressed couples (Crane, Busby, & Larson, 1991; Sharpley & Cross, 1982; Spanier, 1988; Spanier & Thompson, 1982; Walker, Manion, Cloutier, & Johnson, 1992). In this study, a revised version of the Dyadic Adjustment Scale was used (Busby, Crane, Larson, & Christensen, 1995). This version has 14 items measuring four dimensions of relationship adjustment using a 5-point Likert scale (*always in agreement with* to *always in dissension*). This recent version was the object of some validation studies which suggest excellent reliability and validity (Busby, 1990; Busby et al., 1995; Hunsley, Pinsent, Lefebvre, James-Tanner, & Vito, 1995). This short version was validated with a French-speaking population and showed good reliability, validity, and internal consistency (Sabourin, Valois, & Lussier, 2005).

## Results

### Study Sample

A total of 93 women took part in the entire study protocol, although 13 did not meet our selection criteria (e.g., presence of lichen sclerosis or another vulvo-vaginal condition). Of the 80

**Table 1** Summary statistics of variables measured

Sample characteristics	Women ( <i>N</i> = 77)
<b>Sociodemographic information</b>	
Mean age (years)	26.5 ± 6.1
Ethnicity (% Caucasian)	71/77 (92.2%)
Mean education (years)	15.6 ± 2.0
Language (% French)	63/77 (81.8%)
Religion (% catholic)	56/77 (72.7%)
Mean age at first intercourse (years)	17.2 ± 2.5
Mean relationship duration (months)	29.1 ± 23
<b>Marital status</b>	
Married/cohabiting	38 (49%)
Regular partner	29 (38%)
No partner	10 (13%)
Mean time since onset of pain (years)	5.6 ± 4.9
<b>Childbirth</b>	
Uniparous or multiparous	8 (10%)
Nulliparous	69 (90%)
<b>Independent variables</b>	
<i>Dyspareunia Attributions Questionnaire (subscales)</i>	
Internal attributions	5.0/7 ± 1.2
Partner responsibility attributions	2.7/7 ± 1.2
Global attributions	3.9/7 ± 1.4
Stable attributions	4.7/7 ± 1.5
<b>Dependent variables</b>	
<i>Pain severity</i>	
Visual Analogue Scale (VAS)	7.27/10 ± 2.3
McGill–Melzack Pain Questionnaire (MPQ)	37.9/77 ± 14.5
Psychological Distress (BSI)	62.1/80 ± 7.9
Dyadic Adjustment Scale (DAS)	49.7/69 ± 7.2
Female Sexual Functioning Index (FSFI)	19.4/36 ± 5.9

Note. ±Standard deviation

remaining participants, three had missing questionnaire data, resulting in a final sample of 77. The summary statistics of variables measured can be found in Table 1. The average age of participants was 26.5 years, with a range of 19–44 and nearly 80% of women were under the age of 30. The majority were Caucasian (92.2%), Catholic (72.7%) and well educated (15.6 years). Eighty-seven percent of women had been in a romantic relationship for 3 years or more. The average age of the first sexual experience was 17.2 years. Participants all received a diagnosis of provoked vestibulodynia from participating gynecologists. The average number of years since the onset of vestibulodynia was 5.6 years.

### Descriptive Statistics

Overall, participants in this study reported elevated levels of pain intensity and varying degrees of psychological and sexual

distress, as shown in Table 1. The sample mean for pain intensity (7.27/10) was similar to that reported in other samples of chronic pain patients (Chinball & Tait, 1994). The mean psychological distress score was higher (62/80) than non-patient norms (52/80) and just below the clinical cut-off, which is 63/80 (Derogatis & Melisaratos, 1983). The sample means for sexual functioning (19.4/36) were similar to those of a clinical group of women with Female Sexual Arousal Disorder (FSAD) (Rosen et al., 2000). Average dyadic adjustment was 49.7/69, which suggests a moderate dyadic adjustment. Finally, attributions were normally distributed except for partner responsibility, but this dimension was not strongly correlated with the dependant variables. Mostly, we observed that women in the sample perceived themselves to be responsible for their vulvo-vaginal pain (mean of women responsibility attributions = 5.0/7) and viewed their partner as rarely causing the pain (mean of partner responsibility attributions = 2.7/7). Generally, these women perceived that their pain affected their entire life (mean of global attributions = 3.9/7) and that it would always be present in the future (mean of stable attributions = 4.7/7).

