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Experiences of Veteran and Civilian Patients in Exploratory Yoga Sessions for Chronic Pain: A Qualitative Study

Amy Huang [a], Jennifer Anthonypillai [b], and Eleni G. Hapidou [b,c]

[a]Department of Medicine, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada; [b]Michael G. DeGroote Pain Clinic, Hamilton Health Sciences, Hamilton, Ontario, Canada; [c]Department of Psychiatry and Behavioural Neurosciences, McMaster University, Hamilton, Ontario, Canada

ABSTRACT

Background: Yoga integrates all aspects of self, with biological, mental, intellectual, and spiritual elements. The practice of yoga aligns with the biopsychosocial model of health and, as such, it can be instrumental in pain treatment.

Aims: The purpose of this qualitative study was to explore perceptions regarding the yoga sessions for chronic pain through thematic content analysis with comparison of gender, veteran or civilian status, and delivery methods.

Methods: Patients with chronic pain attended a 5-week intensive interdisciplinary chronic pain management program at the Michael G. DeGroote Pain Clinic. Participants were asked to complete six open-ended questions following four weekly 1-h yoga classes, through in-person or virtual delivery. Survey responses were thematically and separately analyzed by reviewers.

Results: Forty-one (N = 41) participants (56% males, 71% veterans) with an average age of 50.87 (SD 10.10) years provided comments. Nine themes emerged: (1) mind and body are one through yoga practices; (2) meaningful practice of yoga basics is productive for range of motion/movement, tension in joints, and chronic pain; (3) yoga classes provide an enjoyable process of learning; (4) yoga reminds patients of their physical capabilities; (5) routine practices lead to improvements; (6) yoga improved on strategies for chronic pain; (7) yoga can be adapted for each patient; (8) mindset improves to include positive thinking, better focus, and willingness to try new things; and (9) improvements exist for the current yoga programming.

Conclusion: Findings of the current study were nine qualitative themes that present the experience of patients with chronic pain in the yoga sessions.

RÉSUMÉ

Contexte: Le yoga intègre tous les aspects de la personne et comporte des éléments biologiques, mentaux, intellectuels et spirituels. La pratique du yoga s'aligne sur le modèle biopsychosocial de santé et, à ce titre, elle peut jouer un rôle déterminant dans le traitement de la douleur.

Objectifs: Le but de cette étude qualitative était d'explorer les perceptions concernant les séances de yoga pour la douleur chronique grâce à une analyse thématique du contenu avec comparaison entre les sexes, entre le statut de civil ou celui d'ancien combattant, et entre les modes de prestation.

Méthodes: Les patients souffrant de douleur chronique ont suivi un programme interdisciplinaire intensif de prise en charge de la douleur chronique d'une durée de cinq semaines à la Clinique de la douleur Michael G. DeGroote. Les participants ont été invités à répondre à six questions ouvertes à la suite de quatre cours de yoga hebdomadaires d'une heure, en personne ou virtuellement. Les réponses à l'enquête ont été analysées de manière thématique et séparée par les évaluateurs.

Résultats: Quarante et un (N = 41) participants (56 % d'hommes, 71 % d'anciens combattants), dont l'âge moyen était de 50,87 ans (ET 10.10) ans, ont fourni des commentaires. Neuf thèmes ont émergé : (1) l'esprit et le corps ne font qu'un grâce à la pratique du yoga; (2) la pratique significative des bases du yoga est productive pour l'amplitude des mouvements, la tension dans les articulations et la douleur chronique; (3) les cours de yoga offrent un processus d'apprentissage agréable ; (4) le yoga rappelle aux patients leurs capacités physiques ; (5) la pratique routinière conduit à des améliorations; (6) le yoga a amélioré les stratégies face à la douleur chronique; (7) le yoga peut être adapté à chaque patient; (8) l'état d'esprit s'améliore et inclut la pensée positive, une meilleure concentration et la volonté d'essayer de nouvelles choses; et (9) le programme de yoga actuel peut être amélioré.

Conclusion: Le résultat de la présente étude était la recension de neuf thèmes qualitatifs présentant l'expérience des patients souffrant de douleur chronique lors des séances de yoga.

