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Communal motivation in couples coping with vulvodynia: Sexual distress mediates associations with pain, depression, and anxiety

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ABSTRACT

Objective: To examine the role of a novel motivational perspective—sexual communal motivation—in women's pain during intercourse and both partners' distress in couples coping with vulvodynia, a prevalent gynecological pain condition. Our goal was to test whether sexual communal strength (i.e., motivation to meet a partner's sexual needs) and unmitigated sexual communion (i.e., prioritization of a partner's sexual needs in neglect of one's own needs) were indirectly associated with pain, depression, and anxiety via sexual distress.

Methods: Couples (N = 101) completed daily surveys about their sexual communal motivation, sexual distress, anxiety, depression, and women reported on their pain during intercourse. Using multilevel modeling, we examined how daily fluctuations in sexual communal motivation were directly and indirectly (via sexual distress) associated with pain and psychological distress.

Results: On days when women with vulvodynia reported higher sexual communal strength, they reported less pain and anxiety, and on days when they reported higher unmitigated sexual communion, they reported more pain, more anxiety, and both partners reported more depressive symptoms. Daily associations between women's unmitigated sexual communion and greater pain, depression and anxiety were mediated by sexual distress.

Conclusions: Being motivated to meet a partner's sexual needs was associated with less pain and anxiety for women with vulvodynia, but when this motivation excluded a focus on one's own needs, there were detrimental consequences for women's pain and both partners' depressive symptoms. Interventions for improving women's pain and the psychological well-being of affected couples should target motivational factors and sexual distress.

1. Introduction

Vulvodynia is a prevalent gynecological pain condition, affecting 8% of women [1]. The most common subtype of vulvodynia is provoked vestibulodynia (PVD), which is characterized by recurrent pain localized in the vulvar vestibule and experienced in sexual and non-sexual contexts [2]. Vulvodynia has consequences for couples' sexual activity and romantic relationship—both of which are central to couples' overall health and well-being [3,4]. Women with vulvodynia are four times more likely to report depression and anxiety than women without vulvodynia, and depression and anxiety disorders are more common following a diagnosis of vulvodynia than preceding it [5]. Often, affected women report feeling stigmatized by health care providers and inadequate as sexual partners, contributing to their distress [6]. In one study, male partners also report more depressive symptoms compared to age-matched controls [7], although other studies have found no such differences [8,9]. Still, a recent qualitative study underscored that male partners experience significant distress in their relationship as a consequence of vulvodynia [10].

Women with vulvoldynia cope with the pain for many years. In a population-based sample, the average pain duration was > 12 years [1] and over two-thirds of affected women receive no diagnosis or treatment [11]. Yet, > 85% of couples report engaging in painful vaginal intercourse [1], underscoring the importance of considering their motivation for doing so. Motivation plays a key role in pain maintenance and psychological adjustment [12,13]. In a study of individuals with chronic pain, both achievement goals for persisting with painful activities and pain-avoidance goals were associated with greater pain severity and disability [14]. Motivational factors also play an important role in the experience of pain and distress for couples coping with

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vulvodynia [15–17]; when affected women engage in sex for avoidance goals (i.e., to avoid conflict) they report greater depressive symptoms and more pain, whereas when they pursue sex for approach goals (i.e., to enhance intimacy) both partners report fewer depressive symptoms [15,16].

Theories of communal motivation have focused on when and for whom being motivated to be responsive to a partner's needs is beneficial. People high in *communal strength*—those who are highly motivated to meet a partner's needs [18,19]—tend to report more satisfaction when making sacrifices for a romantic partner [20]. Whereas people high in *unmitigated communion*—those who provide care to others that involves self-neglect [21,22]—tend to experience poorer health and well-being [22,23]. In couples where one partner experiences chronic pain, being motivated to help that partner for autonomous reasons (i.e., inherent enjoyment), in line with communal strength, as opposed to controlled reasons (i.e., internal obligation), was associated with greater subjective well-being and less distress for both partners [24,25]. In contrast, women with rheumatoid arthritis who reported higher (relative to lower) unmitigated communion were more psychologically distressed [26], and, among patients recovering from their first coronary event, those higher in unmitigated communion had spouses who reported more anxiety and depression [22].

