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The role of self-efficacy in pain intensity, function, psychological factors, health behaviors, and quality of life in people with rheumatoid arthritis : a systematic review

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RUNNING HEAD: SELF-EFFICACY IN RHEUMATOID ARTHRITIS

THE ROLE OF SELF-EFFICACY IN PAIN INTENSITY, FUNCTION, PSYCHOLOGICAL FACTORS, HEALTH BEHAVIOURS, AND QUALITY OF LIFE IN PEOPLE WITH RHEUMATOID ARTHRITIS: A SYSTEMATIC REVIEW

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DECLARATION OF INTEREST

Javier Martinez-Calderon, PhD student at University of Malaga, is supported by the University of Malaga through a pre-doctoral grant. All authors state that the founders had no role in the study and they have no conflicts of interest to declare. All authors have made a substantial scientific contribution to the study and they are thoroughly familiar with the primary data. All authors have read the complete manuscript and take responsibility for the content and completeness of the manuscript and understand that if the paper, or part of the paper, is found to be faulty or fraudulent, all authors share responsibility.

Abstract

Objective. The aim of this study was to systematically review and critically appraise the role of self-efficacy in pain intensity, function, psychological factors, health behaviours, and quality of life in people with rheumatoid arthritis, based on the analyses of longitudinal studies.

Methods. An electronic search of PubMed, AMED, CINAHL, PsycINFO, and PubPsych was carried out from inception to July 2017. Study selection was based on longitudinal studies which have explored the role of self-efficacy in rheumatoid arthritis. The Newcastle Ottawa Scale adapted version was used to evaluate the risk of bias, whereas the Grading of Recommendations Assessment, Development and Evaluation evaluated the quality of the evidence per outcome.

Results. A total of eleven articles met the inclusion criteria. Our results suggest an association between higher self-efficacy and greater goal achievement, positive affect, acceptance of illness, problem-solving coping, physical function, physical activity participation, and quality of life. Inversely, there was also an association between higher self-efficacy and lower pain intensity, depressive symptoms, and anxiety.

Conclusions. The findings of this systematic review suggest that self-efficacy might have a positive effect on the prognosis of this condition, although further longitudinal studies are needed.

PROSPERO: **CRD42016046432**.

Key Words: chronic pain; rheumatoid arthritis; prognosis; self-efficacy; systematic review.

INTRODUCTION

Rheumatoid arthritis (RA) is the most common inflammatory joint disease (Turesson and Matteson, 2004). Its global prevalence ranges from 0.2% to 1.2% (Alamanos, Voulgari, and Drosos, 2006; Neovius, Simard, and Askling, 2011), being three times more frequent in women than in men (Symmons et al., 2002) . It is a highly prevalent, disabling, and costly condition (March and Lapsley, 2001), with a substantial costs to individuals and their families, as well as to the society (West and Wällberg-Jonsson 2009). Rheumatoid arthritis is characterized by pain, stiffness, muscle weakness, fatigue, and swelling of the joints (Adams, et al., 2004; Horsten et al., 2010; Matcham, Ali, Hotopf, and Chalder, 2015). In the long term, it causes irreversible joint destruction, deformities, physical and work disability (Kvien, 2004; West and Wällberg-Jonsson 2009), and eventually, premature mortality (Gabriel, 2008). As a result, RA leads to an inability to carry out work, social, recreational, and household tasks (van Middendorp et al., 2005). It affects the physical, social, and psychological well-being of people with RA, which impacts negatively in their quality of life (West and Wällberg-Jonsson 2009).

Rheumatoid arthritis is a very complex condition. Some mechanisms that contribute to its maintenance and impact remain still unclear. Biological, social, psychological, and physical factors have been found to be associated with the maintenance of symptoms in RA such as pain, disability, or disease activity (Albrecht and Zink, 2017; Sturgeon, Finan, and Zautra, 2016). Among the wide range of biopsychosocial factors that have been found to contribute to the experience and impact of pain and disability in RA, psychological factors have received great empirical attention (Hope et al., 2016; Keefe et al., 2002; Keefe, et al., 2004; Meade, et al., 2017). Inside of psychological factors, patient's sense of self-efficacy (SE) appears to be a helpful factor to confront and

manage RA symptoms (Orengo, et al., 2001; Primdahl, Wagner, and Hørslev-Petersen, 2010; Strahl, Kleinknecht, and Dinnel, 2000). Self-efficacy is conceptualized as the confidence to carry out a specific task with the aim of successfully achieving a desired outcome (Bandura, 1997). Self-efficacy is considered as the central motor to develop human motivation, psychosocial well-being, and personal achievement (Bandura, 1983, 1997). Higher levels of SE are associated with more willingness to take risks, and sense of accomplishment (Picha and Howell, 2017). On the other hand, people with lower SE exhibit fear of risks and uncertainty, low aspirations, and feelings of fear of failure (Picha and Howell, 2017). Higher levels of SE have been associated with lower disease activity, sedentary activity, and perceived pain, higher functional status, and better quality of life in people with RA (Gong and Mao, 2016; Huffman, et al., 2015; Vergara et al., 2017). Self-efficacy is also considered as a mediator in the relationship between perceived control-disability (Schiaffino and Revenson 1992), and pain-performance of life activities in RA (Ahlstrand et al., 2017).

