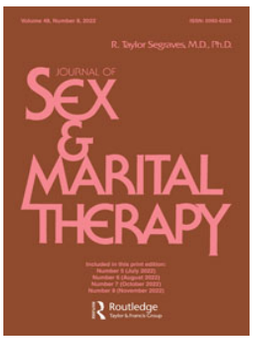

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RESEARCH ARTICLE

Investigation of the Relationships among Self-Efficacy, Stress, and Dyspareunia during the COVID-19 Pandemic

Lindsey R. Yessick, Robyn A. Jackowich, Shannon M. Coyle, Tim V. Salomons and Caroline F. Pukall

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ABSTRACT

This study examined whether low self-efficacy and heightened perceived stress were associated with dyspareunia at two timepoints during COVID-19. Sixty-two participants (31 with and 31 without dyspareunia) completed a longitudinal online survey. Self-efficacy declined during the pandemic, and individuals with dyspareunia reported lower self-efficacy compared to those without dyspareunia. Although stress was greater for those with dyspareunia, both groups reported stress reductions over time. Lower stress was associated with increases in self-efficacy. This study is the first to examine longitudinal trends of dyspareunia during the COVID-19 pandemic and illuminates psychological factors that may influence the experience of dyspareunia.

Introduction

Transmission of the COVID-19 virus in North America was first confirmed in March 2020, and public health responses to the spread of the virus varied widely by region (Bronca, 2020). The closure of workplaces, schools, services (including non-urgent healthcare), and living in an unprecedented, unpredictable, and life-threatening time drastically altered activities of daily living (Addi, Benksim, Amine, & Cherkaoui, 2020; Singh & Singh, 2020). Studies conducted in several different countries during the pandemic indicated high levels of stress, depression, and anxiety symptoms in their participants (Dong, & Bouey, 2020; González-Sanguino et al., 2020; Holmes et al., 2020; Kang et al., 2020; Killgore, Taylor, Cloonan, & Dailey, 2020; Mazza et al., 2020; Pfefferbaum & North, 2020; Reger, Piccirillo, & Buchman-Schmitt, 2020; Rossell et al., 2021; Serafini et al., 2020; Stuijfzand et al., 2020; Wang et al., 2020; Xiong et al., 2020; Zhang et al., 2020). In addition, mitigation measures, such as physical distancing guidelines, altered engagement in social activities, further compounding isolation and stress for many as they navigated without their usual in-person social interactions. As a result, peoples' sexual relationships were also affected. Studies reported an increase in conflict between intimate partners (Luetke, Hensel, Herbenick, & Rosenberg, 2020; Pieh, Ó Rourke, Budimir, & Probst, 2020), lower sexual desire and intercourse frequency (Ibarra et al., 2020), and increases in dyspareunia symptoms (Fuchs et al., 2020).

Dyspareunia refers to genitopelvic pain experienced during sexual activity involving penetration (Dias-Amaral & Marques-Pinto, 2018). Dyspareunia is common, affecting up to 28% of reproductive-aged women (Harlow et al., 2014; Pukall et al., 2016), and it is often associated with significant negative impacts on psychosocial and sexual wellbeing (Aerts, Bergeron, Pukall,

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& Khalifé, 2016; Aikens, Reed, Gorenflo, & Haefner, 2003; Bergeron & Rosen, 2020; Chisari, Monajemi, Scott, Moss-Morris, & McCracken, 2021; Desrochers, Bergeron, Landry, & Jodoin, 2008; Khandker et al., 2011; Payne, Binik, Amsel, & Khalifé, 2005; Pazmany, Bergeron, Van Oudenhove, Verhaeghe, & Enzlin, 2013). Those with dyspareunia face challenges in healthcare settings given the lack of knowledge of effective treatment strategies for their pain (Boyer, Chamberlain, & Pukall, 2017), which are likely further increased given the additional stress of experiencing a pandemic and its resulting negative impacts on mental health, social support, sexuality, and access to healthcare. One study of more than 700 women presenting clinically before and during lockdown measures due to the pandemic found that dyspareunia significantly worsened during lockdown (Fuchs et al., 2020). Those seeking treatment for dyspareunia were likely met with barriers during lockdown, as multiple healthcare providers noted challenges with delivering treatment for sexual-related difficulties during the pandemic (Cocci et al., 2020; Jacob et al., 2020; Li, Li, Xin, Wang, & Yang, 2020). The broader chronic pain literature indicates that the experience of chronic stress due to reductions in social and health-related supports and in response to uncontrollable events can exacerbate the experience of pain (Abdallah & Geha, 2017; Bernardes, Forgeron, Fournier, & Reszel, 2017; Che, Cash, Ng, Fitzgerald, & Fitzgibbon, 2018), and these factors are likely more pronounced during a worldwide pandemic.