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CONTACT Amy Huang huangt44@mcmaster.ca Department of Medicine, Faculty of Health Sciences, McMaster University, 1280 Main St W, Hamilton, ON L8S 4L8, Canada

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Introduction

Across Canada, chronic pain is a pertinent health concern. At the national level, chronic pain is estimated to affect 21.0% of individuals.[1] Pain is defined by the International Association for the Study of Pain as "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage."[2] Chronic pain is persistent or recurrent pain lasting longer than three months.[3–5] Chronic pain is more prevalent in the Canadian military veteran population in comparison to the general population.[6] In a recent sample study of 2754 veterans, 41.0% reported chronic pain.[6] In addition, the COVID-19 pandemic exaggerated existing symptoms in veterans and civilians with chronic pain.[7] In a survey of 152 Canadian Armed Forces veterans and non-veterans, 67.1% of respondents reported worsened pain since the pandemic began and 44.7% experienced moderate to severe psychological distress.[7]

Through the biopsychosocial model of health, chronic pain is regarded as resulting from dynamic interactions among biological, psychological, and social factors reducing quality of life.[8–10] A key yoga teacher, Swami Satyananda, described yoga "as the science of right living, and as such, is intended to be incorporated in daily life. It works on all aspects of the person: the physical, vital, mental, emotional, psychic and spiritual."[11] The multifaceted aspects of yoga could be applied to address chronic pain through the biopsychosocial model.[12,13] Patanjali, an ancient Indian sage, formulated the practice of Ashtanga ("eight limbs") yoga and passed down the practice through generations of oral yoga teachings.[14] In chronological order, the practices are as follows: Yama (moral disciplines), Niyama (positive duties), Asana (yoga postures), Pranayama (breath and prana expansion), Pratyahara (sensory withdrawal), Dharana (concentration), Dhyana (meditation), and Samadhi (achieving peace).[14] Yoga focuses on mental and physical health, allowing for the integration of mind and body.[12,13] Yoga postures and breathing techniques harmonize the physiological system and initiate a "relaxation response" in the neuro-endocrine system.[12] A perspective review reported that the relaxation response includes quieter breathing, stable blood pressure, reduced muscle tension, lower heart rate, and slow brain wave pattern.[13]

Yoga provides an opportunity for patients with chronic pain to stretch muscles and release tension, as well as to focus on mindfulness, acceptance, and positive thinking.[13] A pre- and posttest research study reported that an 8-week yoga intervention, attended twice weekly, was associated with improvements in pain, psychological functioning, mindfulness, and changes in cortisol levels in 22 female participants with fibromyalgia.[15] A randomized controlled trial conducted in Germany with 38 participants reported that a 9-week yoga program with weekly 90-min sessions resulted in statistically significant decreases in pain at rest and in motion.[16] In qualitative literature, a study of six participants with chronic pain undergoing eight weekly sessions of Hatha yoga and at-home practice reported renewed awareness of the body, transformed relationship with the body in pain, and acceptance as major themes.[17] Despite these aforementioned findings in the field of chronic pain and yoga, there remain opportunities to further improve research on yoga. Yoga has been perceived by males as a feminine and female-dominated activity, with male participants less inclined to participate in the practice.[18] A qualitative study on the veteran perspective of yoga for general health revealed the need for further research focusing on yoga and its efficacy treating specific conditions of the veteran population.[19] Lastly, there is paucity of research exploring the facilitators and barriers to virtual yoga delivery for patients with chronic pain.[20]

The objective of the present study was to explore participant perceptions regarding the yoga programming for chronic pain, through thematic content analysis with comparison of gender, veteran or civilian status, and delivery methods. The authors hypothesized that there would be few differences in perceptions between male and female participants, as well as between veterans and civilians. The authors hypothesized that there would be a greater appreciation of yoga through in-person delivery, rather than through virtual delivery (Zoom software).

Methods

Trial Overview

This study was conducted at Hamilton Health Sciences through the Intensive Interdisciplinary Chronic Pain Management Program (see Supplementary File 1 for Program description) offered at the Michael G. DeGroote Pain Clinic. The study received ethical approval from the Hamilton Integrated Research Ethics Board on August 13, 2021 (Project # 11166), through an amendment approval (see Supplementary File 2). The Hamilton Integrated Research Ethics Board reviews and approves research projects that meet acceptable ethical and scientific standards and for which adequate facilities and resources are available. The data were collected between August 2021 and August 2022. Participants answered a six-question open-ended survey about their experiences in the yoga classes upon discharge from the program. An inductive, qualitative, phenomenological approach with thematic analysis was used as the study design.[21]