Several reviews have been carried out to explore the role of SE in RA (Elliott, 2008; Larkin and Kennedy, 2014; Marks, 2014; Matcham, Ali, Hotopf, and Chalder 2015; Primdahl, Wagner, and Hørslev-Petersen, 2011; Somers, Wren and Shelby 2012). For example, Primdahl et al. (Primdahl, Wagner, and Hørslev-Petersen, 2011) evaluated the association between SE and health-related outcomes. Their findings showed that higher levels of SE were associated with lower levels of disability, pain, fatigue, and disease duration. Larkin et al. (Larkin and Kennedy, 2014) investigated which factors correlate with physical activity in RA. They concluded that SE was associated with physical activity. Despite the findings of previous reviews above-mentioned, a synthesis of the evidence on SE and RA is needed. First, past reviews have documented only the association between SE and a great number of health outcomes and health behaviours,

using cross-sectional studies in nature. To determine prognosis between these factors, results from longitudinal studies are needed, in order to summarise the evidence. Second, most of previous reviews have been narrative in nature, without an exhaustive methodological search protocol in their design. Third, some systematic reviews have explored the role of SE in RA (Larkin and Kennedy, 2014; Matcham, Ali, Hotopf, and Chalder, 2015), mainly focused on physical aspects. Four, there is a strong recommendation to carry out updates on systematic reviews every few years (Shojania et al., 2007). Thus, obtaining more knowledge and understanding about the role of SE in a great number of outcomes (pain intensity, function, psychological factors, health behaviours, and quality of life) in people with RA, is warranted. This information could facilitate clinical decision-making and, if necessary, timely, and specific consultation with -or referral to- other health care providers. To our knowledge, this is the first longitudinal synthesis of evidence which evaluates the role of SE in pain intensity, function, psychological factors, health behaviours, and quality of life in people with RA. The elaboration of this systematic review may diminish the uncertainty caused by the heterogeneity of particular studies, permitting to draw firm conclusions through an exhaustive synthesis of data (Chan and Arvey, 2012). Hence, the aim of this study was to answer the following PECOS (P-participant; E-exposure; C-comparator; O-outcome; S-study design) question through a systematic review of the literature of longitudinal studies (S): which is the role of SE (E) in pain intensity, function, psychological factors, health behaviours, and quality of life (O) in people with RA (P), compared to people free of RA (C)?

MATERIAL AND METHODS

The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Liberati et al., 2009). The systematic review protocol was registered at the International Prospective Register of Systematic Reviews (PROSPERO: CRD 42016046432).

Data sources and search strategy

Two independent investigators (JMC and ALS) searched the following electronic databases from inception to January 2017 using optimized search strategies: PubMed, AMED, CINAHL, PsycINFO, and PubPsych. An update of the search strategy was carried out on July 2017 due to the possibility of new potential studies were published. A manual search of relevant eligible studies was also carried out through cross-references identified in the reference lists within both original and review articles, selecting studies missed by the electronic search. A sensitive search strategy using relevant search terms that were developed from Medical Subject Headings (MeSH), and keywords generated from the subject headings, were used: "self-efficacy" [MeSH Terms], "rheumatoid arthritis" [MeSH Terms], "beliefs". The search strategy was as follows: ("self-efficacy"[MeSH Terms] OR ("self"[All Fields] AND "efficacy"[All Fields]) OR "self-efficacy"[All Fields]) AND ("arthritis, rheumatoid"[MeSH Terms] OR ("arthritis"[All Fields] AND "rheumatoid"[All Fields]) OR "rheumatoid arthritis"[All Fields] OR ("rheumatoid"[All Fields] AND "arthritis"[All Fields])) AND ("beliefs"[All Fields]). The grey literature was explored to detect any relevant unpublished work. The following grey literature databases were searched: ACR annual scientific meetings, the EULAR annual congress, the Australian Rheumatology Association, the Rheumatology Health Professionals Association, and the British

Society of Rheumatology scientific meetings. To gather any other non-published data, original authors were contacted directly. References were exported, and duplicates were removed using citation management software (Mendeley desktop v1.17.4).

Eligibility criteria

The PECOS framework, as aforementioned, was followed to determine which studies were included in the present systematic review. Each study had to meet the following inclusion criteria: (i) longitudinal studies examining the role of SE in pain intensity, function, psychological factors, health behaviours, and quality of life in people with RA; (ii) studies whose participants were adults diagnosed with RA; (iii) studies written in English; (iv) no restriction was applied on participants' gender, follow-up duration, and ethnicity; (v) studies recruiting participants from any setting (general population, primary, secondary, and/or tertiary care). The exclusion criteria were, as follows: (i) all studies not including a longitudinal design (e.g. cross-sectional); (ii) studies aiming at modifying levels of SE through any therapy; (iii) studies investigating psychometric properties of SE measures.

