Effectiveness of Occupational Therapy Interventions for Adults With Rheumatoid Arthritis: A Systematic Review

Patricia Siegel, Melissa Tencza, Beverly Apodaca, Janet L. Poole

OBJECTIVE. We reviewed the efficacy of occupational therapy–related interventions for adults with rheumatoid arthritis.

METHOD. We examined 51 Level I studies (19 physical activity, 32 psychoeducational) published 2000–2014 and identified from five databases. Interventions that focused solely on the upper or lower extremities were not included.

RESULTS. Findings related to key outcomes (activities of daily living, ability, pain, fatigue, depression, self-efficacy, disease symptoms) are presented. Strong evidence supports the use of aerobic exercise, resistive exercise, and aquatic therapy. Mixed to limited evidence supports dynamic exercise, Tai Chi, and yoga. Among the psychoeducation interventions, strong evidence supports the use of patient education, self-management, cognitive–behavioral approaches, multidisciplinary approaches, and joint protection, and limited or mixed evidence supports the use of assistive technology and emotional disclosure.

CONCLUSION. The evidence supports interventions within the scope of occupational therapy practice for rheumatoid arthritis, but few interventions were occupation based.

Rheumatoid arthritis (RA) is an inflammatory autoimmune condition that affects the synovium of the joints and is associated with pain, fatigue, deformity, and significant limitations in performance of meaningful occupations. Approximately 1.5 million Americans have RA (Centers for Disease Control and Prevention [CDC], 2014). With earlier diagnosis and the increased use of disease-modifying drugs, the severity of RA has decreased. However, a corresponding improvement in occupational performance does not seem to exist (Diffin et al., 2014). People with RA experience difficulty with activities of daily living and instrumental activities of daily living and reduced social and work participation (Benka et al., 2015; Bertin et al., 2016; Scott, Smith, & Kingsley, 2005). Reduced social participation appears to be related to levels of pain, fatigue, and depression in both early and later RA (Benka et al., 2015).

The most recent systematic review of the effectiveness of occupational therapy interventions for people with RA was published in 2004 (Steultjens et al., 2004) and included studies published before April 2000. That review found that comprehensive occupational therapy and instruction on joint protection resulted in an increase in function (occupational performance). A more recent critical appraisal of occupational therapy interventions for people with RA found strong evidence supporting resistive exercise to improve strength and function and decrease pain when the exercise program was tailored to individual participants’ pain level and stage of joint disease (Ekelman et al., 2014). The review also provided strong evidence for aerobic exercise and sound evidence for...
joint protection but no support for low-intensity aerobicics such as Tai Chi. However, this review included only systematic reviews with a limited scope of interventions, did not include many relevant individual trials, and did not include any publications from 2010 to the present.

Given the limited and outdated reviews, an appraisal of more recent research is needed. Therefore, this systematic review was conducted to answer the question, What is the effectiveness of interventions within the scope of occupational therapy practice that address function, pain, fatigue, and depression in people with RA?

**Method**

This review is part of the American Occupational Therapy Association (AOTA) Evidence-Based Practice Project. The methodology consultant to the AOTA Evidence-Based Practice Project, as well as AOTA staff and the authors, developed the search terms for the systematic review. Terms were reviewed by the advisory group to ensure that relevant articles would be collected from each database. A medical research librarian with experience in completing systematic review searches confirmed the search strategy and completed all searches. The databases and sites searched were MEDLINE, PsycINFO, CINAHL, OTseeker, and Ergonomics Abstracts. Also included were sources of consolidated evidence-based medicine reviews such as the Cochrane Database of Systematic Reviews, the Cochrane Controlled Trials Register, and the Database of Abstracts of Reviews of Effectiveness. In addition, bibliographies from articles included in the databases and relevant journals were hand searched as needed to confirm that all appropriate articles were included.

Inclusion criteria were as follows: an intervention approach within the scope of occupational therapy practice, publication in English, studies related to adults, and peer-reviewed scientific literature (Levels I, II, and III evidence; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). Evidence was considered strong if “consistent results were found from well-conducted studies, usually at least two randomized controlled trials,” moderate if results were from “one RCT or two or more studies with lower levels of evidence,” mixed if findings were inconsistent, and limited if few studies existed (AOTA, 2014, p. 4).