Indeed, cross-sectional research conducted in rapid response to the pandemic has found that lockdown and other measures exacerbated the stress already burdening those living with chronic pain (Lacasse et al., 2021), mainly due to reduced social and health-related supports. Increased social isolation from friends and family and reductions in social roles are known risk factors for the exacerbation of pain conditions (Karos et al., 2020). In addition, Lacasse and colleagues (2021) found that, during the pandemic, more than one-third (38.3%) of pain medication users and two-thirds (68.3%) of those using treatments that required in-person interaction (e.g., physical or psychological pain management) experienced changes in their treatment regimens, and most individuals (69%) experienced worsening of pain symptoms. Another study indicated that two-thirds (68.9%) of individuals living with chronic pain reported worse pain since the pandemic began, with greater stress being associated with increased likelihood of worsened pain outcomes (Pagé et al., 2021).

Uncontrollable events, such as those experienced during the pandemic, have been found to be a consistent predictor of psychological distress (Dickerson & Kemeny, 2004; Foley & Kirschbaum, 2010; Henry, 1993; Müller, 2011), and perceived control has also been shown to moderate the effects of pandemic severity on psychological distress (Zheng, Miao, & Gan, 2020). Self-efficacy is a person's belief about their capabilities to exercise control over events that affect their lives (Bandura, 1989). Strong evidence suggests that greater perceptions of control are associated with improved acute and chronic pain outcomes (Kalapurakkel, Carpino, Lebel, & Simons, 2015; Miles, Pincus, Carnes, Taylor, & Underwood, 2011; Mohr, Leyendecker, Petersen, & Helmchen, 2012; Vancleef & Peters, 2011; Wiech et al., 2006), and that low levels of perceived control can trigger the biological mechanisms of stress response (Müller, 2011). Importantly, it has been established that the perception of being able to control pain is sufficient to increase pain tolerance, regardless of whether the stressor can actually be influenced (Arntz & Schmidt,1989). These findings suggest that pain related self-efficacy (i.e., the belief in one's ability to perform behaviors to cope with their pain experience) may be associated with the development and maintenance of chronic pain. The influence of self-efficacy, however, is not limited only to pain self-efficacy. Previous literature has found that greater general self-efficacy over one's life, and not only related to pain symptoms, is also associated with less chronic pain disability (Taylor, Dean, & Siegert, 2006).

The Lazarus and Folkman (1984) Transactional Model of Stress and Coping defines coping as the cognitive and behavioral responses used to exert control over a stressor, whether internal or external. External factors not specific to the individual can impact perceptions of control, such as environmental variables (e.g., availability of healthcare services). The COVID-19

pandemic may act as an external stressor, disrupting the lives of many individuals and further burdening those who live with chronic pain. Given this framework, the evidence of worsened outcomes for those with chronic pain and dyspareunia (Fuchs et al., 2020; Lacasse et al., 2021; Pagé et al., 2021), increased stress during the pandemic (Dong, & Bouey, 2020; González-Sanguino et al., 2020; Holmes et al., 2020; Killgore et al., 2020; Mazza et al., 2020; Stuijfzand et al., 2020; Wang et al., 2020; Zhang et al., 2020), and the finding that perceived control moderates the effects of pandemic severity on psychological distress (Zheng et al., 2020), the COVID-19 pandemic provides an opportunity to understand predictors of dyspareunia outcomes. Considering the impact of the pandemic on many factors influential to chronic pain outcomes, this study assessed the experience of participants with dyspareunia across multiple timepoints during the pandemic to assess if levels of general self-efficacy and heightened stress were associated with worse pain outcomes. We hypothesized that over time, levels of general self-efficacy would decline and that levels of stress would increase, and that these changes would be associated with increased symptoms of dyspareunia.