### Correlates of Attributions

Correlational analyses were conducted between sociodemographic and other study variables. No significant associations were found except for relationship duration, which was significantly correlated with dyadic adjustment and with pain variables. Pearson product-moment correlations were also computed among attributions, pain, psychological distress, sexual functioning, and dyadic adjustment. No significant correlations were found between partner attributions and dependant variables.

### Attributions as Predictors of Psychological Distress, Sexual Functioning, and Dyadic Adjustment

A series of hierarchical regression equations were used to examine the roles of internal, global, and stable attributions in predicting pain as well as psychological distress, sexual functioning, and dyadic adjustment. Predictor variables were either internal, global or stable attributions. Relationship duration and pain intensity (MPQ and VAS) were controlled for in the analyses because they correlated with some of the outcome measures (psychological distress and dyadic adjustment). Predictor variables were thus entered in three blocks: entered first was the block of relationship duration, the pain intensity block was entered second, and the third block was comprised of internal, global or stable attributions. Psychological distress, sexual functioning, and dyadic adjustment measures included participants' scores on the BSI, DAS, and FSFI. The pain measures consisted of the McGill Pain Questionnaire (MPQ) and the Visual Analogue Scale (VAS) (Table 2).

**Table 2** Summary of results of multiple hierarchical regression analysis with dyadic adjustment, psychological distress and sexual functioning as dependant variables

Dependent variable	Stand $\beta$	Unique $R^2$	$p$
<i>Attributions and dyadic adjustment</i>			
Step 1			
$\Delta R^2 = .05, F = 3.58, p = .064$ trend			
Relationship duration	-0.25	0.05	.066
Step 2			
$\Delta R^2 = .05, F = 0.88, p = ns$			
VAS	0.16	0.02	ns
MPQ	0.02	0.00	ns
Step 3			
$\Delta R^2 = .30, F = 6.53, p = .001$			
Internal attributions	0.34	0.11	.01
Global attributions	-0.38	0.11	.01
Stable attributions	-0.02	0.00	ns
<i>Attributions and psychological distress</i>			
Step 1			
$\Delta R^2 = -.01, F = 0.247, p = ns$			
Relationship duration	-0.12	0.01	ns
Step 2			
$\Delta R^2 = .09, F = 4.90, p = .01$			
VAS	0.12	0.01	ns
MPQ	0.27	0.06	.01
Step 3			
$\Delta R^2 = .18, F = 5.28, p = .001$			
Global attributions	0.17	0.02	ns
Stable attributions	0.22	0.04	ns
<i>Attributions and sexual functioning</i>			
Step 1			
$\Delta R^2 = .03, F = 3.61, p = .061$ trend			
Relationship duration	-0.21	0.04	ns
Step 2			
$\Delta R^2 = .01, F = 0.20, p = ns$			
VAS	-0.06	0.00	ns
MPQ	0.00	0.00	ns
Step 3			
$\Delta R^2 = .05, F = 3.94, p = .051$			
Global attributions	-0.22	0.05	.05

VAS visual analogue scale, MPQ McGill Pain Questionnaire

### Dyadic Adjustment (DAS)

Relationship duration failed to significantly predict scores on the dyadic adjustment scale,  $\Delta R^2 = 0.05$ ;  $F(1, 72) = 3.58$ ,  $p = .06$ . The addition of the pain block did not result in a significant increase in the amount of variance explained,  $\Delta R^2 = 0.04$ ;  $F(3, 72) < 1$ . Adding the block of internal attributions, global attributions and stable attributions in the third step resulted in a substantial increase in the ability to predict dyadic

adjustment,  $\Delta R^2 = 0.30$ ;  $F(6, 72) = 6.53$ ,  $p < .001$ . Specifically, internal attributions were found to be independent predictors of higher levels of dyadic adjustment,  $\beta = 0.34$ ,  $t = 2.75$ ,  $p < .01$ , as were global attributions,  $\beta = -0.38$ ,  $t = -3.19$ ,  $p < .01$ .

