Treatments for hand osteoarthritis: A systematic review: 2024 update.

Online Supplementary Material

Kjeken I, *et al. RMD Open* 2025; 11:e004963. doi: 10.1136/rmdopen-2024-004963

1. LITERATURE SEARCH STRATEGY

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(("Hand" OR "hands" OR "Hand Joints" OR "hand joint" OR "intermetacarpal joint" OR "intermetacarpal joints" OR "finger" OR "fingers" OR "Finger Joint" OR "Carpal Joints" OR "Carpal Joint" OR "Carpal Joints" OR "Carpometacarpal Joint" OR "Carpometacarpal Joints" OR "Finger Joints" OR "Metacarpophalangeal Joint" OR "Metacarpophalangeal Joints" OR "thumb" OR "thumbs" OR "metacarpus" OR "trapeziometacarpal" OR "first metacarpal-carpal" OR "carpometacarpal" OR "interphalangeal" OR "distal interphalangeal" OR "proximal interphalangeal" OR Intermetacarp* OR Interphalang* OR Intercarp* OR Carpometacarp* OR Metacarpophalang* OR Metacarp* OR scaphotrapeziotrapezoid*) AND ("Osteoarthritis" OR osteoarthr* OR "osteoarthrosis" OR "osteoarthroses" OR "degenerative arthritis" OR rhizarthros* OR "arthrosis" OR "arthroses" OR Heberden OR Bouchard) AND ("Treatment Outcome" OR "Treatment" OR "Treatments" OR "treated" OR "Therapeutics" OR "Therapeutic" OR "Therapy" OR "Therapies" OR therapy OR "drug" OR "drugs" OR medicament* OR kinesiotherapy OR kinesiotherapy OR "Exercise Therapy" OR Rehabilitation OR "Rehabilitation" OR "Antirheumatic Agent" OR "Antirheumatic" OR analgesic agent OR Analgesic* OR nonsteroid antiinflammatory agent OR "Nonsteroidal Antiinflammatory" OR "Nonsteroidal Anti-inflammatory" OR "Non-steroidal Antiinflammatory" OR "Non-steroidal Anti-inflammatory" OR NSAID* OR Arthrodesis OR Arthroplasty OR "Arthrodesis" OR "Arthroplasty" OR "surgery" OR "surgical" OR "replacement" OR trapeziectom* OR "exercise" OR "Health Education" OR "education" OR "Self Care" OR "Behavior Therapy" OR "Splint" OR "Orthosis" OR "Self-Help Device" OR splint* OR orthos* OR "assistive device" OR "Thermotherapy" OR "heat application" OR "Topical Drug

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2. FLOW CHART

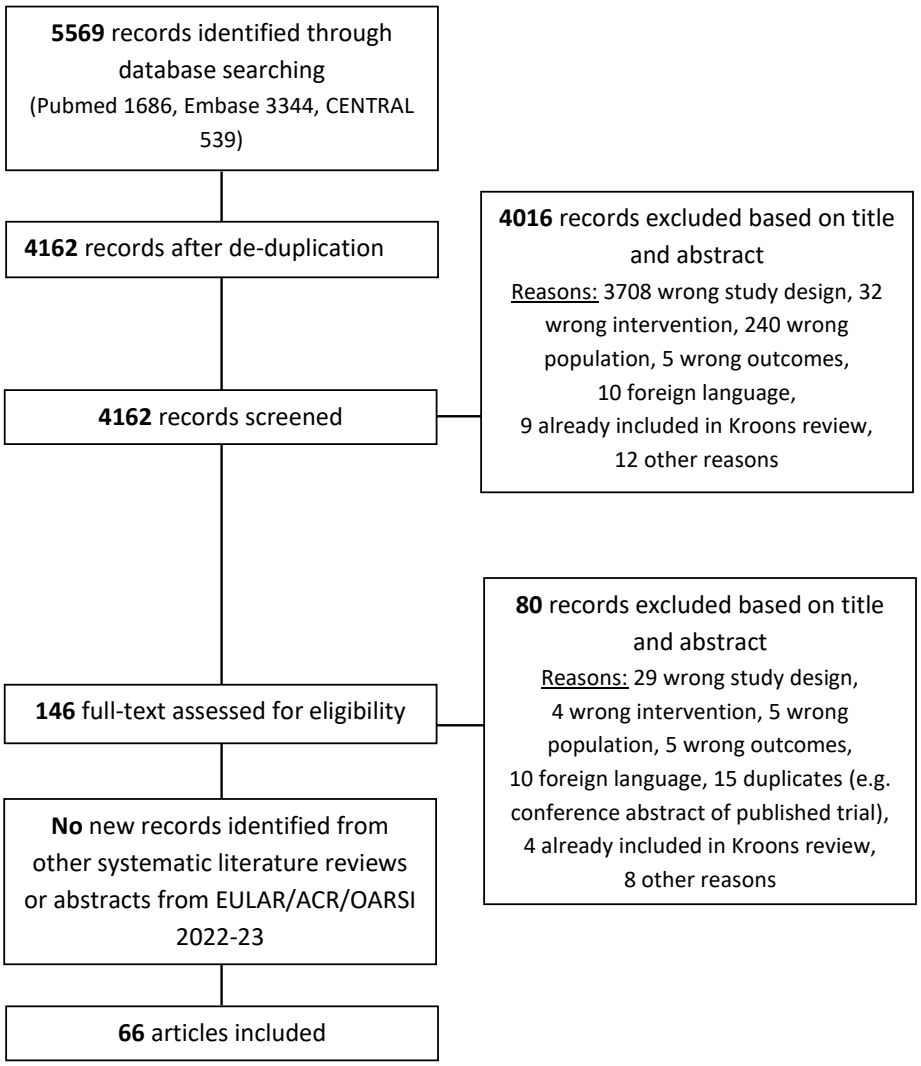


Figure 1. Flow chart of systematic literature review. ACR, American College of Rheumatology; EULAR, European Alliance of Associations for Rheumatology; OARSI, Osteoarthritis Research Society International