Methods

Participants

The present study was part of a larger project examining sexual and relationship outcomes during the pandemic over four timepoints (the fourth remains to be collected). To be eligible for the present study, participants were required to self-report that their genital anatomy consisted of vulvas and vaginas and that they were 18 years of age or older, fluent in English, and comfortable answering questions about sexual functioning and COVID-19. Given that we were interested in including participants who experienced recurrent dyspareunia, responses to certain questions (see below) at three timepoints (May–June 2020, August-November 2020, December 2020–February 2021) were used to determine dyspareunia group membership. Participants were placed in the dyspareunia group if they reported experiencing pain at least "a few times (less than half the time)" at a minimum of two of the three timepoints in response to the Female Sexual Functioning Index (FSFI; Rosen et al., 2000) item, "Over the past 4 weeks, how often did you experience discomfort or pain during vaginal penetration?" Participants were placed in the no-dyspareunia group if they reported that they experienced pain "almost never or never" on the item specified above at a minimum of two of the three timepoints. However, due to an insufficient number of participants responding to all variables of interest at the third timepoint due to attrition, and given that individuals who had not engaged in sexual activity in the previous four weeks were not included in our analyses, the variables of interest for the present study were only analyzed for Times 1 and 2 to ensure sufficient power.

Previous research examining perceived control as a moderator on the influence of the psychological distance during the COVID-19 pandemic on general health outcomes found small to medium effect sizes (Zheng et al., 2020); G*Power version 3.1.9.7 indicated that a total sample of $n = 50$ was required for repeated measure ANOVA with 80% power and Cohen's $f^2 = 0.20$ (Faul, Erdfelder, Buchner, & Lang, 2009). A total of 315 participants responded to these surveys related to sexual and relationship outcomes during the pandemic, and 31 participants completed the present measures of interest and met the study criteria for dyspareunia. This proportion (9.8%) is consistent with the prevalence rates of previous population estimates of dyspareunia (Authors, 2016; Harlow et al., 2014). Due to the greater number of no-dyspareunia versus dyspareunia participants, participants in the no-dyspareunia group were matched on age (±5 years) with those experiencing dyspareunia. In the instance that there was more than one control participant matching each dyspareunia participant, a random number generator was used to select the control participant. Demographic information for the participants can be found in Table 1.

Table 1. Participant demographic information.

	Dyspareunia sample $n=31$	No dyspareunia sample $n=31$	Total sample $N=62$	p-value
Age (M (SD))	25.1 (5.3)	25.7 (5.1)	25.4 (5.2)	.698
Gender				.228
Cis-woman	26 (83.9)	30 (96.8)	56 (90.3)	
Nonbinary	2 (6.5)	1 (3.2)	3 (4.8)	
Trans woman	3 (9.7)	0 (0)	3 (4.8)	
Sexual orientation (n (%))				.835
Another	0 (0)	1 (3.2)	1 (3.6)	
Bisexual	13 (41.9)	10 (32.3)	23 (37.1)	
Other-sex attracted	14 (45.2)	17 (54.8)	31 (50.0)	
Queer	3 (9.7)	2 (6.5)	5 (8.1)	
Same-sex attracted	1 (3.2)	1 (3.2)	2 (3.2)	
Relationship status (n (%))				.246
Divorced	0 (0)	1 (3.2)	1 (1.6)	
Married/common-law/engaged/ Committed/living together	19 (61.3)	23 (74.2)	42 (67.7)	
Single (not dating)	5 (16.1)	1 (3.2)	6 (9.7)	
Other	7 (22.6)	6 (19.4)	13 (21.0)	
Birthplace (n (%))				.449
Canada	20 (64.5)	22 (71.0)	42 (67.7)	
Europe	2 (6.5)	0 (0)	2 (3.2)	
Latin/South America	0 (0)	1 (3.2)	1 (1.6)	
Other	0 (0)	1 (3.2)	1 (1.6)	
United States	9 (29.0)	7 (22.6)	16 (25.8)	
Ethnicity (n (%))				.608
Asian	1 (3.2)	1 (3.2)	2 (3.2)	
Middle Eastern	0 (0)	1 (3.2)	1 (1.6)	
White	27 (87.1)	23 (74.2)	50 (80.6)	
White Asian	1 (3.2)	1 (3.2)	2 (3.2)	
White Indigenous	0 (0)	2 (6.5)	2 (3.2)	
White Hispanic	1 (3.2)	3 (9.7)	4 (6.5)	
White Middle Eastern	1 (3.2)	0 (0)	1 (1.6)	
Education (n (%))				.566
High school	0 (0)	2 (6.5)	2 (3.2)	
Post-high school	26 (14.3)	25 (80.6)	51 (82.3)	
Other	5 (16.1)	4 (12.9)	9 (14.5)	
Income (n (%))				.673
$0 – 29,999	11 (35.5)	10 (32.3)	21 (33.9)	
$30,000 – 59,999	8 (25.8)	6 (19.4)	14 (22.6)	
$60,000 – 89,999	4 (12.9)	4 (12.9)	8 (12.9)	
$90,000 – 119,999	2 (6.5)	6 (19.4)	8 (12.9)	
$120,000 +	5 (16.1)	4 (12.9)	9 (14.5)	
FSFI pain intensity (M (SD))				
Time 1	3.3 (0.7) n=27	5.0 (0) $n=25$	4.1 (1.0) $N=52$	
Time 2	3.3 (0.7) $n=30$	5.0 (0) $n=30$	4.1 (1.0) $N=60$	

Note. Due to missing data, multiple responses, and rounding, not all percentages add up to 100.