The literature included in the review was published between January 2000 and July 2014 and included study participants with a diagnosis of RA. Articles focused on interventions specifically for the upper or lower extremities were not included in this review. Table 1 lists the search terms, and the search strategy is outlined in Supplemental Appendix 1 (available online at http://otjournal.net; navigate to this article, and click on “Supplemental”).

<table>
<thead>
<tr>
<th>Category</th>
<th>Key Search Terms</th>
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<tbody>
<tr>
<td>Arthritis</td>
<td>ankle arthritis, ankylosing spondylitis, arthritis, degenerative joint disease,</td>
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<td></td>
<td>dermato(myositis), fibromyalgia, foot arthritis, gout, hip arthritis, inflammatory</td>
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<td>arthritis, knee arthritis, lupus, osteoarthritis, polymyositis, psoriatic arthritis,</td>
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<td></td>
<td>rheumatoid arthritis, scleroderma, systemic sclerosis</td>
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<td>Intervention</td>
<td>AAROM, activities of daily living, adaptation, adaptive equipment, AROM, arthrokinematics, assistive technology, athletic training, back school, biofeedback, body awareness, body mechanics, cognitive behavior therapy, compensation, create, driving adaptations, durable medical equipment, edema control, education, energy conservation, ergonomics, establish, exercise, functional training, hand therapy, home modification, industrial rehabilitation, interventions, job coaching, job modification, job retraining, joint protection, limb reshaping, modify, occupational medicine, occupational therapy, orthotics, physical agent modalities, physical therapy, postural training, prosthetic and prosthetic training, prevention, problem solving, PROM, promotion, rehabilitation, relaxation techniques, restore, scapulohumeral rhythm, splint, sports medicine, stretching, therapeutic management, therapy, training, treatment, work hardening, work/occupational rehabilitation, work reconditioning/conditioning</td>
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<td>Outcomes</td>
<td>absenteeism, anxiety, circumferential measurement for edema, coordination, coping</td>
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<td>patterns, depression, disability, dynamometry, dysfunction/function, EMG, endurance,</td>
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<td>fatigue, fear, fine motor coordination, functional/work capacity evaluation, grip</td>
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<td></td>
<td>strength, hand function, level of independence (ADLs, IADLs), manual muscle testing</td>
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<td></td>
<td>(MMT), mobility, NCV, occupational engagement (rest, sleep, education, social participation, leisure), occupational performance, occupational stress, pain, physical mobility, pinch strength, productivity, prosthetic use, psychological distress, quality of life, range of motion (ROM), return to work, sensation, sickness, strength, symptom magnification, tolerance to activity, volumetric measurement for edema, weakness, work/employment status</td>
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<tr>
<td>Study and trial designs</td>
<td>appraisal, best practices, case control, case report, case series, clinical guidelines,</td>
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<td></td>
<td>clinical trial, cohort, comparative study, consensus development conferences,</td>
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<td></td>
<td>controlled clinical trial, critique, cross over, cross-sectional, double-blind,</td>
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<td>epidemiology, evaluation study, evidence-based, evidence synthesis, feasibility study,</td>
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<td>follow-up, health technology assessment, intervention, longitudinal, main outcome measure, meta-analysis, multicenter study, observational study, outcome and process assessment, pilot, practice guidelines, prospective, random allocation, randomized controlled trials, retrospective, sampling, scientific integrity review, single subject design, standard of care, systematic literature review, systematic review, treatment outcome, validation study</td>
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*Note. ADLs = activities of daily living; AAROM = active assistive range of motion; AROM = active range of motion; EMG = electromyography; IADLs = instrumental activities of daily living; NCV = nerve conduction velocity; PROM = passive range of motion.*

January/February 2017, Volume 71, Number 1

7101180050p2

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Results

The initial citation and abstract search yielded 1,559 articles related to RA. Duplicate articles, articles that were included in a systematic review, and articles that did not meet the inclusion criteria were removed. We also made a determination at this stage to review only Level I studies. For the remaining articles, we divided titles and abstracts into two broad themes for further review: physical activity and psychoeducational interventions.

