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The Context of Pain in Arthritis: Self-efficacy for Managing Pain and Other Symptoms

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Abstract

Arthritis pain may be best understood in the context of a biopsychosocial model of pain. The biopsychosocial model of pain suggests that adjustment to arthritis pain is multifaceted and is influenced by biological, psychological, and social factors. One psychological construct that appears to be particularly helpful in understanding arthritis pain is patients' self-efficacy for managing pain and other symptoms. In recent work, investigators have included self-efficacy for managing pain and other symptoms as key outcome measures in behavioral and psychosocial intervention studies. The goal of this article was to review recent intervention studies that have examined the effect of behavioral and psychosocial interventions on self-efficacy for managing pain and other symptoms. Throughout the article, we make several suggestions for future clinical and research considerations regarding the role of self-efficacy for managing pain and other symptoms in the context of arthritis pain.

Keywords

self-efficacy; pain; arthritis; biopsychosocial; intervention; psychosocial; behavior

Introduction

Patients with arthritis often report high levels of pain that can result in increased levels of disability and distress.^{1,2} Patients and health care providers routinely turn to biological markers of disease to understand patients' pain and to determine what treatments will benefit them the most. There is increasing evidence, however, that arthritis pain may be best understood in the context of a biopsychosocial model of pain.³ A biopsychosocial model of pain suggests that adjustment to arthritis pain is influenced by biological, psychological, and social factors. One psychological construct that appears to be particularly helpful in understanding arthritis pain is patients' self-efficacy for managing pain and other symptoms. Arthritis patients' confidence (i.e., self-efficacy) in their ability to control their pain has been related to numerous important outcomes, including pain intensity, pain-related disability, disease severity, and psychological distress.^{4–8} There is increasing interest in self-efficacy for managing pain and other symptoms (e.g., fatigue, anxiety) in behavioral and psychosocial interventions. Most behavioral and psychosocial intervention trials carried out in patients with arthritis pain now investigate changes in self-efficacy for managing pain and other symptoms. The goal of this article is to review recent intervention studies that have examined the effect of behavioral and psychosocial interventions to improve self-efficacy for managing pain and other symptoms in patients with arthritis and make suggestions for future clinical and research applications.

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Self-Efficacy for Managing Arthritis Pain and Other Symptoms

Self-efficacy is a broad concept and refers to an individual's belief that they have the ability to perform a certain behavior to achieve a desired outcome.⁹ Self-efficacy is conceptualized as having a sense of mastery in a specific domain rather than having a global sense of mastery.⁹ That is, while a patient with arthritis may have high levels of confidence in their ability to perform a certain task (e.g., job, relationship role) to achieve a desired outcome, they may have low levels of confidence (i.e., self-efficacy) in their ability to control their arthritis pain. The most widely used assessment tool for self-efficacy in arthritis patients is the Arthritis Self-Efficacy Scale (ASES).⁴ The ASES measures three key domains of self-efficacy related to arthritis, including self-efficacy for pain control, self-efficacy to perform functional tasks, and self-efficacy to control other symptoms (i.e., fatigue, affect, remain activity, enjoy activities). Arthritis patients having higher levels of self-efficacy for pain control report lower levels of pain, pain-related disability, physical disability, and psychological distress.^{6,7,10} Self-efficacy for managing pain and other symptoms may be especially important for individuals coping with chronic arthritis pain because self-efficacy can influence whether patients attempt to manage their disease and whether they persist in their management efforts when faced with challenges.