In vulvodynia, where there is interference to the couples' sexual relationship, the motivation to meet a partner's *sexual* needs is important. *Sexual communal strength*—the extent to which people are motivated to be responsive to their partner's sexual needs [27]—and *unmitigated sexual communion*—the motivation to meet a partner's sexual needs to the exclusion of a person's own needs [23]—are shown to be relevant for couples' coping with vulvoldynia [23]. In qualitative studies, women who report pain during intercourse indicated that satisfying their partner's sexual needs was a key reason for continuing to have intercourse [28], and tended to prioritize their partner's sexual needs over their own [29,30]. The partners of women with vulvodynia might feel pressure to focus on the woman's needs given her pain, while setting aside their own sexual needs, which might account for partners' greater distress [10].

One reason people higher in unmitigated communion report greater psychological distress is because when managing an illness or stressor, they feel more distress about the specific health issue [31]. Among women recently diagnosed with breast cancer, those higher in unmitigated communion reported greater psychological distress, and this was accounted for by distress specifically related to their health issue—body image [32]. In contrast, people higher in communion (a construct similar to communal strength) tend to more effectively cope with health issues because they are comfortable receiving support from others and in turn, report greater well-being and less psychological distress compared to people higher in unmitigated communion [33,34]. In the context of vulvodynia, both members of affected couples report significantly higher sexual distress compared to pain-free controls [35–38], and this sexual distress, in turn, exacerbates women's pain. For example, women with vulvodynia who report more negative thoughts about sex (i.e., negative body and genital image) also report greater pain intensity [37]. Understanding the role of couples' sexual distress as an explanatory mechanism in the association between sexual communal motivation, pain and psychological distress is important for improving treatments for vulvodynia; targeting sexual distress could yield benefits for psychological well-being and women's pain.

In the current study—a two-month daily experience study of couples coping with vulvodynia—our key aim was to test the direct and indirect (via sexual distress) associations between daily fluctuations in sexual communal motivation and women's pain during intercourse, and both partners' depression and anxiety. We predicted that on days when women with vulvodynia and partners reported higher sexual communal strength, they would report lower sexual distress, and in turn, women would report less pain and both partners would report less psychological distress. In contrast, on days when women with vulvodynia and partners reported higher unmitigated sexual communion, they would report greater sexual distress, and in turn, women would experience more pain, and both partners would report more psychological distress.

2. Method

2.1. Participants

Women with vulvodynia and their partners (N = 153 couples) were recruited in two North American cities through advertisements (105; 69%), participation in our prior research studies (29; 19%), physician referrals (16; 10%), and word of mouth (3; 2%). For women, the inclusion criteria were: [1] a diagnosis of PVD based on: reports of pain during vaginal intercourse which was subjectively distressing, had lasted for at least six months, and occurred on 80% of intercourse attempts, pain limited to pressure to the vestibule, pain during the diagnostic gynecological examination at a minimum of four on a self-reported scale ranging from 0 (*not pain at all*) to 10 (*worst pain imaginable*); [2] see their partner in-person at least four times per week; and [3] engaged in sexual activity with their partner a minimum of once per month in the previous three months. Exclusion criteria for women were: active vulvo-vaginal infection, pregnancy, age < 18 or > 45 years, and had started menopause (self-reported). The only inclusion criterion specific to partners was age of 18 or older.

Of 153 interested couples, 49 (32%) were ineligible: 12 (8%) did not receive a diagnosis of PVD, 25 (16%) women or partners withdrew before starting the daily surveys, 9 (6%) couples ended their relationship during the eligibility process, and 3 (2%) were ineligible for other reasons (e.g., pain location criteria). Of the 49 ineligible couples, we have demographic information (age, relationship duration, sexual frequency and pain duration) for 34 couples, who did not differ significantly on any of these variables compared to the eligible couples. Of the 104 eligible couples, three couples were excluded because they did not report engaging in sexual activity during the study. The final sample size included 101 women diagnosed with PVD and their partners (n = 99 men; 2 women) (see Table 1 for participant demographics).

