

The development and efficacy of an interdisciplinary chronic pelvic pain program

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Acknowledgements: The authors would like to thank the Ministry of Health and Long Term Care in Ontario Canada, for providing funding to develop and run our program. They would also like to acknowledge all of the volunteers who contributed their time to helping this program and study run, and all of the patients who participated in the program and took the time to complete our questionnaires.

Cite as: Katz L, Fransson A, Patterson L. The development and efficacy of an interdisciplinary chronic pelvic pain program. *Can Urol Assoc J* 2020 November 17; Epub ahead of print. <http://dx.doi.org/10.5489/cuaj.6842>

Published online November 17, 2020

Abstract

Introduction: Chronic pelvic pain (CPP) is a significant issue, and approximately 14% of women experience CPP once in their lifetime. While interdisciplinary pain management is considered the gold standard of treatment, few programs offer this type of treatment in Canada. The aims of this paper were to: 1) describe the development of an interdisciplinary CPP program; and 2) demonstrate changes in patient-related outcomes after attending an interdisciplinary CPP program.

Methods: Referrals were received from community urologists and obstetricians/gynecologists, and pain physicians at the Michael G. DeGroote Pain Clinic. Patients attended an orientation session, completed an interdisciplinary assessment, and if appropriate attended an eight-day interdisciplinary CPP program. Each day consisted of group-based pelvic floor physiotherapy, psycho-education, goal-setting, cognitive behavioral therapy, and mindfulness. Psychometric questionnaires were completed pre- and post-program by patients, and paired sample t-tests were used to evaluate the changes in patient-related outcomes after attending the program.

Results: Thirty-seven female patients completed the program, and results demonstrate that the CPP program was associated with significant improvements in impact of pelvic pain on quality of life, readiness for change, and pain-related self-efficacy, as well as decreases in pain catastrophizing and fear of pain/re-injury.

Conclusions: CPP is a complex condition that requires interdisciplinary management and care. The results of this study demonstrate the short-term benefits of an interdisciplinary CPP program and highlight the unique needs of women with CPP and implicate multiple factors for programming and treatment.

Introduction

One in five Canadians suffer from chronic pain,¹ and it is estimated that chronic pain costs Canada approximately 56-60 billion dollars annually.² Chronic pelvic pain (CPP) is a significant issue for women in Canada. The prevalence of CPP for women in reproductive ages is between 14% – 24%, and approximately 14% of women experience CPP at least once in their lifetime, which would affect approximately 2.5 million Canadian women.^{3,4}

CPP is defined as “intermittent or constant pain in the lower abdomen or pelvis of at least 6 months duration, not occurring exclusively with menstruation or intercourse, and not associated with pregnancy.”⁵ Some examples of associated conditions are interstitial cystitis/bladder pain syndrome (IC/BPS), endometriosis, fibroids, chronic urinary tract infections, vulvodynia, irritable bowel syndrome (IBS), and inflammatory bowel disease (IBD).⁶ CPP is a persistent and debilitating condition that is associated with significant costs and morbidity. Its etiology is often multifactorial further complicating medical treatment and symptom management.^{6,7} Significant costs are associated with CPP including: absences from work, decreased fertility, personal role losses, increased surgeries, and significant cost and burden to the healthcare system.⁷ In comparison to healthy and age matched controls, women with CPP report poorer outcomes including: increased pain, worsened quality of life, sleep dysfunction, depression, pain catastrophizing, anxiety, stress, and issues with social and sexual functioning.⁸

Coping with CPP is a complex and unique process. Impairments and disability are associated with negative affect and pain catastrophizing, and factors such as illness perceptions, emotion regulation, and behavioural coping impact both physical and mental health outcomes in women with CPP.^{9,10} There is also a higher prevalence of early childhood sexual trauma commonly reported in women with CPP.^{6,11} Moreover, many women with CPP are initially provided improper diagnoses and experience debilitating symptoms on average for 6 years (but as much as 11 years) before getting any treatment at all.^{7,12}

Group interdisciplinary treatment for chronic pain is considered the gold standard due to its efficacy, cost-effectiveness, and longitudinal effects.^{13,14} In general, interdisciplinary pain programs follow a self-management framework focusing on the development of personal control by teaching active and direct skills and strategies, developing more balanced and realistic thinking, and increasing productive activity.¹⁵ Interdisciplinary pain management programs are effective in reducing symptoms of pain, pain-related disability, symptoms of stress, anxiety and

low mood, improving functioning and wellness-focused active coping as well as readiness for change.^{13,16,17} Best practice guidelines also recommend an interdisciplinary and biopsychosocial approach for the treatment of CPP,^{18,19} however, few programs offer this type of treatment in Canada. The aims of this paper were to: 1) describe the development of an interdisciplinary CPP program, and 2) to demonstrate changes in patient-related outcomes after attending an interdisciplinary CPP program.