Measures

The survey was implemented using Qualtrics Survey Software (Qualtrics, Provo, UT), and it included validated and adapted questionnaires, and researcher-generated questions.

Dyspareunia

The Female Sexual Functioning Index (Rosen et al., 2000) contains 19 items covering 6 domains of sexual functioning over the previous four weeks: desire, arousal, lubrication, orgasm, satisfaction, and pain. Participants respond to these items on a 6-point scale with anchors varying based on the question. Higher scores indicate greater sexual functioning. The FSFI full scale and subscale scores have demonstrated good internal consistency (Rosen et al., 2000). For the present study, dyspareunia intensity was assessed using the item, "Over the past 4 weeks, how

would you rate your level (degree) of discomfort or pain during or following vaginal penetration?" to which participants could respond from "Very low or none at all" to "Very high". Because participants who have not engaged in intercourse in the previous four weeks may receive artificially low scores (Meston, Freihart, Handy, Kilimnik, & Rosen, 2020; Meyer-Bahlburg & Dolezal, 2007), the data from participants who had not attempted intercourse in the previous 4 weeks were not included in all analyses.

General self-efficacy

The General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995) contains 10 items to measure optimistic beliefs in one's own ability to cope with difficult demands in life. Participants respond to these items on a 4-point scale from not at all true (1) to exactly true (4), with higher scores indicating higher levels of general self-efficacy. The GSE has demonstrated acceptable internal reliability between .76 and .90 across multiple samples (Schwarzer & Jerusalem, 1995). In the present sample, the GSE demonstrated excellent internal consistency at both Time 1 (.85) and Time 2 (.85).

Perceived stress

The Perceived Stress Scale (PSS-10; Cohen, 1988; Cohen, Kamarck, & Mermelstein, 1983) was modified so that instructions referred to stressful thoughts since physical distancing due to COVID-19 (Time 1 survey) and since completing the Time 1 survey (Time 2 survey). Participants responded to the 10 items on a 5-point scale from 0 (Never) to 4 (Very Often) which were summed to create a total score ranging from 0 to 40, with higher scores indicating a greater degree of perceived stress. The PSS has good internal consistency, and its total score has been shown to be significantly associated with measures of stressful life events (Cohen, 1988; Cohen et al., 1983). In the present sample, the PSS demonstrated excellent internal consistency at both Time 1 (.83) and Time 2 (.90).

Sexual distress

Participants responded to the Short Form of the Sexual Distress Scale (SDS-SF; Santos-Iglesias, Bergeron, Brotto, Rosen, & Walker, 2020), which is a five-item self-report scale of distress related to sexual problems. Participants reported the frequency with which they experienced sexual distress from 0 (never) to 4 (always). Example items include: "Distressed about your sex life" or "Frustrated by your sexual problems". Greater scores indicate higher sexual distress. Participants responded to Time 1 in reference to the time since physical distancing began and since the Time 1 survey for Time 2. The SDS-SF demonstrates excellent internal consistency, and its total score is significantly, positively associated with sexual bother and significantly, negatively correlated with sexual satisfaction (Santos-Iglesias et al., 2020). In the present sample, the SDS demonstrated excellent internal consistency at both Time 1 (.92) and Time 2 (.92).

Procedures

Study measures and procedures were approved by the Queen's University General Research Ethics Board (GREB; GPSYC-985-20). Study advertisements titled "An investigation into sexual well-being and relationship satisfaction during physical distancing (COVID-19)" were posted on various social media platforms (e.g., Facebook, Instagram, Twitter). Participants completed the Time 1 survey (May–June 2020) and consented to be recontacted by email approximately 3 months later for Time 2 (August–November 2020). Participants were also recontacted to participate in Time 3 (December 2020–February 2021), but this timepoint was not included in the analyses due to participant attrition. A fourth time point is being collected in December 2021–January 2022.