The full-text versions of potential articles were retrieved, and the review teams made further exclusions on the basis of predetermined exclusion criteria. A summary of article exclusions with reasoning is presented in the PRISMA diagram (Moher, Liberati, Tetzlaff, & Altman, 2009) in Figure 1. The final review included 54 Level I articles. Each article was summarized in an evidence table that displays the methods and major findings for physical activity interventions (Supplemental Table 1, online) and psychoeducational interventions (Supplemental Table 2). Particular attention was given to the following outcomes: function, pain, depressive symptoms, self-efficacy, and fatigue.

Physical Activity Interventions

The physical activity interventions discussed in the articles were divided into six subthemes: home exercise and coaching (n = 4), dynamic exercise (n = 7), aquatic exercise (n = 2), aerobic exercise (n = 2), resistive exercise (n = 3), and Tai Chi and yoga (n = 3).

Home Exercise and Coaching. The home exercise and coaching theme included 1 systematic review and 1 randomized controlled trial (RCT) with subgroup analysis and follow-up. The systematic review, which included 8 studies, reported that home exercise programs were effective in improving strength, mobility, and self-efficacy and reducing stiffness and pain (Crowley, 2009). The RCT examined the effect of coaching to encourage physical

Figure 1. PRISMA diagram for the systematic review.

Note. LE = lower extremity; OT = occupational therapy; PRISMA = Preferred Reporting Items for Meta-Analyses; RA = rheumatoid arthritis; UE = upper extremity. Format from “Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement,” by D. Moher, A. Liberati, J. Tetzlaff, and D. G. Altman; The PRISMA Group, 2009, PLoS Medicine, 6(6), e1000097. https://doi.org/10.1371/journal.pmed1000097
activity (30 min of exercise >4 days/wk). Results showed an increase in perceived health status and strength in the intervention group compared with the control group (Brodin, Eurenius, Jensen, Nisell, & Opava, 2008). A subsequent subgroup analysis of participants (Sjöquist, Almqvist, Asenlöf, Lampa, & Opava, 2010) indicated that the coaching intervention may be most useful for participants with more severe disease symptoms. However, a 2-yr follow-up of the same participants found that improvements were not maintained (Sjöquist, Brodin, Lampa, Jensen, & Opava, 2011).

Dynamic Exercise. Dynamic exercise is defined as exercise in which recurrent and substantial body movements predominate (“Dynamic Exercise,” 2008). Six Level I studies (3 systematic reviews and 3 RCTs) included interventions that combined strength and aerobic training. Cairns and McVeigh’s (2009) review of 18 studies suggested that people with RA should be encouraged to participate in a dynamic exercise program (with caution) because of its positive effects on function, muscle strength, and aerobic capacity. Oldfield and Felson’s (2008) review included 5 studies on dynamic exercise and concluded that exercise appears to improve function, fatigue, and depression. Gaudin et al.’s (2008) systematic review of 9 RCTs reported that dynamic exercise improved muscle strength but not function. Finally, a systematic review of interventions for fatigue (Cramp et al., 2013) that included 6 studies on dynamic exercise reported that exercise had a small benefit in reducing fatigue.

Three RCTs assessed a combination of exercises. Baillet et al. (2009), who compared a dynamic exercise intervention group with a conventional rehabilitation control group, found that function initially improved at 1 mo, but improvements were not maintained at 6 or 12 mo. Breedland, van Scheppingen, Leijisma, Verheij-Jansen, and van Weert (2011), who compared 8 wk of a multidisciplinary exercise and education program with a wait-list control condition, reported no group differences in health status or muscle strength postintervention. In contrast, Strasser et al. (2011), who compared a strength and endurance program with a stretching exercise control condition, found that the strength and endurance group had a significant reduction in disease activity and improvement in pain, function, and general health compared with the stretching exercise group.

Aquatic Exercise. Two systematic reviews examined the effects of aquatic exercise on function, pain, joint tenderness, and quality of life. Al-Qubaeissy, Fatoye, Goodwin, and Yohannes (2013) reviewed 6 RCTs and found short-term positive effects on quality of life. Oldfield and Felson’s (2008) review on exercise therapy, which included two studies on aquatic exercise, indicated that aquatic exercise improved quality of life and function, but improvements were not significantly different from those in land-based exercise conditions.