### Psychological Distress (BSI)

When psychological distress was used as an outcome measure, relationship duration did not contribute significantly to the explained variance,  $\Delta R^2 = -0.01$ ,  $F(1, 72) < 1$ . The addition of the block of two pain intensity measures in the second step significantly added to the explained variance,  $\Delta R^2 = 0.09$ ;  $F(3, 72) = 4.90$ ,  $p < .01$ . Specifically, the MPQ made a significant contribution to the prediction of psychological distress. Higher levels of pain intensity were associated with higher levels of psychological distress,  $\beta = 0.27$ ,  $t = 2.40$ ,  $p < .01$ . The inclusion of the third block, global and stable attributions, resulted in a model of prediction of psychological distress that was significant,  $\Delta R^2 = 0.18$ ;  $F(5, 72) = 5.28$ ,  $p < .001$ , with higher levels of global attributions ( $\beta = 0.17$ ,  $t = 2.57$ ) and stable attributions ( $\beta = 0.22$ ,  $t = 2.87$ ) being associated with higher levels of psychological distress.

### Sexual Functioning (FSFI)

The blocks of variables entered in Step 1 and Step 2 did not successfully predict sexual functioning (relationship duration;  $\Delta R^2 = 0.03$ ;  $F(1, 72) = 3.61$ ,  $p = .06$  and pain intensity;  $\Delta R^2 = 0.01$ ;  $F(3, 72) < 1$ ). Global attributions accounted solely for the increase in the prediction of sexual functioning,  $\Delta R^2 = 0.05$ ;  $F(4, 72) = 3.94$ ,  $p < .05$ . Greater use of global attributions ( $\beta = -0.22$ ,  $t = -1.99$ ,  $p < .05$ ) was associated with lower levels of sexual functioning.

## Discussion

In this study, attributions were found to predict psychological, sexual and dyadic adjustment in women with vestibulodynia, independent of pain intensity and relationship duration. More specifically, internal and global attributions independently predicted higher dyadic adjustment, whereas global and stable attributions together predicted increased psychological distress and global attributions alone predicted lower levels of sexual functioning. Despite our initial hypothesis, attributions were not associated with pain intensity and partner attributions were not related to any dependant variables.

First, internal attributions contributed independently to the prediction of higher dyadic adjustment, explaining 11% of the variance in outcome, beyond the variance accounted for by pain intensity and relationship duration. This result failed to confirm

our initial hypothesis whereby internal attributions would be associated with lower dyadic adjustment. It does nonetheless corroborate the results of other studies on attributions (e.g., Graff-Low et al., 1993; Michela & Wood, 1986). Indeed, it has been suggested that women with internal attributions may have better coping strategies and thus adopt healthier behaviors related to their physical and psychological health (Graff-Low et al., 1993). Attributing the responsibility of the condition to oneself could favour dyadic adjustment via the woman engaging more actively in seeking treatment, adhering to treatment, and feeling more in control of the problem overall. Thus, vestibulodynia could be viewed as posing less of a threat to the romantic relationship.

In addition to internal attributions, global and stable attributions also demonstrated a negative association with dyadic adjustment—the model including all three types of attributions accounting for 30% of the variance, after controlling for pain and relationship duration. In the field of sexual pain, results from a study conducted by Meana et al. (1999) suggested that causal attributions for pain were related to marital adjustment. More specifically, women with dyspareunia who made psychosocial attributions for their pain reported lower levels of dyadic adjustment. Our results were also consistent with the findings from numerous studies showing that cognitive factors such as attributions play an important role in the initiation and maintenance of relationship distress (Baucom & Aiken, 1984; Baucom, Sayers, & Duhe, 1989; Doherty, 1982; Eidelson, & Epstein, 1982; Fincham, 1985; Fincham, Beach, & Baucom, 1987; Holtzworth-Munroe & Jacobson, 1985; Madden & Jannoff-Bulman, 1981).

