**The impact of occupational therapy on the self-management of rheumatoid arthritis: a mixed methods systematic review.**

**Running head** Occupational therapy impact on rheumatoid arthritis self-management

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**Abstract (Limit: 250 words; Count: 248 words)**

*Objective* To determine the impact of occupational therapy (OT) on the self-management of function, pain, fatigue and lived experience for people living with rheumatoid arthritis (RA).

*Methods* Five databases and grey literature were searched up to 30 June 2022. Three reviewers screened titles and abstracts, with two independently extracting and assessing full texts using the Cochrane risk of bias (quantitative) and Critical Appraisal Skills Programme (CASP) (qualitative) tools to assess study quality. Studies were categorized into four intervention types. Grading of Recommendations, Assessment, Development and Evaluations (GRADE) (quantitative) and GRADE-CERQual (qualitative) were used to assess the quality of evidence for each intervention type.

*Results* Of 39 eligible papers, 29 were quantitative (n=2,029), 4 qualitative (n=50) and 6 mixed methods (n=896). Good evidence supports patient education and behavior change programs for improving pain and function, particularly group sessions of joint protection education, but these do not translate to long-term improvements for RA (>24 months). Comprehensive OT had mixed evidence (limited to home OT and an arthritis gloves program), whereas limited evidence was available for qualitative insights, splints and assistive devices, and self-management for fatigue.

*Conclusion* Although patient education is promising for self-managing RA, no strong evidence was found to support OT programs for self-managing fatigue or patient experience and long-term effectiveness. More research is required on lived experience and the long-term efficacy of self-management approaches incorporating OT, particularly timing programs to meet the individual’s conditional needs (i.e., early or established RA) to build on the few studies to date.

*Systematic review registration:* PROSPERO CRD42022302205

*Keywords:* Rheumatoid arthritis, function, arthritis, fatigue, self-management, occupations.

**Significance and Innovations**

* This is the first mixed methods systematic review of the role of OT in the self-management of RA.
* Educational programs incorporating behavioral strategies, offered by OT, appear to be the most effective strategy to improve pain and function for people living with RA for up to 24 months.
* As yet, limited evidence exists supporting self-management programs incorporating OT to reduce fatigue in people living with RA.
* Future research should aim to capture qualitative evidence from people with RA to better understand why self-management programs are effective or not.

Rheumatoid arthritis (RA) is a systemic, autoimmune inflammatory disease impacting around 18 million people worldwide (1, 2), which can cause joint pain, fatigue and muscle weakness (3). In the long-term, uncontrolled disease activity (i.e., inflammation) leads to deterioration of joint cartilage and bone tissue (4), and consequently, disability. Treatment involves medication to control inflammation (5) and multidisciplinary team (MDT) care to improve disease, mental health and physical outcomes. Occupational therapists are well-placed to support RA self-management beyond outpatient care and into daily life. They can equip individuals to adopt strategies to manage the symptoms, the physical and psychological consequences, and the lifestyle transitions associated with RA (6, 7). Although access is limited (8), the holistic approach of occupational therapy (OT) supports MDTs to facilitate client involvement for long-term self-management beyond hospital care. Examples include, supporting RA patients in managing medications, regular physical activity, pacing and energy conservation/management, and accessing medical care during flare-ups (9, 10).

Rheumatoid arthritis symptoms fluctuate, and over time, the disease can limit an individual’s participation in work, caring, household duties, and social activities (11, 12). OT is an effective, non-pharmacological treatment for RA (10, 13), supporting individuals to self-manage in their everyday lives (14). Occupational therapists provide strategies to enhance performance in daily activities, support choices in meaningful occupations, and to engage in practical tasks whilst managing pain and fatigue (10). The effectiveness of OT for RA was last reviewed systematically in 2017 (13), with studies included up to 2014. Based on trials, the evidence suggests that OT-related interventions can improve function through joint protection training (10, 15), physical activity, and educational-behavioral programs, including self-management and assistive devices (13, 15). No synthesis of both quantitative and qualitative findings related to the self-management of RA incorporating OT exists. What remains unclear is the effectiveness of OT in supporting long-term, patient-led self-management of RA on measurable outcomes (e.g., function) and the lived experience of individuals with RA.