The chronic nature of arthritis and arthritis pain requires patients to make constant adjustments to learn to live with their disease. Thus, most behavioral and psychosocial intervention protocols aim to help patients enhance their ability for arthritis self-management. Typical behavioral and psychosocial interventions for patients with arthritis pain address a single or combination of behavioral (e.g., exercise, relaxation, activity pacing) and psychosocial (e.g., mood, social interactions) strategies to increase patients' abilities to manage their arthritis pain and symptoms. Interventions are delivered at a medical or community center and can be in a group or individual setting. Protocols vary widely in terms of treatment dosage, ranging from brief interventions (i.e., one session or task) to extended interventions (i.e., several months). Interventions Examining Changes in Self-Efficacy for Managing Pain and Other Symptoms

In recent work, investigators have included self-efficacy for managing pain and other symptoms as key outcome measures in arthritis studies examining: exercise or movement-based interventions, education protocols, pain coping skill interventions, interventions targeting pain as well as health concerns related to arthritis (i.e., weight, surgical intervention), and protocols combining components from each of these modalities.

In a recent study, Callahan et al. (2011) evaluated the short- and longer-term effects of a six-week walking program for adults with arthritis (N = 462).¹¹ Participants in this study were assigned to either a walking program in a group-based, instructor-led format or a self-directed format. The walking program used was Walk With Ease (WWE), which was developed by the Arthritis Foundation. Previous work had shown that WWE, delivered in a group format, led to increased self-efficacy and less pain.¹² The methodology of the current study was unique in that participants were not randomized but rather selected either the group, instructor-led format or the self-directed format. A main goal of this program was to expand delivery options, by giving participants a self-directed program option. Group participants met three times a week and were led by an instructor, while self-directed participants followed the program using a workbook as their guide. A slight majority of participants (58%) opted for the self-directed format.

Immediately following the six-week program, results demonstrated that self-efficacy for managing pain and other symptoms was significantly higher in participants who used the group format. Participants who used the self-directed format did not experience significant

changes in self-efficacy. Significant pre- to post-treatment differences in pain, fatigue, stiffness, and quality of life were reported in both the instructor-led group and the self-directed group. Interestingly, at the one-year follow-up assessment, participants who used the self-directed program showed a significant increase in self-efficacy for managing pain and symptoms, while instructor-led group participants significantly decreased in their levels of self-efficacy for managing pain and symptoms. Self-directed participants also showed a greater decrease in pain and stiffness at one year compared to the group participants. These results suggest that a group format might lead to initial increases in self-efficacy, but these improvements may not be maintained over time. However, self-directed participants demonstrated long-term improvements in their self-efficacy for managing pain and other symptoms, as well as in their levels of pain and stiffness, highlighting a possible unique benefit of the self-guided program. Based on these findings, self-efficacy for managing pain and other symptoms may be most enhanced by exercise intervention protocols that are initially delivered in a group format and then transitioned to a self-directed format. Future work should investigate this possibility. These findings may be particularly clinically relevant for provider as the self-directed WWE program is a feasible, low cost intervention that could be easily implemented with patients in clinical practice.

Another recent study examined the impact of a movement-based intervention protocol on patients with Rheumatoid Arthritis (RA). In this study, Lee et al. (2012) examined whether or not self-efficacy for managing pain and other symptoms changed in RA patients (N=21) who underwent 24 sessions of Tai Chi, either with or without adjuvant auricular acupressure.¹³ Tai Chi is a mind-body practice that consists of slow, purposeful movements that involve turning, shifting one's weight, and bending. Tai Chi aims to improve balance, strength, and flexibility.¹⁴

Results showed that RA patients who participated in the Tai Chi sessions had increased levels of self-efficacy for managing pain and other symptoms, as well as decreased joint pain, swollen and tender joint count, fatigue, strength, physical function, and mood. This work suggests that improvements in self-efficacy for managing pain and other symptoms, as well as other biopsychosocial outcome measures, may improve in concordance. This type of movement-based exercise program is increasingly being offered in community settings. Additionally, video-based programs of movement-based exercise programs are widely available through DVD and online at little or no cost. This empirical evidence combined with the accessible programs suggest that this is an intervention modality that may be easily disseminated to arthritis patients in clinical settings.