In the present study, the more the women viewed their vestibulodynia problem as external, global and stable, the more relationship distress they experienced. Specifically, in addition to internal attributions, global attributions were found to be an independent predictor of relationship distress. Because global attributions refer to the problem affecting other aspects of one's life, it is not surprising that women who scored high on this item reported lower dyadic adjustment—the romantic relationship being the first life domain, after sexuality, that would be negatively affected by pain during intercourse. Stability attributions may be related to a pessimistic view of vestibulodynia, which may have contributed to greater feelings of helplessness, in particular a fear of losing the partner.

Second, global and stable attributions accounted together for 18% of the variance in psychological distress, independent of pain. The maladaptive nature of global and stable attributions has been documented in the broader attributions literature with respect to psychological distress related to illness and disability. For example, associations between greater internal, global, and stable attributions for negative events and higher rates of depression and helplessness have been shown (Peterson & Seligman, 1984, 1987; Poon & Lau, 1999; Sweeney, Anderson, & Bailey, 1986). Dua (1995) found that among the attributions

for bad events made along three dimensions, global attributions were the best predictor of self-reported emotional and physical health, whereby higher levels of global attributions predicted poorer physical and psychological health. These findings are in line with cognitive-behavioral theories which suggest that negative cognitions generate affective distress (Beck, 1976; Masters, Burish, Hollon & Rimm, 1987; Meichenbaum, 1977).

Additionally, global attributions were negatively associated with sexual functioning and accounted for 5% of its variance, independent of pain intensity. This indicates that a greater use of global attributions contributed to increased sexual impairment in women with vestibulodynia—an overall negative impact on desire, arousal and orgasm. Our results were in accordance with the findings from recent studies by Weisberg et al. (2001) and Scepkowski et al. (2004) who examined the effects of causal attributions on sexual functioning in men with erectile dysfunction. Internal and stable attributions for the perceived erectile problem were related to a significantly lower erectile capacity during the viewing of an erotic film, suggesting that negative attributions may play a role in the development and maintenance of sexual dysfunction. Negative attributions (internal, global and stable dimensions) are characterized by the maintenance of negative expectancies concerning sexual performance situations and possibly a pessimistic explanatory style regarding sexual events (Abrahamson, Barlow, Beck, Sakheim, & Kelly, 1985). Women with vestibulodynia have been shown to harbour more anxiety concerning sexuality (Meana et al., 1997b), more negative sexual self-schemas (Gates & Galask, 2001), and more negative emotions toward themselves in a sexual context (Reed, Advincula, Fonde, Gorenflo, & Haefner, 2003). In addition, results showed that pain intensity was associated with psychological distress. Specifically, pain intensity accounted for 9% of the variance in psychological distress. Previous research has yielded similar findings in other chronic pain populations (e.g., Bennett et al., 1996). Although the present results were correlational, the pain literature has demonstrated the strongest support for the hypothesis that increased levels of psychological distress are a consequence of pain (Dohenwend, Raphael, Marbach, & Gallagher, 1999; Fishbain, Cutler, Rosomoff, & Rosomoff, 1997). Moreover, we found a positive association between psychological distress and dyadic adjustment. Two others studies conducted with prostate cancer patients suggested that dyadic adjustment may play a significant role in subsequent psychological adjustment (Banthia et al., 2003; Wooten et al., 2007).

Lastly, we found no associations between attributions and pain intensity. However, Meana et al. (1999) reported that women with psychosocial attributions (compared to biomedical causes) for their pain showed higher pain intensity and more psychological, dyadic and sexual difficulties. Nonetheless, few studies have examined the relation between attributions and pain intensity, with results indicating that attributions for pain were associated with disability (psychological sequelae) rather than

pain severity (Affleck et al., 1987; Moss-Moris et al., 1996). We observed similar results in our study, whereby attributions were not associated with pain but with psychological distress, sexual impairment and dyadic adjustment. Perhaps attributions are not a crucial variable in pain reduction, but a relevant target in the reestablishment of all life areas affected by pain intensity. A recent study has shown that other cognitive variables, such as catastrophizing, may play a role in pain modulation of women with vestibulodynia (Desrochers, Bergeron, Khalifé, Dupuis, & Jodoin, 2009). Finally, partner attributions were not related to any dependant variables. In fact, very few women believed that their partner was responsible for their pain (mean of 2.7/7). Perhaps a future study conducted with a larger sample could better explain the variations in women's pain intensity, psychological distress, sexual functioning, and dyadic adjustment. It is also possible that women with vestibulodynia refuse to blame their partner because of their fear of losing him.