Participant Sample

Participants were adults who reported pain symptoms for longer than 3 months, indicating chronic pain. Participants reported a history of being involved in a motor vehicle accident or workplace/service-related injuries prior to the start of their pain. Participants had pain of heterogeneous origin; they were not divided in terms of pain location or specific medical diagnosis. However, specific pain locations included head, neck, back, and overall body. Diagnoses included headache, back pain, fibromyalgia, neuropathic pain, and musculoskeletal pain. Program participants expressed willingness to work toward adopting an active rehabilitation approach to managing pain through goal setting, daily exercise, and discussion of the influence of psychological factors such as emotions and stress on pain. Inclusion criteria for the interdisciplinary program included (1) a diagnosis of chronic pain, (2) the ability to commit to a 5-week intensive interdisciplinary chronic pain management program, and (3) approval of the referring agency. Exclusion criteria for the program were (1) progressive disease diagnosis, (2) active psychosis, or (3) seeking a cure for chronic pain. Individuals admitted to the program participated in all aspects of the program schedule including the weekly yoga sessions. Inclusion criteria for this yoga study were attending the intensive interdisciplinary chronic pain management program of the Michael G. DeGroote Pain Clinic between August 2021 and August 2022 for chronic pain management and answering the survey of six questions about their yoga programming experiences at discharge. There were no exclusion criteria for the yoga sessions. Table 1 presents participant demographic characteristics.

Procedures

Participants provided informed consent at the beginning of the program to include their data for research purposes. Informed consent was digitally obtained through REDCap, hosted on McMaster University servers, for participation in research.[22,23] No staff member was involved in this process. The e-mail address and phone number of the research coordinator were shared with participants for any questions that arose during the research study. During the assessment process, each potential participant expressed their preference for either the in-person or virtual program. These preferences were taken into account when the participant was scheduled to attend the program. The Yoga Questionnaire was administered as part of the intensive interdisciplinary chronic pain management program evaluation package, which is sent 5 days before the end of the program. Following the initial e-mail, participants were sent three subsequent automatic e-mail reminders from REDCap. The participant survey responses were

Table 1. Participant demographic characteristics ($N = 41$).

Demographics	*n* (%) or mean (SD)
Sex	
Male	23 (56%)
Female	18 (44%)
Age, years	50.87 (10.10)
Employment status	
Employed	6 (15%)
Unemployed	35 (85%)
Patient referral status	
Veteran	29 (71%)
Civilian	12 (29%)
Place of birth	
Canada	37 (90%)
Other	4 (10%)
Education, years	14.85 (3.00)
Pain duration, years	16.95 (12.20)
Marital status	
Married, common law	27 (66%)
Not married, separated, divorced	14 (34%)
No. of children	1.97 (1.33)
No. of injuries related to work or service	3.40 (3.07)
No. of injuries for other reasons (e.g., car accident)	1.05 (1.18)
Health care utilization since pain problem began	
No. of visits to family physician	9.47 (5.14)
Participants who indicated “a lot, countless” or >20	23 (56%)
Specialist utilization	
No. of specialists visited	5.94 (4.36)
Participants who indicated “a lot, countless”	4 (10%)
Visits to the emergency room	
No. of emergency room visits	2.17 (3.76)
Participants who indicated “a lot, countless” or >20	6 (15%)

obtained between August 2021 and August 2022. Data were managed and deidentified using REDCap.

Intensive Interdisciplinary Chronic Pain Management Program

The intensive interdisciplinary chronic pain management program of the Michael G. DeGroote Pain Clinic is a 5-week program, with the yoga sessions introduced in the second week. In the program, five to six patients participate in education, fitness, and mindfulness classes such as yoga, Tai Chi, relaxation practice, occupational therapy, psychotherapy, and social work over the 5 weeks.[24] Patients also set personal goals in productivity, work, physical fitness, social reintegration, recreation, nutrition, and family.[24]

Yoga Programming

Yoga consisted of weekly 1-h sessions completed over 4 weeks. The Hatha yoga comprised poses and movements known as Pawanmuktasana (anti-rheumatic group) as described in the textbook by Swami Satyananda Saraswati, *Asana, Pranayama, Mudra, Bandha*.[11] The yoga sessions were delivered through in-person and online Zoom methods (due to COVID-19 restrictions on in-person activities and participant preference). All aspects of yoga were identical in both streams except the method of delivery. Lights were dimmed in both streams without visibility being affected. Each yoga session began with a brief body scan and diaphragmatic breathing for approximately 5 min and then progressed to the sequential set of poses (see Supplementary File 3) for 30 to 35 min. Mindful breathing was incorporated with each pose. The session concluded with Yoga Nidra,[25] a guided deep relaxation with visualization, for approximately 20 min.

Participants were encouraged to modify their sitting postures for comfort by either sitting in the base pose on the floor, on a sofa, or in a chair. Poses were repeated progressively from the first to fourth weeks by increasing repetitions from poses: 3 to 5 and 7 to 10 according to each participant's comfort level. Each participant was provided with a physical handout and video on the Michael G. DeGroote Pain Clinic Patient Resources website, under the subheading Yoga for Pain.[26] Participants were instructed to use these materials for additional home practice.[26] During the sessions, no hands-on adjustments were provided but instructions were given in both streams regarding modifications. For example, using the "nonpainful" part of the body first in doing the movements or poses and then involving the "painful" part at less capacity.

