

## Review

### Arthritis and pain

# Psychosocial aspects in the management of arthritis pain

Catherine L Backman

School of Rehabilitation Sciences, The University of British Columbia and The Arthritis Research Centre of Canada, T325-2211 Wesbrook Mall, Vancouver, BC V6T 2B5, Canada

Corresponding author: Catherine Backman, [backman@interchange.ubc.ca](mailto:backman@interchange.ubc.ca)

Published: 5 December 2006

This article is online at <http://arthritis-research.com/content/8/6/221>

© 2006 BioMed Central Ltd

*Arthritis Research & Therapy* 2006, **8**:221 (doi:10.1186/ar2083)

## Abstract

The purpose of this review is to summarize psychosocial factors associated with arthritis pain and highlight recent evidence for psychosocial approaches to managing arthritis pain. By definition, psychosocial factors refer to two dimensions of experience: the psychological (cognitive, affective) and social (interacting with others, engaging in life activities). Psychosocial factors influence the perception of pain and the presence of pain influences psychological well-being and social participation. After discussing the impact of arthritis pain on participation in work, family life, and leisure, evidence for psychosocial interventions is summarized, emphasizing reviews and studies published from January 2000 to August 2006.

## Introduction

Pain is a relatively common and troublesome feature of arthritis. The proportion of people with arthritis and related conditions who report experiencing moderate to severe pain is threefold that reported by people with other chronic conditions [1]. The relationship between psychosocial factors and pain is complex and multidimensional: psychosocial factors influence the perception of pain and the presence of pain influences psychological well-being and social participation. The purpose of this review is to summarize psychosocial factors associated with arthritis pain and highlight recent evidence for psychosocial approaches to managing arthritis pain.

Given the complexity of persistent pain and the cumulative literature on mechanisms and management, a biopsychosocial perspective has been adopted to explain this phenomenon [2]. Such a perspective maintains the important contribution of biological mechanisms to the pain experience, but adds the equally important psychological and social dimensions as both contributors to the pain experience and targets for intervention. Before proceeding, a few definitions may be helpful. 'Psychosocial' is a broad term incorporating both psychological (for example, cognitive and affective) and

social (for example, interacting with others, engaging in life activities) dimensions. Terms pertinent to the discussion of psychosocial aspects of arthritis pain are defined in Table 1. Not unlike pain, assessment of many psychosocial factors relies on self reports of feelings and perceptions, while others may be inferred from observed actions or behaviors. Reliable and valid methods of measuring psychosocial factors are available [3] and many psychosocial factors are modifiable with education, skills training or therapy [3,4]. As a result, there is a considerable body of literature examining relationships among psychosocial and other factors potentially associated with arthritis pain, disability, and quality of life.

This paper is structured in two parts. It begins with an overview of the psychosocial impact of arthritis on daily activities, to serve as the context against which intervention effects should be considered. This is followed by a description of the search strategy for reviewing psychosocial interventions, review of studies, and concluding statement.

## Psychosocial impact of arthritis

Most types of arthritis require people to cope with pain, stiffness, fatigue, and physical limitations. The way they manage these aspects of their illness influences their ability to engage in meaningful, obligatory and discretionary activities, including the domains of work, family life, leisure, and social relationships. As social beings, with specific roles and responsibilities, humans engage in a range of life activities. Pain, along with other symptoms from arthritis, threatens the ability to participate in these activities [5] and may compromise psychological and social well-being [6]. Among a group of older adults with arthritis, those with greater pain disability experienced more psychological distress, higher unemployment and lower self efficacy [7]. Three life domains will be described here: work, family life, and leisure.