Recent narrative reviews of the experiences of living with RA highlight the importance of self-management in equipping people to ‘renegotiate the self’ to manage the emotional and cognitive impacts after disease onset (16, 17). Based on these reviews, OT is most likely to be effective in supporting the self-management of RA by targeting self-esteem, self-efficacy, and self-perception of the illness. Self-efficacy is a major contributor to self-management, given that it reflects an individual’s belief in their ability to manage the disease and it’s symptoms (14). These findings are particularly relevant given recent evidence that the Coronavirus (COVID-19) pandemic has significantly impacted people’s ability to self-manage effectively due to heightened anxieties and increased uncertainty (18, 19).

This is the first mixed methods review of the role of OT in the self-management of RA. It assesses both the effectiveness of self-management interventions involving OT and provides insights into individuals’ experiences of participating in OT for the self-management of RA. It aims to assess the impact of OT on the self-management of RA by reviewing quantitative and qualitative evidence, addressing both patient perspectives and quantifiable outcomes.

**Materials and Methods**

The review protocol was registered on PROSPERO (CRD42022302205) and published in June 2022 (20). Findings are reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (21).

*Information sources and searches*

Searches were conducted via 5 electronic databases: MEDLINE, CINAHL, AMED, PsycINFO and Web of Science (Core Collection), from their earliest date to 1 April 2022, with a refresher search on 30 June 2022. Grey literature searches were across: subject-specific bibliographic databases (OTseeker, OTSearch, OTDBase); the LWW Health Library: Occupational Therapy Collection; the Rehabilitation Field and Musculoskeletal Group databases (Cochrane Collaboration); and academic theses, trials databases, and conference abstracts (published and unpublished), and the Cochrane Library, (NICE) Evidence search, UpToDate [Wolters Kluwer], and the RCOT Library.

The search strategy was co-produced with RA patients and professionals (22) (Table 1). The initial search terms were drafted by the principal investigator (JG), and then peer-reviewed by the co-authors (JL, CB, JA and VF) for the project grant bid (January-February 2021). These terms were then used as the basis of the review’s search strategy. Thereafter, our newly qualified OT researcher (LR) was guided by our librarian co-author (VF) to test the search terms, and subsequently refine the search strategy based on scoping searches (May-July 2021). Co-author, JL, provided expertise on search terms common to qualitative and mixed methods research. Finally, a 90-minute online workshop was held with RA patients (n=5) and facilitated by two reviewers (JG and LR) to refine the search strategy, taking into account patient perspectives (September 2021). The draft search terms, structured using SPIDER, were shared with our patient partners who provided feedback to ensure that terms resonated with their lived experiences. Partners contributed twelve additional terms; these were finally checked by two rheumatology occupational therapists, within the lead reviewer’s (JG) professional network.

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*Study selection*

The inclusion criteria were based on the SPIDER framework: Sample (adults diagnosed with RA), Phenomenon of Interest/Intervention (OT for self-management [including culturally adapted programs]), study Design (primary, qualitative and quantitative research), Evaluation/outcome, Research type (qualitative, quantitative or mixed methods) (see Supplementary Table 1). Only English language papers were included. Based on pilot searches, and to limit the likelihood of excluding relevant studies, outcomes informed the screening process but were not included in the final search strategy (20).

Selection involved firstly conducting a pilot screening, and then full screening (including title and abstract, and then full text). To begin, one reviewer ran the search strategy and removed duplicates (LR) using EndnoteWeb, then papers were exported to a shared Microsoft OneDrive account then uploaded to Rayyan for screening and data extraction. Next, in piloting three reviewers (LR, VF and JG) used Rayyan software (23) to independently screen 20 randomly selected papers. Titles and abstracts of the pilot papers were screened using a predefined tool based on the eligibility criteria and published elsewhere (20). Finally, all three reviewers met to agree on individual papers and refine the eligibility criteria.