Eligible participants received information about the study and provided informed consent to participate in the study. The full survey took approximately 45 minutes to complete. Participants were debriefed and given the option to sign up for Time 2; they were then forwarded to a separate survey to provide their email to be recontacted for Time 2 if they agreed to participant in this timepoint. Participants were also asked to provide their email addresses to be entered into a prize draw for 1 of 25 $50 CAD Amazon gift cards. Time 2 followed the same methodology as Time 1, except participants were given an additional chance to win one of 5 gift cards of $100 CAD each.

Results

Data considerations

No missing data were imputed. Because participants could skip items, sample sizes differ between questions. *T*-tests were used for continuous variables, and Fisher's exact tests were used for categorical variables to examine any demographic differences between groups (Table 1).

A repeated-measures ANOVA was undertaken to examine changes in general self-efficacy (GSE), perceived stress (PSS), and sexual distress scores (SDS-SF) over time (from Time 1 to Time 2) and by group status (dyspareunia, no dyspareunia). Effect sizes are presented in η_p^2. To assess the effect of general self-efficacy and perceived stress at Time 1 on pain intensity (FSFI score on the item, "Over the past 4 weeks, how would you rate your level (degree) of discomfort or pain during or following vaginal penetration?") at Time 2, a multiple regression was conducted. In addition, correlations between the change in general self-efficacy and perceived stress were also calculated. Change scores were obtained by subtracting each participant's Time 2 value from the Time 1 value. Alpha values were set at $p < 0.05$. IBM Statistical Package for the Social Sciences version 26 was used for conducting analyses. Correlations were compared by a Fisher r-to-z transformation (Vassar stats tool http://vassarstats.net/rdiff.html).

Changes across time during COVID-19 for individuals with and without dyspareunia

Perceived stress

No significant interaction was found between group (dyspareunia vs. no dyspareunia) and Time (Time 1 and Time 2) on perceived stress (F (1, 60) = 0.087; $p = .770$; η_p^2 = .001) (Figure 1). The main effect of time showed a statistically significant decrease in perceived stress from Time 1 to Time 2 (F (1, 60) = 12.117; $p = .001$; η_p^2 = .168) for both groups (Figure 1). There was also a significant main effect of group on overall perceived stress scores (F (1, 60) = 4.957; $p = .030$; η_p^2 = .076), with individuals who experienced dyspareunia reporting greater stress at both time points.

General self-efficacy

No significant interaction was found between group (dyspareunia vs. no dyspareunia) and time (Time 1 and Time 2) on general self-efficacy (F (1, 60) = 0.164; $p = .687$; η_p^2 = .003) (Figure 2). The main effect of time showed a statistically significant decrease in general self-efficacy from Time 1 to Time 2 (F (1, 60) = 4.412; $p = .040$; η_p^2 = .068) for both groups (Figure 2). There was a significant main effect of group on overall general self-efficacy scores (F (1, 60) = 4.211; $p = .045$; η_p^2 = .066), with the dyspareunia group reporting lower self-efficacy at both timepoints.

Sexual distress

Based on the finding of a decrease in perceived stress, we performed post-hoc analyses on sexual distress to investigate if changes in sexual distress over time differed from general stress. No

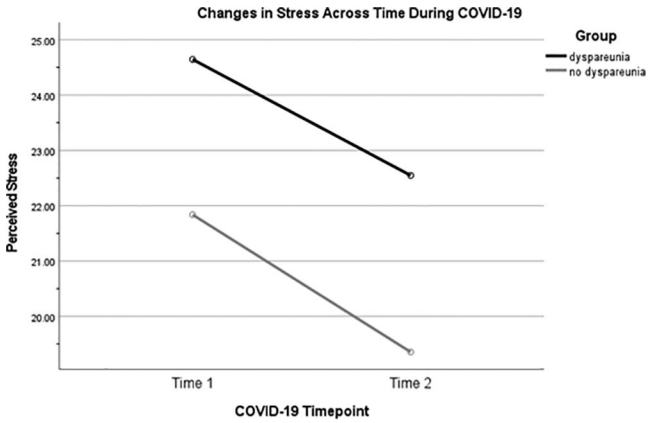

Figure 1. Results of RM-ANOVA comparing the change in self-reported perceived stress across two COVID-19 timepoints between individuals who experience dyspareunia and those who experience no dyspareunia.