**Table 1**

<b>Definitions</b>	
Cognitive behavioral approaches	Based on the premise that thought processes influence feelings and behaviors. Involves learning how to recognize destructive thoughts or ineffective responses, reflection, setting goals, and practicing new strategies
Coping	The process of responding to, managing or contending with life stresses and difficulties. Coping strategies can be categorized in various ways, such as adaptive (effective) or maladaptive (ineffective). Types of coping include 'active or problem-based coping' (purposely learning and enacting behaviors designed to resolve problems), 'passive coping' (avoiding situations or giving up control), and 'catastrophizing' (exaggerating the perceived threat, focusing on the worst that can happen)
Coping skills training	An educational intervention designed to enhance coping skills by identifying problems, practicing skills to resolve them, and evaluating the outcome. Typically compatible with cognitive behavioral approaches, but may not be synonymous depending on the user's theoretical and professional perspective
Helplessness	A belief that nothing can be done to resolve a problem, characterized by emotional, motivational and cognitive deficits
Psychological distress	Feelings of anxiety, depression, and/or emotions to an extent that is perceived as emotional suffering. May manifest as agitation, anger, tearfulness, social withdrawal or other outward signs  'Anxiety' is a feeling of uneasiness, apprehension or dread. May be a rational response to stresses or danger, but is problematic when it escalates to a level interfering with participation in daily routines  'Depression' is a feeling of sadness, melancholy or despair, ranging from a proportionate response to a personal loss, to profound depression, which may be an illness in itself
Self efficacy	A belief that one can achieve specific goals through taking specific action; the level of confidence one has that the goal will be attained
Valued life activities	A subset of life activities that have specific meaning or importance to the individual engaged in them. The value attached to activities varies across individuals and within individuals across the life span or in response to life demands

**Work**

Being employed positively influences perceived quality of life; conversely, energy consumed at work may have negative effects on health status [8]. Job loss resulting from arthritis is associated with reduced life satisfaction and greater depression and pain [9]. Curiously, one study of adults with rheumatoid arthritis (RA) or ankylosing spondylitis found that working was an important predictor of physical health-related quality of life, but not significantly related to mental health-related quality of life [8]. In RA, work disability occurs early and continues at a steady rate [10]; and pain is a significant predictor of work loss or limitation [7,10,11]. Among psychosocial factors studied, self efficacy [10,11], comfort telling co-workers about arthritis [10], perceived importance of work [10], and social support [10,11] contribute significantly to predicting engagement in work. Those reporting work limitations resulting from RA are more likely to have greater pain, poorer function, and rate their work as less psychologically demanding than participants who reported no limitations [11].

In a 'best evidence' synthesis of the literature on work disability in RA, de Croon and colleagues [12] summarized 13 high and medium quality studies and concluded that the evidence for pain as a predictor of work disability is inconsistent. The review found inconsistent evidence for the direct effect of biomedical variables on work disability, confirming the notion "that work

disability is a biopsychosocially determined misfit between work environmental demands and individual capability" [12]. In other words, pain and disease status variables are insufficient to explain work status; rather, it is an individualized combination of factors within and external to the person that supports or hinders their work participation.

Coping styles have been investigated with regard to work loss secondary to arthritis pain [13]. Those who left the work force were engaged in fewer activities and more likely to use attention diverting and activity pacing coping strategies to deal with their pain [13]. These two types of coping behaviors significantly contributed to a model predicting work loss above and beyond work-related factors, when adjusted for age, sex, disease duration and disease activity. In a prospective, longitudinal study of 366 employed people with arthritis, lack of support in the workplace and work limitations were predictors of future depression [14]. There was also an association between greater pain catastrophizing, considered a maladaptive coping style, and future depressive symptoms.

**Family life and relationships**

Not only does pain interfere with work, but it restricts participation in other roles, including those integral to family life, such as being a parent, managing a household or maintaining intimate relationships [15].

Difficulties caring for children are frequently reported by parents with arthritis [5,11,16]. Evans and colleagues [16] compared the psychosocial functioning and coping of mothers with chronic pain (including mothers with arthritis) to mothers without pain, with regard to their ratings of parenting efficacy. There was a significant association between the level of psychological distress and parenting difficulties. While mothers with chronic pain reported using both problem-focused and emotion-focused coping strategies, the use of emotion-focused coping was associated with greater psychological distress [16]. Mental health status emerged as the most significant predictor of parenting efficacy. Elsewhere, social support from family members has been identified as a contributor to performance of household work and parenting [11].

In studies of pain, marital functioning and psychological distress, there are mixed results regarding the contribution of spousal support to their partner's experience of pain and psychological distress [17]. The most consistent finding is that negative responses or problematic forms of spousal 'support' are significantly associated with psychological distress [17-19] and pain severity [17]. Interestingly, the presence of positive forms of support does not consistently demonstrate an association to either psychological well-being or pain [18]. Marital satisfaction may have an inverse relationship to the presence of depressive symptoms [18]. A study exploring how couples shared the management of one partner's arthritis indicates the potential for conflict that adversely affects both the relationship and health outcomes [20].