3. OVERVIEW OF NUMBER OF NEW AND PREVIOUS STUDIES INCLUDED IN META-ANALYSES

Supplementary table 2. Overview of new and previous included studies. (One RCT with 3 groups, from which 2 groups (thermal treatment and control) is included as non-pharmacological therapy and 2 groups (herbs and control) are included as pharmacological therapy)

	Therapy	**Number of new studies**				**Studies from Kroons review included in meta-analyses**		
		Total	**RCT**	**CO**	**Included in meta-analyses**	**Total**	**RCT**	**CO**
Non-pharmacological (n=35)	Hand exercises	11	9	1	8	5	5	0
	Hand exercises	*6*	*5*	*1*	*2*	*5*	*5*	*0*
	Proprioceptive exercises	*5*	*5*	*0*	*5*	*0*	*0*	*0*
	Orthoses (splints)	6	5	1	2	10	9	1
	Orthoses vs no orthoses	*3*	*3*	*0*	*2*	*5*	*5*	*0*
	CMC orthoses vs orthoses also immobilising the wrist and/or additional thumb joints	*3*	*2*	*1*	*3*	*4*	*0*	*4*
	Assistive devices	1	1	0	1	1	1	0
	Kinesiology tape	2	2	0	0	0	0	0
	Thermal modalities	7	7	0	2	5	5	0
	Ultrasound/laser therapy	1	1	0	0	2	2	0
	Low-dose radiation* (One study reported in 2 articles)	1	1	0	0	0	0	0
	Vibrating gloves	1	1	0	0	0	0	0
	Acupuncture	1	1	0	0	0	0	0
	Combination programs	3	3	0	2	3	3	0
Pharmacological (n=17)	Herbs	2	2	0	0	0	0	0
	Topical NSAIDs	0	0	0	0	3	3	0

	Topical corticosteroid	1	1	0	0	0	0	0
	Oral NSAIDs	0	0	0	0	3	3	0
	Oral glucocorticoids	1	1	0	1	2	2	0
	Intra-articular glucocorticoids	0	0	0	0	3	3	0
	Intra-articular hyaluronic acid	1	1	0	1	2	2	0
	Biological disease-modifying anti-rheumatic drugs (bDMARDs)	3	3	0	0	4	3	1
	Synthetic DMARDs anti-rheumatic drugs (Hydrochloroquine)	1	1	0	2	2	2	0
	Synthetic DMARDs anti-rheumatic drugs (Methotrexate)	2	2	0	2	0	0	0
	Platelet rich plasma injections	3	3	0	0	0	0	0
	Colchicine tablets	2	2	0	2	0	0	0
	Oral conjugated oestrogens	1	1	0	0	0	0	
Pharmacological and non-pharmacological (4)	Education+ exercises + orthosis, Diclofenac gel 1%	1	1	0	0	0	0	0
	Extracorporeal shock wave therapy, intra-articular Hyaluronic Acid	1	1	0	0	0	0	0
	Nerve block injection + prednisolone + exercises Exercises	1	1	0	0	0	0	0
	Botulinum toxin A injections+orthosis	1	1	0	0	0	0	0
Surgery (10)	Total joint replacement (Maia prosthesis) Trapeziectomy	1	1	0	0	0	0	0
	Total joint replacement (Touch® TMC joint dual mobility press-fit prosthesis) Trapeziectomy with tendon interposition arthroplasty	1	1	0	0	0	0	0
	Total joint replacement (The double mobility TCMC prosthesis) Trapezioectomy with resection-	1	1	0	0	0	0	0

	interposition (flexor carpi radialis) arthroplasty							
	Total joint replacement (Hydroxyapatite-coated ElektraTM) Trapezioectomy with LRTI Joint replacement	1	1	0	0	0	0	0
	Trapeziectomy alone Trapeziectomy + LRTI*	1	1	0	0	0	0	0
	Trapeziectomy with suspension-interposition arthroplasty Trapeziectomy with a human dermal collagen template	1	1	0	0	0	0	0
	Trapeziectomy with LRTI Trapeziectomy with suture-button suspensionplasty	1	1	0	0	0	0	0
	Partial trapeziectomy with suspension and interposition arthroplasty based on Weilby technique Total trapeziectomy with suspension and interposition arthroplasty based on Weilby technique	1	1	0	0	0	0	0
	Arthroscopic distal hemitrapeziectomy Open trapeziectomy	1	1	0	0	0	0	0
	LRTI Hematoma distraction arthroplasty	1	1	0	0	0	0	0
***LRTI = ligament reconstruction and tendon interposition**								

4. CHARACTERISTICS AND RISK OF BIAS OF NEW INCLUDED STUDIES

4.1 NON-PHARMACOLOGICAL INTERVENTIONS

4.1.1. Hand exercises: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Kang 2019[1]	L	L	L	H	S	H	Calibration of dynamometer not mentioned, nor the intra-rater reliability of the investigators. Effect size calculations not shown. Knowledgde about interventions. Some selective outcome-reporting. Small sample. Differences in follow up time. Impossible to blind participants.
Leonard 2021[2]	L	L	L	S	S	S	Self-reported outcomes / patients are the assessors. No blinding. No statistical analysis plan (SAP) available. Impossible to blind participants.
Magni 2022[3]	**S**	**L**	**L**	**H**	**L**	**H**	Due to the nature of study design (knowledge of interventions and extra visits to health care providers in the intervention groups). No blinding. Some mistakes from randomisation (imbalances in allocation of women and KL-score.) Impossible to blind participants.
McVeigh 2021[4]	**L**	**L**	**L**	**H**	**S**	**H**	Self-reported VAS. Unclear which time-point is the primary one for measurement. Short follow up. No placebo. Knowledge of the intervention and unclear blinding may rise some bias, as well as an additional visit for treatment. Expectations of intervention may influence the outcome. No SAP, limited information about use of ITT in the method section - only a between group comparison reported. Impossible to blind participants.
Pedersini 2021[5]	**S**	**L**	**L**	**S**	**H**	**H**	Limited information. Simple random technique (computer based), no more info about allocation or concealment. The same therapist conducted the interventions for both groups. Impossible to blind participants, outcomes are self-reported. First analysis showed no differences between groups. The authors used the post-hoc analysis to conclude. several VAS questions and timepoints, including primary time point) not reported.

