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REVIEW ARTICLE

How can clinicians enhance self-efficacy beliefs in osteoarthritis? An overview of systematic reviews with meta-analysis

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Abstract

This overview of reviews aimed to synthesize the effectiveness of non-pharmacological approaches to enhance self-efficacy in people with osteoarthritis. The CINAHL, Embase, PsycINFO, PubMed, SPORTDiscus, and the Cochrane Library databases were searched from inception to December 2023. We considered systematic reviews with meta-analysis of randomized clinical trials evaluating any non-pharmacological intervention. We used AMSTAR 2 to assess the methodological quality of reviews. The overlap between reviews was calculated. We included eight systematic reviews with meta-analysis evaluating 30 different clinical trials. Overall, mind–body exercises, psychological interventions, and self-management strategies may improve arthritis self-efficacy. Specifically, the meta-analyses showed tai chi exercises, coping skills training, and the arthritis self-management program are more effective than controls to enhance arthritis self-efficacy in people with hip and/or knee osteoarthritis. In addition, inconsistent results were detected across meta-analyses regarding the effectiveness of multidisciplinary interventions. Finally, the degree of overlap between all reviews was moderate (CCA = 6%) and many included reviews reported most of the items of AMSTAR 2. Tai chi exercises, coping skills training, and the arthritis self-management program may be beneficial for enhancing arthritis self-efficacy. Open Science Framework Registration: https://doi.org/10.17605/OSF.IO/VX2T6.

Keywords Interventions · Meta-analysis · Osteoarthritis · Overview · Self-efficacy · Systematic review

Introduction

Osteoarthritis is a chronic disease that mainly causes cartilage degradation, acute and chronic synovial inflammation, subchondral bone alteration, and osteophytes [1]. Osteoarthritis is probably the most common type of arthritis along with rheumatoid arthritis. In 2020, 595 million people reported this condition, entailing an increase of 132% in comparison to 1990. The prevalence of osteoarthritis is higher in women and in those individuals over 70 years. [2] In addition, osteoarthritis is an important cause of general practitioner consultations, admissions to hospitals, suicide ideation, and all-cause mortality [3, 4].

A large number of pharmacological and non-pharmacological interventions have been proposed in osteoarthritis [5–7]. The European League Against Rheumatism (EULAR) recommends that non-pharmacological approaches should be focused on improving lifestyle habits in people with hip and knee osteoarthritis, using strategies such as education, tailored exercise, and behavior change techniques [8]. EULAR has also recommended that self-management approaches may be useful in hand osteoarthritis [9], and self-efficacy beliefs have emerged as a core part in the design of self-management strategies [10] as well as rehabilitation adherence [11].

Self-efficacy is a cognitive construct proposed by Albert Bandura within his social cognitive theory as part of the

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process of self-regulation of behavior [12]. Self-efficacy fosters proactive behaviors and is followed by a personal estimate that certain behaviors will lead to specific results [12]. Bandura proposed four modulating sources of self-efficacy: performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal [12, 13] and a recent meta-analysis seems to confirm this, especially in the first three factors [14].

In osteoarthritis, different forms of self-efficacy have been studies such as pain self-efficacy and arthritis self-efficacy [15–17]. In observational studies, pain self-efficacy has been associated with less physical disability [18]. Furthermore, arthritis self-efficacy has been related to fewer depression symptoms, neuroticism, negative affect, better vitality, extraversion, positive affect, problem-solving, and positive thinking [15, 16]. Arthritis self-efficacy may also mediate the association between resilience and pain in osteoarthritis [15] and mediate the effects of telehealth-delivered exercises on pain and disability [19].

In the last decade, different clinical trials [20, 21] and systematic reviews with meta-analysis have evaluated the effectiveness of non-pharmacological approaches to modulate self-efficacy in osteoarthritis [22–25]. Therefore, it is timely to conduct an overview of reviews that synthetizes these meta-analyses and detect potential gaps in knowledge that allow us to propose future recommendations on this topic. The objective of this overview was to summarize the effectiveness of non-pharmacological interventions to enhance self-efficacy in people with any type of osteoarthritis using systematic reviews with meta-analysis.

Methods

We used the Preferred Reporting Items for Overviews of Reviews (PRIOR) [26] and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 for abstracts [27]. The review protocol was prospectively registered at Open Science Framework: https://doi.org/https://doi.org/10.17605/OSF.IO/VX2T6.