2.2. Procedure

The current study used data collected from an ongoing study. One paper has been published focusing on sexual functioning, sexual satisfaction, and relationship satisfaction [23]. The current paper, however, focuses on associations between sexual communal motivation and women's pain during intercourse, which has been shown to be unrelated to sexual and relationship functioning in vulvodynia [39], as well as both partners' symptoms of anxiety and depression, which are broader indices of couples' psychological adjustment. Women were screened for eligibility using a structured interview and gynecological examination (if not referred directly from a physician). The gynecological exam involved a well-validated “cotton swab test” [2]. Study participation had the benefit of expediting a gynecological appointment. Eligible couples attended a laboratory session where they provided informed consent and completed online questionnaires. Participants then completed daily online surveys for eight consecutive weeks. They were instructed to begin the daily surveys that evening and to complete them each evening (reflecting on the previous 24 h) independently from their partner. Daily measures included an item asking whether or not the participant had engaged in sexual activities in the preceding 24 h. If the participant answered yes, they completed measures of sexual communal strength, unmitigated sexual communion, and sexual distress. If they indicated that vaginal intercourse occurred, women reported on their experience of pain (i.e., intensity and unpleasantness). Each day participants also completed measures of depressive symptoms and anxiety. After completing the study, participants received psychoeducational information and references to local health professionals with expertise in vulvodynia. Women received $20

Table 1
Sample characteristics (N = 101 couples).

Characteristic	Women		Partners	
	M (range) or n	*SD* or %	*M* (range) or n	*SD* or %
Age (years)	25.59 (18–45)	5.66	26.97 (18–50)	6.97
Cultural background				
French Canadian	52	52%	42	43.8%
English Canadian	32	32%	33	34.4%
American	1	1%	1	1%
European	5	5%	9	9.4%
Other	10	10%	11	11.4%
Annual income (household; CAD$)				
$0–19,999	31	31%	– –	– –
$20,000–39,999	13	13%	– –	– –
$40,000–59,999	18	18%	– –	– –
$60,000–79,999	18	18%	– –	– –
$80,000–99,999	10	10%	– –	– –
≥$100,000	15	10%	– –	– –
Relationship status				
Married	19	19%	– –	– –
Cohabitating	48	48%	– –	– –
Dating	33	33%	– –	– –
Relationship duration (months)	49.84 (6–204)	41.66	– –	– –
Women's pain duration (months)	62.10 (6–264)	55.55		
Sexual frequency (per month)	2.56 (0–5)	1.35		
Study Variables (daily)				
Sexual communal motivation	2.36 (0–4)	1.16	2.62 (0–4)	1.15
Unmitigated sexual communion	2.51 (1–5)	1.11	2.77 (1–5)	0.99
Sexual distress	1.43 (0–4)	1.08	0.80 (0–4)	0.80
Anxiety	0.67 (0–4)	0.82	0.49 (0–4)	0.72
Depression	0.52 (0–4)	0.76	0.34 (0–4)	0.63
Women's pain intensity	1.96 (0–5)	1.12		
Women's pain unpleasantness	4.39 (0 – 10)	2.74		

for the gynecological examination, each partner received $10 for attending the laboratory session and up to $96 each for completing the daily experience study. The research ethics boards at Dalhousie University and Université de Montréal approved the present study.

2.3. Measures

Participants reported their age and cultural background and women reported their annual household income, relationship status, relationship duration (in months), pain duration (in months), and sexual frequency at the lab session. These variables were collected to describe the sample and to test as covariates. For example, in previous research, pain duration has been associated with pain intensity [39]. We used brief daily measures to reduce participant burden [40]. Means and standard deviations of all measures are presented in Table 1.

2.3.1. Sexual communal strength

We used three items from a previously validated measure [27] that were adapted to focus on sexual activity that occurred that day: "During sex, I was focused on meeting my partner's needs," "During sex, I did things to meet my partner's needs without expecting him or her to directly reciprocate," and "Meeting my partner's needs was a high priority for me during sex" [23]. Items were rated on a 5-point scale from 0 (*not at all*) and 4 (*extremely*) (women: Cronbachs's α = 0.81; partners: α = 0.87).