### **Leisure**

Compared to controls from the general population, people with RA engage in fewer types of leisure activities, but this difference appears statistically significant only among people with lower educational attainment [21]. Given that result, it was hypothesized that people with less education may also have fewer resources and opportunities to explore leisure interests.

As leisure is more discretionary by nature, especially when one juggles the demands of family, work, and self management of a chronic illness, there may be a tendency to set aside leisure interests in order to fulfill more obligatory responsibilities. Alternatively, in the presence of pain and physical limitation, it may seem daunting to engage in active recreational pursuits. Pain and fatigue are both independent predictors of loss of participation in activities such as recreation and hobbies [5]. Studies of valued life activities demonstrate that declining ability to engage in recreational activities, hobbies and social interactions appear to significantly increase the risk of new depressive symptoms, even more so than activity losses in other domains [22]. The role of leisure in maintaining or restoring psychological well-being in the presence of arthritis pain warrants further study.

## **Psychosocial approaches to managing arthritis pain**

### **Search strategy**

The EBSCOhost platform was used to search PsycInfo and CINAHL databases, and the search was repeated using the PubMed database. Search terms included combinations of pain, pain management, psychosocial, and arthritis, and the search was limited to studies of adults and the English language. Studies needed to measure pain as an outcome and employ a specific psychosocial intervention to be included in the review. Because prior reviews have summarized literature through the 1990s [4] this review focuses on papers published from January 2000 through August 2006, inclusive of early on-line editions.

### **Psychosocial approaches**

Psychosocial approaches to managing arthritis pain include educational programs, coping skills training (CST), and cognitive behavioral therapy (CBT). As a group of interventions, the focus is the provision of information necessary to understand the rationale for the approach selected, and techniques to enhance self efficacy, manage stress, decrease helplessness and catastrophizing, and perhaps most importantly, develop and practice specific skills, applied to the person's unique life situation. While most people with arthritis are able to access basic medical care, timely, comprehensive care regarding psychosocial aspects of living with arthritis is limited [3].

A widely known educational intervention is the community-based Arthritis Self Management Program [23], typically a series of six weekly group sessions led by trained lay leaders, which specifically targets self efficacy skills in the management of arthritis symptoms, including pain. Other individualized or group specific educational programs may be designed by health care providers to match the needs of their audience, and may include elements similar in nature to the Arthritis Self Management Program or CST and CBT approaches. CST or CBT include cognitive and behavioral exercises, conducted individually or in groups over several weeks. A typical program might introduce a simplified overview of a theory of pain control, attention diversion techniques such as relaxation or guided imagery, changing cognitions (recognizing and reducing negative thoughts), changing activity patterns (pacing, choosing pleasurable activities) and the provision of homework to apply new techniques outside the treatment setting [3,4,24]. Some pain management techniques, such as relaxation, may be taught in isolation, but this in itself does not comprise a program of CST or CBT.

The list of psychosocial factors potentially associated with pain management is daunting. Keefe and colleagues [25] have organized these into two general categories: factors associated with poor pain control (catastrophizing, anxiety and fear, helplessness) and factors associated with effective pain control (self efficacy, pain coping strategies, readiness

to change). While this schema is generally supported in the literature, the evidence from cross-sectional and longitudinal studies remains muddled with regard to the precise mechanism by which psychosocial factors might influence the pain experience. Some investigations [26,27] have found improved coping skills to be associated with decreased psychological distress and/or pain reduction, but others have failed to find a significant effect for coping as a mediator of the relationships between life stresses and psychological well-being [28]. Passive coping [29], feelings of helplessness [30], and catastrophizing [31-33] appear to be associated with more pain and poorer health outcomes, while active coping [33,34] and self efficacy [33] appear to decrease pain. Increasingly, clinical trials are being reported that examine various intervention protocols.