Methods

Development of the program

Referrals and orientation

The Interdisciplinary CPP Program was developed as an adaptation from established and ongoing pain programs running at the Michael G. DeGroote Pain Clinic^{17,20} focusing specifically on key factors identified from the literature based on the needs of women struggling to cope with CPP. The interdisciplinary team consisted of a psychologist, pelvic floor physiotherapist, pharmacist, dietician, occupational therapist, and social worker, all of which were female as many of the topics in this program were sensitive in nature. Referrals were received from urologists and obstetricians/gynecologists in the community, as well as pain physicians from our clinic. It was important for the women being referred to have a full diagnostic assessment and opportunity for treatment from a specialist before participating in our program. As such, referrals were only accepted from specialists and not from family physicians. After being referred, patients were invited to attend a one-hour orientation session to learn about the program and to determine if they would be interested in participating. The orientation provided brief psycho-education on CPP, the biopsychosocial model of chronic pain from a self-management perspective, and the nature of our program. Provision of a diagnosis or removal of pain were not goals of this program. More specifically, the program emphasized learning active skills and strategies to help individuals better cope with and manage their CPP and improve their overall quality of life and functioning. If interested, patients were scheduled for a 90-minute interdisciplinary assessment with the psychologist and pelvic floor physiotherapist.

Assessment for the program

The pelvic floor physiotherapist assessed medical history, general activity and functioning as well as an optional internal pelvic floor assessment for the purpose of individualized exercise recommendations. The assessment also consisted of a brief psychological interview conducted by the psychologist to screen for significant psychological issues that might impact the patients' ability to participate and engage in the programming. Inclusion criteria were: experience of CPP for at least 6 months, at least 18 years of age, and ability to read and write in English. Exclusion criteria were: currently a falls risk, dependent with self-care/transfers, or severe psychiatric distress (e.g., active psychosis or bipolar disorder, severe suicidality). If the patient was assessed

to be appropriate for the program and was interested in participating, they were scheduled for an upcoming program. If the patient was assessed not to be appropriate for the program, community recommendations were provided (e.g., mental health support, community individual pelvic floor physiotherapy), and if interested were provided with a follow-up appointment for re-assessment.

Interdisciplinary CPP program

The program was a closed group in which the same cohort of patients attended one day a week for 8 consecutive weeks for 3 hours each day. Each day consisted of group-based pelvic floor physiotherapy, psycho-education classes, goal setting, cognitive-behavioural therapy (CBT) and mindfulness. The pelvic floor physiotherapy class involved cardiovascular, stretching, and strengthening exercises individualized and geared towards lengthening the pelvic floor muscles. Patients also learned strategies to wind down their nervous systems (e.g., self-trigger point release techniques, self-skin rolling techniques, piston breathing) and techniques to increase body awareness of the pelvic floor. The psycho-education classes consisted of the following topics: 1. The science of chronic pain; 2. Sleep; 3. Dealing with flare-ups; 4. Pacing and activity education; 5. Emotion regulation; 6. Trauma and chronic pain; 7. Communication and sexual intimacy; and 8. The anti-inflammatory diet for bladder and bowel management. Goal setting followed S.M.A.R.T. (specific, measurable, achievable, realistic, timely) goals for homework review and setting goals for the following week. The CBT component involved psycho-education on the CBT model and practice with cognitive restructuring to develop more balanced and realistic thoughts about their pain. Lastly, the mindfulness practice was adapted from the protocol by Basson, Brotto and Carlson et al. (2014).²¹ Each program consisted of 6-8 women, and this was primarily to ensure safety in the group physiotherapy component of the program with one attending physiotherapist, as well as for the purposes of individualized goals, exercises and hands on direction in addition to the incorporation of CBT training. Psychometric questionnaires were administered pre (during the initial assessment) and post program (on the last day). Institutional research ethics were approved for this study (Hamilton Health Sciences, #4883).