Study selection

All studies identified by the search strategy were screened using the eligibility criteria specified previously. The first stage of assessment involved the screening of title and abstract by two reviewers (JMC and ALS). Two reviewers (JMC and ALS) undertook the second stage, screening the full-text. In cases of disagreement, a decision was made by consensus or, if necessary, a third reviewer (MM) was consulted. A short checklist was adapted to the present review, and was used to guide the selection of relevant studies (see **appendix A**) (Adom, Puoane, De Villiers, and Kengne, 2017).

Data extraction

Two independent reviewers (JMC and ALS) extracted the following information from each study: study details (first author and year of publication), characteristics of participants (mean age and disease duration), SE measures, outcome measures, duration of follow-up, and study design. If there was any discrepancy between reviewers, a third reviewer was consulted (MM). When the original article did not contain the information needed, the original authors were contacted to provide further information.

Methodological quality assessment

Two reviewers (JMC and ALS) independently assessed the risk of bias of included studies using an adapted version of the Newcastle-Ottawa Scale (NOS) (Bawor et al., 2014). This adapted version includes seven questions among four domains of risk of bias assessment: methods for selecting study participants (selection bias), methods to control for confounding (performance bias), statistical methods (detection bias), and methods of exposure and outcome assessment (information bias). Seven items compose the four domains. Each item is scored from zero (high risk) to three (low risk) points. Therefore, the maximum score for each study could be of twenty-one points. To assess the overall quality and the strength of the evidence per outcome the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach was used (Atkins, et al., 2004). In brief, the GRADE classification was downgraded from high quality by one level for each of the following factors identified: (i) risk of bias, (ii) inconsistency of results (iii) indirectness, (iv) imprecision, and (v) other considerations (e.g. reporting bias). Two researchers (JMC and ALS) judged whether these factors were present for each outcome. The GRADE approach was applied when each outcome was reported, at least, by three studies.

Statistical analysis

For the primary analysis, studies were grouped per outcomes. Due to the heterogeneity was too high in terms of study participants, metric of SE, metric or outcome evaluated, and statistical methods used, a meta-analysis could not be carried out. Consequently, a descriptive quantitative analysis (the most relevant summary measure with a precision estimate) for each study was provided. For those studies that reported results with several degrees of adjustment for confounders in different models, we extracted the estimate from the model which showed the best adjustment. GRADEpro software (Schünemann and Brozek 2015), and Review Manager (RevMan) version 5.3 (Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014) software were used in the review to process data.

RESULTS

Study characteristics

A total of 847 citations were identified through electronic databases, with 57 additional studies identified through reference screening. After removing duplicates, authors screened 539 titles and abstracts, and reviewed 121 full-text articles for eligibility. The number of studies retrieved from each database and the number of studies excluded in each screening phase are shown in **Figure 1**. The full references of excluded studies in the last screening (n=110) are reported in **Appendix B**. The conflicts of interests of included studies are shown in **Appendix C**.

Of these, 11 longitudinal studies (3,684 participants) met the inclusion criteria (Barlow, Cullen, and Rowe, 2002; Brekke, Hjortdahl, and Kvien, 2001; Brekke, Hjortdahl, and Kvien, 2003; Holm, Rogers, and Kwoh, 1998; Iversen et al., 2016; Knittle et al., 2011; Lee et al., 2011; Mielenz et al., 2013; Odegård et al., 2005; Parker et al., 1993; Schiaffino, Revenson, and Gibofsky, 1991). Follow-up ranged from three months to

seven years. The following outcomes measures divided in five domains (pain intensity, function, psychological factors, health behaviours, and quality of life) were included in the present review: (1) pain intensity, (2) function (work disability, and physical function), (3) psychological factors (depressive symptoms, anxiety, acceptance of illness, positive and negative affect, and problem-solving coping), (4) health behaviours (physical activity participation, goal achievement, and pain behaviour) and (5) quality of life. The characteristics of the included studies are reported in **Table 1**.

Methodological quality (risk of bias)

The degree to which studies met the risk of bias criteria varied considerably. The risk of bias assessment of all included studies is presented in **Table 2**.

The strength of evidence for each outcome was determined through the GRADE system (see **Table 3**). A descriptive of the statistical results about the role of self-efficacy in pain intensity (see **appendix D**), function (see **appendix E**), health behaviours (see **appendix F**), quality of life (see **appendix G**), and psychological factors (see **appendix H**) is reported.

The role of self-efficacy in pain intensity in people with rheumatoid arthritis

The role of SE in pain intensity was reported in five studies (Barlow, Cullen, and Rowe, 2002; Brekke, Hjortdahl, and Kvien, 2001; Brekke, Hjortdahl, and Kvien, 2003; Knittle et al., 2011; Lee et al., 2011). Four studies showed that higher levels of SE were significantly associated with lower levels of pain intensity (Barlow, Cullen, and Rowe, 2002; Brekke, Hjortdahl, and Kvien, 2003; Knittle et al., 2011; Lee et al., 2011).