Aerobic Exercise. Two studies examined aerobic exercise as an independent intervention. A meta-analysis of 14 RCTs concluded that aerobic activity undertaken at 50%–90% of maximal heart rate resulted in significant improvements in pain and quality of life compared with nonaerobic control conditions (Baillet et al., 2010). An RCT comparing therapist-supervised aerobic exercise with an unsupervised aerobic exercise home program (Hsieh et al., 2009) reported a significant increase in aerobic capacity in the supervised exercise group but no significant changes in function.

Resistive Exercise. Three studies, 1 meta-analysis and 2 RCTs, examined the effectiveness of resistive exercise. The meta-analysis of 10 RCTs comparing interventions using resistance with those without resistance found that resistive exercise improved muscle strength, function, and walking ability (Baillet, Vaillant, Guinot, Juvin, & Gaudin, 2012). An RCT by Flint-Wagner et al. (2009) compared an individualized low- and high-intensity strength training intervention with usual care. The study concluded that high-intensity strength training may lead to improvements in muscle strength, function, and decreased pain. Another RCT comparing a 24-wk high-intensity progressive resistive training condition with a home-based exercise condition concluded that such training significantly increased muscle mass, strength, and walking ability but not function (Lemmey et al., 2009).

Tai Chi and Yoga. A systematic review of 8 RCTs of yoga interventions reported weak evidence for the use of yoga for people with RA and recommended that yoga be considered an ancillary treatment (Cramer, Lauche, Langhorst, & Dobos, 2013). An RCT (Evans et al., 2013) that compared a 6-wk biweekly Iyengar yoga program with a wait-list control found that yoga resulted in improvements in pain, function, general health, and vitality that were maintained at a 2-mo follow-up assessment.

The effectiveness of Tai Chi was examined in 1 Cochrane review of 4 studies that compared Tai Chi with any other type of therapy (Han et al., 2004). Results of the review indicated that Tai Chi interventions did not produce clinically important or significant changes in disease activity, function, tender and swollen joints, or global ratings. However, participants reported enjoying Tai Chi, and the intervention had a higher level of participation than typical interventions.
Psychoeducational Interventions

The psychoeducational interventions assessed in the articles were divided into seven subthemes: patient education and self-management (n = 7), cognitive–behavioral therapy (CBT; n = 13), multidisciplinary approaches (n = 3), joint protection (n = 5), assistive devices (n = 1), emotional disclosure (n = 3), and comprehensive occupational therapy (n = 1).

Patient Education and Self-Management. For the purposes of this review, the patient education and self-management theme includes studies that used an education program to address broad topics such as the definition of RA, symptom management, and communication with health care providers, all in an attempt to help participants better self-manage RA. These educational programs either were created specifically for the study or were already well established, such as the Arthritis Self-Management Program (ASMP; Lorig, Lubeck, Kraines, Seleznick, & Holman, 1985).

Two RCTs evaluated the effects of the ASMP. Solomon et al. (2002) found that participants in the ASMP group did not show a difference in pain or function compared with the control group. However, Conn et al. (2013) found that both the ASMP and the usual-care groups improved at the same rate until participants attended four or more sessions, after which a significant 20% improvement in tender and swollen joints, but not function, was observed.

Other studies in this category more broadly evaluated the effects of nonstandardized patient education and self-management interventions, all with varied results. A meta-analysis of 17 self-management studies reported small improvements in pain and function, but the studies had high dropout rates (Warsi, LaValley, Wang, Avorn, & Solomon, 2003). Another systematic review that included 7 RCTs on patient education (Niedermann, Fransen, Knols, & Uebelhart, 2004) concluded that although patient education programs increased overall knowledge and adherence, they resulted in no change in tender and swollen joints, pain, function, or strength and that the evidence for the effects on self-efficacy and long-term behavior change was inconsistent.