Deviations from the review protocol

Several deviations from the review protocol were made. Most of these decisions allowed us to reach more direct conclusions. The overview was only focused on non-pharmacological interventions aiming to modulate self-efficacy. Manual searches including expert opinion and reviews related to our scope were developed. Manual searches in the list of references of the included studies were not conducted. Study selection was eventually developed by one reviewer. Only non-pharmacological interventions were included. Only systematic reviews with meta-analysis were selected. Upset plots were changed to a bar plot.

Search strategies and data sources

One reviewer (JMC) searched the CINAHL (via EBSCOhost), Embase, PsycINFO, PubMed, SPORTDiscus (via EBSCOhost), and the Cochrane Library databases from inception to December 10, 2023. No search filters were applied. The most important search terms were osteoarthritis, arthrosis, self-efficacy, systematic-review, meta-analysis, meta-review, and meta-analytic-review. Supplementary File 1 shows the full search strategy for each electronic database. In addition, the systematic search was checked for completeness with manual search searching for expert opinions, and studies (e.g., systematic reviews or overviews) related to our scope.

Eligibility criteria

One reviewer (JMC) used the Patient, Intervention, Comparison, Outcome, Study Design (PICOS) framework to select studies [28]. We only considered systematic reviews with meta-analyses published in peer-reviewed journals and written in English or Spanish language. The following inclusion criteria were applied: (1) people with any type of osteoarthritis without sociodemographic (e.g., age) and clinical (e.g., duration of symptoms) restrictions, (2) any type of non-pharmacological (e.g., exercise) intervention, (3) any type of control group, (4) any form of self-efficacy assessed as a primary or secondary outcome (e.g., pain self-efficacy or arthritis self-efficacy), and (5) systematic reviews with meta-analysis included non-randomized and randomized clinical trials. Pilot and feasibility trials were also considered.

The exclusion criteria were as follows: (1) conference abstracts or proceedings, (2) thesis dissertations, (3) impossibility of accessing full text, (4) meta-analysis combined studies evaluating osteoarthritis with studies evaluating other populations, (5) meta-analysis combined studies evaluating self-efficacy with studies assessing other factors, (6) preprint, and (7) review protocols.

Study selection

One reviewer (JMC) used Zotero 6.0.9 Citation Management Software to include all references retrieved from the electronic databases. Afterward, this reviewer manually removed duplicates [29] and read titles and abstracts. Then, full texts were evaluated when abstracts seemed eligible or when abstracts were unavailable. No consensus was required.

Methodological quality assessment

Two reviewers (JMS and MIC) used AMSTAR 2 to independently analyze the methodological quality of reviews [30]. This tool is composed of 16 items that can be rated as yes, partial yes, or no. An overall score is not recommended, but seven items are considered critical domains: items 2, 4, 7, 9, 11, 13, and 15 [30]. Disagreements among reviewers were solved by consensus. The two reviewers met by video call and discussed the items where they agreed or disagreed. In those items where they disagreed, they debated them until to reach a consensus. Afterward, the percentage of agreement between these reviewers was calculated. This percentage was calculated considering the number of items JMS and MIC rated with the same score before pooling the results of their independent assessments.

Data extraction

Two reviewers (JMS and MIC) developed data extraction. The reviewers met by video call and discussed the items where they agreed or disagreed. In those items where they disagreed, they debated them until to reach a consensus. The following information was extracted when possible: first author, year of publication, if the authors developed: meta-regressions, subgroup meta-analysis, and sensitivity analysis, if the authors evaluated the certainty of evidence using the GRADE system [31], the replication of the reviewed interventions using the TIDieR checklist [32], and the methodological quality/risk of bias assessment of primary studies. In addition, details regarding interventions, controls, and outcomes of interest were extracted. Finally, the main findings were collected. Disagreements among reviewers were solved by consensus.

Data analysis

Furthermore, we aimed to report in the main text the effects of non-pharmacological interventions reported by type of intervention and type of self-efficacy in the main text. These results were reported narratively and quantitively using the meta-analyses reported by the included reviews. We included as multidisciplinary interventions those reviews that meta-analyzed primary studies that included more than one type of intervention in their experimental groups (e.g., exercise plus diet or exercise plus manual therapy). We made this decision in four reviews, although these reviews focused mainly their objectives on exercise [22, 33], family-based interventions [25], or self-management approaches [34].

We developed citation matrices to calculate the corrected covered area (CCA), which is needed to evaluate the degree of overlap between reviews [35]. The CCA refers to the area that is covered after removing studies the first time they are counted. The degree of overlap between reviews can be classified as slight (CCA 0–5%), moderate (CCA 6–10%), high (CCA 11–15%), or very high (CCA > 15%) [35]. Finally, one reviewer (CGM) built a bar plot to depict the degree of overlap between reviews. We only calculated the CCA when at least two reviews meta-analyzed the same type of intervention.