In full screening, three reviewers (JG, LR and VF) used the eligibility criteria (Supplementary Table 1) to screen titles and abstracts, and finally, two reviewers (JG and LR) screened the full-text papers to identify papers for data extraction. Disagreements were resolved in discussion with a clinically experienced reviewer (AH or CB). The reference lists of full-text papers and previous reviews were checked for additional papers (11, 24-28). Grey literature screening followed the same process and was conducted via the OneDrive account.

*Outcomes*

Based on previous reviews (10, 13), the primary quantitative outcomes were: function (including strength and mobility), pain, and fatigue. The primary qualitative evaluation was lived experience and related concepts including, self-care, self-efficacy, occupational balance, and self-management (including problem-solving/goal setting). RA patients reviewed and refined the initial outcomes identified by the reviewers (22); these were later finalized by the research team. Some outcomes were assessed both quantitatively and qualitatively (e.g., self-efficacy and pain).

*Data extraction and quality assessment*

Two reviewers (JG and LR) independently extracted, synthesized, and assessed the data quality from included papers using a standardized Microsoft Excel form (20). Data were extracted on i) general information (including date and methodology), ii) study eligibility, iii) characteristics of included studies, iv) risk of bias assessment, v) data and analysis, and vi) other information (including conclusions and recommendations). When further information was required, the lead reviewer (JG) contacted the paper’s author(s).

The Cochrane risk of bias tool (29) was used to assess the quality of quantitative papers (seven assessment domains), and the Critical Appraisal Skills Program (CASP) tool (30) for qualitative papers (ten assessment domains). For mixed methods papers, quantitative data were assessed with risk of bias, and qualitative data with CASP. The overall quality of quantitative papers was determined using the criteria: ‘low risk’, when three or fewer domains were deemed an unclear risk and no domains were high risk; ‘moderate risk’, when three or more domains were unclear risk and one domain was deemed high risk; ‘high risk’, when two or more domains were rated as high risk (31). The overall quality of qualitative papers was scored out of ten, with scores: >9 deemed high quality; between 7 and 9 deemed moderate quality; and scores <7 deemed low quality (16).

Selected papers were categorized into 4 intervention types: i) patient education; ii) behavior change; iii) comprehensive, community (home) OT – quantitative and qualitative; and iv) other interventions (including exercise and workplace) (10). Confidence in the findings for each intervention type was rated using the Grading of Recommendations, Assessment, Development and Evaluations’ (GRADE) approach for quantitative, and the GRADE Confidence in Evidence from Reviews of Qualitative research (CERQual) approach for mixed methods and qualitative (32). Papers were rated as high, moderate, low, or very low-quality evidence.

*Data synthesis and analysis*

Characterization and quality assessment of selected papers was based on those deemed most effective in promoting physical and psychosocial health in people with RA. Information from papers are presented in separate quantitative and qualitative tables (32), containing descriptive statistics and quotations, respectively, to summarize papers. Given the limited qualitative papers eligible for review, thematic analysis was unnecessary; instead, the reviewers used the themes identified by the paper authors.

**Results**

*Study selection and characteristics*

Initially, 2,389 articles were identified, including 23 grey literature articles. Following title and abstract screening, 160 articles were accepted for full-text screening. Finally, 34 articles and 5 grey literature articles met the eligibility criteria (29 quantitative, including 15 RCTs, 6 CCTs, 4 qualitative and 6 mixed methods) (Figure 1).

<<< Insert Figure 1 here >>>

Characteristics of the 39 included articles (n=2,018 adults with RA) are summarized in Tables 2 (intervention type and OT role) and 3 (participants, methods, and results). Three papers reported from an education behavioral RCT (33-35), 2 papers from a workplace RCT (11, 28), 2 from an arthritis gloves trial (36, 37), and 1 study and report from a group cognitive behavioral therapy (CBT) RCT (38, 39). Only 4 studies reported on participant ethnicity (35, 38, 54, 62).