The yoga teacher was trained in the Sivananda and Satyananda lineage and has been a practicing clinician for over 30 years. Another yoga teacher, of a different lineage, provided occasional coverage by conducting no more than two out of the four sessions and practiced the same sequence as described above. The former provided input to the research team and maintained neutrality in research processes through refraining from content analysis.

Measures

Qualitative and quantitative data were collected from all participants using the online REDCap software. Participants received the questionnaires through e-mail, sent by the research coordinator (see Supplementary File 4 for the Yoga Questionnaire).

Qualitative data included participants' written answers to the following six questions adapted from a study led by Schmid et al.[27]

(1) What did you like most about the yoga classes and why?
(2) What did you like least about the yoga classes and why?
(3) Name one change in attitude or beliefs that occurred since beginning the yoga classes.
(4) Name a change in a behavior that occurred since beginning the yoga classes.
(5) Which new skills did you learn that will likely be used after the end of the yoga classes?
(6) Share any suggestions for future yoga programming.

Quantitative demographic measures included sex, age, employment status, referral status, place of birth, years of education, pain duration in months, marital status, number of children, number of injuries, and health care utilization. Data were not collected on additional home yoga practice.

Qualitative Analysis

Qualitative methodology was followed.[21] Content analysis occurred through an iterative process of data immersion, identification of initial codes, clustering codes into categories, and and clustering categories into themes.[28] The goal of analysis was to reach data saturation, where no further analysis is necessary because all possible themes are extracted from participant comments.[29] Data saturation was achieved through identification of new codes or themes by the number of participants commenting, using the theoretical model known as inductive thematic saturation.[29] Comments

were first reviewed and organized into themes by the first two authors using Microsoft Excel. Both authors then met to discuss the comments and themes to arrive at a consensus to ensure interrater agreement. Through the process of data anonymization, individual analysis, and group corroboration, the authors ensured quality and integrity of data analysis.

Ethical Considerations

Participants were made aware that one of their yoga teachers was a clinician of the pain clinic and that this dual relationship would not affect their experience in the intensive interdisciplinary chronic pain management program. Participants were made aware that yoga should be completed in a safe environment with an appropriate warm-up to prevent distraction and potential injury, especially for those living with chronic pain.

Results

Summary of Participants and Yoga Programming Completion

Participants in this study included 29 veterans and 12 civilians. In the veteran group, there were more men (n = 21) than women (n = 8), whereas in the civilian group, there were more women (n = 10) than men (n = 2). Program delivery was through virtual sessions (N = 21) or in-person sessions (N = 20). In the virtual group, there were more women (n = 13) than men (n = 8), whereas in the in-person group, there were more men (n = 15), than women (n = 5). Please see Table 2 for a visual representation of the distributions.

All participants attended each session (four classes, one in each of the 4 weeks) and completed the program, with no dropouts. Study completion was defined by full attendance (four out of four classes). Class size for the intensive interdisciplinary chronic pain management program is five to six individuals for each 5-week session. Table 3 presents the themes by number of comments divided by gender, veteran status, and mode of delivery.

Comparison of Gender, Civilian/Veteran Status, and Mode of Delivery

Yoga and Gender

Twenty-three male and 18 female participants attended the yoga sessions. In thematic analysis, there was no notable difference between genders and the comments provided. All themes were shared by both male and female participants (see Table 3). In addition, the number of comments was distributed proportionately in both genders across all themes.

Veteran and Civilian Commonalities

The study included 29 veteran and 12 civilian participants. All themes were shared by both civilian and veteran participant groups. Because the sample population consisted of more veteran participants than civilians, the veteran comments encompassed some themes in more detail. The themes expressed

Table 2. Visual representation of veteran/civilian, gender, virtual/in-person distribution (N = 41).

Virtual (n = 21)				In-person (n = 20)			
Veteran (n = 14)		Civilian (n = 7)		Veteran (n = 15)		Civilian (n = 5)	
M (n = 7)	F (n = 7)	M (n = 1)	F (n = 6)	M (n = 14)	F (n = 1)	M (n = 1)	F (n = 4)

Table 3. Themes by number of participant comments (N = 41).