### **Clinical trials of psychosocial interventions and arthritis pain**

A systematic review and meta-analysis of cognitive-behavioral and psychoeducational interventions found 25 trials of sufficient quality to analyze for pooled effects on 6 outcomes of interest (pain, disability, tender joints, psychological status, coping and self efficacy) [35]. Results indicated small effect sizes for reducing pain and disability over the short term, an effect that unfortunately was not sustained in the studies that employed a follow-up assessment. With regard to psychological status, the most frequently measured outcome was depression. Across trials, there was a small average effect size for reducing symptoms of depression, and this change was maintained in those studies that included a follow-up assessment. Small but significant average effect sizes for coping and self-efficacy suggested that interventions were successful in improving skills. Not all studies provided enough information to calculate effect sizes, and when reviewed at the individual study level, the authors report a number of inconsistencies that could be due to lack of statistical power (most studies used relatively small samples), variation in the treatments used, or characteristics of the patients studied.

Inconsistencies across studies have been reported in another systematic review of group interventions for adults with RA or osteoarthritis (OA) [34]. The types of group interventions provided were self-management education or cognitive behavioral therapy for stress management. One of three studies demonstrated an improvement in coping skills, one of four studies demonstrated improved social contacts, and six of thirteen studies showed improvement in functional status. More research is required to tease out the circumstances under which positive outcomes occur. Beyond methodological limitations, there is the likelihood that some interventions are successful for some people but not others, and these characteristics need to be delineated to better inform clinical practice.

In a trial of CBT compared to sympathetic attention to arthritis symptoms and usual care control groups in adults with lupus,

the experimental group demonstrated significant improvement in pain following treatment while the changes for both control conditions did not significantly differ from baseline [36]. However, improvements in pain were not sustained at the nine-month follow-up assessment. Similar results were obtained for psychological and physical functioning.

If desirable outcomes are achieved in the short term but not sustained in the long term, it is reasonable to hypothesize that some type of maintenance program may resolve this problem. One such trial compared conventional pain CST to a CST program enhanced with a maintenance component and two control conditions: arthritis education and usual care [24]. A comprehensive daily diary was used to monitor pain variables. Although 167 participants were randomized (38 to 46 in each group), just 95 completed the trial, and the attrition was greatest in the two pain CST groups (19 and 18, respectively, completing the study), which threatens the strength of the conclusions. Unexpectedly, the conventional pain CST was superior to the maintenance-enhanced program and both control conditions in reducing pain and negative mood and increasing coping efficacy; however, the maintenance-enhanced pain coping skills group was superior in enhancing positive mood.

An 18-month follow-up study assessed the longer-term efficacy of CBT for adults with recently diagnosed RA [37]. The original intervention compared a series of eight individual sessions of CBT with a psychologist to routine care. In the intent-to-treat analysis, the changes in pain and coping were not statistically significant at follow up. However, while depression and anxiety increased in the routine care group, they decreased in the cognitive behavioral treatment group. The proportion of possible/probable clinical depression or anxiety was significantly lower in the treatment group than the control group. In contrast to that favorable outcome, another small but well-designed trial of cognitive-behavioral education with newly diagnosed RA patients, compared to standard care, found no significant improvements in functional status, helplessness, or self efficacy and no between-group differences at six months post-intervention [38]. The treatment in this trial was group sessions of two hours duration, once per week for four weeks. Could the different outcomes in the two trials be attributed to the intensity of the intervention (eight individual versus four group sessions)? The 'dose-response' relationship for most psychosocial interventions has not been fully investigated. Given their results, the authors of the latter study recommend re-examining the trend to offer cognitive behavioral treatment early in the disease course with a larger sample and longer follow up [38].

In a non-randomized trial of a seven-week educational program addressing pain and stress management, coping skills, goal-setting and exercise, compared to a wait-list control group in Korea, the intervention group showed significant improvement in the outcomes of pain and

depression, but not functional status [39]. Additionally, there were significant associations between pain management skills, coping skills and the outcome measures, supporting the theory that training improves skills, which, in turn, improve outcomes. In another paper with a similar purpose, examining the mechanism by which stress management may mediate pain and depression in adults with RA, Rhee and colleagues [40] conducted a secondary analysis of their earlier clinical trial. Comparing a group of 47 who received comprehensive stress management training to 45 receiving standard rheumatologic care, they found support for the hypothesis that stress management based on CBT indirectly improves pain and depression via cognitive-behavioral variables (efficacy, coping and helplessness).

Only one study was found comparing psychosocial and medical interventions, although the primary outcome was depression rather than pain. This randomized controlled trial [41] compared three groups in the management of depression: CBT plus medication, attention plus medication, and medication only. Outcomes were measured at baseline, post-treatment (10 weeks), and 6 and 15 month follow-up assessments. Participants were 54 adults with RA and major depression. Unfortunately, after drop outs, only 13 or 14 participants remained in each group. There were no significant between-group differences on the main outcome of depression, nor for most secondary outcomes, including pain, self efficacy, helplessness, or coping.