Results

A total of 542 references were retrieved from the electronic databases. Of them, 427 titles and abstracts were read, and the rest ($k = 115$) were directly removed (duplicates). Then, 189 full texts were analyzed. In addition, seven references were manually found and analyzed in full text. Finally, eight systematic reviews with meta-analysis were included (Fig. 1) [22–25, 33, 34, 36, 37]. Supplementary File 2 shows the list of excluded studies with reasons. Supplementary File 3 shows the list of studies manually found. Table 1 shows the characteristics of the included reviews.

The degree of overlap between reviews

The degree of overlap between reviews considering all reviews ($k = 8$) was moderate (CCA = 6%). In addition, the degree of overlap between reviews regarding multidisciplinary or psychological reviews was slight (CCA = 5%) and very high (CCA = 25%), respectively (Fig. 2 and Supplementary Files 4, 5, 6, 7).

Methodological quality assessment

The methodological quality of the included reviews was evaluated with AMSTAR 2 (Table 2, the inter-rater agreement was 86.72%). Overall, the included reviews did not show important methodological flaws. However, some methodological aspects were not completely managed. For example, many reviews did not specify the reasons for selecting a specific research design in their eligibility criteria. The sources of funding for primary studies were not reported by most of the included reviews. In addition, no reviews assessed the impact of the risk of bias of primary studies on the results of the meta-analysis.

Mind–body exercises

Hu et al. 2021 meta-analyzed the effectiveness of tai chi exercises in people with knee osteoarthritis [37]. One meta-analysis of interest was included and showed that this intervention was more effective than education or physical therapy in improving arthritis self-efficacy (SMD = 0.27 [95% CI