Pisano 2022[6]	L	H	H	H	S	H	No ITT, blinding or imputation if patient losses occurred. 40-70% did not perform their home exercise programme. No attention to incomplete data. High unknown loss of participants.

4.1.2. Proprioceptive hand exercises: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Cantero-Tellez 2023[7]	**S**	**S**	**L**	**S**	**L**	H	Pilot study. No info about randomisation process, nor on concealment. Between group comparison. No ITT, no blinding. New concept without validated measurements, other factors may influence outcome, which the authors acknowledge.
Cantero-Tellez 2022a[8]	S	L	L	L	S	S	Block randomisation 1:1, single centre, high loss of participants, but still enough power. No SAP. Impossible to blind participants.
Cantero-Tellez 2022b[9]	S	S	L	L	S	H	Block randomisation. Limited information about allocation process. ITT, between group. Unclear whether the participants knew their allocation in the trial. Differences between analyses described in the protocol and those performed. Few participants indicate non-realistic high effect sizes. Rated with high risk of bias as three domains are some concerns. Impossible to blind participants.
Campos-Villegas 2022[10]	L	L	L	S	S	S	Self-reported. Knowledge about the intervention. No SAP. Impossible to blind participants.
Cruz-Gambero 2023[11]	S	L	L	H	S	H	Lack of information on sex and x-ray. No blinding. High loss of participants, and even still powered, the adherence was not discussed (selective reporting). No SAP.

4.1.3. Orthoses vs no orthoses or placebo: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Adams 2021[12]	L	H	L	S	L	H	Mistakes in delivery of orthoses, many participants lost to follow up in all groups due to reported reasons, of which are AEs. More than 5% loss. Outcomes self-reported by participants, possible knowledge about group allocation.
Can 2020[13]	S	H	H	S	S	H	Limited information about concealment. 5 excluded from analysis in the intervention group due to mistake of not receiving the orthosis. No ITT. 17 hands excluded. Impossible to blind participants. High dropout in both group, reasons for dropout not completely described. No information about calibration of strength testing. No primary outcome complicates RoB evaluation. No SAP.
Silva 2020[14]	L	L	L	H	S	H	Due to the design of the study (blinding not possible). No SAP. Analysis presented adjusted with the Bonferroni

4.1.4. Thumb orthoses immobilising the CMC-joint only vs thumb orthoses also immobilising the wrist and/or more additional joints: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Cantero-Tellez 2018a[15]	H	L	L	S	L	H	Pilot study and new concept without validated evaluation. Allocation due to order of arrival over time. Impossible to blind participants. No information about concealment. Self-reported outcomes.

Cantero-Tellez 2018b[16]	S	L	L	L	S	S	Incomplete information about allocation; "Patients were divided into 2 equal groups using a randomized allocation". Very short follow up.
Eyiis 2023[17]	S	L	L	H	H	H	Lack of randomization procedure information. Tendencies of imbalances in groups, but statistical comparisons are not presented. Unblinded with potential knowledge about intervention. Self-reported outcome. No SAP. This is a special report, as it raises to questions: brace material/technology, and joint stabilization. It acknowledges the differences, but report on only one. Satisfaction may be related to both, and high risk of bias is given.

4.1.5. Assistive devices: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Amaral 2018[18]	S	L	L	S	S	H	Unclear allocation with risk of bias (en bloc), unclear description of the block procedure. Self-reported outcomes. No blinding, and more frequent interaction with investigators for intervention group which may lead to bias-potentials and more satisfaction as measured.

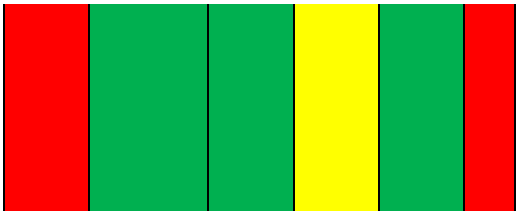
4.1.6. Kinesiology tape-studies: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Farhadian 2019[19]	S	S	L	S	H	H	Lack of information (i.e., disease severity and adverse effects). Impossible to blind participants. Self-reported outcomes. Selection of reporting highly possible. No real placebo.
Wade 2018[20]	S	L	L	S	S	H	Very open criteria which may rise the risk of confounders as no stratification was done. No table with baseline data presented. Gender and age variability, work and smoking reported in the text. VAS is not inappropriate; however, question marks should be raised to recruitment as there may be too many confounders affecting the outcome. A small number of participants, leaving the study highly underpowered. Both groups used some form of tape, no real control group (without tape) to control for the placebo-effect. No SAP, incomplete recruitment.

4.1.7. Thermal modalities: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Aksanyar 2022[21]	S	S	L	L	S	**S**	Flip-coin randomization, no info about concealment, statistical analysis plan, no power calculation. Single blinded for allocation (assessor), with a theoretical bias of knowledge about intervention among participants. However, no

							differences between groups at BL or outcomes.
Benini 2021[22]	**L**	**L**	**L**	**S**	**L**	**S**	Single-blinded (investigator). Italian version of AUSCAN not validated, however FIHOA was and somehow confirmed the AUSCAN scorings. Self-reported outcomes.
De Azevedo 2023[23]	**S**	**S**	**L**	**H**	**S**	**H**	Abstract only. Little information about both randomization and analysis processes. No blinding and self-reported outcome. No SAP.
Kasapoğlu Aksoy 2018[24]	S	S	L	S	S	H	Lack of information regarding randomisation and concealment. Lack of baseline data and treatments. No info about what participants knew about received intervention. Reasons for dropouts not reported. Modified ITT? No SAP. No effect sizes mentioned, even though this was supposed to be calculated. Possible selective reporting of results.
Savas 2019[25]	S	S	L	S	S	H	Lack of information about the randomisation process, analyses and participation rate in the control group. The nature of the study design, and few participants add to the RoB-score.
Ustun 2023[26]	H	H	L	H	S	H	Randomization with "the envelope-method" is the only information provided. Importantly: Disease duration or severity not reported between groups, and function differed - not possible to say if this is a chance finding or related to the process (little information). otherwise looks balanced. No blinding. Differences in follow up and knowledge about interventions. No information about additional treatments allowed by participants (i.e., rescue medications), which may lead to an increased RoB in a small sample. No SAP.
Öncel 2021[27]	**H**	**L**	**L**	**S**	**S**	**H**	Randomisation: sealed envelope method, performed locally with no information about who performed it, or when treatment started. No information about blocks or stratification. Many issues that may compromise the allocation is reported, this process is open to deliberate tampering and considered to beat the lower end compared to distance randomization processes. Differences in



gender allocation with more men receiving the paraffin. No information concerning disease severity or joint count. Possible knowledge of the intervention. No info about power-calculations. Unclear reporting. No SAP.