2.3.2. Unmitigated sexual communion

We adapted three items from a validated measure [22,27] to focus on the sexual activity that occurred that day: "During sex, I was only focused on meeting my partner's needs," "During sex, I put my partner's needs ahead of my own needs," and "During sex, it was impossible for me to satisfy my own needs if they conflicted with my partner's needs" [23]. Items were rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*) (women: α = 0.79; partners: α = 0.71).

2.3.3. Sexual distress

Participants reported on their sexual distress using an adapted version of the Female Sexual Distress Scale (FSDS) [41], previously used with men as well [42]. Three face valid items with high factor loadings from the original scale were adapted for the daily context. Participants were asked to think about how often a sexual concern had caused them distress during the last 24 h and to respond to the following three items: "How often did you feel: [1] distress about your sex life?; [2] inferior because of sexual problems?; and [3] worried about sex?" using a 5-point scale (0 = *Never*, 4 = *Always*) (women: α = 0.85; partners: α = 0.80).

2.3.4. Pain intensity and pain unpleasantness

Women's pain intensity during vaginal intercourse was assessed with the Present Pain Intensity scale (PPI) of the McGill Pain Questionnaire (MPQ) [43]. Women rated the intensity of their pain during intercourse using the 6-point PPI scale, which ranged from 0 (*no pain*) to 5 (*excruciating*) [44]. The PPI correlates significantly with the Pain Rating Index (PRI) of the MPQ across a number of chronic pain conditions [43]. Women reported the unpleasantness of their intercourse pain by using a numerical rating scale ranging from 0 (*not unpleasant*) to 10 (*most unpleasant ever*). Given the high correlation between the two pain measures in the current sample ($r = 0.74$, $p < 0.001$), a composite variable was created using the standardized score of each measure. The pattern of results reported below is the same when analyses are conducted separately for each pain outcome.

2.3.5. Depression and anxiety

Depressive symptoms and anxiety were assessed with the Profile of Mood States (POMS; [45]), consisting of four items measuring depression (sad, discouraged, hopeless, worthless) and four items measuring anxiety (on edge, uneasy, anxious, nervous). Participants rated the extent to which they had experienced these feelings in the past 24 h on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*). The scale demonstrated good internal consistency for both the depression (α = 0.85 for women and partners) and anxiety subscales (α = 0.86 for women; α = 0.82 for partners).

2.4. Data analyses

Data were analyzed using multilevel modeling in SPSS 20.0, guided by the Actor Partner Interdependence Model (APIM; [46]). We tested the associations between women's and partners' daily sexual motivation (i.e., sexual communal strength and unmitigated sexual communion), women's pain during intercourse, and both partners' depressive symptoms and anxiety. Our analyses tested both actor effects (i.e., the association between a person's sexual motivation and their own outcomes) and partner effects (i.e., the association between a person's sexual motivation and their partner's outcomes). We also tested whether these associations were mediated by women's and partners' sexual distress following the guidelines for a 1-1-1 mediation, where all variables are reported at the daily level [47], and using the Monte Carlo Method of Assessing Mediation (MCMAM; [48]) to test the significance of the indirect effects. We tested two-level cross models with separate random intercepts for women and partners, where persons are nested within dyads, and person and days are crossed to account for the fact that both partners completed the daily surveys on the same days [46]. All daily-level predictors were person-mean centered such that coefficients reflect associations between deviations from a person's mean