<<< Insert Table 2 here >>>

<<< Insert Table 3 here >>>

*Patient education*

Studies with interventions emphasizing patient education were reported in 16 papers (n=1,021): 1 high (40), 1 moderate quality (41) (qualitative), and 6 moderate and 8 high risk of bias (quantitative, including a MA thesis (41)). In Hammond’s (43) cohort study, behavior change was assessed using the Joint Protection Behavior Assessment (JPBA) (43) following 2 educational sessions on: i) joint protection and awareness of activities of daily living (ADLs) (85 minutes), and ii) energy conservation/management and exercise (120 minutes). Greater attention to joint protection was reported post-intervention, yet this did not translate into behavior change. The follow-up RCT focusing on behavior change found that 4 group education sessions (2 hours weekly on joint protection behaviors) led to improved pain, fewer GP visits and flare-ups post-12 months (33). Although adherence to joint protection and reduced joint stiffness were reported post-48 months (34), functional ability and pain returned to baseline levels. Both studies (33, 43) focused on early RA (mean duration=1.6 years) and did not blind outcome assessors.

Masiero and colleagues’ (45) RCT involved occupational therapists in developing and delivering a multidisciplinary intervention focusing on joint protection for moderate-to-severe RA (mean duration=15.4 years). Like Hammond and Freeman (33), four 2-hour group education sessions involving spouses/partners were run every 3 weeks, covering: joint protection in ADLs, environmental adaptations, and exercises. Pain, function, and disability significantly improved post-intervention for the education group, but not usual care.

One RCT used a pictorial ‘PRISM’ tool (based on social learning and self-management) to complement traditional education, to enhance short-term improvements in joint protection behavior (6 months) and adherence (12 months) (46). Four 45-minute sessions involving partners/spouses, plus a 2-month follow-up, led to participants viewing joint protection as a coping method for daily tasks via pain and function management (40). Other benefits included personal control, self-acceptance and improved psychological wellbeing: “*…more positive towards life*”; “*less stress because of easier task performance*” (40) (p. 149).

Barriers to joint protection education related to a negative self-image, perceived disability, and complicating task performance (Table 3). Adherence to self-management was also reported up to 24 months for early RA following four 1-hour individual treatments and a 2-hour group workshop (35). Function, pain or self-efficacy remained unchanged. Elsewhere, adding hand exercises to an 8-week RCT of joint protection education led to increased strength, but not disability, pain or ADLs (47). Two pilot RCTs promoting energy conservation (48, 49) found 6 weekly educational sessions (each 90 minutes, using the PRECEDE model (50)) did not significantly affect pain, fatigue, function or behavior at 9 months, nor did standard OT.

One 2-hour self-help group involving relaxation, exercise and joint protection led to 84% changing their ADL performance and 85% of participants improving their understanding of RA (41). In a 6-month CCT (51), elective group workshops and individual education were associated with improved problem-solving but not knowledge or fatigue. Another high-risk CCT involving a half-day OT education session over 3 months led to increased strength and function at 3 months (26). One self-instructional OT program (four 20-25 minute sessions) increased knowledge but not task performance/function; mobility exercises, joint protection, and nursing had no added benefit (27). Finally, a high-risk cohort study reported 1-hour of OT increased patient knowledge at 6 months, but pain, function and fatigue were not assessed (52) (Table 3).