One of the possible explanations for sometimes conflicting results across studies is the characteristics of the sample. What is 'right' for a young adult with early RA is likely not appropriate for an older adult with OA. In a study of homebound older adults experiencing moderate to severe symptoms of stiffness, fatigue and pain from RA or OA, more than half reported depression [42]. Those with RA reported less pain and limitations and greater self efficacy and social interactions than those with OA, suggesting that their arthritis had been better managed over the course of their illness. Self-management programs intended to address pain and psychosocial issues should consider the unique needs of different populations such as this one [42]. In another study of older women with RA or OA, Zautra and Smith [43] also found similarities and differences between the two disease-groups. While depression was related to pain in both groups it was associated with elevated stress and increased reactivity to stress in older women with RA but not those with OA, raising another set of immunological-related questions.

There may also be gender differences in selecting the best therapeutic approach. Hirsh and colleagues [15] report a significant relationship between pain-related disability in life activities and negative mood and that this relationship is stronger among women with chronic pain than in men. After controlling for negative mood, pain remains a predictor of overall disability in men, but is no longer a significant

predictor of disability for women. Findings such as these may suggest different approaches for men and women. Personal preferences and personality may also play a part, but that moves beyond the scope of this review.

People also vary in their ability to cope and their health beliefs. It has been hypothesized that small beneficial effects from psychosocial interventions may result in part from heterogeneous samples with regard to their risk for psychosocial dysfunction. Evers and colleagues [44] recruited 64 patients with early RA with psychological profiles suggesting they were 'at risk', defined as scoring in the upper 30% of scores for anxiety or negative mood. Patients were randomly assigned to CBT or standard care. Using an individualized approach to CBT, where patients chose their priority topics for therapy during ten biweekly sessions plus a 'booster' follow-up session four weeks later, results demonstrated generally improved physical, psychological and social function, but no direct, significant effect on pain. However, only 11 patients in the CBT group chose pain management as a priority topic for intervention. This suggests CBT must be specifically applied to targeted symptoms and behaviors in order to have a measurable effect.

### **Role-specific interventions**

Because the psychosocial interventions reviewed above are, to some degree, individualized, they are likely to address how to manage pain in specific situations or when fulfilling certain roles. That is, patients learn to apply the general strategies to their own priorities, such as better managing pain at work, family activities, or social situations. However, sometimes programs are designed to enhance performance of specific roles, appealing to a specific group of individuals based on the role first, and secondarily incorporating psychosocial approaches to pain management into program content. Given the stage set earlier in this paper, where the psychosocial impact of arthritis pain was related to social roles at work, family life, and leisure pursuits, this more contextual approach to organizing and delivering intervention may appeal to different audiences. Two examples are briefly cited here: vocational rehabilitation to maintain or facilitate return to employment, and programs aimed at enhancing social support and relationships.

The intervention used in a randomized trial of vocational rehabilitation counseling for people with RA at risk for job loss included a review of the nature of work, positive messages about each participant's ability to work and skills training on how to request and implement job accommodations. The control group received printed information alone. The result was significantly less job loss in the intervention group, demonstrating that job loss can be delayed or prevented [9].

The pain experience is influenced by interactions with significant others; therefore, some studies have investigated

interventions involving family members [3]. There is a suggestion that involving family members in psychosocial interventions, such as cognitive behavioral approaches or CST, is beneficial for reducing arthritis symptoms, enhancing self efficacy, and improving social support for the person with arthritis, but the effect on family members is largely unmeasured [45].

## Conclusion

A phenomenological study of women living with lupus reported participants felt that health care professionals did not fully appreciate the psychosocial impact of the illness, and consequently did not provide information to meet those needs [46], a finding supported by other women with RA, ankylosing spondylitis and lupus [47]. Reports like this are reason to carefully consider the psychosocial aspects of arthritis and discover interventions that not only alleviate arthritis pain, but ensure people are able to participate in valued life activities, as much as possible maintaining physical and psychological well-being.