The role of self-efficacy on function in people with rheumatoid arthritis

The role of SE on function was explored in four studies (Barlow, Cullen, and Rowe, 2002; Holm et al., 1998; Odegård et al., 2005; Schiaffino, Revenson, and Gibofsky, 1991). Three studies showed that higher SE was significantly associated with better physical function (Barlow, Cullen, Rowe, 2002; Holm, Rogers, and Kwoh, 1998; Schiaffino, Revenson, and Gibofsky, 1991). There was no significant statistical relationship between SE and work disability in people with RA (Odegård et al., 2005).

The role of self-efficacy in health behaviours in people with rheumatoid arthritis

The role of SE in health behaviours was evaluated in four studies (Iversen et al., 2016; Knittle et al., 2011; Mielenz et al., 2013; Parker et al., 1993). Two studies showed that higher SE was significantly associated with higher physical activity participation (Knittle et al., 2011; Mielenz et al., 2013). One study reported that higher SE was significantly associated with higher goal achievement (Knittle et al., 2011). There was no significant statistical relationship between SE and pain behaviours (Parker et al., 1993).

The role of self-efficacy in quality of life in people with rheumatoid arthritis

The role of SE in quality of life (measured by AIMS-2 and SF-36) was tested in three studies (Brekke, Hjortdahl, and Kvien, 2001; Brekke, Hjortdahl, and Kvien, 2003; Knittle et al., 2011). Higher SE was significantly associated with better quality of life across studies (Brekke, Hjortdahl, and Kvien, 2001; Brekke, Hjortdahl, and Kvien, 2003; Knittle et al., 2011).

The role of self-efficacy in psychological factors in people with rheumatoid arthritis

The role of SE in psychological factors was analysed by two studies (Barlow, Cullen, and Rowe, 2002; Schiaffino, Revenson, and Gibofsky, 1991). One study showed that higher SE was significantly associated with lower depressive symptoms, lower anxiety,

greater positive affect and greater acceptance of illness (Barlow, Cullen, Rowe, 2002). One study showed that higher SE was significantly associated with greater problem-solving coping (Schiaffino, Revenson, and Gibofsky, 1991). There was no significant statistical relationship between SE and negative affect (Barlow, Cullen, Rowe, 2002).

DISCUSSION

Statement of principal findings

The objective of this review was to explore the role of SE in pain intensity, function, psychological factors, health behaviours, and quality of life, in people with RA, based on the analyses of longitudinal studies. Our results suggest a possible association between higher SE and greater goal achievement, positive affect, acceptance of illness, problem-solving coping, physical function, physical activity participation, and quality of life. Inversely, there was also a possible association between higher SE and lower pain intensity, depressive symptoms, and anxiety. Nevertheless, the findings should be taken with caution due to the very low quality of the evidence.

Comparison with other studies

To our knowledge, this is the first synthesis of the evidence that longitudinally analyses the role of SE in pain intensity, function, psychological factors, health behaviours, and quality of life specifically in RA. Our findings are in accordance with the social cognitive theory proposed by Bandura (Bandura, 1997). In this model, it is hypothesised that SE often appears in order to deal with an unfavourable issue when an actual or perceived threat comes into play (Bandura, 1997). People with higher SE can carry out many activities despite their pain, because they have the ability to confront and manage that negative pain experience (Bandura, 1983, 1997). In this sense, this model has been supported by previous reviews in RA (Elliott, 2008; Matcham, Ali, Hotopf, and Chalder, 2015). Elliot (2008) examined the reasons and solutions about poor adherence

to medication in adult with RA. A lack of SE was associated with an increase of concerns about medications and a reduction of the adherence to treatment. Matcham et al. (Matcham, Ali, Hotopf, and Chalder, 2015) studied which psychological variables are associated with fatigue in RA, showing an association between SE and fatigue. Moreover, a recent study has proposed a model focused on the importance of SE to achieve the desired outcomes after therapy (Picha and Howell, 2017). Both models (Bandura, 1997; Picha and Howell, 2017), as well as our results and previous reviews RA (Elliott, 2008; Matcham, Ali, Hotopf, and Chalder, 2015), underline that SE is associated, not only with several outcomes (e.g. pain intensity) in people with RA, but also SE might have a positive effect in the prognosis of this condition. However, as above-mentioned, there were methodological limitations, inconsistencies, indirectness of evidence, imprecisions of results, and other issues in the present review, thus, the conclusions should be taken with caution.

Strengths and weaknesses of the study

The strengths of this review included the use of a pre-specified protocol registered on PROSPERO, the PRISMA checklist, the adapted NOS scale, and the GRADE approach. The limitations associated with this study must be acknowledged when interpreting the results. First, despite the use of a long variety of MeSH terms, grey literature, and a manual search, it could be possible that not all studies were identified. Second, outcome measures were very diverse, and authors often used a simple question to evaluate these outcomes rather than using a validated tool (e.g. patient reported outcome).

