

The effects of a brief mindfulness-based intervention on pain perceptions in patients with chronic pelvic pain: A case series

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ABSTRACT

Introduction: Chronic pelvic pain affects 15–20% of women, and patients frequently do not find relief with first-line therapies. Mindfulness-based meditation programs are effective in improving outcomes for patients with chronic pain conditions, but limited data exists for patients with chronic pelvic pain. We describe the effect of a brief mindfulness-based program, incorporated into pelvic-floor physical therapy visits, on perceived pain in patients with chronic pelvic pain.

Case series: Patients being treated for pelvic pain participated in this 8-week program. Pelvic-floor physical therapists delivered a brief mindfulness-based exercise during routine physical therapy visits. Patients reported pain scores and pain catastrophizing scores at the beginning and end of the program. Ten patients completed the program. Paired-samples *t*-tests showed that pain catastrophizing significantly decreased from baseline to 8 weeks in patients who completed the mindfulness training and increased among patients who withdrew.

Conclusion: Mindfulness-based exercises may be a useful complementary therapy for the treatment of chronic pelvic pain.

1. Introduction

Chronic pelvic pain is defined as noncyclic pain of 6 or more months' duration that localizes to the anatomic pelvis, anterior abdominal wall at or below the umbilicus, the lumbosacral back or the buttocks, and is of sufficient severity to cause functional disability or require medical care [1,2]. Chronic pelvic pain affects between 5.7% and 26.6% of women [3]. In 2019, the definition of chronic pelvic pain was expanded to include cyclical pelvic pain and dyspareunia when it adversely affects a patient's wellbeing [4].

Mindfulness-based interventions have been effective in improving clinical outcomes in patients with chronic pain conditions [5–7]. However, traditional mindfulness-based interventions are time intensive, typically consisting of 8 weekly 2½-hour sessions with approximately 45 minutes of daily homework, and concluding with a full-day meditation retreat [5]. While there is evidence that mindfulness-based stress reduction may benefit patients with chronic pelvic pain, time and cost have been cited as barriers [8,9]. We hypothesize that similar benefits in

reduction in pain perception can be accomplished with a brief mindfulness-based intervention incorporated into usual care. In this case series, we report on the utility of a brief mindfulness-based intervention for patients with chronic pelvic pain. We also evaluate preliminary effects of the intervention on pain levels and pain catastrophizing.

2. Case series

2.1. Methodology

This study is a single-center case series of non-consecutive patients who agreed to participate in the program. For a 14-month period, all eligible patients being treated for chronic pelvic pain were invited to participate in a novel program incorporating mindfulness training into their routine physical therapy visits. Chronic pelvic pain was defined as noncyclic pain of 6 or more months' duration that localizes to the anatomic pelvis, anterior abdominal wall at or below the umbilicus, the lumbosacral back or the buttocks, and is of sufficient severity to cause

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functional disability or lead to medical care [1]. Patients were included if they: (1) had a chronic pelvic pain diagnosis; (2) were prescribed pelvic-floor physical therapy as part of their treatment plan; and (3) scored a minimum of 20/52 on the Pain Catastrophizing Scale [10]. Patients were not invited to participate if they were under the age of 18; pregnant; were unable to read, write or speak English; or had prior formal mindfulness experience. Eligible and interested patients provided written informed consent prior to their participation. Our Institutional Review Board (IRB) approved the case series (#4136–18). Patients completed self-report questionnaires before and after the program to measure pain perceptions.

The mindfulness intervention was introduced by the physical therapist during routine pelvic-floor physical therapy visits. Three pre-taped meditation exercises that were specifically designed for the program were used to guide the practice. Exercises included a seated meditation, a body scan, and a compassion meditation. The meditations were designed specifically for patients with chronic pelvic pain. Patients were also given weekly “practice cards” with written guidance for their practice, education about the impact of stress on pain, journal exercises, inspirational quotes, ideas for 1-minute mindfulness practices, and a log to keep track of their homework.

In addition to meeting with their physical therapist, patients met with their treating physician twice during the program. Physicians reinforced the role of mindfulness in managing the pain experience along with providing routine, individualized pelvic pain care.

Patients completed a numerical pain rating scale and the Pain Catastrophizing Scale before and after the intervention. The numerical rating scale is a commonly used 11-point scale. It asks patients to rate their pain from 0 to 10, with 0 being no pain and 10 being the worst pain imaginable. Patients rated their average, maximum, and minimum pain. The Pain Catastrophizing Scale is a validated 13-item questionnaire which asks patients to rate statements about pain from 0 (not at all) to 4 (all the time). Scores range from 0 to 52. Higher scores indicate increased pain catastrophizing behavior and higher risk of pain development [10]. A cut-off of 20/52 indicated pain catastrophizing behavior for the purpose of our program.

We performed descriptive statistics to summarize patient demographic characteristics. We first used repeated measures analysis of variance to examine change in pain scores from baseline to follow-up among those who did and did not complete the intervention. A priori covariates included Charlson comorbidity index and number of pain diagnoses. To evaluate change in pain scores across the study, we performed paired-samples *t*-tests. Analyses were conducted using IBM SPSS version 25. This case series has been reported in line with the PROCESS Guideline [11].