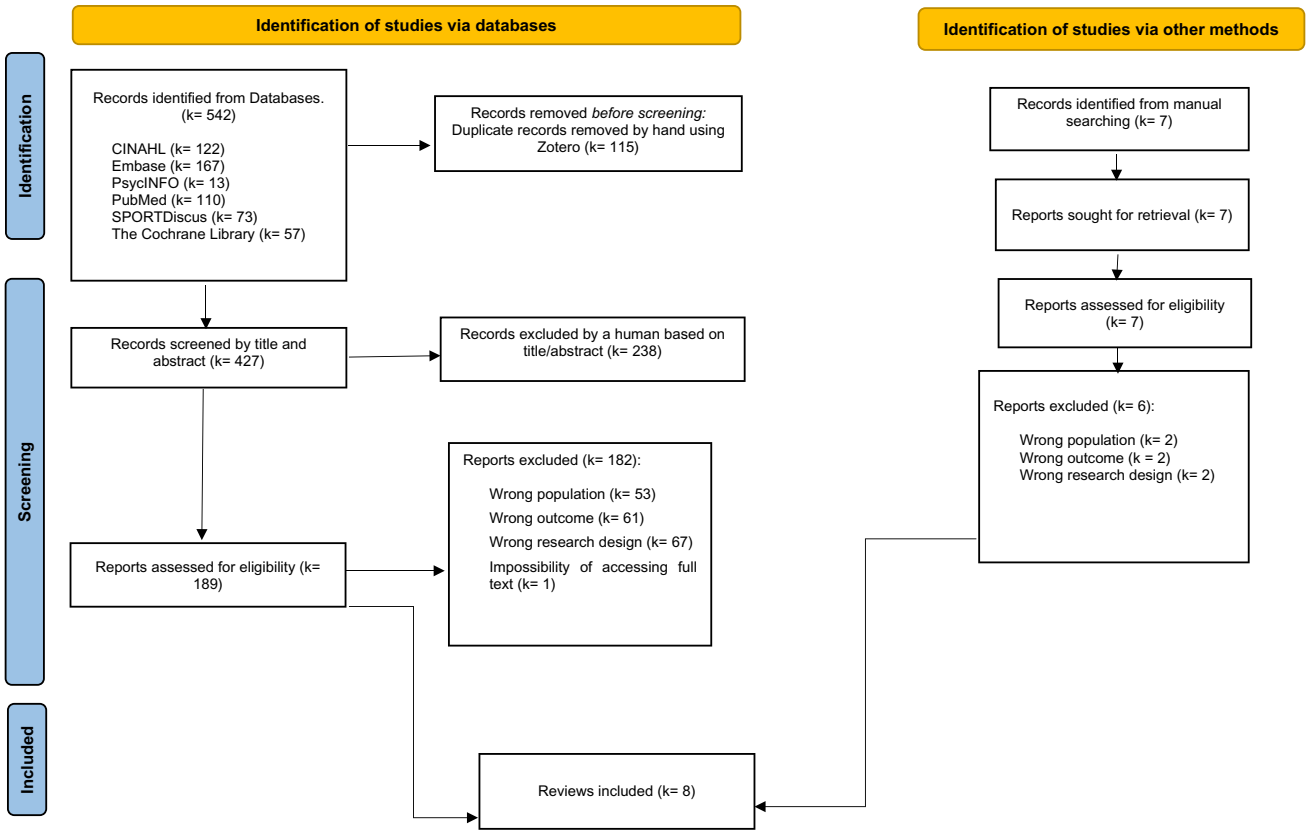

Fig. 1 The PRISMA 2020 flow diagram

0.06 to 0.48], $p = 0.01$; $I^2 = 44\%$). The certainty of evidence using the GRADE system was low.

Multidisciplinary and multimodal interventions

Ariie et al. meta-analyzed the effectiveness of multidisciplinary (e.g., exercise plus psychological intervention) and multimodal (e.g., different exercise modalities) programs in people with knee osteoarthritis [22]. One meta-analysis of interest was included in this overview, which evaluated different forms of self-efficacy: arthritis self-efficacy-pain, pain self-efficacy, and general self-efficacy. Multidisciplinary and multimodal programs with or without usual care were not more effective than usual care alone at 3–10.5 months after the end of the intervention (SMD = 0.04 [95% CI − 0.39 to 0.47], $p = 0.85$; $I^2 = 72\%$, $k = 5$, $N = 329$). The certainty of evidence using the GRADE system was very low.

Fritsch et al. 2021 meta-analyzed the effectiveness of family-based interventions (patients plus spouses) based mainly on multidisciplinary interventions (e.g., education plus psychological intervention) in people with osteoarthritis in different body locations (back, hip, and/or knee) [25]. Two meta-analyses of interest were selected and showed that this intervention was not more effective than similar interventions without the involvement of spouses to improve arthritis self-efficacy at ≤ 10 weeks after intervention (SMD = − 8.35 [95% CI − 19.42, 2.71], $p = 0.14$; $I^2 = 89\%$) and > 10 weeks up to 6 months (SMD = − 4.83 [95% CI − 12.24, 2.58], $p = 0.20$; $I^2 = 76\%$). The GRADE system was not applied in these subgroup meta-analyses.

Hurley et al. 2018 meta-analyzed the effectiveness of multidisciplinary interventions including exercise or mind–body exercises (e.g., tai chi) in people with hip or knee osteoarthritis [33]. The global meta-analysis showed that multidisciplinary interventions were more effective than multiple controls (e.g., education, sham intervention, usual care, or waitlist) in enhancing different forms of self-efficacy (e.g., arthritis self-efficacy) from 12 weeks up to 18 months (SMD = 0.46 [95% CI 0.34 to 0.58], $p < 0.00001$; $I^2 = 47\%$, $k = 11$, $N = 1138$). The certainty of evidence using the GRADE system was low. In addition, two subgroup meta-analyses were selected and showed that multidisciplinary interventions were more effective than different types of controls (e.g., sham intervention or usual care) in improving arthritis self-efficacy pain (SMD = 0.37 [95% CI 0.11 to 0.63], $p = 0.0059$; $I^2 = 77\%$, $k = 2$, $N = 230$) from 12 weeks up to 52 weeks and global arthritis self-efficacy (pain, function, and other symptoms) (SMD = 0.95 [95% CI 0.63 to

Table 1 Characteristics and effect sizes from the included reviews

Included reviews	MR	Sens.A	Subg.A	TIDieR	MQ/RoB	Main findings of the meta-analyses												
						Patient characteristics	Self-efficacy outcome	Follow-up	Intervention		K*	*N*	SMD	95% CI		*p*	I^2	GRADE
									Experimental	Control				Lower	Upper			
Ariie et al. [22]	No	Yes	Yes	No	Yes	≥ 18 years Knee OA or self-reported knee OA	Arthritis self-efficacy (arthritis self-efficacy scale-pain dimension); pain self-efficacy (pain self-efficacy questionnaire); general self-efficacy (self-efficacy scale)	3 to 10,5 months after intervention	Multidisciplinary (e.g., exercise plus psychological therapy) and multimodal exercise (e.g., aerobic and strengthening) with or without usual care	Usual care	5	329	0.04	−0.39	0.47	0.85	72%	Very low
Fritsch et al. [25]	No	No	Yes	No	Yes	> 18 years Back, hip, and/or knee OA	Arthritis self-efficacy (arthritis self-efficacy scale-UR dimensions)	≤ 10 weeks after intervention	Multidisciplinary approaches including education and psychological therapies (e.g., cognitive behavioral therapy or coping skill training) with the involvement of spouses	Same that the experimental groups without the involvement of spouses	3	265	−8.35	−19.42	2.71	0.14	89%	*
						> 18 years Hip and/or knee OA		> 10 weeks up to 6 months after intervention			3	272	−4.83	−12.24	2.58	0.20	76%	*
Hu et al. [37]	No	No	No	No	Yes	≥ 18 years Knee OA	Arthritis self-efficacy (arthritis self-efficacy scale-UR dimension) and exercise self-efficacy (exercise self-efficacy scored from 1 to 5)	After intervention (no further details provided)	Tai chi exercises (Yang style)	education or physical therapy	4	352	0.27	0.06	0.48	0.01	44%	Low