Self-efficacy for managing pain and other symptoms may act as a mediator of treatment effects. While this is an interesting question, it has not been well-explored in arthritis behavioral and psychosocial intervention research. One limitation of the Lee et al.¹³ study is that the only assessment conducted was immediately following the end of the intervention, so it is not known if increases in self-efficacy for managing pain and other symptoms were sustained over time. This work highlights two important directions for future research. First, investigators should consider using statistical tests of formal mediation to better understand whether or not self-efficacy for managing pain and other symptoms is a mechanism of change in behavioral and psychosocial interventions that aim to decrease arthritis pain and disability. Second, it will be important to understand if gains in self-efficacy seen from this type of intervention are sustained or improved over time. Based on the results of Callahan et al.¹¹, future work should specifically investigate whether or not self-efficacy improvements endure when physical activity interventions are applied in a group setting.

Increasing numbers of patients with osteoarthritis (OA) are undergoing joint replacement surgeries to increase their mobility and decrease their pain.¹⁵⁻¹⁷ Investigators have been

interested in how interventions applied prior to surgery may enhance patients' self-efficacy for managing pain and other symptoms and improve overall outcomes. A recent study explored this interesting question in a sample of OA patients prior to total knee arthroplasty (TKA). McKay et al. examined the effect of a six-week prehabilitation exercise training program for OA patients undergoing total knee arthroplasty (N=22).¹⁸ Patients in this trial were randomized to receive either the active training program of an aerobic warm-up followed by a circuit of bilateral lower body strength building exercises, or a placebo training program of the same aerobic warm-up and upper-body strength circuit exercises. Follow-up assessments occurred immediately following the study intervention, prior to TKA, six-weeks following TKA, and 12-weeks following TKA. Self-efficacy for pain, function, and other symptoms significantly improved over time in both groups, but it was not significantly different between groups at post-treatment or following surgery. Likewise, there were significant time effects for strength, mobility, pain, function, and physical health related-quality of life, but there were no differences in these outcomes between groups.

The participants in this study improved on several important outcomes measures, including self-efficacy for pain, function, and symptom management, but no differences between treatment groups were evident. It is possible that simply having the patients do aerobic warm-ups and strength training led to important increases in patients' self-efficacy, and that increased self-efficacy mediated the other important changes in these patients (i.e., strength, mobility, pain, function, physical health related-quality of life). It is also possible that TKA itself was the event that led to positive changes overtime. The lack of statistically significant group differences may also be due to a small sample size, advanced disease status of patients undergoing TKA, or the focus of the intervention on exercise alone (vs. education or coping skills). This is an interesting area of work, and as the rates of joint replacement surgeries continue to increase, the impact of self-efficacy for managing pain and other symptoms in this population should be further explored.

While several studies focus on intervention protocols that are solely exercise-based, many studies also examine interventions that include: arthritis education, arthritis pain coping skills to decrease pain and other symptoms, and skills to manage health concerns related to arthritis (e.g., obesity). Gronning et al. examined the effect of an arthritis educational program on patients diagnosed either with RA, psoriatic arthritis, or unspecified polyarthritis.¹⁹ Participants (N=141) in this study were randomized to the educational program (i.e., three group sessions and one individual session) or a standard of care control group. This protocol was nurse-delivered and included information on arthritis progression and symptoms, coping skills, goal setting, problem solving, and exercise and diet. Assessments were conducted at baseline and four months later after the intervention ended.

Results demonstrated no significant differences between groups on the measures of self-efficacy for pain management and a small statistically significant difference in self-efficacy for other symptom management. The control group decreased in their level of self-efficacy for other symptom management, while the intervention group maintained their baseline level over the course of the study. No difference between groups was found on the Arthritis Impact Measurement Scale 2 (AIMS 2) pain subscale or other subscales (i.e., social, role, affect)²⁰, fatigue, patient global assessment, psychological distress, or physical functioning. Participants who participated in this intervention did report higher levels of global well-being, activation, and lower scores on a visual analog scale of pain.