*Behavior change*

Six RCTs and 1 cohort study reported programs focusing on behavior change. The cohort study (44) observed improved knowledge but not pain or behavior up to 12 weeks after four 2-hour weekly group sessions (including personalized strategies and goal-setting for joint protection). Reasons for unchanged behavior related to difficulties changing habits, lack of skill, and joint protection viewed as inappropriate for established RA (disease duration=6.4 years). The follow-up RCT (33) did reduce pain and showed trends for improved self-efficacy at 6 months (duration=1.1 years). One RCT (38) used group CBT (6 weekly 2-hour sessions with an hour consolidation) to increase self-efficacy at 26 weeks and reduce fatigue 2 years post-intervention. In a head-to-head comparison, CBT and OT group for 10 weekly sessions (2 hours each) had similar effects on increasing knowledge and promoting active involvement in self-management (25). Only CBT led to improved pain-coping behavior. A similar program was used for self-management for short-term improvements in illness perception and pain self-efficacy, but not pain (53). Interestingly, only six studies measured self-efficacy (three behavior change [33, 38, 53]; three patient education [35, 46, 62]; with one report [39] and one guideline [61] reporting on these studies) (Table 3).

*Comprehensive, community-based (home) OT*

1. *Quantitative studies*

Interventions targeting occupational performance were reported in 2 RCTs and 1 CCT. Two additional studies used comprehensive OT but were not community-based and addressed patient education (35, 52). One RCT (24) reported home-based OT (6 weeks, individual treatment) improved function 12 weeks post-intervention for established RA. Assessor blinding was used, but not participant blinding (Table 4). The other 6-month RCT (54) did not blind participants or assessors. This involved 6 to 8 sessions (30-120 minutes; at home, clinics, and/or workplace), which improved function, coping, and work performance more than usual care. The CCT (55) incorporated four OT sessions (each 60-90 minutes) into a 10-day physiotherapy program, reporting improvements in pain, disability, and occupational performance 1-month post-intervention. However, there was no control, nor participant and assessor blinding.

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1. *Qualitative studies*

Two interview studies involving personalized home OT (weekly for 6-12 weeks) were reported across 3 papers exploring the changing beliefs, values and knowledge in participants with early RA (n=21; aged 38-67 years; diagnosis ≤2 years) (56-58). Two papers were of moderate quality (56, 57) and one of low quality (58) (Table 5).

<<< Insert Table 5 here >>>

Six core themes were identified relating to i) illness, as a driver for personal change, ii) independence, iii) activity and iv) altruism, as values/traits the participants possessed pre-diagnosis (that were subsequently influenced by RA and home OT), v) self-care, and vi) self-respect, as emerging from engaging in home OT (Table 3) (56, 58). RA patients redefined their views of independence, however functioning in activities remained similar, albeit ‘within their means’:

*“Being active, being able to work…Being able to use my brain…that’s all still there…I just have to learn different roads to get to the same way…”* (56) (p. 402)

Following home OT, self-care changed from a fear of losing independence to being more accepting of help whilst continuing to help others (Table 3) (56). Device and splint provision were initially observed as “*a step down*”, whereas post-intervention, these aids became “*a way to increase what I am* *able to do”* (57). Pacing in daily tasks also became beneficial:

*“Pacing myself? … take more pleasure in what I do…instead of thinking about it, I’m actually feeling it.”* (56) (p. 404)

Around 80% reported OT recommendations conflicted with personal values, particularly energy conservation advice, self-pacing and help-seeking strategies (57):

*“…to finish what I start was important … resting made me feel guilty.”* (56) (p. 35)

Patients with established RA developed rules for moderating daily activities based on pain and tiredness.

*Other interventions*

Four studies involving 267 participants found splint provision and assistive devices (36, 37, 59, 60) had little impact on function, pain and occupational performance. Other salient splint and device studies targeting RA were identified in screening; however, only the four above involved both occupational therapy and, self-management, delivered to patients with RA or undifferentiated inflammatory arthritis. The arthritis gloves trial (36, 37) fitted intervention group participants with three-quarter length Isotoner® gloves (exerting 23-32 mmHg pressure), and the control group receiving Jobskin® oedema gloves (exerting 15-25 mmHg pressure);both groups were provided with a hand self-management booklet including joint protection and hand exercises. Isotoner® compression gloves were no more effective than the loose-fitting placebo gloves, nor cost-effective (36). Nested interviews revealed participants liked both the compression and placebo gloves’ thermal qualities and comfort in light activities but were ambivalent about use (37).