Table 2
Correlations among key study variables.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	**0.85*****	0.55***	0.67***	− 0.19	0.60***	− 0.19	− 0.08	0.00	− 0.02	− 0.06	− 0.14	− 0.10
2. Income	0.49***	**1.00*****	0.41***	− 0.36***	0.46***	− 0.17	− 0.02	0.13	− 0.03	− 0.08	− 0.01	0.03
3. Rel duration	0.08	–	–	− 0.24*	0.54***	− 0.20*	− 0.04	0.05	− 0.01	− 0.09	− 0.04	− 0.08
4. Sex frequency	− 0.31**	− 0.42***	–	**0.91*****	− 0.15	0.05	0.05	− 0.27**	0.22*	0.19	− 0.03	− 0.12
5. Pain duration	–	–	–	–	–	− 0.08	0.04	0.14	0.13	0.15	− 0.13	− 0.07
6. Sexual communal motivation	− 0.17	− 0.10	–	0.09	–	**0.03**	0.73***	0.24*	0.09	0.06	0.22*	0.27**
7. Unmitigated sexual communion	− 0.05	0.01	–	− 0.03	–	0.77***	**0.04**	0.38***	0.15	0.15	0.24*	0.29**
8. Sexual distress	0.07	− 0.03	–	− 0.26**	–	− 0.03	0.14	**0.21****	0.35***	0.33**	0.34**	0.35**
9. Anxiety	− 0.04	0.00	–	− 0.09	–	0.13	0.21*	0.38***	**0.20****	0.81***	0.14	0.14
10. Depression	− 0.10	− 0.03	–	− 0.16	–	0.27**	0.37***	0.42***	0.84***	**0.18***	0.10	0.09
11. Woman's Pain Intensity	–	–	–	–	–	–	–	–	–	–	–	0.74***
12. Woman's Pain Unpleasantness	–	–	–	–	–	–	–	–	–	–	–	–

Correlations are between aggregates of the daily variables; women's correlations are above the diagonal; partner's correlations are below the diagonal; bolded correlations are between women and partner reports; Rel = relationship. Note: only women reported on relationship duration, pain duration, and pain intensity and unpleasantness.

* $p < 0.05$

** $p < 0.01$.

*** $p < 0.001$.

score on each sexual motivation variable (and on sexual distress as the mediator) [49]. As such, these analyses account for between-person differences and assess whether day-to-day *changes* from a participant's own mean on the sexual motivation variables were associated with corresponding changes in women's pain and both partners' sexual distress, depressive symptoms and anxiety. Given that sexual motivation was only assessed when sexual activity occurred, the analyses only included sexual activity days, except the analyses with pain as an outcome, which only included vaginal intercourse days.

We also conducted lagged day analyses to provide increased confidence in the direction of the effects. Since depressive symptoms and anxiety (but not pain or sexual distress) were assessed every day—a necessity for lagged day analyses—we were only able to test the associations between sexual motivation and depressive symptoms and anxiety on one day while controlling for these variables on the previous day, an approach that tests day-to-day *changes* [65]. The coefficients reported are unstandardized betas (*b*) and are interpreted as the change in the outcome for every one-unit increase in the predictor; these act as an indication of the effect size. Correlations among all study variables are reported in Table 2. Participants' age, income, relationship duration, sexual frequency, and women's pain duration were correlated with our key variables at < 0.30 (all *rs* between − 0.27 and 0.15) and were not included as covariates. We recruited couples from two sites, but there were no significant differences on study variables between sites.

3. Results

The total rate of diary completion was 87.04% (9748 diaries of a possible 11,200). Participants reported a mean of 8.77 sexual activity days ($SD = 5.77$; Range = 1–31), and 73% of these days included sexual intercourse ($M = 5.96$, $SD = 4.53$, Range 1–21). As predicted and reported in Table 3, on days when women with vulvodynia reported higher sexual communal strength, they reported less pain during intercourse and fewer symptoms of anxiety. Conversely, on days when affected women reported higher unmitigated sexual communion, they reported more pain and anxiety and both partners reported more depressive symptoms. Partners' daily sexual motivation was not associated with women's pain, or either partner's depression and anxiety.

The results of the lagged analysis indicated that affected women's higher sexual communal strength was associated with decreases in her anxiety from the previous day ($b = -0.11$, $SE = 0.04$, $t(498.77) = -2.87$, $p = 0.004$), whereas affected women's higher unmitigated sexual communion was associated with increases in her anxiety ($b = 0.17$, $SE = 0.04$, $t(499.28) = 2.84$, $p < 0.001$) and increases in both partners' depressive symptoms from one day to the next (women: $b = 0.12$, $SE = 0.04$, $t(467.91) = 2.84$, $p = 0.02$; partners: $b = 0.08$, $SE = 0.03$, $t(477.25) = 2.83$, $p = 0.01$).