Psychosocial approaches enhance medical regimes of care [2,3]. There is evidence that psychosocial interventions improve coping and self efficacy, reduce psychological distress, and reduce pain, at least in the short term. While there is a body of literature examining psychosocial approaches, the volume addressing any one specific approach or research question is not large enough to draw confident conclusions. More studies into their effectiveness are required, with adequate sample sizes and careful attention to study populations in order to identify which strategies work best for which groups of people, based on their own priorities as well as factors such as pain experience, diagnosis, age, gender, income and vocation. Cost-effectiveness has yet to be adequately assessed. The acceptability, availability, and applicability of programs for different patient populations should also be further explored in order to inform decisions regarding the allocation of health care resources. Truly interdisciplinary collaborations may advance the understanding between physiological and psychological processes [48], and advance the rather sparse evidence for efficacy of biopsychosocial approaches [49]. Engaging the patient as a research collaborator may also foster innovation. Clinical guidelines for managing arthritis pain recognize the importance of thoughts, feelings and emotions, and recommend CBT to reduce pain, psychological distress, and improve coping [50]. Additional

clinical research will clarify the most effective therapeutic approaches.

## Competing interests

The author declares that they have no competing interests.

## Acknowledgements

The author acknowledges Linda Del Fabro Smith for assistance with searching and retrieving literature. The author's participation in a workshop on pain and arthritis hosted by the Canadian Arthritis Network January 27-29, 2006, influenced the development of this paper.

## References

1. Lagacé C, Perrucio A, DesMeules M, Badley E: **The impact of arthritis on Canadians.** In *Arthritis in Canada*. Edited by Badley E, DesMeules M. Ottawa, ON: Health Canada; 2003:7-34.
2. Keefe FJ, France CR: **Pain: Biopsychosocial mechanisms and management.** *Curr Directions Psychol Sci* 1999, **8**:137-141.
3. Keefe FJ, Abernethy AP, Campbell LC: **Psychological approaches to understanding and treating disease-related pain.** *Annu Rev Psychol* 2005, **56**:601-630.
4. Bradley LA, Alberts KR: **Pain management in the rheumatic diseases.** *Rheum Dis Clin N Am* 1999, **25**:215-230.
5. Katz PP, Morris A, Yelin E: **Prevalence and predictors of disability in valued life activities among individuals with rheumatoid arthritis.** *Ann Rheum Dis* 2006, **65**:763-769.
6. Tsai P, Tak S, Moore C, Palencia I: **Testing a theory of chronic pain.** *J Adv Nurs* 2003, **43**:158-169.
7. James NT, Miller CW, Brown KC, Weaver M: **Pain disability among older adults with arthritis.** *J Aging Health* 2005, **17**:56-69.
8. Chorus AMJ, Miedema HS, Boonen A, van der Linden S: **Quality of life and work in patients with rheumatoid arthritis and ankylosing spondylitis of working age.** *Ann Rheum Dis* 2003, **62**:1178-1184.
9. Allaire SH, Li W, LaValley MP: **Reduction of job loss in persons with rheumatic diseases receiving vocational rehabilitation.** *Arthritis Rheum* 2003, **48**:3212-3218.
10. Lacaille D, Sheps S, Spinelli JJ, Chalmers A, Esdaile JM: **Identification of modifiable work-related factors that influence the risk of work disability in rheumatoid arthritis.** *Arthritis Rheum* 2004, **51**:843-852.
11. Backman CL, Kennedy SM, Chalmers A, Singer J: **Participation in paid and unpaid work by adults with rheumatoid arthritis.** *J Rheumatol* 2004, **31**:47-56.
12. de Croon EM, Sluiter JK, Nijssen TF, Dijkman BAC, Lankhorst GJ, Frings-Dresen MHW: **Predictive factors of work disability in rheumatoid arthritis: a systematic literature review.** *Ann Rheum Dis* 2004, **63**:1362-1367.
13. Chorus AMJ, Miedema HS, Wevers CWJ, van der Linden S: **Work factors and behavioural coping in relation to withdrawal from the labour force in patients with rheumatoid arthritis.** *Ann Rheum Dis* 2001, **60**:1025-1032.
14. Li X, Gignac MAM, Anis AH: **Workplace, psychosocial factors and depressive symptoms among working people with arthritis: a longitudinal study.** *J Rheumatol* 2006, **33**:1849-1855.
15. Hirsh AT, Waxenberg LB, Atchison JW, Gremillion HA, Robinson ME: **Evidence for sex differences in the relationships of pain, mood and disability.** *J Pain* 2006, **7**:592-601.
16. Evans S, Shipton EA, Keenan TR: **Psychosocial functioning of mothers with chronic pain: a comparison to pain-free controls.** *Eur J Pain* 2005, **9**:683-690.
17. Leonard MT, Cano A, Johansen AB: **Chronic pain in a couples context: a review and integration of theoretical models and empirical evidence.** *J Pain* 2006, **7**:377-390.
18. Cano A, Gills M, Heinz W, Geisser M, Foran H: **Marital functioning, chronic pain, and psychological distress.** *Pain* 2004, **107**:99-106.
19. Griffin KW, Friend R, Kaell AT, Bennett RS: **Distress and disease status among patients with rheumatoid arthritis: roles of coping styles and perceived responses from support providers.** *Ann Behav Med* 2001, **23**:133-138.
20. Mann C, Dieppe P: **Different patterns of illness-related interaction in couples coping with rheumatoid arthritis.** *Arthritis Rheum* 2006, **55**:279-286.