Theme	No. of total comments	No. of comments by gender (male:female)	No. of comments by veteran status (veteran: civilian)	No. of comments by mode of delivery (in-person:virtual)
(1) Mind and body are one through yoga practices	31	(19:12)	(25:6)	(17:14)
(2) Meaningful practice of yoga basics is productive for range	13	(6:7)	(10:3)	(8:5)
of motion/movement, tension in joints, and chronic pain	4	(3:1)	(3:1)	(3:1)
	12	(7:5)	(8:4)	(7:5)
(3) Yoga classes provide an enjoyable process of learning	16	(9:7)	(11:5)	(11:5)
(4) Yoga reminds patients of their physical capabilities	12	(6:6)	(7:5)	(5:7)
(5) Routine practices lead to improvements	9	(4:5)	(4:5)	(3:6)
(6) Yoga improved upon strategies for chronic pain	9	(5:4)	(6:3)	(5:4)
(7) Yoga can be adapted for each patient	9	(4:5)	(6:3)	(5:4)
(8) Mindset improves to include positive thinking, better	6	(3:3)	(5:1)	(4:2)
focus, and willingness to try new things	5	(4:1)	(4:1)	(3:2)
	8	(5:3)	(7:1)	(4:4)
(9) Improvements exist for the current yoga programming	12	(5:7)	(11:1)	(10:2)

disproportionately among veteran participants were mind and body are one through yoga practices; meaningful practice of yoga basics is productive for range of motion/movement, tension in joints, and chronic pain; yoga classes provide an enjoyable process of learning, mindset improves to include positive thinking, better focus, and willingness to try new things; and improvements exist for the current yoga programming. This was made evident by the breakdown of each theme and comments between veteran and civilian groups in Table 3. However, the civilian comments did touch on each expressed theme, though there were fewer comments.

Mode of Delivery and Themes

Twenty-one participants attended the yoga sessions virtually through Zoom software, and the other 20 participants attended yoga sessions in person. All nine main qualitative themes were shared by both in-person and virtual groups. Some themes were expressed more frequently (see Table 3) by in-person participants, such as meaningful practice of yoga basics is productive for range of motion/movement, tension in joints, and chronic pain; yoga classes provide an enjoyable process of learning; and improvements exist for the current yoga programming.

The results of the content analysis are provided below, and key quotes, edited slightly for spelling and clarity, illustrate the themes.

Results of the Qualitative Analysis

Mind and Body Are One through Yoga Practices

The most frequently mentioned theme was the connection of mind and body through yoga. A 54-year-old male veteran (in-person sessions) wrote, "Mind and body are one." A 53-year-old female veteran (virtual sessions) wrote, "I found the breathing/relaxation part to be the best part. At some points I almost felt as though I was floating above my chair. I found it easy to give myself to the practice and to totally let go. The [teacher's] voice is very relaxing to listen to and it was easy to follow her direction." Participants enjoyed the combination of exercise and breathing, as well as active mindful breathing in their daily lives. A 53-year-old female veteran (virtual sessions) wrote, "The breathing while doing the body scan was a great new skill. I found that scanning each body part while breathing in and out almost always removed the nerve pain burning that runs down into my arms." In conclusion, participants reported a heightened sense of connection between their minds and bodies, with associated benefits.

Meaningful Practice of Yoga Basics is Productive for Range of Motion/Movement, Tension in Joints, and Chronic Pain

The meaningful practice of yoga basics was reported to be productive by participants. A 45-year-old male veteran (in-person sessions) wrote, "Not everything had to be too physical; it can be more meaningful with basics." On flare days, participants noted the importance of yoga practice. A 48-year-old female civilian (in-person sessions) wrote, "Keep the practice simple on flare days; a little practice is better than none." Yoga was reported to improve participants' range of motion and joint flexibility. Thirteen participants noted the impact of yoga on range of motion or movement, and four participants noted impacts in joint tension. A 61-year-old male veteran (virtual sessions) wrote, "Half butterfly helps loosen up hips." A 58-year-old female veteran (in-person sessions) wrote, "The stretching. It felt better than I thought and loosened my body up so I can do more." A 54-year-old male veteran (in-person sessions) wrote, "I enjoyed the instruction as well as the different ways that movement increases mobility and the importance behind the reasons why movement is so important." Twelve participants noted the further impact of yoga on their chronic pain. A 63-year-old male veteran (virtual sessions) wrote, "The focusing and my joints are quite stiff, and I found the yoga improved my range of motion and pain levels." A 57-year-old female civilian (virtual sessions) wrote, "I liked the passive use of movement and how it can alleviate pain." In conclusion, participants reported simple yoga movements to improve their range of motion, tension in joints, and chronic pain.

Yoga Classes Provide an Enjoyable Process of Learning

Participants reported on the learning process of the yoga sessions. A 54-year-old male veteran (in-person sessions) wrote, "I enjoyed the instruction." A 48-year-old female civilian (in-person sessions) wrote, "The practice of yoga and breathing techniques is gentle/do-able." Participants were given a handout to help with home practice. A 40-year-old female veteran (virtual sessions) wrote, "I am glad to have the exercises in my binder as well as that takes the strain off with having to remember them all and I can practice them whenever I want and need to." A 58-year-old female veteran (in-person sessions) summarized the yoga classes as, "I can do this!!" In conclusion, participants enjoyed the learning experiences offered by the yoga classes.