Clinical implications of study findings

Self-efficacy is known to be a facilitator in the adherence to rehabilitation programmes in different chronic pain conditions (Thompson, Broadbent, Bertino, & Staiger, 2015). Furthermore, SE is also considered as a modifiable factor that may facilitate earlier

achievement of pain relief and functional recovery (Picha and Howell, 2017). Physiotherapy plays an important role in the management of people with RA (Park and Chang, 2016; Riemsma, Taal, Kirwan, & Rasker, 2004). Recent guidelines have been developed in order to facilitate physiotherapists when it is necessary to apply physiotherapy treatment in this condition (Peter et al., 2016). Specifically, exercise therapy has shown good results over pain, disability, cardiovascular risk, and disease activity in people with RA (Baillet, et al., 2012; Cairns and McVeigh, 2009; Cooney et al., 2011), and SE plays a pivotal role in the adherence to exercise therapy in patients with disability (Mcauley and Szabo, 2011; Picha and Howell, 2017). Based on that, physiotherapists should pay attention to identify the presence of SE prior to the prescription of any intervention, e.g., exercise therapy, since its presence may require a different and more specific approach than standard rehabilitation programmes. Rheumatoid arthritis is complex, and an exhaustive screening to prevent and reduce morbidity is warranted (Widdifield et al., 2017). There are some tools that have shown good properties in assessing SE levels in arthritis populations (e.g., the Arthritis Self-Efficacy Scale: ASES), although the optimal frequency of screening is not known. Physiotherapists need to be aware of such tools and their utility when designing treatment approaches for patients with RA. Further, taking the time to prepare and explain the screening and assessment process to the patient could give him or her a greater sense of control in his/her disease management.

Future Research

There is a clear gap in the literature about the role of self-efficacy in pain intensity, function, psychological factors, health behaviours, and quality of life in people with RA. It is based mainly on two aspects: the unclear sustainability and effectiveness in the long-term of many self-management programs in the management of chronic disease

(including RA) (Nicholas and Blyth, 2016; Riemsma, Kirwan, Taal, & Rasker, 2003), and the absence of longitudinal studies that can solve the flaws found in the present review. Hence, there are some recommendations to guide future research: (i) further experimental studies evaluating the effectiveness in the long-term of therapeutic strategies such as pain self-management (Damush et al., 2016), cognitive-behavioural therapy (Nash et al., 2013), or mindfulness (Turner et al., 2016)), that appear to enhance SE levels, are needed; (ii) further studies analysing prospectively the role of SE in people with RA, are required.

CONCLUSIONS

This systematic review provides information about the role of SE in pain intensity, function, psychological factors, health behaviours, and quality of life in people with RA based on the analysis of longitudinal studies. The available evidence suggests a possible association between higher SE and greater goal achievement, positive affect, acceptance of illness, problem-solving coping, physical function, physical activity participation, and quality of life. Inversely, there was also a possible association between higher SE and lower pain intensity, depressive symptoms, and anxiety. Nevertheless, the quality of the evidence was very low, and further research is needed.

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REFERENCES

Adams J, Burridge J, Mullee M, Hammond A, Cooper C 2004 Correlation between upper limb functional ability and structural hand impairment in an early rheumatoid population. *Clinical Rehabilitation* 18:405-13.

Adom T, Puoane T, De Villiers A, Kengne AP 2017 Prevalence of obesity and overweight in African learners: a protocol for systematic review and meta-analysis. *BMJ Open* 7:e013538.

Ahlstrand I, Vaz S, Falkmer T, Thyberg I, Björk M 2017 Self-efficacy and pain

acceptance as mediators of the relationship between pain and performance of valued life activities in women and men with rheumatoid arthritis. *Clinical Rehabilitation* 31:824-834.

Alamanos Y, Voulgari PV, Drosos AA 2006 Incidence and prevalence of rheumatoid arthritis, based on the 1987 American College of Rheumatology criteria: a systematic review. *Seminars in Arthritis and Rheumatism* 36:182-8.

Albrecht K, Zink A 2017 Poor prognostic factors guiding treatment decisions in rheumatoid arthritis patients: a review of data from randomized clinical trials and cohort studies. *Arthritis Research & Therapy* 19:68.

Atkins D, Best D, Briss PA, Eccles M, Falck-Ytter Y, Flottorp S, Guyatt GH, Harbour RT, Haugh MC, Henry D, Hill S, Jaeschke R, Leng G, Liberati A, Magrini N, Mason J, Middleton P, Mrukowicz J, O'Connell D, Oxman AD, Phillips B, Schünemann HJ, Edejer T, Varonen H, Vist GE, Williams JW Jr, Zaza S; GRADE Working Group 2004 Grading quality of evidence and strength of recommendations. *BMJ* 328:1490.