Table 1 (continued)

Included reviews	MR	Sens.A	Subg.A	TIDieR	MQ/RoB	Main findings of the meta-analyses											
						Patient characteristics	Self-efficacy outcome	Follow-up	Intervention		K*	*N*	SMD	95% CI		*p*	I^2	GRADE
									Experimental	Control				Lower	Upper			
Hurley et al. [33]	No	No	Yes	No	Yes	OA in different locations (e.g., hip or knee)	different forms of self-efficacy: six-minute walk self-efficacy, exercise beliefs self-efficacy, arthritis self-efficacy (arthritis self-efficacy scale-pain, function, and other symptoms dimensions), arthritis self-efficacy-pain (arthritis self-efficacy-pain dimension), McAuley self-efficacy exercise scale, self-efficacy score, pain self-efficacy (visual analogue pain scale self-efficacy)	12 weeks up to 18 months after intervention	Multidisciplinary intervention including exercise + advice, breathing techniques, counseling, diet, education, family (spouses) coping interventions, manual therapy, mind–body exercises, relaxation techniques, self-management strategies	Attention control/placebo, education, multidisciplinary intervention (e.g., attention placebo/alternative intervention + wellness education + stretching program), sham intervention, telephone call, usual care, waitlist	11	1138	0.46	0.34	0.58	< 0.00001	47%	Low
						OA in different regions (e.g., hip or knee)	Arthritis self-efficacy pain (arthritis self-efficacy-pain dimension)	12 weeks up to 52 weeks after intervention	Multidisciplinary interventions including exercise + education or manual therapy	Education or sham intervention	2	230	0.37	0.11	0.63]	0.0059	77%	*
						OA location not specified	Arthritis self-efficacy (self-efficacy exercise scale- pain, function, and other symptoms dimensions)	12 weeks after intervention	Multidisciplinary intervention including exercise + advice or education	Usual care or waitlist	2	168	0.95	0.63	1.27	< 0.00001	0%	*
Kroon et al. [34]	No	Yes	Yes	No	Yes	Hip and/or knee OA	Arthritis self-efficacy (arthritis self-efficacy scale-UR dimensions)	Immediately post-intervention	Overall, multidisciplinary interventions based on exercise + activity strategy training or spoused assisted coping skills training + education	Multidisciplinary interventions (e.g., education + spousal support or education + exercise), exercise, or usual care	3	186	0.42	− 0.05	0.89	0.08	55.88%	*

Table 1 (continued)

Included reviews	MR	Sens.A	Subg.A	TIDieR	MQ/RoB	Main findings of the meta-analyses											
						Patient characteristics	Self-efficacy outcome	Follow-up	Intervention		K*	*N*	SMD	95% CI		*p*	I^2	GRADE
									Experimental	Control				Lower	Upper			
Wang et al [24]	No	Yes	Yes	No	Yes	Hip and/or knee OA	Arthritis self-efficacy (arthritis self-efficacy scale-UR dimensions)	UR	Pain coping skills training	Unspecified	8	1114	0.27	0.07	0.46	0.007	55%	NA
Wu et al. [23]	No	No	Yes	No	Yes	Knee OA	Arthritis self-efficacy pain (arthritis self-efficacy scale-pain dimension)	1 week up to 48 weeks after intervention	Self-management strategies (arthritis self-management program) + usual care	Usual care	2	197	MD = 2.82	0.35	5.29	0.03	0%	*
						Knee OA	Arthritis self-efficacy other symptoms (arthritis self-efficacy scale-other symptoms dimension)	1 week up to 48 weeks after intervention			2	197	MD = 3.99	1.55	6.43	0.001	25%	*
Zhang et al. [36]	No	Yes	No	No	Yes	Osteoarthritis located in different body regions: hip and/or knee	Arthritis self-efficacy (arthritis self-efficacy scale-UR dimensions)	Post-intervention	Coping skills training including pain coping skills training, spouses coping skills training	Assessment only, education, spousal support, usual care	5	575	0.58	0.40	0.75	< 0.00001	4%	NA
						Osteoarthritis located in different body regions: hip and/or knee	Arthritis self-efficacy (arthritis self-efficacy scale-UR dimensions)	6 months follow-up after intervention	Coping skills training including pain coping skills training, spouses coping skills training	Education, spousal support, usual care	2	315	0.35	0.10	0.60	0.006	76%	NA
						Osteoarthritis located in different body regions: hip and/or knee	Arthritis self-efficacy (arthritis self-efficacy scale-UR dimensions)	12 months follow-up after intervention	Coping skills training including pain coping skills training, spouses coping skills training, and internet-based coping skills strategies	Education, spousal support, usual care	2	315	0.36	0.10	0.63	0.007	60%	NA