One practice guideline (updated for 36, 37) advocated wrist orthoses to reduce pain, based on review evidence alone (61). Quantitative studies focusing on methods of splint provision (59, 60) were limited to pre- and post-immediate time points, lacked allocation concealment, and participant, personnel and assessor blinding. Callinan and Mathiowetz (59) used a single-group crossover study with random allocation to either a soft, hard or no splint for 28 days without a ‘washout’ period. Occupational therapists fitted and instructed participants on splint use for the dominant hand, which did not affect function, but soft splints did result in fewer painful joints. Soft splints were preferred (by 57%) based on pain reduction and compliance when compared to hard (33%) and no splint (10%). Although there was no structured self-management program, each participant was briefed to be aware of the comfort and preference for the material quality of each splint type. Feinberg (60) involved OT further by delivering an initial consultation and a follow-up phone call to foster the patient-practitioner relationship and increase adherence. Splints were worn between rheumatology appointments (28-55 days). After which, adherence for daily use was 45% (OT consultation) and 20% (usual care); pain was unaffected, but the intervention group had marginally less morning stiffness.

A multidisciplinary intervention (62) used a 2-hour clinic comprising five 20-minute appointments (nurse, social worker, physiotherapist, podiatrist and hand OT [provided self-management, cognitive-behavioral approaches and joint protection]) to marginally improve health-related quality of life (HR-QOL), disease activity and coping, over usual care. Newly diagnosed or severe cases of RA had a greater likelihood of improving HR-QOL following multidisciplinary care. A 30-day virtual program focusing on joint protection techniques and co-produced with RA patients (63) did not benefit function but improved joint protection knowledge (by 52%) compared to the control. Adherence was poor (60%), with the program deemed ‘acceptable’ by participants. Mohanty et al. (64) found an 8-week proprioceptive hand exercise program had a greater effect on health status and function when compared to home hand exercises (both 3 times weekly). No details were reported on randomization or blinding, and data were selectively reported. One 12-week ‘Care for Work’ program (11, 28) involved integrated care and a participatory workplace intervention (including consultations, individualized plans and evaluations) and had little impact on work instability or productivity for up to 12 months. However, the authors concluded that participants were potentially recruited too early, given the low RA work instability scores reported, which may have limited the intervention’s effectiveness. Other workplace/employment studies were identified in screening; these were either not: i) exclusively involving RA participants (or group data identifiable for RA amongst other rheumatological conditions), ii) including a component of self-management, and/or iii) including occupational therapy as an intervention.

**Discussion**

This review synthesized 39 papers to i) assess the effectiveness of self-management interventions involving OT and ii) understand the lived experiences of participants in self-management for RA. This involved searching databases from their inception to 2022 to capture quantitative and qualitative evidence, as therapeutic services have developed over time. Of the 39 included papers, interventions were characterized as: patient education, behavior change, comprehensive community-based OT (i.e., targeted at improving occupational performance), and other interventions (including workplace and exercise programs). Good evidence was found for patient education and behavior change programs on pain and function, particularly group sessions involving joint protection education. However, few qualitative insights exist into patients’ lived experiences.

At first glance, the included papers in Table 2 omit key articles within the search period, including the ‘Strengthening and stretching for rheumatoid arthritis of the hand’ (SARAH) (65) and WORK-IA (66) trials. Studies evaluating OT interventions without explicitly stating how they involved OT in self-management support for people with RA were excluded, consistent with the review’s purpose.

*Synthesizing findings across studies*

We initially intended to adopt Thomas and Harden’s (67) thematic synthesis in generating codes and themes from primary qualitative studies, to help explain quantitative findings across the different intervention types. However, given that our qualitative evidence was limited to comprehensive, community-based OT and other interventions (i.e., an arthritis gloves trial). We opted to focus our synthesis solely on these intervention types, to avoid de-contextualizing findings beyond their settings (67). The improvements in function (24, 54) and coping (54) shown following comprehensive, community OT, could be partly explained in the short-term at least (up to 6-months), by the greater independence and self-care (56, 58) arising from personalized and occupational support. The qualitative findings suggest a shift in perspectives for independence, in that the individual may be more capable of adapting and coping, particularly in maintaining work performance/remaining in work (54). As a meaningful occupation, this could, in turn, bring a sense of empowerment and help preserve independence as the disease progresses.