Subjects

From January 2017 to December 2019, ten orientation sessions have been offered and seven separate 8-week CPP programs have been run. Forty-five patients were found to be appropriate and enrolled in the program, and 41 completed the program (attended at least 5 out of 8 of the sessions). Reasons for not being appropriate for the program were related to issues such as living too far away to commute to the program on a regular and ongoing basis, due to an acute mental health crisis or significant psychosocial stressors at the time. The completion rate of our program was 91%, and several reasons for women not completing the program once enrolled were related to issues such as an unexpected family emergency or the recurrence of significant mental health issues and symptoms. The subjects of this study were a convenience sample of patients who

attended our chronic pelvic pain program in the clinic and also provided consent to complete questionnaires and be a part of this study.

Measures

Demographics

Patients provided demographic information such as age, gender, marital status, ethnicity, place of birth, education level, employment status, time since pain problem began, and time since being off work. They also provided information on past medical/mental health diagnoses, related symptoms and adverse life events.

The Pelvic Pain Impact Questionnaire

Life impact of pelvic pain was assessed using the Pelvic Pain Impact Questionnaire (PPIQ).²² Eight items were scored from 0 (*Not at all*) to 4 (*A great deal*), and were summed for a total score out of 32. Areas assessed reflect one's energy level, mood, sleep, gastrointestinal functioning, ability to sit, engage in functional activities and exercise, and wear certain clothing. Two additional supplemental questions query about menstruation and levels of intimacy. The PPIQ has high utility and excellent psychometric properties in women with a variety of pelvic pain conditions.²²

Pain catastrophizing

The Pain Catastrophizing Scale (PCS) consists of 13 statements that asked patients to rate different thoughts and feelings associated with pain.²³ Higher scores represent increased levels of pain catastrophizing, and each item was scored from 0 (*Not at all*) to 4 (*All the time*). The PCS is a valid and reliable measure, and its use is well-established in chronic pain samples.²³

Fear of pain/re-injury

The Tampa Scale of Kinesiophobia (TSK) assessed fear of pain and re-injury.²⁴ Eleven items rated on a scale from 1 (*Strongly disagree*) to 4 (*Strongly agree*) asked patients how they feel about their pain. The TSK is a valid and reliable metric to assess for fear of movement/re-injury in samples of chronic pain.²⁵

Readiness for change

Patients' readiness for change was assessed using the Pain Stages of Change Questionnaire (PSOCQ).¹⁵ This scale consisted of 30 items assessing patient's readiness to adopt a self-management approach to pain management, rated from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), which were used to calculate four stages of change, including pre-contemplation, contemplation, action, and maintenance. The PSOCQ has been found to be a reliable and valid measure to use in individuals with chronic pain.¹⁵

Pain self-efficacy

Patients' confidence in being able to perform a behavior/task despite experiencing pain was assessed using the Pain Self-Efficacy Questionnaire (PSEQ), which consists of ten items rated on a scale from 0 (*Not At All Confident*) to 10 (*Completely Confident*).²⁶ The PSEQ has demonstrated good psychometric properties.²⁷

Data analysis

Data were analyzed using the statistical program SPSS version 25. The data were cleaned with respect to missing values. Data was found to be missing at random, and questionnaires with completion of 85% or more data were imputed using simple mean imputation. All other data was considered missing and the cases were deleted from the dataset. Paired-sample t-tests were employed to evaluate the efficacy of the CPP program and changes in outcomes pre- and post-program, and Cohen's D was calculated to evaluate the effect sizes.

Results

The following results are from the initial sample of women who attended and completed the interdisciplinary CPP program and provided informed written consent to be a part of this study (N=37; see Table 1). The sample of women was on average 41 years of age, and had been experiencing pain for approximately a decade. The women were primarily born in Canada (92%), Caucasian (97%), with at least some university/college education or higher (94%), and with an average of one child. About half of the women were employed (46%), and married or common-law (56%). See Table 2 for self-reported clinical characteristics of the sample. Briefly, the majority of the women had a diagnosis of endometriosis, experienced urinary symptoms such as urgency, frequency and accidental urine loss, along with bowel-related symptoms and pain with sex, and reported histories of anxiety and depression and experiences of sexual abuse. Approximately 48% of the subjects were referred from obstetricians/gynecologists, 35% from pain clinics and 17% from urologists.