Next, we tested sexual distress as a mediator of these associations. Only affected women's unmitigated sexual communion was significantly associated with higher sexual distress ($b = 0.19$, $SE = 0.05$, $t(529.13) = 2.84$, $p = 0.02$); therefore, we only tested mediation models with women's unmitigated sexual communion as the predictor and women's sexual distress as the mediator. As predicted, affected women's sexual distress significantly mediated the association between her higher unmitigated sexual communion and pain (95% CI [0.05, 0.21]). When sexual distress was entered as a mediator, the association between women's unmitigated sexual communion and pain became non-significant ($b = 0.12$, $SE = 0.13$, $t(496.03) = 0.96$, $p = 0.34$). Women's sexual distress also mediated the association between her unmitigated sexual communion and her own (95% CI [0.01, 0.05]) and her partner's (95% CI [0.001, 0.03]) daily depressive symptoms and her own anxiety (95% CI [0.001, 0.03]), although the direct effects

Table 3
Daily associations between sexual motivation, women's pain, and both partners' depression and anxiety.

Predictors	Women's pain		Women's depression		Partner's depression		Women's anxiety		Partner's anxiety	
	b (SE)	*t*	*b*(SE)	*t*	*b* (SE)	*t*	*b* (SE)	*t*	*b* (SE)	*t*
Women's SCM	− 0.24 (0.10)	− 2.52*	− 0.03 (0.04)	− 0.85	− 0.03 (0.04)	− 1.86	− 0.12 (0.04)	− 3.13**	− 0.03 (0.03)	− 1.24
Partner's SCM	− 0.03 (0.12)	− 0.31	0.02 (0.04)	1.19	0.03 (0.03)	1.19	0.06 (0.04)	1.34	0.05 (0.03)	1.60
Women's USC	0.29 (0.10)	2.81**	0.12 (0.04)	3.06**	0.07 (0.03)	2.96**	0.18 (0.04)	4.62***	0.03 (0.03)	0.29
Partner's USC	0.19 (0.13)	1.41	0.03 (0.05)	0.52	− 0.02 (0.03)	− 0.64	− 0.001 (0.05)	− 0.02	− 0.01 (0.04)	− 0.23

b values are unstandardized coefficients; SCM = sexual communal motivation, USC = unmitigated sexual communion. Degrees of freedom ranged from 502.90 to 582.52.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

remained significant (women's depression: $b = 0.10$, $SE = 0.04$, $t(576.30) = 2.39$, $p = 0.01$; partners' depression: $b = 0.15$, $SE = 0.03$, $t(562.18) = 2.11$, $p = 0.04$; women's anxiety: $b = 0.16$, $SE = 0.04$, $t(562.03) = 3.84$, $p < 0.001$ respectively).

4. Discussion

Motivational models have demonstrated that goals for persisting with painful activities affect pain and distress in chronic pain populations (e.g., [50]), including vulvodynia [15,17]. The current findings indicated that on days when women with vulvodynia were motivated to meet their partner's sexual needs without neglecting their own needs (i.e., higher sexual communal strength), they reported less pain during intercourse and lower anxiety. However, on days when they neglected their own needs (i.e., higher unmitigated sexual communion), they reported more sexual distress and in turn, more pain, greater anxiety and both partners reported more depressive symptoms.

The current results suggest that promoting women's sexual communal strength could have implications for reducing women's pain and both partners' psychological distress. Given that women higher in sexual communal strength tend to be motivated to meet their partner's sexual needs to enhance positive outcomes in the relationship [27], they may be more fully immersed in the positive aspects of a sexual experience and better able to cope with pain. In fact, in community samples, sexual communal strength is associated with higher sexual desire [27], and in a sample of women with vulvodynia, those who reported more positive cognitions about sex (i.e., thought about sex as a time of intimacy) also reported lower pain intensity [51]. Therefore, women with vulvodynia who are higher in sexual communal strength may view sex more positively, a factor associated with less pain, but future research is needed to test this possibility.