This study again points to the possibility that when self-efficacy for managing pain and other symptoms is not (or just slightly) impacted by an intervention, the intervention may also fail to provide patients with clear benefits across the biopsychosocial spectrum of pain. The investigators suggest that one reason there might not have been significant findings on

several outcomes, particularly self-efficacy, was that the intervention focused more on the overall impact of living with arthritis and less on patients' self-efficacy for coping with pain. This may suggest that interventions providing patients with specific coping skills to manage pain are more likely to improve patients' levels of self-efficacy for managing pain and other symptoms.

In a novel study recently published by our group, the importance of self-efficacy for managing pain and other symptoms, as well as self-efficacy for weight management, is highlighted.²¹ This study was a randomized controlled trial examining the impact of pain coping skills training (PCST), lifestyle behavioral weight management (BWM), their combination (PCST+BWM), or standard care in 232 overweight or obese OA patients. The rationale for this study was that overweight and obese OA patients are challenged by both their OA pain and their weight and would benefit from a psychosocial intervention combining both pain and weight management strategies. PCST consisted of 18 group sessions designed to decrease maladaptive pain coping strategies (e.g., catastrophizing—the tendency to focus on and magnify pain sensations and feel helpless in the face of pain²²) and enhance patients' abilities to control and decrease pain through the use of adaptive coping strategies (e.g., cognitive restructuring). BWM consisted of 18 group sessions focusing on behavioral and cognitive strategies for weight management and 12 weeks of weekly exercise (i.e., three times). PCST+BWM was a combination of these two protocols.

In this study, we focused on the relationship of PCST+BWM compared to the other groups. Interestingly, we found that a protocol that combined pain coping skills training with behavioral and cognitive strategies for weight management in overweight and obese OA patients led to significantly greater increases in self-efficacy for managing pain and other symptoms of arthritis than either treatment alone or the standard care control condition. PCST+BWM was also superior to the other three conditions in decreasing pain, physical disability, psychological disability, weight, and other important outcomes. While we suspect that increases in self-efficacy for managing pain and other symptoms mediated treatment related changes, we did not formally test this hypothesis in this study. In future work, it will be important to further investigate self-efficacy for managing pain and other symptoms as a mechanism of change in these patients.

Self-efficacy for Managing Pain and Other Symptoms in Diverse Samples

Arthritis is a condition that affects both men and women of varying racial/ethnic backgrounds, both domestically and worldwide.^{23,24,25,26} In the United States, arthritis affects racial and ethnic populations disproportionately. Caucasian and American Indians/Alaska Natives have the highest prevalence.²⁴ Despite the fact that the prevalence of arthritis is lower among many minority populations including African Americans, Hispanics, and Asians/Pacific Islanders, the impact of arthritis has been documented to be worse.^{24,25} For example, research has indicated that African American patients report more severe pain and activity/work limitations, and lower utilization of surgical treatments and self-management programs.²⁷⁻²⁹

Research on behavioral and psychosocial arthritis interventions regularly under-represent minority populations, providing limited information about the efficacy of such treatments for patients of varying racial/ethnic backgrounds.²⁷ Thus, research on self-efficacy for managing pain and other symptoms has been limited among minority populations. Research that prioritizes investigating the effectiveness of interventions that target self-efficacy for managing pain and other symptoms in a diverse arthritis patient population deserves attention as this field of research moves forward.

Parker et al. recently reported on the outcomes of the Arthritis Foundation's Self Help Program (ASHP) among African-Americans (n=29), Hispanics (n=38), and Non-Hispanic Whites (n=27).²³ The ASHP is a community-based, pain management and self-efficacy enhancing course. It consists of six, weekly classes addressing pain education, relaxation, cognitive coping skills, problems solving, and communication skills. Outcomes of interest included self-efficacy for pain control, pain, mood, and exercise frequency.