CI confidence interval; *GRADE* Grading of Recommendations Assessment, Development, and Evaluation; *K* studies included in the analysis; *MD* mean difference; *MQ* methodological quality; *MR* meta-regression; *N* sample size included in the analysis; *NA* not assessed; *OA* osteoarthritis; *p p* value; *RoB* risk of bias; *Sens.A.* sensitivity analysis; *SMD* standard mean difference; *Subg.A.* subgroup analysis; *TIDieR* Template for Intervention Description and Replication; *UR* unreported

*The GRADE judgment was not extracted as it was not applied to the included MAs. All primary studies were randomized controlled trials

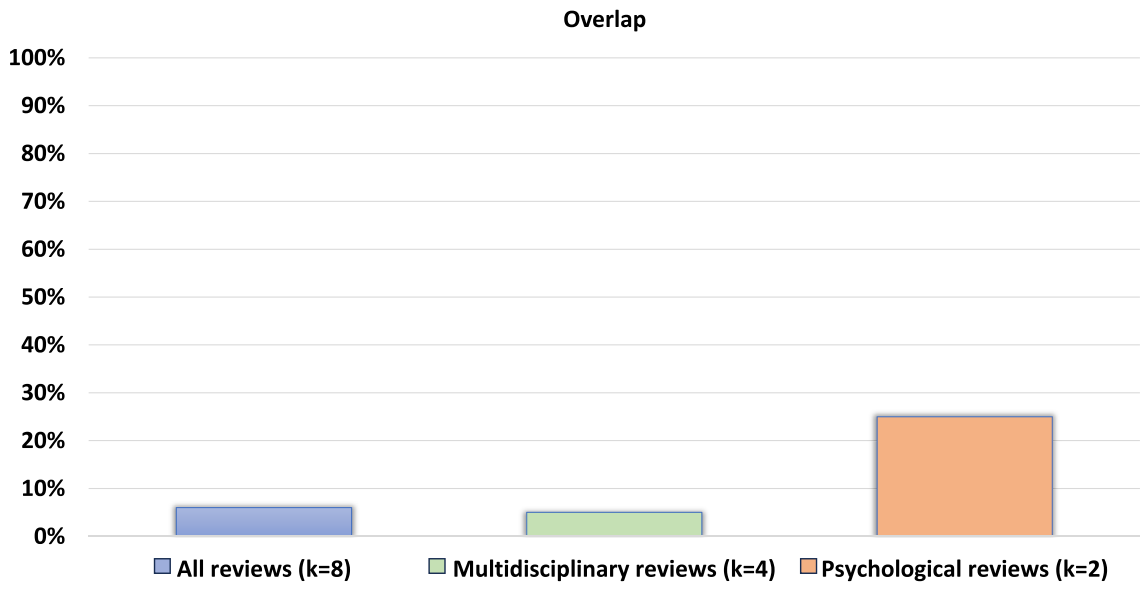

Fig. 2 The degree of overlap between reviews

1.27], $p < 0.00001$; $I^2 = 0\%$, $k = 2$, $N = 168$) at 12 weeks. The GRADE system was not applied in these subgroup meta-analyses.

Kroon et al. 2014 included one meta-analysis of interest evaluating the effectiveness of multidisciplinary interventions in people with hip and/or knee osteoarthritis [34]. This meta-analysis showed that multidisciplinary interventions including education, spoused assisted coping skills training, or exercise were not more effective than different types of control such as education, exercise, or spousal support to improve arthritis self-efficacy immediately after the intervention (SMD = 0.42 [95% CI − 0.05 to 0.89], $p = 0.08$; $I^2 = 55.88\%$, $k = 3$, $N = 186$). The GRADE system was not applied in these subgroup meta-analyses.