4.1.8. Ultrasound/laser therapy: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Cantero-Tellez. 2020[28]	L	S	H	L	S	H	Analysis method not described. Discordance between flow chart and table 2 concerning loss of participants and n used in analysis, no information about reasons for losses. Cannot see that last observation was carried forward as protocolled for follow up. Dropouts seem to be excluded. The total loss of participant (4+4) calculates to 18%.

4.1.9. Low-dose radiation: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Minten 2018[29]	L	S	L	L	L	S	Therapist not blinded to group allocation. Analyses not clearly described. No SAP
Van den Ende 2020[30]	L	L	L	L	L	L	Methodically well performed and reported

4.1.10. Gloves: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Jamison 2018[31]	H	H	H	H	H	H	Lack of information presented. Participants got paid to participate, participants in control group also wanted interventions. Substantial loss of participants questions the validity of analyses. Not controlling for external factors that may have affected the outcomes. No SAP or appropriate information to complete all RoB-evaluations.

4.1.11. Acupuncture: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Barnard 2020[32]	L	S	L	L	L	S	Unintended accidents with risk of confusing the blinding. No passive / real control group to evaluate context bias, expectations or real effects of treatment. However, few other limitations for RoB2-tool.

4.1.12. Combination programmes: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Rodriguez Sanchez-Lauhlè 2023[33]	L	L	L	H	H	H	High loss of participants, but still powered. Primary outcome: Performed by phone instead of self-reported directly due to Covid-19. Knowledge about intervention and group allocation. Differences in health-care visits. No SAP. Even being a well performed study, bias evaluation is based upon principles of related to D4 and D5 as specified by Cochrane chapter 8.6 for RoB2 evaluations.
Stoffer-Marx 2018[34]	S	L	L	H	S	H	Based on the first and fourth domains, in addition, complete blinding was not possible, even though the significance would be presumably low for the assessed outcome for this report.
Tveter 2022[35]	L	L	L	S	L	S	Blinding of participants not possible. Any risk of interaction between participants are not discussed. Self-reported outcomes. Little time / interaction with therapists.

4.2 PHARMACOLOGICAL INTERVENTIONS

4.2.1. Herbal treatment: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Kim 2021[36]	L	S	H	L	H	H	A high proportion of patients excluded from final analysis due to missing follow-up even though they received allocated treatment. Participants excluded from analysis, unclear from the flow chart which group they belonged to. Missing power analysis and effect size estimates. Assumptions that the authors are favouring intervention group and do not mention the superior outcomes for the control group. Funded by the manufacturer of the intervention medicine, and supportive presentation of this study is reasonable. The effects presented as "statistically significant" are small and may even clinical undetectable.
Liu 2021[37]	L	L	L	L	L	L	
Savas 2019[38]	S	S	L	S	S	H	Lack of information about the analyses and participation rate for control group and randomisation process. The nature of the study design, and few participants add to the RoB-score.

4.2.2. Topical glucocorticoids: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Wang Y 2023a[39]	L	L	L	L	L	L	No SAP found, but ITT is obviously used.

4.2.3. Oral glucocorticoids: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Kroon 2019[40]	L	L	L	L	L	L	

4.2.4. Intra-articular Hyaluronic acid: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Wang P 2023[41]	S	L	L	L	S	S	Imbalances in randomization (sex and dominant vs non-dominant hand affection) potentially influencing the outcome - especially here due to lack of power calculation and analysing a very small sample. No SAP. No control groups. In turn, one should interpret these results with caution.

4.2.5. Biological DMARDs/TNF-inihibitors: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Kloppenburg 2019[42]	L	L	S	L	S	S	Loss of participants. Lack of information available for the RoB2 users, no SAP
Richette 2021[43]	L	L	L	L	L	L	

Schett 2020[44]	S	L	L	L	H	H	No statistic estimates for baseline. Control group tended to be younger and with longer disease duration. No stratification, the number of blocks were few and made by the sponsor of the study. ITT of the primary analysis is presented with non-statistical differences; however, the conclusion ids based on results from secondary analysis. Analysis made by sponsors and authors. No SAP available

4.2.6. Synthetic DMARDs (Hydrochloroquine): Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Kedor 2021[45]	S	L	S	S	L	S	Imbalanced groups with regards to sex. Unclear how analysis was performed. Exclusions of eligible participants for whom outcome data are available. Unblinding possible due to adverse effects.

4.2.7. Synthetic DMARDs (Methotrexate): Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Ferrero 2021[46]	S	S	L	L	S	S	Control group imported from another stud Baseline data not available. Radiological readings involve some judgements. No SAP.
Wang Y 2023b[47]	L	L	L	L	L	L	A 15% loss of participants reported, balanced between groups. Still enough power to detect warranted effects. Some

imbalances in group allocations, but not influencing the results.

4.2.8. Platelet-rich plasma: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Abdelsabor Sabaah 2020[48]	S	S	L	H	H	H	No control group. Few participants. Incomplete presentation of methods and outcomes. Potential selective presentation.
Malahias 2021[49]	S	S	L	S	S	H	Overall limited information about critical parts of the process (allocation, randomisation, analysis). Small sample sizes and lack of control group.
Winter 2023[50]	S	S	H	L	H	H	Computer randomized ("randomizer"). Blinded participants, not clear until when (concealment). Disease duration not reported, and nor rescue medications. Flow-chart unclear: 100 persons were randomized, 88 left for 2y follow up. However, 1 is lost *before* allocation, even 100 were allocated from which 5 did not get the injections, and 6 more were lost during the study. This is a N=12 = 12% loss from randomization, and a 7.4% loss from those being treated. Reasons for losses not completely reported. Thus, unclear how many were analysed in each group (differences in losses). Sensitivity analysis highlighted, but no reporting of between-group differences in pain or power to support the conclusions. Small samples add to risk of wrong conclusions. It was not feasible to blind surgeons. No SAP. Naïve protocol analysis seems to have been used.