Results from paired sample t-tests demonstrate significant improvements in patient-related outcomes post-program. More specifically, there were significant improvements in pelvic pain impact on quality of life, readiness for change and pain-related self-efficacy, and decreases in pain catastrophizing and fear of pain/re-injury. Table 3 demonstrates the mean change scores, standard deviations, paired sample t-test values, significance values, and Cohen's d effect size values with the respective ranges.

Discussion

CPP is a debilitating and complex condition that affects a significant proportion of women and is associated with significant costs and morbidity.^{3,4,7,8} The etiology of CPP is often multifactorial further complicating treatment and symptom management.^{6,7} Interdisciplinary chronic pain management programs have been implicated as the gold standard for treatment,^{18,19} however few such programs are offered for CPP in Canada. The aims of this paper were to: 1) describe the

development of an interdisciplinary CPP program, and 2) to demonstrate changes in patient-related outcomes after attending an interdisciplinary CPP program. Results from this study demonstrate that our CPP program was associated with significant improvements in impact of pelvic pain on quality of life, readiness for change, and pain-related self-efficacy as well as decreases in pain catastrophizing and fear of pain/re-injury.

To date, seven programs have been completed and our completion rate was 91%. It is suspected that our completion rate is relatively high due to multiple steps and assessments required before program admission. This ensures that only those who are appropriate, are ready to make behavioural and life changes and are motivated to participate actively in the programming are admitted, which is essential in a publically funded system with limited resources. However, several patients did not complete the program due to ongoing mental health issues. As such, more intensive mental health screening might be warranted in the assessment to ensure that patients are able to engage and complete the program at the time of admission. Moreover, patients who are assessed not to be ready to participate in programming due to acute issues with mental health can be referred to appropriate programs and services to ensure they are receiving necessary mental health support.

Interestingly, while few women in our sample had an official diagnosis of IC/BPS, many experienced significant urinary symptoms such as urgency, frequency and accidental urine loss. Moreover, the majority of the women in our sample had been diagnosed with endometriosis, and this is likely due to the fact that many of the women had been referred from an endometriosis clinic at our centre. Our initial sample also represented a relatively young group of women who have only recently been off work in comparison to other chronic pain programs.^{17,20} Earlier intervention may lead to less persistent pain-related interference and disability, and this presents an opportunity to support this group of individuals learn coping strategies to better manage their pain, increase their functioning, and potentially get back to work and important life roles earlier on. An interesting line of future investigation would be to examine whether or not attending an interdisciplinary CPP program earlier on in the disease/surgical process would lead to better outcomes and less disability over time.

Our sample reported a high prevalence of history of anxiety and depression and adverse childhood events (e.g., sexual/physical abuse) and pain catastrophizing, which is consistent with the literature.^{6,8,11} Interdisciplinary CPP programs should include skills and strategies for mood and anxiety management and pain de-catastrophizing, along with psycho-education on the relationship between chronic pain and stress/trauma and techniques to down-regulate patients' nervous systems. As mentioned above, our sample also reported a relatively high prevalence of urinary and bowel symptoms and dyspareunia. Accordingly, it is beneficial for programming to include pelvic floor physiotherapy that focuses on strategies and techniques to lengthen pelvic floor musculature to relieve symptomatology as well as home practice of safe individualized

exercises to gradually increase activity levels, confidence to move again and decrease fear of movement and re-injury.

The results of our study demonstrate significant improvements in patient-related outcomes post-program. After completion of our program, patients reported less impact of pelvic pain on their quality of life and greater self-efficacy to manage their pain-related symptoms. Patients also reported significant decreases in pain catastrophizing and fear of pain/re-injury. These effects are likely due to the content of our program, which included weekly CBT sessions on cognitive de-catastrophizing, as well as weekly and home/individualized exercises to decrease fear of movement and increase confidence that exercise can be performed without increasing pain. Moreover, the program also emphasized teaching numerous skills and strategies, not necessarily to take one's pain away, but to be more in control of one's pelvic pain symptoms and feel more efficacious. There were also significant decreases in the pre-contemplation stage of change, in which an individual continues to seek a medical cure for their pain and demonstrates passive coping, while there were significant increases in the active and maintenance stages of change, in which an individual takes more active steps to change their behaviour and is thought to have more self-control over their pain and coping.¹⁵ As mentioned above, these results are likely related to the fact that our program strongly emphasizes the importance of the self-management of CPP while actively teaching skills and strategies throughout the 8-weeks. These results are important as these progressions through the stages of change are suggested to be associated with better patient outcomes such as improvements in mood and decreased disability.²⁸