2.2. Findings

A total of 20 patients enrolled in the study. The average age of patients was 33 years (range 20–61 years). Most patients identified as white (85%) and non-Hispanic (85%). Seven patients were married or had a legal partner, one was divorced and 12 were single. Patients were physically healthy, with a mean Charlson comorbidity index of 0.5. On average, patients had more than 2 pelvic pain diagnoses, including endometriosis, dysmenorrhea, dyspareunia, vaginismus, vulvodynia, pelvic-floor myalgias, interstitial cystitis/painful bladder syndrome, irritable bowel syndrome, ilioinguinal neuralgia, anal fissures, and persistent genital arousal disorder. Nine had prior pelvic surgery and 4 had undergone hysterectomy. Nine patients reported a diagnosis of fibromyalgia or other central pain disorder, and 19 reported anxiety or depression (Table 1).

Ten patients (50%) completed the 8-week program. Four patients withdrew from the physical therapy with mindfulness but continued with usual pelvic pain care. Six patients left the program and were lost to follow-up.

At baseline, mean pain scores were 5.32 (range 0–9) for average pain

Table 1
Demographics.

Variable	Mean (SD)	Range
Age (years)	33.0	(20–61)
Gravidity/Parity	1.0/0.75	(0–4)/(0–4)
Race	N (%)	
White	17 (85)	
Black	3 (15)	
Other/Unknown	0	
Ethnicity	N (%)	
Hispanic/Latino	3 (15)	
Not Hispanic/Latino	17 (85)	
Marital Status	N (%)	
Married/Legal Partner	7 (35)	
Single	12 (60)	
Divorced	1 (5)	
Charlson Comorbidity Index	0.5	(0–2)
Number of pelvic pain diagnosis ^a	2.6	(1–4)
Number of other localized pain diagnosis	0.45	(0–2)
	N (%)	
Prior Hysterectomy	4 (20)	
Prior pelvic surgery	9 (45)	
Diagnosis of fibromyalgia/central sensitization	9 (45)	
History of anxiety/depression	19 (95)	
Lifetime history of abuse (%)	11 (55)	
Tobacco use		
Never	11 (55)	
Current	3 (15)	
Former	6 (30)	
Marijuana use (%)	11 (55)	
Drug or ETOH abuse		
Never	17 (85)	
Current	1 (5)	
Former	2 (10)	

^a endometriosis, dysmenorrhea, dyspareunia, vaginismus, vulvodynia, pelvic floor myalgias, interstitial cystitis/painful bladder syndrome, irritable bowel syndrome, ilioinguinal neuralgia, anal fissures, and persistent genital arousal disorder.

level, 9.08 (range 7–10) for maximum pain level, and 3.18 (range 0–8) for minimum pain (Table 2). Baseline pain scores did not differ among study completers and non-completers (*p* values > .21). The mean Pain Catastrophizing Scale score for patients was 36.37 (range 16–51) at baseline (Table 2). One patient had a score at enrollment of 16 after having a score over the cut-off at the time of recruitment. Pain Catastrophizing Scale scores did not differ between completers and non-completers at baseline (*t* = −0.80, *p* = .44).

We compared baseline and follow-up pain scores for women who completed the mindfulness program. There was reduction in all pain scores; however, this did not reach statistical significance (Table 3). Repeated measures ANOVA revealed that change in Pain Catastrophizing Scale scores significantly differed by group (*F* = 7.49, *p* = .029) (Table 3). Pain catastrophizing decreased among women who completed the program from 35.33 to 25.44, and increased for those who withdrew from 34.50 to 42.00 (Fig. 1).

3. Discussion

In this case series, we examined the effect of a brief mindfulness-based program embedded into physical therapy for women with chronic pelvic pain. We found that 50% of patients completed the 8-week program and women who completed the mindfulness-based

Table 2
Baseline mean pain scores.

Pain/Catastrophizing Scores	Intake	Range (SD)
Average pain score (0–10)	5.32 (<i>n</i> = 19)	0–9 (2.28)
Maximum pain score (0–10)	9.08 (<i>n</i> = 18)	7–10 (0.97)
Minimum pain score (0–10)	3.18 (<i>n</i> = 19)	0–8 (2.66)
Pain catastrophizing score (0–52)	36.37 (<i>n</i> = 19)	16–51 (8.93)

Table 3
Intake vs. week 8 mean pain scores.