2.9. Colchicine: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Davis 2021[51]	L	L	L	L	L	L	
Døssing 2023[52]	L	S	L	L	L	S	Little information about final demographics, blinding, and adverse effects. A well performed abstract with references to clinicaltrials.com and protocol. However, still some information lacking to receive better RoB2 outcome.

4.2.10. Oestrogens: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Williams 2022[53]	L	L	L	L	L	L	

4.3.1. Pharmacological and non-pharmacological interventions: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Deveza 2021[54]	S	H	L	H	L	H	A higher expectancy and intervention credibility noted in the intervention group. Accidental unblinding of assessor (n=25). Adverse effects.
Ioppolo 2018[55]	L	S	L	H	H	H	Person who administered the self-reported outcomes (primary) and secondary outcomes has an unreported blinding-status and role. Evaluation tool not validated for CMC-OA. Unbalanced presentation of effects. No estimates or reporting of clinical relevance of the findings. Focuses on hypothetical working mechanisms not assessed in this study, excluding patients' beliefs as well as contextual biases due to a lack of blinding. No real control group.
Metin Ökmen 2018[56]	S	S	L	H	S	L	No information about concealment or allocation due to disease severity (radiological). Limited information concerning the blinding. No info about ITT. Between group comparison is performed, but no effect size or clinical relevance reported. No placebo. Knowledge of the intervention may rise some bias, as well as an additional visit for treatment. No SAP.
Nguyen 2022[57]	L	L	L	L	L	L	

4.4. SURGICAL INTERVENTIONS

4.4.1. Surgical interventions including joint replacement: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
De Jong 2023[58]	L	L	L	L	L	L	Well performed and presented. Disease duration not mentioned (important for pain?). ITT-analysis used. Self-reported outcome. Of note: The MHQ may have been a threat to internal validity due to inappropriateness to be used for sample size calculation in this study.
Guzzini 2023[59]	S	H	L	H	H	H	Both groups received information about both procedures, and were then randomized. No more information regarding concealment before the actual surgery was done. No blinding. Different regimen postoperatively.
Klim 2023[60]	L	L	L	H	S	H	A substantial difference in dominant vs non-dominant hand between groups which potentially has an impact on the outcome of interest. Also, age differs. No statistical comparison or comments of value to table 1. Rating given due those imbalances not commented, lack of information and no SAP. Unclear section: Flowchart; Loss to follow up is balances (around 8% in both groups, mostly due to declinations). However: Sample size based upon pilot (no references), but no more information is needed about number of patients and what calculation was done (i.e., whether loss is taken into account).
Thorkildsen 2019[61]	S	H	L	H	L	H	Imbalances in baseline data. Low RoB score is furthermore due to the natural consequences and risks of surgery trials with change of groups/procedures due to AEs etc., however the authors are aware the biases. Possible floor effect for the evaluation tool potentially leading to a type 1 error.

4.4.2. Surgical interventions comparing different techniques: Risk of bias

Study	Randomisation process	Deviations from intended interventions	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall bias	Comments
Brennan 2021[62]	L	S	S	H	S	H	ITT impossible due to the available data. High loss to follow up. Validity of evaluation questionable for the purpose. No control group.
Marks 2017[63]	L	H	L	S	S	H	Violation to allocation occurred, resulting in a per protocol analyses. Differences in adverse effects between groups may have influenced the self-reported outcomes. Change in outcome of interest (from subscale to total sum) without information of why or when this was done.
Morais 2022[64]	S	S	L	S	S	S	Little information about concealment, also scarce about blinding. Due to different post-operative regimes allocation may have been revealed. AEs = 9%; 3 persons needed reoperation (representatives from both groups). Unclear information about outcomes (time points and primary/secondary). No SAP, no info about ITT.
Sanchez-Flo 2020[65]	L	S	L	S	S	S	Per protocol analyses. Knowledge about the interventions and influence from the examiner. No SAP, but agreements between methods and results. The authors present their process and interpretations with caution.
Van Laarhoven 2022[66]	S	L	L	H	S	H	Little information about demographics (i.e., disease duration). Gender differences between groups- potentially relevant for i.e., pain. No blinding. No SAP.
Zarezadeh 2021[67]	S	S	L	H	S	H	Little information about randomisation and concealments. Different regimen may have unblinded staff or participants. Unclear evaluation. No reports of adverse effects. No SAP or information about ITT.

Table 1. Characteristics of studies of non-pharmacological interventions published up to June 7th 2017 that are included in the meta-analyses

RoB	Study	Design	Intervention	Duration, frequency, instructions	Measure-ment timepoints analyzed	N	OA location, definition	Women (%)	Age in years (SD)	*Primary outcome (PO)*
Exercises										
	Hennig 2015[68]	RCT parallel	A: Exercise + education B: Education	A: Progressive exercise program 3x10-15 reps, 3days/ w for 12 w	Long-term	40 40	Hand, ACR	100 100	60.6 (7.9) 60.9 (6.2)	Activity performance measured with PSFS after 12 w (GRIP-IT)
	Lefler 2004[69]	RCT parallel	A: Exercise B: Control	A: Exercises 10-15 repetitions of <40% 1RM to 6-8 >60% 1RM for 6 w	Short-term	9 10	Hand, criteria NR	88.9 90	82.0 (10.0) 82.0 (9.0)	NR. Measured pain (VAS) and grip strength.
	Nery.2021[70] (Nery 2015)*	RCT parallel	A: Progressive resistance exercise program + a single education session B: Single education session	A: Exercises 3x10 repetitions twice a w for 12 w	Short-term Long-term	30 30	Hand, ACR, history of IP pain NRS 3-8	97 100	64.7 (8.9) 68.9 (8.8)	Pain (NRS) after 6 and 12 w
	Paolillo 2015[71]	RCT parallel (three groups)	A: Low level laser therapy (LLLT) (diode laser 808 nm) + ultrasound + hand exercises B: LLL (diode laser 808 nm) + ultrasound C: Sham laser therapy**	A and B: Laser + ultrasound, 15 min per hand, once a w for 12 w A: 10 daily exercises with progressive load every 15th day,1 session of 15 min/w for 12 w	Long-term	13 13 11	Hand, criteria NR	100	68 (6) 69 (5) 72 (6)	NR. Measured grip strength (JAMAR) and pain threshold (algometer) after 12 w