There are a number of limitations of this study. Our sample was fairly homogenous consisting of primarily educated Caucasian females which might lead to issues with generalizability. This highlights the issue of accessibility and possible barriers to participation and is an important area for future research. Accessing the location of the clinic was another barrier, and our group is looking into adapting some of the materials and group content to be offered online for this reason. This study data also consists of a relatively small sample of patients who attended the orientation and completed the assessment, who are likely already fairly motivated and engaged, which represents a potential sampling bias. As such, it would be important to replicate these findings in a larger sample, and potentially a sample of males with CPP, and to also collect patient characteristics of patients who were not necessarily interested in engaging in interdisciplinary CPP programming. Moreover, this manuscript did not examine in detail medical/surgical history and physical examination as research variables as it was not the objective of this particular paper, but will be more closely detailed in follow-up research.

Conclusions

CPP is a complex condition that requires interdisciplinary management and care. Results demonstrate short-term improvements following an 8-week interdisciplinary CPP program in pelvic pain impact on quality of life, readiness for change and pain-related self-efficacy and

decreases in pain catastrophizing and fear of pain/re-injury post-CPP program. Based on our results, beneficial programming components might include active skills and strategies to cope with pain from a self-management perspective, cognitive pain de-catastrophizing, psycho-education about chronic pain and stress/trauma, techniques to down-regulate patients' nervous systems, and activity levels with graded exercises to re-emphasis less fear with movement and pelvic floor physiotherapy.

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Figures and Tables

Table 1. Sample demographics (N=37)	
	Years \pm SD
Age	40.59 \pm 11.69
Time since pain	9.16 \pm 8.31
Time since work	2.78 \pm 3.60
Number of children	1.08 \pm 1.14
	% (n)
Place of birth – Canada	91.9 (34)
Ethnicity – Caucasian	97.3 (36)
Marital status	
Married/Common-law	55.6 (20)
Single	30.6 (11)
Separated/divorced	13.9 (5)
Employment status	
Employed	45.9 (17)
Unemployed	16.2 (6)
Retired	13.5 (5)
Student	10.8 (4)
Homemaker	5.4 (2)
Education	
Elementary/high school	5.6 (4)
Some college/university	19.4 (7)
Graduated college/university	52.8 (19)
Postgraduate degree	22.2 (8)

SD: standard deviation.

Table 2. Clinical characteristics

Past medical diagnoses	% (n)
Endometriosis	62.2 (23)
Irritable bowel syndrome	37.8 (14)
Adenomyosis	18.9 (7)
Fibromyalgia	13.5 (5)
Interstitial cystitis/bladder pain syndrome	10.8 (4)
Inflammatory bowel disease	10.8 (4)
Experience of symptoms in the past 2 weeks	
Accidental urine loss	43.2 (16)
Urinary urgency	48.6 (17)
Urinary frequency	56.8 (21)
Constipation	71.4 (25)
Pain during/after bowel movements	65.7 (23)
Pain during/after sexual intercourse or insertion of objects	94.1 (32)
Adverse life events and mental health	
History of anxiety or panic attacks	64.9 (24)
History of depression	67.6 (25)
History of physical abuse	29.7 (11)
History of sexual abuse	48.6 (18)

Table 3. Changes in outcomes post-program

	Mean change score	SD	t	p	Cohen's D	Range
PPIQ	-3.47	6.27	-3.37	<0.01	0.50	Medium
PCS	7.68	9.89	4.73	<0.01	0.77	Medium
TSK	2.38	5.70	2.51	0.02	0.39	Small
Pre-contemplation	0.38	0.54	4.24	<0.01	0.59	Medium
Contemplation	0.07	0.52	0.85	0.40	0.16	Small
Action	-0.67	0.68	-5.93	<0.01	1.14	Large
Maintenance	-0.57	0.63	-5.41	<0.01	1.02	Large
PSEQ	-6.05	8.98	-3.99	<0.01	0.63	Medium

SD: standard deviation; PCS: Pain Catastrophizing Scale; PPIQ: Pelvic Pain Impact Questionnaire; PSEQ: Pain Self-Efficacy Questionnaire. TSK: Tampa Scale of Kinesiophobia;

Pre-contemplation, Contemplation, Action, Maintenance = subscores from the Pain Stages of Change Questionnaire.

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