Cramp et al.'s (2013) Cochrane review of 24 studies of interventions for fatigue in people with RA concluded that psychosocial interventions, the majority of which were education or self-management based, provide a small benefit in managing fatigue. A 1-wk educational program RCT, delivered with both word and picture supplements, significantly increased participants’ knowledge of RA, but no differences between groups and no effect on depression or function were found (Walker et al., 2007). A final RCT that provided group education, self-management, and an exercise program with homework found that the intervention group demonstrated significantly better function, self-efficacy, disease measures, and pain after 12 wk compared with the control group (Manning et al., 2014).

Cognitive–Behavioral Therapy. The CBT theme included studies that provided a psychological component with the intervention in addition to, or instead of, broad patient education. Psychological interventions commonly use CBT, which aims to influence coping behavior at a deeper level by reorganizing the cognitive process related to one’s disease experience (Zautra et al., 2008). Ten RCTs, 1 systematic review, and 2 meta-analyses with this intervention theme were reviewed.

Niedermann et al.’s (2004) systematic review of 4 RCTs on CBT concluded that CBT increased short-term coping abilities but that long-term effects were seen in only half the studies. Two meta-analyses (Astin, Beckner, Soeken, Hochberg, & Berman, 2002; Knittle, Maes, & de Gucht, 2010) concluded that, overall, CBT had a small but significant effect on pain, function, and psychological status.

The RCTs reported similar findings. Three studies found no changes in pain, function, or depression after CBT compared with control conditions (Freeman, Hammond, & Lincoln, 2002; Multon et al., 2001; Shigaki et al., 2013), and another study reported improvements in depression (Garnefski et al., 2013). The latter RCT, along with another RCT (Shigaki et al., 2013), also found improvements in self-efficacy in the CBT group compared with the control group.

Another RCT found less depression and a significant improvement in overall pain in both the CBT and the control groups (Sharpe et al., 2001); however, the CBT group experienced significantly fewer depressive symptoms at 6 and 18 mo postintervention and significantly better function and anxiety after 18 mo (Sharpe, Sensky, Timberlake, Ryan, & Allard, 2003). A subsequent study compared the same CBT protocol with behavioral therapy (BT), cognitive therapy (CT), and a wait-list control (Sharpe & Schrieber, 2012). This study found that the CBT and CT groups had less disease activity both immediately after intervention and after 6 mo and that the BT and CT groups had less anxiety than the CBT or control groups. No changes in function were found, but depression improved over time in all groups.

Finally, an RCT that compared a participant-and-spouse intervention with a participant-only intervention revealed improved function and psychological functioning in both groups. However, communication improved significantly in the participant-and-spouse group at 6-mo
follow-up (van Lankveld, van Helmond, Näring, de Rooij, & van den Hoogen, 2004).

Two studies evaluated mindfulness interventions. An RCT (Pradhan et al., 2007) found that eight weekly sessions of mindfulness-based stress reduction along with three refresher classes over 4 mo resulted in no group differences at 2-mo follow-up. However, significant improvements in well-being and depressive symptoms were found when the intervention group was compared with the control group 6 mo postintervention. A second RCT comparing CBT with mindfulness-based emotion regulation (Zautra et al., 2008) found that the CBT group demonstrated better cognitive control of disease symptoms and pain control and that the mindfulness group had better awareness of coping and emotions and physician-rated joint tenderness.

Multidisciplinary Approaches. Three studies within the multidisciplinary approaches theme were reviewed. A multidisciplinary approach was defined as interventions implemented by two or more disciplines including occupational therapy.

A systematic review of 11 studies that evaluated multidisciplinary interventions (Badamgarav et al., 2003) found that overall improvements in function were small and not significant. However, the review noted that multidisciplinary interventions lasting >5 wk resulted in significantly better improvements than those lasting ≤5 wk. A second systematic review (Christie et al., 2007) of 28 studies of occupational and physical therapy interventions concluded that high-quality evidence supported the use of joint protection and patient education to improve function and that the evidence for exercise and comprehensive occupational therapy in improving pain and function was of low quality.

In a large RCT (Primdahl, Wagner, Holst, & Hørslev-Petersen, 2012), participants received an educational component before being randomly assigned to different follow-up conditions. No changes were found after 3 mo, but after 1 yr self-efficacy scores were significantly improved in the group receiving multidisciplinary follow-up care compared with those receiving no planned follow-up care.