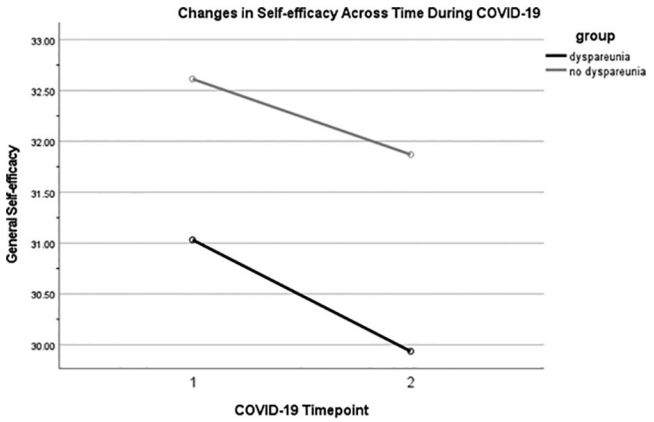

Figure 2. Results of RM-ANOVA comparing the change in self-reported general self-efficacy across two COVID-19 timepoints between individuals who experience dyspareunia and those who experience no dyspareunia.

significant interaction was found between group (dyspareunia, no dyspareunia) and time (Time 1 and Time 2) on sexual distress (F (1, 60) = 1.129; $p = .292$; η_p^2 = .018) (Figure 3). There was no significant main effect of time on sexual distress from Time 1 to Time 2 (F (1, 60) = .393; $p = 0.533$; η_p^2 = 0.007). There was a significant main effect of group on overall sexual distress scores (F (1, 60) = 11.703; $p = .001$; η_p^2 = .163), with the dyspareunia group reporting greater sexual distress at both timepoints.

Relationship between general self-efficacy and perceived stress

Time 1 general self-efficacy (p = .282) and perceived stress (p = .284) did not significantly predict dyspareunia at Time 2 ($F(2, 57)$ = 1.579, p =.211, R^2 = .053). A Pearson correlation was conducted to determine the relationship between the change in general self-efficacy from Time 1 to Time 2 and the change in perceived stress from Time 1 to Time 2. For the dyspareunia group, the correlation between change in self-efficacy ($M = 1.10$, $SD = 3.32$) and change in perceived stress ($M = 2.10$, $SD = 5.23$) was not significant ($r = -.110$, $n = 31$, p = .556). For the no-dyspareunia group, there was a moderate negative correlation between change in self-efficacy (M = .74, $SD = 3.57$) and perceived stress ($M = 2.48$, $SD = 5.13$) ($r = -.392$, $n = 31$, p = .029) (Figure 4). In other words, for those without dyspareunia, experiencing a decline in perceived stress was

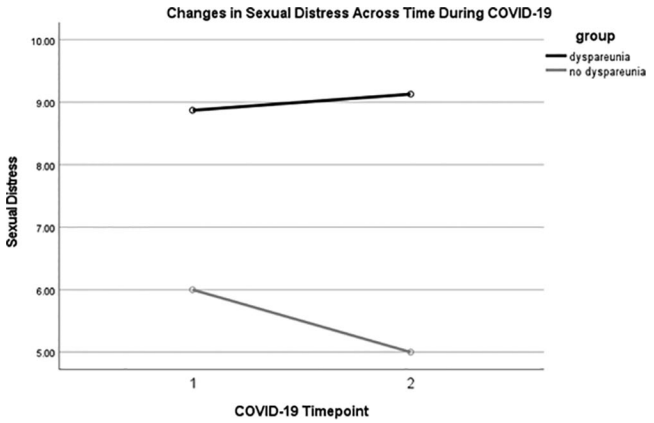

Figure 3. Results of RM-ANOVA comparing the change in self-reported sexual distress across two COVID-19 timepoints between individuals who experience dyspareunia and those who experience no dyspareunia.

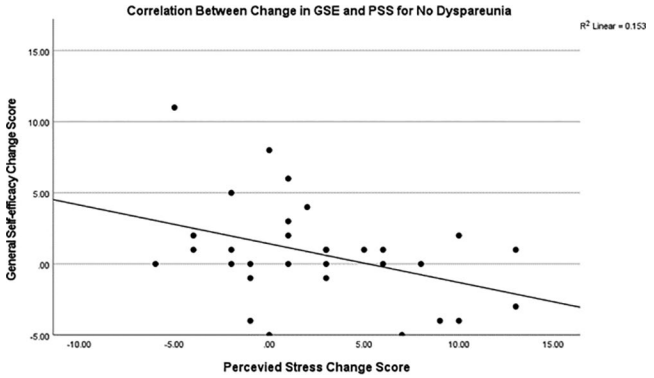

Figure 4. Results of the Pearson correlation assessing the relationship between the change scores for GSE and PSS from Time 1 to Time 2 in the no-dyspareunia group.