Psychological interventions

Wang et al. included one meta-analysis of interest analyzing the effectiveness of pain coping skills training in people with hip and/or knee osteoarthritis [24]. This meta-analysis showed that this intervention was more effective than controls (unspecified) in improving arthritis self-efficacy (SMD = 0.27 [95% CI 0.07 to 0.46], $p = 0.007$; $I^2 = 55\%$, $k = 8$, $N = 1114$). The follow-up was not specified. The GRADE system was not applied.

Zhang et al. included three meta-analyses of interest also analyzing the effectiveness of coping skills training in people with hip and/or knee osteoarthritis [36]. Mainly, coping skills training strategies included pain coping, spouse coping, and internet-based coping training. The meta-analyses showed that coping skills training is more effective than different controls (e.g., spousal support or usual care) in improving arthritis self-efficacy after intervention (SMD = 0.58 [95% CI 0.40 to 0.75], $p < 0.00001$; $I^2 = 4\%$, $k = 5$, $N = 575$), 6 months (SMD (CI 95%) = 0.35 [95% CI 0.10 to 0.60], $p = 0.006$, $I^2 = 76\%$, $k = 2$, $N = 315$), and 12 months follow-up (SMD = 0.36 [95% CI 0.10 to 0.63], $p = 0.007$, $I^2 = 60\%$, $k = 2$, $N = 315$). The GRADE system was not applied.

Self-management approaches

Wu et al. 2022 included two meta-analyses of interest evaluating the effectiveness of the arthritis self-management program plus usual care in people with knee osteoarthritis [23]. The meta-analyses showed that this intervention was more effective than usual care alone in enhancing arthritis self-efficacy pain (MD = 2.82 [95% CI 0.35 to 5.29], $p = 0.03$; $I^2 = 0\%$, $k = 2$, $N = 197$) and arthritis self-efficacy other symptoms (MD = 3.99 [95% CI 1.55 to 6.43], $p = 0.001$; $I^2 = 25\%$, $k = 2$, $N = 197$) from 1 to 48 weeks. The GRADE system was not applied in these subgroup meta-analyses.

Discussion

This overview of reviews aimed to summarize the effectiveness of non-pharmacological interventions to enhance different forms of self-efficacy in people with osteoarthritis. Eighth systematic reviews with meta-analysis evaluating 30 different randomized controlled trials were selected. These meta-analyses analyzed the effectiveness of mind–body exercises, multidisciplinary interventions, psychological interventions, and self-management strategies.

Table 2 The methodological quality of systematic reviews (AMSTAR-2)

Systematic review										0	1	2	3	4	5	6
Ariie et al. [22]																
Fritsch et al. [25]																
Hu et al. [37]																
Hurley et al. [33]																
Kroon et al. [34]																
Wang et al. [24]																
Wu et al. [23]																
Zhang et al. [36]																

Answers: red color: no, yellow color: partially yes, green color: yes

Items: AMSTAR 1: Did the research questions and inclusion criteria for the review include the components of PICO? AMSTAR 2: Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? AMSTAR 3: Did the review authors explain their election of the study designs for inclusion in the review? AMSTAR 4: Did the review authors use a comprehensive literature search strategy? AMSTAR 5: Did the review authors perform study selection in duplicate? AMSTAR 6: Did the review authors perform data extraction in duplicate? AMSTAR 7: Did the review authors provide a list of excluded studies and justify the exclusions? AMSTAR 8: Did the review authors describe the included studies in adequate detail? AMSTAR 9: Did the review authors use a satisfactory technique for assessing the risk of bias in individual studies that were included in the review? AMSTAR 10: Did the review authors report on the sources of funding for the studies included in the review? AMSTAR 11: If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? AMSTAR 12: If meta-analysis was performed, did the review authors assess the potential impact of risk of bias in individual studies on the results of the meta-analysis or other evidence synthesis? AMSTAR 13: Did the review authors account for risk of bias in individual studies when interpreting/discussing the results of the review? AMSTAR 14: Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? AMSTAR 15: If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? AMSTAR 16: Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

Tai chi exercises were the only type of mind–body exercise included in the meta-analyses of interest. This intervention seems to be effective in improving arthritis self-efficacy in people with knee osteoarthritis. Positive effects in favor of tai chi exercises have been found in other types of arthritis. For example, tai chi exercises may enhance psychological factors in people with rheumatoid arthritis such as motivation, self-esteem, and self-efficacy [38]. In addition, tai chi exercises combined with auricular acupressure may enhance pain self-efficacy in this population [39].