Pain/Catastrophizing Scores	Intake	Week 8	p-value
Average pain score (0–10) (n = 8)	4.37 (2.37)	3.18 (2.64)	0.11
Maximum pain score (0–10) (n = 9)	8.83 (0.79)	6.61 (2.89)	0.88
Minimum pain score (0–10) (n = 9)	3.27 (2.25)	1.89 (1.90)	0.08
Pain Catastrophizing score (0–52) (n = 9)	35.33 (10.89)	25.44 (8.73)	0.04

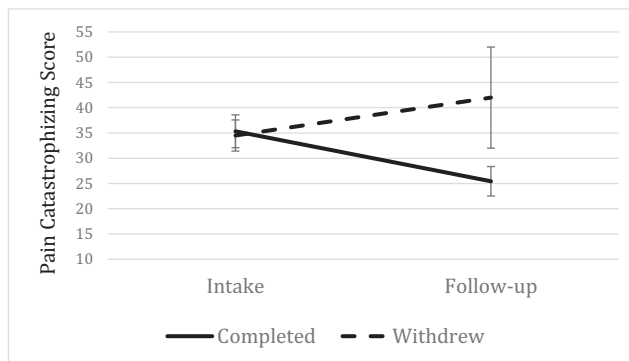


Fig. 1. Pain catastrophizing scores comparing patients who completed the mindfulness program vs. patients who withdrew.

program in addition to usual care reported reduced pain catastrophizing and a trend toward lower pain scores. Interestingly, we found that women who withdrew from the program experienced a significant increase in pain catastrophizing scores over a similar time period. We hypothesized that a brief mindfulness intervention would improve acceptability of this program, as compared to traditional mindfulness programs for patients with chronic pelvic pain [8,9]; however, our program had a drop-out rate of 50%. In most cases, patients reported difficulty keeping the appointments as the reason for leaving the program.

Chronic pelvic pain is a complex disorder associated with a wide range of conditions [1]. Pelvic pain can arise from the gynecologic, gastrointestinal, urologic, and/or neuromusculoskeletal systems. Pain can arise from more than one system, and in treating chronic pelvic pain, it is important to consider how psychological and psychosocial factors interact with pain [1]. Treatments for chronic pelvic pain include management of peripheral pain sources, as well as targeting the centrally mediated response to pain [2]. The use of centrally acting pain medications, including opioids, is common in patients with pelvic pain [12]. There are no studies showing benefit of chronic opioid therapy for patients with chronic pelvic pain, endometriosis, interstitial cystitis or irritable bowel syndrome. There is increasing literature advising against the use of opioids for chronic pain, citing risks of dependence, addiction, and overdose-related death [13].

Pelvic-floor physical therapy is a first-line treatment for chronic pelvic pain conditions including: pudendal neuralgia, dyspareunia, vaginismus, vulvodynia, and tight pelvic floor muscles causing painful myofascial trigger points [14,15]. These conditions may occur in isolation or in conjunction with other pain diagnoses such as irritable bowel syndrome, endometriosis, and interstitial cystitis/bladder pain syndrome. In 2005, a large systematic review found that 59–80% of women reported improvement in pelvic pain after participating in pelvic-floor physical therapy; however, many patients required multimodal treatment [16].

Structured mindfulness-based interventions are another treatment strategy for patients with chronic pain syndromes. Mindfulness is an internal practice, in which the patient works toward a state of curiosity, nonjudgement, acceptance, and focus on the present [7]. Mindfulness

practices increase neuronal activity in areas of interoceptive awareness and allows for reappraisal of sensory information that can lead to a reduction in pain perception [5–7]. Several other studies investigating mindfulness-based interventions for chronic pelvic pain conditions have shown promise; however, the time-intensive nature of these programs has been cited as a barrier to care [8,9].

The strengths of this study include a novel approach to a complex pain condition for which current treatment options are limited. Additionally, we included women with a wide range of pelvic pain conditions, making the results widely applicable. Nonetheless, the study findings need to be interpreted in the context of some limitations. First, this study was a single-arm study, and it is possible that the treatment effect was due to the mindfulness intervention, pelvic-floor physical therapy, the multidisciplinary pelvic pain program, or a combination of the interventions. Second, the non-completion rate was 50% and the sample size was small; however, the improvement in pain catastrophizing that was demonstrated in this case series supports the promise of this treatment strategy. Finally, implementation of the program requires a team of providers that is able to deliver multidisciplinary care, including pelvic pain care, mindfulness, and pelvic-floor physical therapy.

4. Conclusions

This case series demonstrates a preliminary benefit of a brief mindfulness-based program for women with chronic pelvic pain, which can be incorporated into routine pelvic pain care as part of a multimodal treatment strategy. Continued research into the role brief mindfulness-based interventions can play in the management of women with chronic pelvic pain should be pursued.

Contributors

Lindsay E. Clark Donat contributed to conception and development of the study, data interpretation, manuscript writing and editing, and patient management.

Jennifer Reynolds contributed to conception and development of the study, manuscript writing and editing, and patient management.

Margaret H. Bublitz contributed to data analysis and interpretation and manuscript writing and editing.

Ellen Flynn contributed to conception and development of the study and manuscript writing and editing.

Lauri Friedman contributed to conception and development of the study and patient management.

Sarah D. Fox contributed to conception and development of the study, data interpretation, manuscript writing and editing, and patient management.

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Patient consent

Written informed consent was obtained from all participants.

Ethical approval

The Lifespan Institutional Review Board (IRB) approved the case series (#4136-18).

Provenance and peer review

This article was not commissioned and was peer reviewed.

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Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case series.

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