	Østerås 2014[72]	RCT parallel	A: Exercise + usual care B: Usual care	A: Exercises with 10-15 repetitions, 3 days/w for 12 w	Long-term	65 65	Hand, ACR	89 91	67(8.0) 65 (9.0)	Activity per-formance (PSFS and FIHOA) after 12 w
Thumb orthoses vs no orthoses or placebo										
	Adams 2014[73]	RCT parallel Pilot study (three groups)	A: Thumb orthosis + occupational therapy B: Occupational therapy C: Placebo orthosis**	A or B: Program duration = 4 w Content of occupational therapy and instructions for use of orthoses not described.	Short-term	9 9 9	CMC, NR	78 (sample)	61.2 (9.4) (sample)	Pain (AUSCAN) at 4 w
	Arazpour 2017[74]	RCT parallel	A: Custom-made thumb orthosis B: No intervention	A: Orthosis should be used in 4 w when performing ADL and removed during sleeping and bathing	Short-term	16 9	CMC, clinical diagnosis and E-L stage I-II	87 88	50.2 (5.7) 52.3 (6.4)	NR. Measured pain (VAS) and function (MHQ) at 4 w
	Gomes-Carreira 2010[75]	RCT parallel	A: Custom-made thumb orthosis B: No intervention	A: Orthosis should be used in 26 w when performing ADL and removed during sleeping and bathing	Short-term Long-term	40 40	CMC, clinical diagnosis and E-L stage I-II	100 90	62.8 (8.5) 65.1 (10.1)	Pain at the base of the thumb (VAS)
	Hermann 2014[76]	RCT parallel	A: Prefabricated thumb orthosis + exercises B: Exercises only	A: Orthosis should be used as much as participants wanted in 2 months, especially when symptomatic and performing heavy tasks. A and B: Exercises: 2 sessions/day with 10 rep per exercise for 2 months	Short-term	30 29	CMC, ACR, thumb pain	96.2 100	70.3 (7.3) 70.2 (6.2)	Pain (VAS)
	Rannou 2009[77]	RCT parallel	A: Custom-made thumb orthosis	A: The orthosis should be used at night- in 12 months	Short-term Long-term	57	CMC, clinical and Rx diagnosis	93	63.0 (7.9) 63.5 (7.6)	Pain (VAS) at 1 month

			B: Usual care			55		85		
Orthoses immobilising the CMC-joint only against orthoses also immobilising the wrist and/or one or more additional thumb joints										
	Bani 2013[78]	RCT crossover (2 w washout) (three groups)	A: Custom-made thumb orthosis immobilising the CMC joint B: Pre-fabricated neoprene thumb orthosis immobilising the wrist, CMC and MCP joint C: No intervention**	A and B: Use each orthosis for 4 w with 2 w wash-out before crossing over (total period = 10 w). Orthosis should be used when performing ADL and removed during sleeping and bathing.	Short-term	12 12 11	CMC, clinical diagnosis and E-L stage I-II	66.7 75 72.7	53.4 54.9 58.6	NR. Measured pain (VAS), function (DASH) and grip strength (JAMAR)
	Van der Vegt 2017[79] *(Van der Vegt 2017)	RCT cross-over (2 w washout)	A: prefabricated semi-rigid Push thumb orthosis immobilising the CMC joint only B: custom-made rigid orthosis immobilizing the CMC and MCP joint	2 w with each orthosis with 2 w wash out before crossing over (total period = 4 w) Instructions for use not described	Short-term	33 30	CMC, clinical and Rx diagnosis	61.1 (8.0) 58.8 (8.3)	73 67	Pain (VAS) after each 2-w period
	Weiss 2000[80]	RCT crossover	A: thumb orthosis immobilising the CMC joint only B: custom-made rigid orthosis immobilizing the wrist, CMC and MCP joint	1 w with each orthosis without any wash out period before crossing over, (total period = 2 w). Orthosis should be used when feeling thumb symptoms, day or night	Short-term	26	CMC, clinical and Rx diagnosis	80.8	57 (range 36-88)	Pain (VAS) after each w

	Weiss 2004[81]	RCT crossover	A: thumb orthosis immobilising the CMC joint only B: custom-made rigid orthosis immobilizing the wrist, CMC and MCP joint	1 w with each orthosis without any wash out period before crossing over, (total period = 2w) Orthosis should be used when feeling thumb symptoms, day or night	Short-term	25	C CMC, clinical diagnosis and E-L stage I-II	84	Not reported	Pain VAS after each w
Assistive devices										
	Kjeken 2011[82]	RCT parallel	A: Assistive devices incl. splint + information B: Information only	A. 12 w period in which devices should be used as part of activity performance	Long-term	35 35	Hand, ACR	97 97	61.1 (6.0) 59.9 (7.5)	Occupational performance (COPM)
Thermal modalities										
	Dilek 2013[83]	RCT parallel	A: Paraffin bath B: Control	A: 15 min 5 days/w for 3 w, 52°C	Short-term Long-term	29 27	Hand, ACR	83 90	58.9 (9.5) 60.0 (8.7)	Pain (VAS 10 cm) at w 12. Also measured function (AUSCAN) and grip strength (JAMAR)
	Fiorvanti 2014[84]	RCT parallel	A: Mud bath B: Control	A: 6 sessions of 15 min per w for 2 w, 38-43°C	Long-term	30 30	Hand, ACR, pain >30 on VAS, and FIHOA≥5	93 80	72.4 (8.3) 69.2 (9.9)	Hand pain (VAS) and function (FIHOA)
	Horvath 2012[85]	RCT parallel (three groups)	A: Pulsed magnetic field therapy (PMFT) + mineral heat bath 38°C** B: PMFT + Mineral heat bath 36°C C: PMFT	A and B: mineral heat baths 20 min per day, 5 days/w for 3 w All groups received PMFT (60 Hz, 20 J) applied on the hands for 15 min, 3 times/w.	Short-term Long-term	21 21 21	Hand, ACR hand pain for min 3 months	76 81 85.6	62.3 (4.8) 63.5 (4.7) 63.8 (4.4)	Pain (VAS), grip strength (Saehan dynamometer) and function (HAQ)