Although multidisciplinary interventions mainly including exercise may improve arthritis self-efficacy (e.g., arthritis self-efficacy pain) in people with hip and/or knee osteoarthritis, the effectiveness of these interventions was inconsistent across the meta-analyses [22, 25, 33, 34]. It was not unexpected since important disparities in the type of intervention were observed if we compared the included meta-analyses. For example, Ariie et al. included multidisciplinary (e.g., exercise plus psychological intervention) and multimodal exercise (e.g., aerobic and strengthening) with or

without usual care [22], whereas Hurley et al. 2018 included a large number of interventions such as exercise + advice, breathing techniques, counseling, diet, education, family (spouses) coping interventions, manual therapy, mind–body exercises, relaxation techniques, and self-management strategies [33]. In this sense, we encourage readers to be cautious with the conclusions regarding multidisciplinary interventions.

On the other hand, coping skills training based on pain coping skills, spouses coping skills, and internet-based coping skills have shown positive effects in enhancing arthritis self-efficacy in people with hip and/or knee osteoarthritis. These results are also in line with individual studies that have evaluated the importance of coping skills training in other types of arthritis. For example, the combination of pain coping skills training and a lifestyle weight loss intervention has been found to improve self-efficacy for weight control in people with rheumatoid arthritis [40]. In addition, the inclusion of coping skills training in an online program with other psychological interventions such as psychoeducation and stress management may enhance arthritis self-efficacy in adolescents with juvenile idiopathic arthritis [41].

The arthritis self-management program is probably one of the most known interventions to foster self-management strategies in individuals with arthritis. Two meta-analyses found this intervention may produce benefits in improving arthritis self-efficacy for pain and arthritis self-efficacy for other symptoms in people with knee osteoarthritis [23]. Previous results also support these findings in other types of arthritis. For example, a community-based lay-led Arthritis Self-Management Program showed positive results in improving arthritis self-efficacy in people with chronic inflammatory arthritis [42]. This program has also found positive effects on arthritis self-efficacy among individuals with arthritis or fibromyalgia [43].

Altogether, the results of this overview may have important public health and clinical implications. Although recent advances and recommendations have been proposed in the pharmacological management of osteoarthritis [5], evidence also underlines effective disease-modifying drugs are lacking [44]. In this context, EULAR has recently developed eight recommendations to integrate non-pharmacological interventions into current osteoarthritis management protocols [8]. Some of them are in line with the results of this overview. EULAR has proposed that individuals with hip or knee osteoarthritis should be offered strategies for self-management (e.g., information and education) that should be reinforced in booster sessions. Additionally, exercise and mind–body exercises modalities using adequate dosage and mode of delivery, as well as the use of tailoring approaches should be applied according to the preferences of patients and available facilities. We also recommended clinicians to use coping skills training in individuals with osteoarthritis and adapt this intervention factors should be specifically increased. For example, some patients may need to improve their skills to manage pain, whereas other patients may require their spouse help them better handle the course of symptoms.

Limitations

We acknowledge as a limitation of this overview that we only included systematic reviews with meta-analyses published in peer-reviewed journals and written in English or Spanish language. This could cause that important information had been missed. This information may appear in systematic reviews without meta-analysis and other types of research (e.g., thesis dissertation). We also encourage readers to be caution with our findings due to the overlap found between some reviews. Specifically, we observed a very high overlap between reviews exploring psychological interventions. Although some differences were found between the objectives of the included reviews evaluating psychological interventions, these reviews shared clinical trials in their meta-analyses. We encourage authors of systematic reviews to check those databases that register reviews such as PROSPERO, Open Science Framework, or INPLASY before registering their protocols. This may help decrease the degree of overlap on this topic.

Conclusions

Overall, this overview of systematic reviews with meta-analysis can be helpful for clinicians who aim to enhance arthritis self-efficacy in people with hip and/or knee osteoarthritis. Mainly, the results show that tai chi exercises, coping skills training, and the arthritis self-management program may be beneficial for these patients. We encourage the research community in this field to increase the body of knowledge on this topic as well as the use of the GRADE system to reach more robust and direct conclusions.

Clinical messages

- Tai chi exercises may improve arthritis self-efficacy in people with knee osteoarthritis.
- Coping skills training may enhance arthritis self-efficacy among individuals with hip and/or knee osteoarthritis.
- The arthritis self-management program may improve arthritis self-efficacy in people with knee osteoarthritis.

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Data availability All data relevant to the study are included in the article or are available as supplementary files.

Declarations

Consent to participate Not applicable.

Disclosures None.

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