Baillet, A, Vaillant, M, Guinot, M, Juvin, R, & Gaudin, P 2012 Efficacy of resistance exercises in rheumatoid arthritis: Meta-analysis of randomized controlled trials. *Rheumatology*, 51: 519–527. <http://doi.org/10.1093/rheumatology/ker330>

Bandura, A 1983 Self-efficacy determinants of anticipated fears and calamities. *Journal of Personality and Social Psychology* 45:464–469.

Bandura, A 1997 Self-efficacy and health behaviour. In Baum A, Newman S, Wienman J, West R, & McManus C (eds) *Cambridge handbook of psychology, health and medicine*, pp 160-162. Cambridge: Cambridge University Press.

Barlow JH, Cullen LA, Rowe IF 2002 Educational preferences, psychological well-being and self-efficacy among people with rheumatoid arthritis. *Patient Education*

- and Counseling 46:11-9.
- Bawor M, Dennis BB, Anglin R, Steiner M, Thabane L, Samaan Z 2014 Sex differences in outcomes of methadone maintenance treatment for opioid addiction: a systematic review protocol. *Systematic Review* 3:45.
- Brekke M, Hjortdahl P, Kvien TK 2001 Self-efficacy and health status in rheumatoid arthritis: a two-year longitudinal observational study. *Rheumatology (Oxford)* 40:387-92.
- Brekke M, Hjortdahl P, Kvien TK 2003 Changes in self-efficacy and health status over 5 years: a longitudinal observational study of 306 patients with rheumatoid arthritis. *Arthritis and Rheumatism* 49:342-8.
- Cairns, AP, & McVeigh, JG 2009. A systematic review of the effects of dynamic exercise in rheumatoid arthritis. *Rheumatology International*, 30: 147–158. <http://doi.org/10.1007/s00296-009-1090-5>
- Chan ME, Arvey RD 2012 Meta-Analysis and the Development of Knowledge. *Perspectives on Psychological Science*, 7:79–92.
- Cooney JK, Law RJ, Matschke V, Lemmey AB, Moore JP, Ahmad Y, Jones JG, Maddison P, Thom JM 2011 Benefits of exercise in rheumatoid arthritis. *Journal of Aging Research*, 2011:681640. doi: 10.4061/2011/681640.
- Damush TM, Kroenke K, Bair MJ, Wu J, Tu W, Krebs EE, Poleshuck E 2016 Pain self-management training increases self-efficacy, self-management behaviours and pain and depression outcomes. *European Journal of Pain* 20:1070-8.
- Elliott RA 2008 Poor Adherence to Medication in Adults with Rheumatoid Arthritis. *Disease Management & Health Outcomes* 16:13–29.
- Gabriel SE 2008 Why do people with rheumatoid arthritis still die prematurely? *Annals of the Rheumatic Disease*. 67:iii30-4.

- Gong G, Mao J 2016 Health-Related Quality of Life Among Chinese Patients With Rheumatoid Arthritis: The Predictive Roles of Fatigue, Functional Disability, Self-Efficacy, and Social Support. *Nursing Research* 65:55-67.
- Holm MB, Rogers JC, Kwok CK 1998 Predictors of functional disability in patients with rheumatoid arthritis. *Arthritis Care & Research* 11:346-55.
- Hope, HF, Bluett, J, Barton, A, Hyrich, KL, Cordingley, L, & Verstappen, SMM 2016 Psychological factors predict adherence to methotrexate in rheumatoid arthritis; Findings from a systematic review of rates, predictors and associations with patient-reported and clinical outcomes. *RMD Open*, 2:e000171 <http://doi.org/10.1136/rmdopen-2015-000171>
- Horsten NC, Ursum J, Roorda LD, van Schaardenburg D, Dekker J, Hoeksma AF 2010 Prevalence of hand symptoms, impairments and activity limitations in rheumatoid arthritis in relation to disease duration. *Journal of Rehabilitation Medicine* 42:916-21.
- Huffman KM, Pieper CF, Hall KS, St Clair EW, Kraus WE 2015 Self-efficacy for exercise, more than disease-related factors, is associated with objectively assessed exercise time and sedentary behaviour in rheumatoid arthritis *Scandinavian Journal of Rheumatology* 44:106-10.
- Iversen MD, Frits M, von Heideken J, Cui J, Weinblatt M, Shadick NA 2017 Physical Activity and Correlates of Physical Activity Participation Over Three Years in Adults With Rheumatoid Arthritis. *Arthritis Care & Research (Hoboken)* 69:1535-1545.
- Keefe FJ, Rumble ME, Scipio CD, Giordano LA, Perri LM 2004 Psychological aspects of persistent pain: current state of the science. *The Journal of Pain* 5(4):195-211.
- Keefe FJ, Smith SJ, Buffington AL, Gibson J, Studts JL, Caldwell DS 2002 Recent