*What is known?*

Previous reviews on the effectiveness of OT for RA identified interventions across therapeutic exercise (13, 68), comprehensive OT, motor skills training (10), splint provision (10, 13, 68), and educational-behavioral approaches (typically patient education, self-management, CBT, assistive devices and joint protection (10, 13, 68)). These interventions differ from this review’s focus, which examined self-management interventions, incorporating OT as either a stand-alone intervention, or component of multidisciplinary care. Our main finding concurs with previous reviews, in that good evidence supports patient education and behavior change for improving pain and function (particularly via joint protection education for enhancing self-management). We advance previous work by i) reviewing evidence beyond Level 1 studies in peer-reviewed publications, ii) including quantitative and qualitative evidence, and iii) focusing solely on RA (excluding mixed diagnoses [e.g., osteoarthritis/lupus] but including undifferentiated inflammatory arthritis), and OT interventions for supporting patient self-management. Studies varied across intervention types in sample size, sessions (number and duration), outcome measures, and follow-up periods (0-48 months; Table 3), making comparisons difficult. Papers were consistent, however, in rarely reporting participants’ economic, educational, and ethnicity demographics.

Our review suggests that OT interventions (including patient education and behavior change) may not impact pain, function, and fatigue outcomes for those with early RA (<2 years) based on limited longitudinal, long-term evidence, and condition-specific management strategies (34, 35). This may partly be attributable to pathological and psychological changes, as the individual must adapt as functional symptoms manifest. Medications are used in early RA to suppress inflammation and, in turn, avoid or delay the progression of joint damage and control pain (5). Although OT can support the management of acute functional limitations in early RA through behavior change (33), it cannot limit physical joint deterioration. As RA progresses, the need for patients to develop strategies for managing daily occupations grows (56, 58), increasing the potential for OT to support patient self-management lifestyle adaptations. In turn, this can increase function (24, 54) and reduce pain (45). This is where qualitative studies could be focused, to provide better understanding as to how behavioral changes following OT intervention can lead to functional and ‘physical’ improvements. It is, therefore, surprising that only six studies measured self-efficacy (all relating to patient education and/or behavior change interventions), and no study readiness to change. Although readiness for change is more likely in those with established RA, early OT involvement may lead to greater long-term engagement for self-management (69).

*Where are the gaps?*

Although the results indicated that patient education and behavior change interventions support RA self-management outcomes, only five trials assessed outcomes ≥12 months (28, 33-35, 38, 46). Scant evidence exists to support that behavior change following OT intervention can lead to improved long-term physical outcomes. Increased knowledge and adherence after OT intervention does not correspond to behavior change. Hammond and Freeman (34) observed that self-perceived change did not translate to changed behavior 3 years post-intervention; although, those with lower functional ability were more susceptible to change. Perhaps, as shown by our qualitative evidence, this could partly be explained by a greater relative functional improvement, not ‘within their [functional] means’, but beyond. Increasing patient knowledge in early diagnosis, whilst promoting active involvement in self-management may be important for mental health and coping, particularly for flare-ups and physical deterioration over the long term. It should be noted, however, that the lack of evidence for changed behavior may reflect the challenges associated with the implementation of complex behavioral trials, not necessarily a lack of OT impact.