This review is part of a series on  
*Arthritis and pain*  
edited by Jason McDougall.

Other articles in this series can be found at  
[http://arthritis-research.com/articles/  
review-series.asp?series=ar\\_pain](http://arthritis-research.com/articles/review-series.asp?series=ar_pain)

21. Wikström I, Book C, Jacobsson LTH: **Difficulties in performing leisure activities among persons with newly diagnosed rheumatoid arthritis: a prospective, controlled study.** *Rheumatology* 2006, **45**:1162-1166.
22. Katz PP, Yelin EH: **Activity loss and the onset of depressive symptoms. Do some activities matter more than others?** *Arthritis Rheum* 2001, **44**:1194-1202.
23. Lorig KR, Holman H: **Self-management education: history, definition, outcomes, and mechanisms.** *Ann Behav Med* 2006, **26**: 1-7.
24. Carson JW, Keefe FJ, Affleck G, Rumble ME, Caldwell DS, Beaupre PM, Kashikar-Zuck S, Sandstrom M, Weisberg JN: **A comparison of conventional pain coping skills training and pain coping skills training with a maintenance training component: A daily diary analysis of short- and long-term treatment effects.** *J Pain* 2006, **7**:615-625.
25. Keefe FJ, Rumble ME, Scipio CD, Giordano LA, Perri LCM: **Psychological aspects of persistent pain: current state of the science.** *J Pain* 2004, **5**:195-211.
26. Curtis R, Groarke AM, Coughlan R, Gsel A: **Psychological stress as a predictor of psychological adjustment and health status in patients with rheumatoid arthritis.** *Patient Educ Couns* 2005, **59**:192-198.
27. Persson L-O, Sahlberg D: **The influence of negative illness cognitions and neuroticism on subjective symptoms and mood in rheumatoid arthritis.** *Ann Rheum Dis* 2002, **61**:1000-1006.
28. Dekkers JC, Geenen R, Evers AWM, Kraaijmaat FW, Bijlsma JWJ, Godaert GLR: **Biopsychosocial mediators and moderators of stress-health relationships in patients with recently diagnosed rheumatoid arthritis.** *Arthritis Care Res* 2001, **45**:307-316.
29. Evers AWM, Kraaijmaat FW, Geenen R, Jacobs JWJ, Bijlsma JWJ: **Stress-vulnerability factors as long-term predictors of disease activity in early rheumatoid arthritis.** *J Psychosom Res* 2003, **55**:293-302.
30. Naidoo P, Pretorius TB: **The moderating role of helplessness in rheumatoid arthritis, a chronic disease.** *Soc Behav Pers* 2006, **34**:103-112.
31. Edwards RR, Bingham CO, Bathon J, Haythornthwaite JA: **Catastrophizing and pain in arthritis, fibromyalgia, and other rheumatic diseases.** *Arthritis Rheum* 2006, **55**:325-332.
32. Sinclair VG: **Predictors of pain catastrophizing in women with rheumatoid arthritis.** *Arch Psychiatr Nurs* 2001, **15**:279-288.
33. Strahl C, Kleinknecht RA, Dinnel DL: **The role of pain anxiety, coping, and pain self-efficacy in rheumatoid arthritis patient functioning.** *Behav Res Ther* 2000, **38**:863-873.
34. Savelkoul M, de Witte L, Post M: **Stimulating active coping in patients with rheumatic diseases: a systematic review of controlled group intervention studies.** *Patient Educ Couns* 2003, **50**:133-143.
35. Astin JA, Beckner W, Soeken K, Hochberg MC, Berman B: **Psychological interventions for rheumatoid arthritis: a meta-analysis of randomized controlled trials.** *Arthritis Rheum* 2002, **47**:291-302.