Joint Protection. Five RCTs evaluated the effectiveness of joint protection. Even though joint protection is sometimes a component of a broader educational intervention, the interventions in these RCTs offered individualized joint protection instruction using psychoeducational components to more permanently influence behavior change. One study (Hammond, Jeffreson, Jones, Gallagher, & Jones, 2002) that included four 2-hr face-to-face sessions and a home program resulted in a significant increase in the use of joint protection behaviors after 3 mo. Immediately after intervention, increases in grip strength, overall knowledge, and self-efficacy were seen. A 4-yr follow-up of these same participants found that even though function decreased in both groups over time, this decline was steeper in the control group (Hammond & Freeman, 2004). The intervention group also demonstrated less morning stiffness, fewer joint deformities, improved self-efficacy, and improved perceived control of their illness.

Niedermann et al. (2011) provided four 45-min sessions on joint protection over 3 wk. The intervention resulted in improved use of joint protection behaviors and pain levels in both the intervention and control groups. However, at the 3-mo follow-up, pain levels were maintained in the intervention group but returned to baseline in the control group. Another study using the same protocol demonstrated that at both 6-mo and 12-mo follow-up, the intervention group continued to increase joint protection behaviors and increased grip strength and self-efficacy (Niedermann et al., 2012). Similarly, Masiero et al. (2007) found that 8 mo postintervention, the joint protection intervention group had significant improvements in function, disease symptoms, social interaction, and pain compared with the control group.

Assistive Devices. Only 1 study was identified that assessed the effectiveness of an assistive device in people with RA. This Cochrane review (Tuntland et al., 2009) found only 1 intervention study on assistive technology. This study evaluated the helpfulness of an adaptive eye-drop device and found that, compared with an unadapted bottle, the device may improve the ability to squeeze drops from the bottle, aim drops, and control the number of drops and prevent any negative side effects resulting from touching the eye with the eye-drop bottle. Thus, the review found very limited evidence for the use of assistive technology interventions for people with RA.

Emotional Disclosure. Three RCTs within the emotional disclosure theme were reviewed. The intervention used in all of these studies involved either writing in a journal or speaking into a tape recorder about upsetting or emotional experiences that had occurred over the course of the day or week. Mixed results were seen, but a combination of written and spoken emotional disclosure may contribute to a reduction in pain at 6 mo postintervention (Lumley et al., 2011). No significant difference was seen in psychological well-being at 3 mo postintervention (van Middendorp, Geenen, Sorbi, van Doornen, & Bijlsma, 2009). Similarly, no significant improvement in disease activity or emotional reactions occurred among the intervention group compared with the control group postintervention or at 6 wk, but mood had significantly improved by 10 wk (Wetherell et al., 2005).
Comprehensive Occupational Therapy. Although all of the preceding interventions may be incorporated into occupational therapy practice, one study examined a comprehensive occupational therapy intervention that incorporated multiple facets that do not compare with the specific, single-intervention studies. In an RCT (Macedo, Oakley, Panayi, & Kirkham, 2009), occupational therapists completed comprehensive assessments and developed individualized treatment plans for participants in the intervention group using the Canadian Occupational Performance Measure. After 6 mo, improvements in coping, function, work productivity, pain, and tender joint count were all significantly greater in the intervention group than in the control group.

Discussion
This systematic review found strong evidence to support the use of physical activity and psychoeducational interventions to improve function, pain, fatigue, depression, self-efficacy, and disease symptoms in people with RA. Across themes, 51 articles were Level I systematic reviews, meta-analyses, or RCTs.

None of the included studies reported adverse events or increased disease activity in participants. Thus, physical activity appears safe for people with RA and does seem to improve pain and function. Although the majority of RCTs reported group differences in favor of the intervention condition, a small number of studies found no significant changes in intervention groups compared with control groups. These studies often involved interventions that were short in duration, such as 1 wk (Walker et al., 2007) or used interventions that were very similar, such as the ASMP versus The Arthritis Helpbook (Solomon et al., 2002), which is a part of the ASMP, or CBT versus arthritis education programs (Freeman et al., 2002; Multon et al., 2001).