	Kasapoğlu Aksoy 2017[86] (*Kasapoğlu Aksoy 2017)	RCT parallel Pilot study	A: Hot peloid mud therapy + home exercise program B: Home exercise program	A: Peloid mud therapy 47°C, 5x30 min sessions/w for 2 w A and B: Exercises 5 sessions/w for 2 w	Short-term	33 30	Hand, Rx and VAS pain ≥4	58.2 (9.3) 60.6 (8.5)	96.7 88	NR. Measured pain (VAS), function (AUSCAN) and grip strength (JAMAR)
	Kovacs 2012[87]	RCT parallel	A: Sulphurous thermal spa water B: Control – tap water	A and B: 20min x 5/w for 3 w	Long-term	24 21	Hand, ACR, KL ≥2 in min 2 joints and ≥3 VAS pain	95.8 90	58 (47–71) 61 (50–73)	NR. Measured pain (VAS), function (AUSCAN) and grip strength (Dyna-9 dyna-mometer)
Ultrasound/laser therapy										
	Brosseau 2005[88]	RCT parallel	A: Low level laser therapy B: Sham laser therapy	A:: 20 min sessions with J/cm^2 /point x 3/w for 6 w B: Sham therapy 20 min sessions x 3/w for 6 w	Short-term Long term	42 46	Hand, ACR, Kallman Rx criteria	73.8 82.6	64.2 (9.9) 65.1 (10.2)	Pain (AUSCAN), after 3 and 6 w
	Paolillo 2015[71]	RCT parallel (three groups)	A: Low level laser therapy + ultrasound B: Low level laser therapy (diode laser 808 nm) + ultrasound + hand exercises** C: Sham laser therapy	A: diode laser 808 nm 1 session of 15 min/w fo 3 months B: Sham laser therapy 1 session of 15 min/w for 3 months	Long-term	13 13 11	Hand, NR	100 (sample)	69 (5) 68 (6) 72 (6)	NR. Measured grip strength (JAMAR)
Combination programmes										
	Paolillo 2015[71]	RCT parallel	A: Low level laser therapy (LLLT)(diode laser 808 nm) + ultrasound** B: LLLT (diode laser	B: diode laser 808 nm 1	Long-term	13 13	Hand, NR	100 (sample)	69 (5) 68 (6)	NR. Measured grip strength (JAMAR)

			808 nm) + ultrasound + hand exercises C: Sham laser therapy	session of 15 min/w for 3 months. Hand exercises with 1 wly session with 10 repetitions per session and increasing load over 3 months C: Sham therapy 1 session of 15 min/w for 3 months		11			72 (6)	
	Stukstette 2013[89]	RCT parallel	A: Joint protection + exercise + education B: Education only	A: 4 group-based sessions and doing hand exercises daily for 12 w B: 30 minutes explanation of written material	Long-term	76 75	Hand, ACR	82 84	60,0 (7.0) 58.0 (9.0)	Function (AUSCAN) and OARSI responders at 12 w
	Villafane 2012[90]	RCT parallel	A: Manual therapy + exercise B: Sham intervention	A and B: Both groups received six sessions over 4 w	Short-term Long-term	30 30	CMC, clinical and Rx diagnosis	90 80	82.0 (2.0) 83.0 (1.0)	NR. Measured pain sensitivity

* = Available as abstract only to the 2018 review of Kroon et al (paragraph) – full-text manuscript evaluated for the update. Colours denote RoB (green: low, yellow: some concern, red: high). (A) indicates conference abstract. ACR, American College of Rheumatology; ADLs, activities of daily living; AUSCAN, Australian/Canadian Hand Osteoarthritis Index; CMC, first carpometacarpal joint; CO, cross-over trial; COPM, Canadian Occupational Performance Measure; DASH, Disabilities of the Arm, Shoulder and Hand; DHI, Duruöz Hand Index; DIP, distal interphalangeal joint; E-L, Eaton-Litter; FIHOA, Functional Index for Hand OsteoArthritis; IP, interphalangeal joint; MCP,metacarpophalangeal; MHQ, Michigan Hand Questionnaire; N, number; NR, not reported; NRS, numerical rating scale; OA, osteoarthritis; PO, Primary outcome; qDASH, quick DASH, RCT, randomised controlled trial; RoB, risk of bias; Rx, radiography; SLR, systematic literature review; VAS, visual analogue scale; w, week; WA, wash-out period.

Table 2. Characteristics of studies of studies of pharmacological interventions published up to June 7th 2017 that are included in the meta-analyses

RoB	Study	Design	Intervention	Frequency, duration (instructions)	Measurement time-points analyzed	N	OA location, definition	Age Y (SD)	Women (%)	Primary outcome
Topical NSAIDs										
	Altman 2009[91]	RCT parallel	A: Topical NSAIDS (diclofenac gel 1%) B: Placebo	A and B: Applied 4 times per day in 8 w	Short-term	198 187	Hand, Rx, KL 1-3	76.8 77.0	63.6 (10.3) 64.7 (9.6)	Pain (VAS)
	Romero 2013[92]	RCT parallel	A: Topical NSAIDS (diclofenac gel %) B: Topical Sphaeralcea angutifolia (placebo)	A and B: Applied 3 per day for 7 w	Short-term	58 55	Hand, ACR	95.3 86.1	62.0 (10.2) (sample)	Function (DFI)
	Widrig 2007[93]	RCT parallel	A: Topical NSAID (ibuprofen cream 5%) B: Herbs (placebo)	A and B: applied 3x/day for 3 w	Short-term	85 89	Hand, ACR	61.2 66.8	64.0 (11.4) 64.0 (12.0)	Pain VAS
Oral NSAIDs										
	Dreiser et al 1993[94]	RCT parallel	A: Ibuprofen 800 mg/day B: Placebo	A and B: Daily for 2 w	Short term	30 30	Hand, Rx damage, pain exacerbation	80 90	58.5 (1.7) 60.3 (2.0)	NR
	Grifka et al 2004[95]	RCT parallel	A: Lumiracoxib 200 mg/day B: Lumiracoxib 400 mg/day C: Placebo	A, B and C: Daily for 4 w	Short term	205 193 196	Hand, ACR	82 83 83	62.0 (12.1) 61.0 (12.4) 62.7 (11.7)	Pain (VAS)