On days when women with vulvodynia reported higher sexual communal strength, they reported lower anxiety. In general, women with vulvodynia tend to report higher anxiety than controls [52], and anxiety is associated with greater self-focused attention [53]. It is possible that affected women who are more sexually communal are able to reduce their anxiety by focusing on being responsive to their partners (i.e., less self-focused), although these benefits did not extend to sexual distress or depressive symptoms. In previous research, communion has been inconsistently associated with distress [31,34]. Instead, communion is more consistently associated with positive outcomes (i.e., higher relationship quality), but not negative outcomes (i.e., psychological distress) [23], which might explain the mixed findings in the current study. Future research may consider additional mechanisms for the associations between sexual communal strength and both positive and negative indicators of well-being.

Consistent with research on unmitigated communion in chronic pain populations [26], when women with vulvodynia focused on their partner's needs to the exclusion of their own needs, there were both direct and indirect (via sexual distress) associations with greater pain, anxiety, and both partners' depressive symptoms. For affected women, higher unmitigated sexual communion could mean that they ignore their need to engage in less painful sexual activities or do not communicate their pain to their partner, which might exacerbate their pain and distress. In a study of women with fibromyalgia, women higher in unmitigated communion reported more negative emotions in response to negative relationship events, such as an argument [54], suggesting that women higher in unmitigated communion may be particularly sensitive to experiencing negative feelings in response to a stressor. Women with vulvodynia who are higher in unmitigated *sexual* communion might focus more on the negative aspects of sex, feel distressed about sex, and in turn experience more depressive symptoms and anxiety. People higher in unmitigated communion tend to have low self-worth and are overly focused on their partner's needs in order to feel valuable [31]. Women experiencing pain during sex often report feeling sexually inadequate [29], and women with vulvodynia whose self-worth is contingent on maintaining their sexual relationship have reported greater sexual distress and pain [55]. Therefore, women with vulvodynia who are higher in unmitigated sexual communion may have an insecure sense of self that is contingent on meeting their partner's sexual needs, which is associated with more sexual distress, and in turn exacerbates their pain. It is possible that their heightened sexual distress also interferes with their arousal and triggers pelvic floor muscle dysfunction, factors known to exacerbate vulvovaginal pain [56].

While affected women higher unmitigated sexual communion were solely focused on meeting their partner's sexual needs, their partners did not benefit from this focus and instead reported increased depression. One reason why people high in unmitigated communion have trouble coping with health issues is because they are uncomfortable accepting support from others [31]. If women with vulvodynia are resistant to accepting support from their partner, this may lead the partner to feel discouraged and helpless. Future research may investigate strategies couples use to provide and accept support both in sexual and non-sexual contexts in order to effectively cope with vulvodynia.

We did not see significant effects of a partner's sexual communal motivation in the current study, possibly because affected women are carrying the burden of the pain and their sexual motivation is more important for both partners' experience of distress [15]. Previous research has demonstrated that a partner's response to women's pain has implications for her pain and both partners' psychological distress [57–59]. Women with vulvodynia whose partners provide more adaptive support (e.g., facilitative partner responses [60]), which have been linked to women's lower pain and distress, may experience lower levels of unmitigated sexual communion. One important direction for future research is to investigate the role of partner support in reducing women's sexual unmitigated communion and sexual distress, and in turn, their pain and psychological distress.

The current study had several strengths. Dyadic daily experience methods allowed us to capture couples' experiences close in time to when they occurred. Motivations for engaging in sex [61] and women's pain fluctuate day-to-day [62], making it important to investigate the role of motivation in pain and distress in a daily context. The dyadic nature of this study illustrated that women's unmitigated sexual communion not only had negative repercussions for her own pain and distress, but also for her partner's depressive symptoms.

Although we tested day-to-day changes in depression and anxiety, the research was correlational and causal conclusions cannot be drawn. It is possible that the associations are bidirectional, whereby women with vulvodynia who are more depressed and anxious feel more sexually distressed and in turn, become overly focused on their partner's needs while neglecting their own. Following couples over a longer period of time could provide further insights into the direction of the associations, as well as the factors that might promote higher sexual communal strength and buffer against unmitigated sexual communion.

Therapeutic interventions targeting motivational factors have shown promise for improving pain and well-being in chronic pain populations [63,64]. The current study provides initial evidence for sexual communal motivation as a novel target for intervention and research into the development of therapeutic strategies, implementation and outcomes is worthy of further investigation.

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