36. Greco CM, Rudy TE, Manzi S: **Effects of a stress-reduction program on psychological function, pain, and physical function of systemic lupus erythematosus patients: a randomized controlled trial.** *Arthritis Rheum* 2004, **51**:625-634.
37. Sharpe L, Sensky T, Timberlake N, Ryan B, Allard S: **Long-term efficacy of a cognitive behavioral treatment from a randomized controlled trial for patients recently diagnosed with rheumatoid arthritis.** *Rheumatology* 2003, **42**:435-441.
38. Freeman K, Hammond A, Lincoln NB: **Use of cognitive-behavioral arthritis education programmes in newly diagnosed rheumatoid arthritis.** *Clin Rehabil* 2002, **16**:828-836.
39. Oh HS, Seo WS: **Decreasing pain and depression in a health promotion program for people with rheumatoid arthritis.** *J Nurs Scholarsh* 2003, **35**:127-132.
40. Rhee SH, Parker JC, Smarr KL, Petroski GF, Johnson JC, Hewett JE, Wright GE, Multon KD, Walker SE: **Stress management in rheumatoid arthritis: What is the underlying mechanism?** *Arthritis Care Res* 2000, **13**:435-442.
41. Parker JC, Smarr KL, Slaughter JR, Johnston SK, Priesmeyer ML, Hanson KD, Johnson GE, Hewett JE, Irvin WS, et al.: **Management of depression in rheumatoid arthritis: a combined pharmacologic and cognitive-behavioral approach.** *Arthritis Rheum* 2003, **49**:766-777.
42. Nour K, Laforest S, Gignac M, Gauvin L: **Appreciating the predicament of housebound older adults with arthritis: portrait of a population.** *Can J Aging* 2005, **24**:57-70.
43. Zautra AJ, Smith BW: **Depression and reactivity to stress in older women with rheumatoid arthritis and osteoarthritis.** *Psychosom Med* 2001, **63**:687-696.
44. Evers AWM, Kraaijmaat FW, van Riel PLCM, de Jong AJL: **Tailored cognitive-behavioral therapy in early rheumatoid arthritis for patients at risk: A randomized controlled trial.** *Pain* 2002, **100**:141-153.
45. Martire LM: **The "relative" efficacy of involving family in psychosocial interventions for chronic illness: are there added benefits to patients and family members?** *Families Systems Health* 2005, **23**:312-328.
46. Hale ED, Treharne GJ, Lyons AC, Norton Y, Mole S, Mitton DL, Douglas KMJ, Erb N, Kitas GD: **"Joining the dots" for patients with systemic lupus erythematosus: personal perspectives of health care from a qualitative study.** *Ann Rheum Dis* 2006, **65**: 585-589.
47. Backman CL, Del Fabro Smith L, Smith S, Montie PL, Suto M: **The experiences of mothers living with inflammatory arthritis.** *Arthritis Rheum* 2007, in press.
48. Zautra AJ: **Comment on "Stress-vulnerability factors as long-term predictors of disease activity in early rheumatoid arthritis."** *J Psychosomatic Res* 2003, **55**:303-304.
49. Foster NE, Pincus T, Underwood MR, Vogel S, Breen A, Harding G: **Understanding the process of care for musculoskeletal conditions: why a biomedical approach is inadequate [Editorial].** *Rheumatology* 2003, **42**:401-403.
50. Simon LS, Lipman AG, Jacox AK, Caudill-Slosberg M, Gill LH, Keefe FJ, Kerr KL, Minor MA, Sherry DD, Vallerand AH, Vasudevan S: **Pain in Osteoarthritis, Rheumatoid Arthritis and Juvenile Chronic Arthritis.** 2nd edition. Glenview IL: American Pain Society; 2002. [*Clinical Practice Guideline*, no. 2.]