The Cochrane review that examined Tai Chi (Han et al., 2004) found that even though the physical measurement of symptoms did not change, self-report scores indicated improvement. This trend was observed in several other studies with both subjective and objective outcome measurements, indicating that outcomes important to people with RA, such as function and well-being, may still change even if disease activity measures such as tender joint counts do not change.

The studies varied with regard to number of participants, outcome measures, types and length of interventions, and length of follow-up periods. More research is needed to determine the optimal amount and type of maintenance needed to sustain improvements. Several of the studies included in our review, especially those using joint protection, CBT, or a multidisciplinary approach, found long-term improvements in function, pain, depression, and self-efficacy from 6 mo to as much as 4 yr postintervention (Hammond et al., 2002; Masiero et al., 2007; Niedermann et al., 2012; Primdahl et al., 2012; Sharpe et al., 2003; Shigaki et al., 2013). Outcome measures varied; however, most are widely used in rheumatology research but not in occupational therapy. In addition, many of the measures of function do assess areas of occupational performance but are referred to as measures of function, functional performance, or functional disability.

Additional high-quality research is needed to demonstrate the efficacy of assistive technology in helping people with RA. The 1 study included that addressed this topic (Tuntland et al., 2009) was a Cochrane review that included 1 study and excluded 12 others because they were not RCTs, controlled trials, clinical controlled trials, or controlled before-and-after studies.

Risk of Bias and Limitations of the Review
Details regarding the risk of bias for each individual study are included in Supplemental Tables 3 and 4 (online). Although all of the studies included in this review were Level I studies and many were RCTs, it was almost impossible to blind participants to group allocation. The majority of the studies used self-reports as outcome measures. Many of the studies on physical activity used several concurrent interventions, and it was difficult to determine the effectiveness of single types of physical activity.

Limitations of this review also include the potential for incomplete retrieval of identified research and for a reporting bias resulting from exclusion of studies included in the systematic reviews but inclusion of follow-up studies that were not in the systematic reviews. In addition, we did not include studies that had participants with a variety of arthritic conditions. Unless separate analyses were performed for the participants with RA, there would be no way to separate the effects of interventions on people with other types of arthritis versus RA.

Implications for Occupational Therapy Practice
For the 1.5 million Americans living with RA (CDC, 2014), the disease activity leads to decreases in occupational performance, social participation, and work productivity. Additional symptoms such as pain, fatigue, depression, and decreased self-efficacy further contribute to disability in this population.

The majority of the studies in this review were not designed or completed by occupational therapists and,
thus, were not occupation based. For that reason, this systematic review focused on the efficacy of interventions within the scope of occupational therapy practice to improve both physical and psychosocial outcomes and maintain independence. We conclude the following implications for occupational therapy practice:

- Occupational therapy practitioners should be mindful of each person’s disease process and plan around both flare-ups and stable periods to make the most of interventions (Gauden et al., 2008).
- Strong evidence was found to support aerobic exercise, resistive exercise, and aquatic exercise as individual interventions for the reduction of pain, improvement of quality of life, and overall independence. Occupational therapy practitioners may incorporate exercise approaches such as coaching, home exercise, aquatic exercise, general strength training, or aerobic exercise.
- Occupational therapy practitioners may use components of Tai Chi, yoga, or dynamic exercise programs to improve fatigue, depression, and vitality or recommend that clients participate in community-based programs.
- Practitioners can use a variety of psychoeducational interventions such as general patient education, self-management, CBT, and individualized joint protection to improve function, pain, fatigue, depression, and self-efficacy.
- Practitioners should keep in mind the outcome of self-efficacy to empower clients with RA. Even though laboratory measures of disease activity may not appear to change, improvements in self-efficacy may have positive effects on psychological status, function, and overall well-being.

### Acknowledgments

We thank Marian Arbesman and Deborah Lieberman for their support and assistance with this review. We also thank Fabiola Contreras for her assistance in formatting tables and references. Portions of this article were presented at the 2015 AOTA Annual Conference & Expo.

### References


*Indicates studies that were systematically reviewed for this article.*