The present study was not without limitations. First, the sample may not be representative of the larger population of women with dyspareunia, although we know that vestibulodynia is the most common cause of dyspareunia in pre-menopausal women (Friedrich, 1987). Second, this study was correlational in nature and hence does not allow us to determine the direction of the relationship between attributions and psychological distress, sexual functioning, and dyadic adjustment, thereby limiting inferences concerning causal mechanisms. However, based on the cognitive attributional model (Peterson & Seligman, 1984, 1987), it is likely that the relationship is unidirectional to some extent. Indeed, there exists a wealth of prospective data showing that attributions are predictors of health outcomes (Agrawal & Dalal, 1993; Bar-On et al., 1994; Billings et al., 1997; Chalder et al., 1996; Dua, 1995). On the other hand, it is important to consider that lower dyadic adjustment, and/or higher distress, could lead to more negative attributions (Fincham et al., 1987). In addition, although we can hypothesize that the external dimension of the ASQ encompasses biomedical causal explanations, while the internal dimension has to do with attributing the responsibility of the condition to oneself, the quantitative nature of our instrument could have hindered our attempt to touch upon all the core explanations that women with genital pain may formulate. Finally, the present study examined some but not all potential predictors associated with the experience of sexual pain. However, our results, which suggest that attributions may explain between 5% and 20% of the variance in psychosocial and sexual outcomes, were similar to those obtained in other chronic pain populations (e.g., Sullivan, Stanish, Waite, Sullivan, & Tripp, 1998). Nonetheless, we cannot exclude the possibility that other cognitive factors, such as fear of pain (Payne, Binik, Amsel, & Khalifé, 2005), may have explained some of the variance in psychological and sexual adaptation in our sample. Future research is needed to examine more closely the contribution of other cognitive factors in the experience of pain during intercourse.

Despite its limitations, the present research has some important implications. A major strength of this study was the examination of psychosocial factors that may cause or maintain vestibulodynia, whereas the majority of published work in this area has focused exclusively on biomedical factors (Bergeron, Pukall, & Mailloux, in press). It was one of the first attempts to investigate the role of a specific cognitive variable (attributions) in the prediction of dyspareunia and associated psychological and sexual impairment. Moreover, apart from Meana et al.'s (1999) preliminary study, this was the first to focus on women's personal explanations or theories concerning the presence of their genital pain. This is particularly interesting when we know that these women continue to receive stereotyped messages by health professionals, including that the problem is "in their head" or that they simply do not enjoy sex.

Importantly, results from the present study do not support the popular notion that psychological and sexual impairment is necessarily a direct consequence of pain intensity in women with vestibulodynia. As is the case with other pain syndromes, psychosocial factors may play an important role in pain-related disability (Keefe et al., 2004; Turk & Okifuji, 2002). Attributions contributed to explain the individual differences observed among women suffering from vestibulodynia concerning their psychological distress, sexual functioning, and dyadic adjustment.

As for clinical implications, the present findings have suggested that cognitive variables, such as attributions, should be targeted in the psychological and sexual treatment of vestibulodynia. Specifically, the modification of a woman's attributional style could increase her dyadic adjustment, sexual functioning, and mood. Results thus lend support to the use of cognitive-behavioral therapy as an intervention for vestibulodynia (Bergeron et al., 2001). Specifically, 35–83% of patients appear to benefit from this treatment modality (Landry, Bergeron, Dupuis, & Desrochers, 2008). Additionally, the impact of attributions on dyadic adjustment indicated that it may be worthwhile to integrate the partner in sex therapy interventions as well as to further study his role in the experience of painful genital sexual activity. In conclusion, future studies should focus prospectively on cognitive, affective, and interpersonal variables that may contribute to the etiology of dyspareunia.

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