Improvements in self-efficacy for pain management were only found in the Hispanic participants. Hispanic participants were also the only group to report fewer arthritis-related symptoms and demonstrated the greatest increase in their use of exercise. Mood was improved in Hispanic and White participants, while pain intensity decreased among all participants. It is important to note that the greatest overall treatment gains were found in Hispanic patients, suggesting again that self-efficacy for pain control might have been an important mediator of treatment effects. It may be important to note that this intervention did not have an impact on self-efficacy for pain management or arthritis related symptoms in African-American participants. Self-efficacy for pain management may be a culturally sensitive construct and interventions may differentially impact self-efficacy across racial groups.

Wu et al. examined and reported on the outcomes of one of the first arthritis self-management programs in a non-Western country.³⁰ Their study included 215 OA patients in Taiwan randomized to receive either routine care or a self-management program for arthritis. This program included four-weekly group sessions (10-15 participants each), focusing on coping skills for arthritis that would lead to increased exercise, better problem solving, goal setting, and self-efficacy enhancement. Results of this study showed that eight-weeks following the intervention, patients in the self-management program had significantly increased self-efficacy for managing pain and other symptoms compared to the routine care control group. The intervention group also demonstrated significantly less pain, pain-disability, and use of medical services compared to the routine care control group. This study is important because it is one of the first studies to demonstrate increases in self-efficacy for managing pain and other symptoms following an arthritis self-management program in a non-Western sample of arthritis patients.

Future Directions for Clinical and Research Applications

Self-efficacy for managing pain and other symptoms is an important construct in understanding the context of pain in patients with arthritis. However, several clinical and research issues remain to be addressed regarding the role of self-efficacy for managing pain and other symptoms in arthritis.

One important question is how these research findings translate into clinical practice. An important first step may be the routine assessment of self-efficacy for managing pain and other symptoms in arthritis. Past empirical work as well as the recent intervention studies reviewed in this paper strongly suggests that arthritis patients with lower levels of self-efficacy for managing pain and other symptoms are much more likely to have increased pain, physical disability, and psychological distress. An eight-item, paper-and-pencil version of the ASES⁴ that is easily scored is available and could be implemented into clinical practice. Clinicians could consider implementing behavioral or psychosocial strategies that are likely to increase patients' levels of self-efficacy for patients scoring low on this measure.

Another important question is to understand how the research based intervention protocols described above and other promising behavioral or psychosocial protocols can be implemented into clinical practice to increase patients' self-efficacy for managing arthritis

pain and other symptoms. Intervention protocols reviewed ranged from four to 24 weeks, and varied in treatment content (e.g., exercise, psychoeducation) and delivery format (i.e., group, individual). Most patients, particularly younger patients who are working full time, may have difficulty participating in interventions that span over the course of several months and/or have inflexible times (e.g., 10:00am on Wednesdays). Future research work should aim to determine characteristics of treatment (e.g., length, content, delivery format) that are most acceptable to patients, yet still demonstrate efficacy, in clinical settings. Additionally, determining patient characteristics (e.g., pain, marital status, age) that suggest patients are likely to benefit from behavioral/psychosocial interventions will be vital to the clinical utility of these treatments. For instance, patients who have limited social support may be less likely to benefit from an individual treatment and more likely to benefit from the support offered by a group intervention.

It is interesting that none of the recent articles reviewed use mobile health (mHealth) technologies to apply behavioral or psychosocial interventions for patients with arthritis. The use of mHealth technologies may be particularly useful in increasing patients' confidence in their ability to control their arthritis pain and other symptoms. At a simple level, mHealth technologies could be used to send these patients prompts to practice behaviors or skills that would increase their ability to manage their pain. For example, patients could receive a text message reminding them to engage in progressive muscle relaxation after an initial session teaching them the technique. At a more intricate level, patients' daily levels of pain or self-efficacy for pain management could be assessed with mHealth technologies (i.e., smartphone) which could be relayed to the investigators in real-time, and subsequently, a personalized text message based on their own symptom report could be sent to them suggesting action they could take (i.e., activity pacing, relaxation) to decrease their pain. Future work should consider how mHealth technologies can impact patients' levels of self-efficacy for managing pain and other symptoms, presumably leading to decreases in pain and pain-related disability. Importantly, there is evidence that the majority of adults in the US, as well as worldwide, have access to mHealth technologies. If mHealth behavioral or psychosocial interventions impacting self-efficacy for managing pain and other symptoms are found to be effective, patients may be highly likely to access such interventions.