Yoga Reminds Patients of Their Physical Capabilities

Participants noted that yoga reminded them of their previous physical capabilities. A 40-year-old female veteran (virtual sessions) wrote, "One thing I was reminded of with yoga is that I am still capable of movement that I otherwise thought I was not able to perform. For example, putting my foot onto my thigh has been a figment of my imagination until we worked up to the position and I actually did it. And it didn't hurt as I expected and left me feeling looser and more flexible afterwards. So grateful for that." A 36-year-old female civilian (in-person sessions) wrote, "Yoga is still doable for me!" To summarize, feedback from participants indicated that yoga served as a reminder of their physical abilities.

Routine Practices Lead to Improvements

Participants noted the importance of routine practice for their physical and mental health. A 40-year-old female veteran (virtual sessions) wrote, "Learning how important it is to move the fluid within the joints has been vital to my mood since learning it. I start all of my days with yoga and it has been a true benefit to my mood stability." A 61-year-old male veteran (in-person sessions) wrote, "Relaxing is good … morning, afternoon, and daily efforts in relaxing mind body spirit is a must." The importance of routine practice was emphasized. A 57-year-old female civilian (virtual sessions) wrote, "The moves can be done more often in everyday life since they are subtle and minimal moves" and "Smaller movements can also be effective." Overall, participants reported on the importance of continuous practice in improving their mental health and chronic pain symptoms.

Yoga Improved upon Strategies for Chronic Pain

Participants enjoyed yoga as an extension of other pain coping strategies. A 40-year-old female veteran (virtual sessions) wrote, "I loved that it was an extension of a lot of other coping strategies we have learned and therefore was like practicing multiple strategies at once." She continued with, "[Yoga] allowed me to accomplish more in a day with pacing than I have been for years." A 53-year-old female veteran (virtual sessions) wrote, "I always thought yoga had to be done with so many strenuous movements. I tended to shy away from this form of pain management, but I now realize that it can be adjusted. It's another coping exercise that I can add to my routine." Acceptance was briefly commented on by one participant: a 57-year-old male civilian (virtual sessions) wrote, "Breathing, relaxing and learning to try and let go or reduce my pain as best I can." In conclusion, participants reported that the practice of yoga may become a part of their overall pain management.

Yoga Can Be Adapted for Each Patient

Participants reported that techniques of yoga were adaptable to their lifestyles and chronic pain. A 40-year-old female civilian (in-person sessions) wrote, "It was great in the way that they modified the yoga classes so that it doesn't hurt to do." In addition, the adaptability of yoga extended to its flexibility as a practice itself, allowing participants to practice in the place and time of their choosing. A 57-year-old female civilian (virtual sessions) wrote, "The moves can be done more often in everyday life." A 40-year-old female veteran (virtual sessions) wrote, "I loved the fact that it [yoga] was modified to suit me and allow me to practice it. . . . Plus, a lot of the movements I can do anywhere as needed. Love that." In summary, participants enjoyed the adaptability of the yoga sessions and yoga as a practice itself.

Mindset Improves to Include Positive Thinking, Better Focus, and Willingness to Try New Things

Participants reported changes in their mindset, with increased positive thinking, better focus, and a willingness to try new things. Six participants changed their mindset; that is, they saw situations more positively. A 54-year-old male veteran (in-person sessions) wrote, "Positivity towards overall mind and body through movement even if pain is present." A 57-year-old male civilian (virtual sessions) wrote, "I haven't been thinking as much about the negative and trying to be more positive." Five participants noted the usefulness of yoga in focusing the mind. A 59-year-old male veteran (in-person sessions) wrote, "Yoga is good to refocus your mind." A 57-year-old male civilian (virtual sessions) wrote, "I've been able to focus somewhat better on what's important to me." Eight participants commented on yoga motivating them to try new things. A 40-year-old female civilian (in-person sessions) wrote, "Willingness to try different exercises." A 29-year-old female veteran (virtual sessions) wrote, "I am more open to yoga and actively searching out different poses that may be better suited for me." Overall, participants noted positive changes in their mindsets, including positive thinking, better focus, and a willingness to try new things.

Improvements Exist for the Current Yoga Programming

Participants suggested improvements for the yoga programming. A 52-year-old male veteran (in-person

sessions) wrote, "Find a way to force the reading or watching of videos well prior to the beginning of the program to ease the mind that not all yoga is twisting yourself into a pretzel." A 29-year-old female veteran (virtual sessions) wrote, "... modifications for those students wanting to increase activity rather than just options of decreasing." A 51-year-old female civilian (in-person sessions) wrote, "Accommodate people who can't sit too long." A 52-year-old male veteran (in-person sessions) wrote, "The class setup and the hallway noise probably weren't the best, but considering COVID it was as good as it could be." In conclusion, the participants reported possible improvements for the current yoga sessions, such as encouraging participants to review preparatory materials, implementing modifications for increased activity, accommodations for increased movement, and a quieter class setup.