- advances and future directions in the biopsychosocial assessment and treatment of arthritis. *Journal of Consulting and Clinical Psychology* 70:640-55.
- Knittle KP, De Gucht V, Hurkmans EJ, Vlieland TP, Peeters AJ, Runday HK, Maes S 2011 Effect of self-efficacy and physical activity goal achievement on arthritis pain and quality of life in patients with rheumatoid arthritis. *Arthritis Care & Research* (Hoboken). 63:1613-9.
- Kvien TK 2004 Epidemiology and burden of illness of rheumatoid arthritis. *Pharmacoeconomics* 22:1-12.
- Larkin L, Kennedy N 2014 Correlates of physical activity in adults with rheumatoid arthritis: a systematic review. *Journal of Physical Activity and Health* 11:1248-61.
- Lee YC, Cui J, Lu B, Frits ML, Iannaccone CK, Shadick NA, Weinblatt ME, Solomon DH 2011 Pain persists in DAS28 rheumatoid arthritis remission but not in ACR/EULAR remission: a longitudinal observational study. *Arthritis Research & Therapy* 13:R83.
- Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JP, Clarke M, Devereaux PJ, Kleijnen J, Moher D 2009 The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *Journal of Clinical Epidemiology* 62:e1-34.
- March L, Lapsley H 2001 What are the costs to society and the potential benefits from the effective management of early rheumatoid arthritis? *Best Practice & Research. Clinical Rheumatology* 15:171–85.
- Marks R 2014 Self-efficacy and arthritis disability: An updated synthesis of the evidence base and its relevance to optimal patient care. *Health Psychology Open* 1:205510291456458.

- Matcham F, Ali S, Hotopf M, Chalder T 2015 Psychological correlates of fatigue in rheumatoid arthritis: A systematic review. *Clinical Psychology Review* 39:16–29.
- Mcauley, E, & Szabo, A 2011 Self-efficacy: implications for Physical Activity , Function , and Functional Limitations in Older Adults. *American Journal of Lifestyle Medicine*, 5:361–369. <http://doi.org/10.1177/1559827610392704>.
- Meade, T, Manolios, N, Cumming, SR, Conaghan, PG, & Katz, P 2017 Cognitive Impairment in Rheumatoid Arthritis: A Systematic Review. *Arthritis Care & Research*, 70:39–52. <http://doi.org/10.1002/acr.23243>
- Mielenz TJ, Kubiak-Rizzone KL, Alvarez KJ, Hlavacek PR, Freburger JK, Giuliani C, Mercer VS, Callahan LF 2013 Association of self-efficacy and outcome expectations with physical activity in adults with arthritis. *Arthritis* 2013:621396.
- Nash VR, Ponto J, Townsend C, Nelson P, Bretz MN 2013 Cognitive behavioral therapy, self-efficacy, and depression in persons with chronic pain. *Pain Management Nursing* 14:e236–e243.
- Neovius M, Simard JF, Askling J 2011 Nationwide prevalence of rheumatoid arthritis and penetration of disease-modifying drugs in Sweden. *Annals of the Rheumatic Diseases* 70:624–9.
- Nicholas, MK, & Blyth, FM 2016 Are self-management strategies effective in chronic pain treatment? *Pain Management*, 6:75–88. <http://doi.org/10.2217/pmt.15.57>
- Odegård S, Finset A, Kvien TK, Mowinckel P, Uhlig T 2005 Work disability in rheumatoid arthritis is predicted by physical and psychological health status: a 7-year study from the Oslo RA register. *Scandinavian Journal of Rheumatology* 34:441–7.
- Orengo CA, Wei SH, Molinari VA, Hale D & Kunik ME 2001 Functioning in Rheumatoid arthritis. *Clinical Gerontologist*, 23:3–19.

<http://doi.org/10.1300/J018v23n03>

- Park, Y, & Chang, M 2016 Effects of rehabilitation for pain relief in patients with rheumatoid arthritis: a systematic review. *Journal of Physical Therapy Science*, 28:304–308. <http://doi.org/10.1589/jpts.28.304>
- Parker JC, Callahan CD, Smarr KL, McClure KW, Stucky-Ropp RC, Anderson SK, Walker SE 1993 Relationship of pain behavior to disease activity and health status in rheumatoid arthritis. *Arthritis Care and Research* 6:71–77.
- Peter, WF, Hurkmans, EJ, van der Wees, PJ, Hendriks, EJM, van Bodegom-Vos, L, & Vliet Vlieland, TPM 2016 Healthcare Quality Indicators for Physiotherapy Management in Hip and Knee Osteoarthritis and Rheumatoid Arthritis: A Delphi Study. *Musculoskeletal Care*, 14:219–232. <http://doi.org/10.1002/msc.1133>
- Picha KJ, Howell DM 2017 A model to increase rehabilitation adherence to home exercise programmes in patients with varying levels of self-efficacy. *Musculoskeletal Care* 1–5.
- Primdahl, J, Wagner, L, & Hørslev-Petersen, K 2010 Self-efficacy in rheumatoid arthritis: Translation and test of validity, reliability and sensitivity of the Danish version of the Rheumatoid Arthritis Self-Efficacy Questionnaire (RASE). *Musculoskeletal Care*, 8:123–135. <http://doi.org/10.1002/msc.172>
- Primdahl J, Wagner L, Hørslev-Petersen K 2011 Self-efficacy as an outcome measure and its association with physical disease-related variables in persons with rheumatoid arthritis: A literature review. *Musculoskeletal Care* 9:125–140.
- Riemsma, RP, Kirwan, JR, Taal, E, & Rasker, JJ 2003. Patient education for adults with rheumatoid arthritis. *The Cochrane Database of Systematic Reviews*, (2): CD003688. <http://doi.org/10.1002/14651858.CD003688>
- Riemsma, RP, Taal, E, Kirwan, JR, & Rasker, JJ 2004 Systematic review of rheumatoid