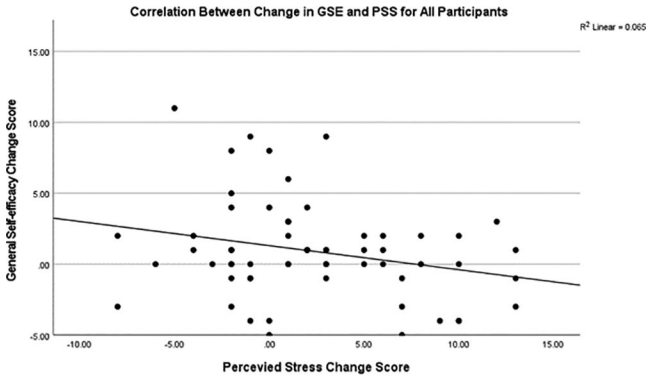

Figure 5. Results of the Pearson correlation assessing the relationship between the change scores for GSE and PSS from Time 1 to Time 2 in all participants.

associated with experiencing an increase in general self-efficacy. However, there was no significant between-groups difference in the correlations (p = .254).

After collapsing across groups to include all participants, the significant negative correlation between change in self-efficacy (M = .92, SD = 3.42) and perceived stress (M = 2.30, SD = 5.14) (r = –.256, n = 62, p = .045) remained (Figure 5).

Discussion

Previous examination of the experience of dyspareunia during the COVID-19 pandemic has been cross-sectional in nature (Fuchs et al., 2020), and the present study is the first to examine longitudinal trends of dyspareunia during the pandemic. As expected, general self-efficacy declined during the pandemic, and individuals with dyspareunia reported lower self-efficacy over their lives in comparison to those without dyspareunia. Similarly, perceived stress was greater for individuals with dyspareunia, but surprisingly, both those with and without dyspareunia reported reductions in perceived stress from Time 1 to Time 2. There was no significant interaction between time and group for general self-efficacy or perceived stress, and neither variable at Time 1 predicted pain intensity at Time 2. Due to the unexpected findings of declines in stress, post-hoc correlations were conducted to assess if change in perceived stress was associated with change in general self-efficacy. Change scores were only associated for individuals without dyspareunia, such that a decrease in perceived stress was associated with an increase in general self-efficacy; however, the correlations were not significantly different between groups. The results of this study have implications for further understanding the impact of stress and general self-efficacy on dyspareunia during the pandemic.

General self-efficacy and stress

As previously discussed, coping is conceptualized as the means to exert control over a stressor, whether internal or external (Lazarus & Folkman, 1984), and the COVID-19 pandemic can be viewed as acting as an external stressor. Both stress and perceptions of control (i.e., self-efficacy) can contribute to the experience of pain, and uncontrollable events have been found to be a consistent predictor of psychological distress (Dickerson & Kemeny, 2004; Foley & Kirschbaum, 2010; Henry, 1993; Müller, 2011). In a study of the relationship among pain intensity, helplessness, and cortisol secretion (i.e., the primary stress hormone), Müller found that those exposed to uncontrollable stress reported significantly higher pain intensity and helplessness, and their salivary cortisol in response to an electric shock was increased (Müller, 2011). For extended periods of time during the pandemic, many individuals had little control over their environment as they were mandated to stay indoors and socially isolate. For this reason, it is unsurprising that both groups in the present study reported decreases in self-efficacy from Time 1 to Time 2 and that individuals with dyspareunia, who are already burdened with the stress of living with chronic pain, reported more stress and less self-efficacy over their lives at both timepoints. Surprisingly, although self-efficacy decreased from Time 1 to Time 2, stress also decreased in both groups.

This result appears at first to contradict previous findings that self-efficacy is believed to buffer the experience of stress (Frazier et al., 2011). A meta-analysis assessing the association between the perception of control and response to pain confirmed that when pain is perceived as something that can be resolved and controllable, individuals are more likely to utilize active coping strategies (Jackson, Wang, & Fan, 2014). In contrast, when pain is perceived as an uncontrollable threat to their physical well-being, they are more likely to respond passively to pain and not attempt to change the source of pain. When a stressor is behaviorally uncontrollable, an emotion-focused coping strategy may be more effective (Carver, Scheier, & Weintraub, 1989). Based on these assumptions, optimal coping in response to an environmental stressor requires both types of coping strategies (active and emotion-focused).

Our post-hoc hypothesis predicted that as participants appropriately assessed their lack of environmental control and reported a decline in self-efficacy, perhaps they were able to appropriately select coping strategies that led to a decline in perceived stress. However, when examining the correlation between change scores in self-efficacy and perceived stress, the expected pattern of self-efficacy buffering the experience of stress held in the control group: as self-efficacy increased, stress decreased. Although this correlation was not significant in the dyspareunia

group, the correlations were not significantly different from each other, and the correlation was significant when collapsing across groups, suggesting that the relationship between self-efficacy and stress was in the expected direction, despite the surprising finding that stress reduced over the course of the study.