Discussion

The stated objective of this study to explore participant perceptions regarding yoga for chronic pain was achieved, and nine key themes emerged. These themes were synthesized through participants' responses to the questionnaire and were analyzed on the basis of participant gender, veteran or civilian status, and yoga delivery mode. To the authors' knowledge, this study is the first qualitative analysis of yoga programming for chronic pain through virtual and in-person settings in Canadian veteran and civilian populations. These data can inform holistic approaches to chronic pain management in interdisciplinary pain management programs and provide patients with a nonpharmacological strategy to address pain.

Yoga as a Health Intervention

In this study, 31 participants emphasized the integration of mind and body in yoga practices as a key aspect of their experience. Participants enjoyed active breathing with the movement of the postures, with a subset of participants noticing an onset of relaxation. A randomized within-subjects crossover study reported that 15 min of yoga postures can promote a relaxation response, consisting of reduced perceived stress and reduced respiratory rate.[30] These underlying physiological relaxation mechanisms of yoga can impact the participant's experience of pain. A randomized controlled trial investigating the effect of the breathing relaxation technique reported a significant reduction in pain intensity in patients with chronic lower back pain.[31] Another randomized controlled trial reported that relaxation response initiated by autogenic training and cognitive restructuring significantly reduced pain intensity, worst pain, and pain distraction in patients with chronic pain.[32] In summary, participant comments included increased feelings of relaxation and decreased pain, which is congruent with randomized controlled trials in the field of pain medicine.

In the present study, qualitative findings showed that yoga had positive impacts on tension in the joints (4 participants), range of motion/movement (13 participants), and chronic pain (12 participants) and improved upon strategies for chronic pain (9 participants). A perspective review indicated that yoga provides the opportunity for patients with chronic pain to address their concerns via holistic treatment.[13] Intervention studies reported reductions in pain outcomes, functional disability, pain medication usage, depression, and fatigue in yoga group participants.[15,16,33,34] Research in the field corroborated our findings that yoga programming is valuable in creating positive outcomes in persons living with chronic pain. Of note, 9 participants reported the importance of routine yoga practice in their health improvements. A pilot study in patients with metastatic breast cancer showed that the duration of daily practice was related to same-day improvements in pain, as well as next-day improvements in pain, fatigue, invigoration, acceptance, and relaxation.[35] In conclusion, participants in the present study reported that being involved in yoga resulted in improvements in tension in the joints, range of motion/movement, chronic pain, and strategies for chronic pain, and this is consistent with results from other research trials.

Yoga and Veterans

Health interventions for veterans with chronic pain should take into consideration lived experiences. Veterans' familiarity with military conditioning may enable them to feel in control of the uncontrollable pain experiences and employ practical, pragmatic approaches to managing pain.[36] In the yoga sessions, lived experiences were taken into consideration as instructors provided resources to all participants, including veterans, to allow them to take an active role in their management of pain. Based on the participants' responses and comments during the yoga classes, they were shown, given, or sent additional information/handouts on yoga poses, according to their expressed needs, areas of pain, and physical limitations to facilitate learning and practice outside of the programming. Participants were encouraged to add yoga to their strategies for coping with pain and to have a personalized approach to pain management. The present study found

that yoga had a positive effect on the management of chronic pain in a sample of majority veterans. This conclusion is supported by a 4-year pilot yoga study in veterans with chronic pain, which found significant reductions in kinesiophobia (fear of movement or physical activity).[37] Qualitative military research supports the use of yoga in relieving tension in the muscles and improving pain levels.[19] In conclusion, this study adds to the field of veteran research in chronic pain and provides qualitative perspectives on yoga from Canadian veterans.

Delivery of Yoga Intervention

Contrary to the hypothesis that there would be a greater appreciation of yoga through in-person delivery, rather than through the Zoom software, results showed no difference in thematic content expressed between participants using each delivery method. However, some themes were expressed in greater volume through the in-person participant group, but the virtual group did touch on these themes as well. A recent pilot randomized controlled trial investigating the impact of 8 weeks of yoga education through virtual or face-to-face delivery reported no statistically significant differences in mean change scores in chronic chemotherapy-induced peripheral neuropathy pain between delivery methods.[33] A cross-sectional online survey of 156 Australian participants reported virtual delivery of yoga to be affordable, convenient, and beneficial to mood.[38] These studies support the use of virtual yoga programming in delivering health care. In conclusion, based on the expression of all themes in both in-person and virtual yoga groups and current research in the field, the authors would like to present virtual yoga programming as a viable option in pain management.