- arthritis patient education. *Arthritis and Rheumatism*, 51:1045–1059.
<http://doi.org/10.1002/art.20823>
- Schiaffino KM, Revenson TA, Gibofsky A 1991 Assessing the impact of self-efficacy beliefs on adaptation to rheumatoid arthritis. *Arthritis & Rheumatism* 4:150–157.
- Schiaffino KM, Revenson TA 1992 The role of perceived self-efficacy, perceived control, and causal attributions in adaptations to rheumatoid arthritis: distinguishing mediator from moderator effects. *Personality and Social Psychology Bulletin* 18:709–718.
- Schünemann HJ, Brozek J 2015 GRADEpro Guideline Development Tool. Hamilton, Canada, McMaster University.
- Shojania KG, Sampson M, Ansari MT, Ji J, Doucette S, Moher D 2007 How quickly do systematic reviews go out of date? A survival analysis. *Annals of Internal Medicine* 147:224-33.
- Somers TJ, Wren AA, Shelby RA 2012 The context of pain in arthritis: self-efficacy for managing pain and other symptoms. *Current Pain and Headache Reports* 16:502-8.
- Strahl, C, Kleinknecht, RA, & Dinnel, DL 2000 The role of pain anxiety, coping, and pain self-efficacy in rheumatoid arthritis patient functioning. *Behaviour Research and Therapy*, 38:863–873. [http://doi.org/10.1016/S0005-7967\(99\)00102-3](http://doi.org/10.1016/S0005-7967(99)00102-3)
- Sturgeon JA, Finan PH, Zautra AJ 2016 Affective disturbance in rheumatoid arthritis: psychological and disease-related pathways. *Nature Reviews Rheumatology* 12:532–542.
- Symmons D, Turner G, Webb R, Asten P, Barrett E, Lunt M, Scott D, Silman A 2002 The prevalence of rheumatoid arthritis in the United Kingdom: new estimates for a new century. *Rheumatology (Oxford)* 41:793-800.
- Thompson, E, Broadbent, J, Bertino, MD, & Staiger, PK 2015 Do Pain-related Beliefs

- Influence Treatment adherence? A Systematic Review. *The Clinical Journal of Pain*, 32: 1. <http://doi.org/10.1097/AJP.0000000000000235>
- Turesson C, Matteson EL 2004 Management of extra-articular disease manifestations in rheumatoid arthritis. *Current Opinion in Rheumatology* 16:206–211.
- Turner JA, Anderson ML, Balderson BH, Cook AJ, Sherman KJ, Cherkin DC 2016 Mindfulness-based stress reduction and cognitive-behavioral therapy for chronic low back pain: similar effects on mindfulness, catastrophizing, self-efficacy, and acceptance in a randomized controlled trial. *Pain* 157:2434–2444.
- van Middendorp H, Geenen R, Sorbi MJ, Hox JJ, Vingerhoets AJ, van Doornen LJ, Bijlsma JW 2005 Styles of emotion regulation and their associations with perceived health in patients with rheumatoid arthritis. *Annals of Behavioral Medicine* 30:44-53.
- Vergara F, Rosa J, Orozco C, Bertiller E, Gallardo MA, Bravo M, Catay E, Collado V, Gómez G, Sabelli M, García MV, Rosemffet MG, Citera G, Schneeberger EE, Catoggio LJ, Soriano ER 2017 Evaluation of learned helplessness, self-efficacy and disease activity, functional capacity and pain in Argentinian patients with rheumatoid arthritis. *Scandinavian Journal of Rheumatology* 46:17-21.
- Widdifield J, Ivers NM, Bernatsky S, Jaakkimainen L, Bombardier C, Thorne JC, Ahluwalia V, Paterson JM, Young J, Wing L, Tu K 2017 Primary Care Screening and Comorbidity Management in Rheumatoid Arthritis in Ontario, Canada. *Arthritis Care Res (Hoboken)* 69:1495-1503. doi: 10.1002/acr.23178.
- West E, Wållberg-Jonsson S 2009 Health-related quality of life in Swedish men and women with early rheumatoid arthritis. *Gender Medicine* 6:544-54.

Figure legends

Figure 1. Preferred Reporting Items for Systematic reviews and Meta-Analyses flow diagram of the conducted search.

Table 1. Characteristics of included studies

Table 2. Assessment of risk of bias of included studies through the adapted NOS scale.

Table 3. Summary of findings and Quality of evidence assessment.