Sexual distress

While perceived stress and self-efficacy decreased over time, a significant change in sexual distress over time was not observed in either group, with the dyspareunia group reporting significantly higher sexual distress than the group without dyspareunia. Based on past research, we would hypothesize a relationship where decreases in perceived stress would be associated with decreases in sexual distress, as the negative association between stress and sexual well-being has been observed both prior to (e.g., Avis et al., 2005) and during (e.g., Gauvin et al., 2022 in press; Lehmiller, Garcia, Gesselman, & Mark, 2021) the pandemic. However, other factors may be contributing to, and maintaining, sexual distress in the present sample in addition to perceived stress. For example, lack of treatment access or changes in treatments may result in poorly managed dyspareunia symptoms and greater associated distress similar to what has been observed in studies of other chronic pain conditions during the pandemic (Lacasse et al., 2021).

Alternatively, the broader mental health burden of COVID-19 (González-Sanguino et al., 2020; Kang et al., 2020; Killgore et al., 2020; Mazza et al., 2020; Reger et al., 2020; Rossell et al., 2021; Serafini et al., 2020; Wang et al., 2020; Zhang et al., 2020) may also be associated with greater sexual distress, as low mood and anxiety are associated with poorer sexual outcomes (Rosen et al., 2009; Shifren, Monz, Russo, Segreti, & Johannes, 2008). Indeed, the Sexual Distress Scale (Santos-Iglesias et al., 2020) captures sexual distress more broadly (not just distress related to dyspareunia), and other studies have found a broader range of changes in sexuality over the course of the pandemic which may be distressing (e.g., decreases in sexual desire and frequency of sexuality activity, increases in conflict; Ibarra et al., 2020; Luetke et al., 2020; Pieh et al., 2020). Schiavi et al. (2020) found significant increases in sexual distress during the first month of the pandemic as compared to a pre-pandemic baseline, a pattern that differs from our results, likely because the present study did not include a pre-pandemic baseline. Instead, Time 1 was collected shortly after the pandemic began.

Limitations

Interpretation of the study results is limited by our inability to control for variation in public health restrictions by region, meaning that it is possible that although the pandemic and restrictions generally encompassed the two timepoints, individuals' responses may have varied depending on the specific physical distancing guidelines in their region. It is also possible that this contributed to the reduction in stress over time: certain regions in response to the initial surge of COVID-19 may have had greater restrictions from May-June 2020 (Time 1) than from August-November 2020 (Time 2), resulting in higher stress in Time 1. However, this explanation would not account for the reported declines in general self-efficacy, as we would hypothesize that greater COVID-19 restrictions at Time 1 would result in a lower sense of general self-efficacy over one's life in comparison to Time 2. In addition, the severity of dyspareunia varies greatly in the present study. As the data from participants who had not attempted intercourse in the past 4 weeks were not included in the analyses likely excludes participants who experience severe symptoms and thus avoid sexual activity. Some participants may meet diagnostic criteria for a chronic genitopelvic pain condition and others may not. More severe pain symptomatology may have revealed greater declines in functioning over time.

Conclusions

This study provides longitudinal data on the impact of COVID-19, as well as general self-efficacy and stress, on those experiencing dyspareunia. The results further illuminate the factors that may uniquely influence individuals with dyspareunia, who experienced more stress and less general-self-efficacy across the time points assessed in the present study. Those with dyspareunia experienced less self-efficacy and greater perceived stress and sexual distress during the COVID-19 pandemic. In addition, this study did not find that decreases in perceived stress were associated with decreases in sexual distress, suggesting other factors may be contributing to, and maintaining, sexual distress. Clinicians working with individuals who have been experiencing dyspareunia throughout the pandemic may consider incorporating assessment questions about how factors related to the pandemic (e.g., feelings of helplessness, decreased access to treatments and social supports) have influenced dyspareunia symptoms and associated sexual distress. Individuals with dyspareunia may benefit from interventions, such as cognitive behavioral therapies, that target cognitions related to low self-efficacy and utilize behavioral self-management strategies to reduce feelings of helplessness during uncontrollable life events. Future research should seek to examine what coping strategies are most effective for those with dyspareunia experiencing global life stress and low general self-efficacy and under which conditions these coping strategies might be effective.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, CP, upon request.

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