Yoga and Gender

Findings of the current study revealed a similar experience of yoga between male and female participants. In contrast to the current study, a quantitative pre and post yoga research study on within-group cohorts reported that female veterans had significantly larger reductions in depression and pain on average than male veterans.[39] A qualitative descriptive study examined male participants' perceptions of yoga and identified a male perception of yoga as a feminine practice.[40] A quantitative nonrandomized controlled trial found improvements in depression, anxiety, and stress in an all-male veteran population after a yoga intervention, findings that support the present study results as reported by male participants.[41] The previous three studies reveal inconsistent results in the literature regarding the influence of gender on the observed impacts of yoga on chronic pain. This qualitative exploration of yoga in a majority male study sample represents a shift in the perception of yoga as a female-dominated exercise to a therapeutic practice for all. In conclusion, the current study revealed the need for further research into the implementation of yoga programming in the management of chronic pain for both male and female populations. Future studies could also explore the experiences of trans-identifying and non-binary persons to further enrich the literature on gender and yoga.

Strengths

One strength of the current study is its gender distribution: 23 male and 18 female participants. Yoga is often investigated through majority female samples,[42] limiting the applicability of findings to the chronic pain population as a whole. Our study population of male and female participants provided the opportunity for the study of qualitative experiences of both sexes. Another strength is that yoga, as part of the intensive interdisciplinary chronic pain management program of the Michael G. DeGroote Pain Clinic, had a 100% completion rate. Because all participants completed the programming, we can conclude that the present study had no attrition bias. In summary, strengths of the current study include the gender distribution of the participants and the total yoga completion rate.

Limitations

A limitation of this study was the integration of yoga sessions into the intensive interdisciplinary chronic pain management program. The program was integral to the organization of the yoga sessions and recruiting participants for our study. Although participants were instructed to comment solely on the yoga aspect of the program, their yoga experiences may have been impacted by the rest of the chronic pain management program. In the future, ideal research conditions would consist of exploring yoga independently. Another limitation was the lack of data collection for additional home practice of yoga with the provided resources. There may have been variability in the dosing of yoga across participants, which may have affected their experiences in the programming. An additional limitation is the introduction of self-selection bias from participants choosing a virtual or an in-person delivery of the program. Self-selection bias can potentially group together individuals with similar characteristics not represented equally in the other group. This bias could

limit the study's generalizability, because differences in qualitative theme expression might be influenced more by these underlying participant traits than the chosen delivery method of the yoga sessions. Our last perceived limitation would be the short duration of four weekly 1-h yoga sessions. A longer duration of the yoga sessions would allow for study of long-term changes in the participants' chronic pain symptoms and mental and physical health. In conclusion, the integration of yoga into the intensive interdisciplinary chronic pain management program, lack of additional documentation of at-home practice, potential self-selection bias, and short duration of the yoga sessions are limitations of this study.

Future Directions

Findings from this study can inform health care providers on integrating holistic yoga techniques, such as poses, breathing, and mindfulness aspects, into the nonpharmaceutical armamentarium of chronic pain management. Providers could utilize the attached supplemental materials in their practice (see Supplementary File 3). To support the addition of yoga in pain management, policymakers and health care administrators can complement their efforts to promote the best care for patients with chronic pain. Yoga implementation would include hiring instructors, creating a safe and welcoming space for patients to practice yoga, and creating accessible educational resources. In addition, in this study, we included the utilization of Zoom (video communication tool) in yoga delivery. Future research can explore delivery of yoga comparing live-streamed and prerecorded yoga sessions for patients with chronic pain. In conclusion, findings from the current study will be used to inform holistic approaches to pain management and delivery of yoga programming for patients.

Conclusion

This qualitative analysis explored participant perceptions regarding the yoga sessions of the Michael G. DeGroote Pain Clinic in participants with chronic pain through thematic content analysis with comparison of gender, veteran or civilian status, and delivery methods. Participant comments, whether from the male or female groups, conveyed all qualitative themes. In addition, both veterans and civilians learned key pain management strategies through the yoga sessions. Lastly, all nine qualitative themes were expressed by both in-person and virtual groups through the participant comments. Further research of longer duration, with yoga programming separate from interdisciplinary pain management, is necessary to determine the long-term effects of using yoga for chronic pain. To conclude, yoga programming provides an opportunity for persons living with chronic pain to pursue nonpharmaceutical treatments and adds to the armamentarium of options for managing chronic pain.

Disclosure Statement

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ORCID

Amy Huang http://orcid.org/0000-0002-5608-857X
Jennifer Anthonypillai http://orcid.org/0009-0002-7778-5566

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