Evidence of self-management interventions on patient experience and health inequalities is lacking. However, group sessions were impactful in providing patients and partners with greater insights into their situations and sharing self-help strategies. Qualitative insights from individual, home-based OT show that beliefs, values and knowledge change in early diagnosis (56-58), making group-based sessions appealing for promoting acceptance with peer-support and in developing strategies for long-term self-management. Only one study, using group cognitive-behavioral approaches to complement usual care, was associated with reduced fatigue for up to 2 years (38). Tutors highlighted the course’s success was contingent upon buy-in from managers and colleagues, models of training and support, and observing patient progression (39). Rheumatology care has been significantly disrupted by COVID-19 (18, 70), but has seen telehealth adopted widely, potentially offering greater access to group interventions. Telehealth also offers promise, in terms of overcoming the lack of access to OT in rheumatology practice, which is currently a worldwide problem (70, 71).

This is the first mixed methods review of the evidence on the impact of OT in the self-management of RA providing a holistic overview of outcomes and patient experience. There were limitations in our review. Firstly, it was beyond the scope of this review to identify the most effective components of OT intervention for RA self-management. Intervention components (e.g., practitioner roles or educational-behavioral strategies) and characteristics (e.g., home/clinic or individual/group) most related to effectiveness are crucial in translating research evidence into clinical programs. Secondly, qualitative evidence was derived from only four eligible studies of low-to-moderate quality, and therefore inconclusive.

*Recommendations*

Our review has generated three key recommendations. Firstly, to improve the OT evidence-base and inform decision-making on implementing self-management involving OT, consensus in the research community is needed on core outcome measures and participant demographic characteristics. Secondly, opportunities should be sought to implement digital technologies to support ‘early OT’ in RA diagnosis and management. This can help patients understand their condition holistically. Peer-support can be used to facilitate this by promoting active involvement in self-management. Finally, to develop the OT evidence-base for RA self-management, research should reflect real-life, multidisciplinary care. Research should assess the long-term effectiveness of OT intervention for improving RA self-management, and its impact on health outcomes, and patient experience. As advocated in the 2022 ACR Guideline for Exercise, Rehabilitation, Diet, and Additional Integrative Interventions for Rheumatoid Arthritis (70), we must work to raise awareness of OT to support the long-term care of RA. OT has clear beneficial impacts on RA self-management, yet we must continue to generate robust evidence to educate the medical community and inform people living with RA.

**Conclusion**

This review has highlighted what is known from the published literature on the impact of OT to support self-management of RA, in terms of function, fatigue, pain, and lived experience.

Patient education offers improvements in pain and function (≤24 months) in adults with RA. However, there is insufficient evidence to demonstrate that improvements persist for the long term. No strong evidence was found to support OT programs for improving fatigue management or patient experience. Qualitative insights were limited to home OT (focusing on illness and independence) and arthritis gloves for hand pain and function.

**Declarations**

*Ethics approval and consent to participate*

This article reports a mixed methods systematic review, whereby no human participants participated in the research. Ethical approval was not required.

*Consent for publication*

Not applicable.

*Availability of data and materials*

Raw data are available on request.

*Competing interests*

Authors declare that they have no conflicting interests.

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*Authors' contributions*

JG, VF, JL, AH, ED and CB contributed to the study conception and design. JA established the international collaborations, and also contributed with JG, to obtaining funding for the project grant. LR and VF developed and tested the search strategy, with all authors contributing on subsequent revisions. JG, LR and VF conducted the pilot searches. JG developed the data extraction form, with guidance from JL, CB and AH. The manuscript was drafted by JG. All authors contributed to and reviewed the final manuscript.

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*Authors' information (optional)*

Not applicable.

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**Tables and Figure Legends**

Table 1. Search strategy for the mixed methods review.

Table 2. Study characteristics – type of intervention (or phenomenon of interest), study type and the role of occupational therapy.

Table 3. Study characteristics for quantitative, qualitative, and mixed methods papers – participants, methods and results from included articles.

Table 4. Quality assessment – risk of bias for quantitative studies.

Table 5. Quality assessment – CASP for qualitative studies.

Figure 1. PRISMA flow chart of literature identification, screening, eligibility and inclusion of studies.

Supplementary Table 1. Inclusion and exclusion criteria.

Supplementary Table 2. PRISMA reporting checklist for the systematic review (without a meta-analysis).