Finally, future work should work toward understanding what components of interventions are most likely to lead to increases in self-efficacy for managing pain and other symptoms. As can be seen from this brief review of recent work, changes in self-efficacy for managing pain and other symptoms in patients with arthritis has been assessed in response to a number of distinct types of interventions (e.g., gym-based exercise, walking, coping skills). One important question that remains is: are there specific components of an intervention that lead to changes in self-efficacy for pain and symptoms management or do most interventions lead to self-efficacy improvements?

Past research has demonstrated that arthritis interventions that impact self-efficacy for managing pain and other symptoms can also affect pain levels, fatigue, physical functioning, mood, and quality of life.^{11,13,14,18,19,21,23} However, to date, the effects of these interventions on key disease outcomes, such as biomarkers of disease, physician and patient rated disease, healthcare utilization variables, and cost variables, have not been thoroughly explored. Understanding if there is an association between key disease outcomes and self-efficacy for managing pain and other symptoms would add to the literature in this field, as it would enable researchers to investigate how intervention related changes in psychological outcomes (e.g., self-efficacy) relate to changes in biomarkers of arthritis. Assessing health care utilization and cost variables in future intervention studies targeting self-efficacy for

managing pain and other symptoms could provide objective data regarding intervention efficacy (e.g., fewer emergency room visits, decreased pain medication consumption).

It is clear based on this limited review of recent work that investigators examining disparate types of behavioral and psychological interventions agree that self-efficacy for managing pain and other symptoms is an important outcome measures. Understandably, researchers often focus their reports on outcomes such as pain, physical functioning, and physical performance measures. However, self-efficacy for managing pain and other symptoms may serve as a mechanism of change in these intervention studies. That is, arthritis patients who are able to increase their confidence in their ability to manage their pain and other symptoms may subsequently have less pain and better physical functioning and performance. Interestingly in the studies reviewed above, when an intervention led to increases in self-efficacy for managing pain and other symptoms, it also led to decreases in pain and increases in physical functioning and performance. This raises the possibility that intervention-related positive changes in self-efficacy for managing pain and other symptoms mediate positive intervention related changes in pain and physical outcomes. Past cross-sectional work in patients with RA has found that self-efficacy for managing pain and other symptoms mediated the impact of disease severity on the outcomes of pain and physical functioning.⁶ Understanding how and why behavioral and psychological interventions work is an important area of future research.³¹ If changes in self-efficacy for managing pain and other symptoms are indeed a mediator of positive change in arthritis intervention protocols, it will be important to investigate novel ways to increase self-efficacy in patients with arthritis. Future work should be designed to examine changes in self-efficacy for managing pain and other symptoms as a mediator of intervention related changes in patients with arthritis.

Conclusion

Recent evidence as well as past work emphasizes the importance of self-efficacy for managing pain and other symptoms in understanding the context of pain in patients with arthritis. This article reviewed recent behavioral and/or psychosocial intervention studies that have examined self-efficacy for managing pain and other symptoms as an outcome measure. It will be important that clinicians treating patients with arthritis pain consider the salience of self-efficacy for managing pain and other symptoms in patients' adjustment to arthritis pain. It is also important that researchers make efforts to move beyond simply looking at self-efficacy as an outcome variables in intervention studies, but investigate deeper to understand how self-efficacy for managing pain and other symptoms changes and what leads to important changes.

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