	Seiler 1983[96]	RCT parallel	A: Meclofenamate sodium 300 mg/day B: Placebo	A and B: Daily for 4 w	Short term	22 19	Hand, Clinical diagnosis, ≥1 inflamed DIP and Rx damage	95 84	62.5 (34–77) 65.0 (49–80)	NR. Measured pain and grip strength
Oral glucocorticoids										
	Kvien 2008[97]	RCT parallel	A: Prednisone 3 mg/day + dipyridamole 200 mg/ B: Placebo	A and B: Daily for 6 w	Short-term	42 41	Hand, ACR, Rx KL>1	93 93	61.1 (5.0) 59.6 (5.3)	Pain (AUSCAN)
	Wenham 2012[98]	RCT parallel	A: Prednisone 5mg/day B: Placebo	A and B: Daily for 4 w	Short-term Long-term	35 35	Hand, ACR, Rx KL>0	74 89	61.9 (6.6) 61.1 (9.0)	Pain (VAS)
Intra-articular (IA) glucocorticoids										
	Heyworth 2008 [99]	RCT parallel	A: Glucocorticoids IA 1mL in the CMC-joint B: Hyaluronic acid IA 8mg/1mL** C: Placebo IA (1 mL Saline)	A: Once+1 IA placebo. 2 w B: 1 per w for 2 w C: 1 per w for 2 w	Long-term	22 28 18	CMC, Rx E-L stage I-IV	90 80 89	60 (9.4) 65 (10.6) 64 (8.5)	NR Measured pain (VAS) and function ((DASH)
	Mandl 2012[100]	RCT parallel	A: Glucocorticoid IA, 40 mg/1 mL in the CMC joint B: Hyaluronic acid IA. 8 mg/1 mL** C: Placebo (bupivacaine) IA, 1 mL, in the CMC joint	A: Once+1 IA placebo,2 w B and C: 1 per w for 2 w	Long-term	65 62 61	CMC, clinical diagnosis and Rx KL>0	68.0 (total sample)	66.5 (45–89) (total sample)	NR Measured pain (VAS) and function ((DASH)

	Meenagh 2004[101]	RCT parallel	A: Glucocorticoid IA, 5 g/0.25 mL in the CMC joint B: Placebo (saline) IA, 0.25 mL in the CMC joint	A and B: Once	Long-term	20 20	CMC, NR	95 85	60.6 (41–71) 59.3 (46–69)	Pain (VAS) improvement ≥ 20%
Biological DMARDs (TNF-inhibitors)										
	Aitken 2018[102] *(Aitken 2017)	RCT cross-over trial	A: Adalimumab 40 mg subcutaneously B: Placebo subcutaneously	A and B: Once per 2nd w for 12 w	Short-term Long-term	25 18	ACR, erosive hand (Rx erosion) MRI synovitis	63.1 (8.4) 61.2 (8.4)	83 72	Pain (VAS) at 12 w
	Chevalier 2015[103]	RCT parallel	A: Adalimumab 40 mg subcutaneously B: Placebo subcutaneously	A and B: 2 subcutaneous injections at a 15-day interval	Long-term	42 43	Hand, ACR, Rx damage IPs	62.8 (6.9) 62.2 (7.0)	87 83	Improvement ≥ 50 % in pain (VAS)
	Kloppenburg 2018[104] *(Kloppenburg 2016)	RCT parallel	A: Etanercept subcutaneously B: Placebo subcutaneously	A: Injection with 50 mg/w for 24 w, thereafter 25 mg/w for 28 w B: Placebo injection once a w for 1 year	Long-term	45 45	IP, ACR, erosive (Rx erosion IP)	82 80	59.4 (6.5) 60.1 (8.7)	Pain (VAS) at 24 w
	Verbruggen 2012[105]	RCT parallel	A: Adalimumab 40 mg subcutaneously B: Placebo subcutaneously	A and B: 1 injection every 2nd w for 1 year	Long-term	30 30	IP, ACR, erosive (Rx erosion IP)	87 83	61.9 (6.1) 60.7 (6.9)	Reduction in progression of structural damage. Also measured pain and function

										(AUSCAN) and grip strength
Synthetic DMARDs (Hydrochloroquine)										
	Kingsbury 2018[106] *(Kingsbury 2016)	RCT parallel	A: Hydroxychloroquine oral 200-400 mg B: Placebo oral	A and B: Once per day for 1 year	Long-term	124 124	Hand, ACR	62.8 (9.1) 62.5 (9.2)	78 85	Pain (NRS) at 6 months
	Lee 2018[107] *(Basoski 2015)	RCT parallel	A: Hydroxychloroquine oral 400mg/day B: Placebo oral	A and B: Once per day for 24 w	Short-term Long-term	100 102	Hand, ACR	57.7 (8.2) 58.3 (7.0)	88 84	Pain (VAS) at 24 w

* = Available as abstract only to the 2018 review of Kroon et al (paragraph) - full-text manuscript evaluated for the update. **= not included in meta-analyses. Colours denote RoB (green: low, yellow: some concern, red: high). (A) indicates conference abstract. ACR, American College of Rheumatology; ADLs, activities of daily living; AUSCAN, Australian/Canadian Hand Osteoarthritis Index; CMC, first carpometacarpal joint; CO, cross-over trial; DASH, Disabilities of the Arm, Shoulder and Hand; DHI, Duruöz Hand Index; DIP, distal interphalangeal joint; DMARDs, disease modifying anti-rheumatic drugs; E-L, Eaton-Litter; FIHOA, Functional Index for Hand OsteoArthritis; IA, intra-articular; IP, interphalangeal joint; KL, Kellgren-Lawrence; MCP, metacarpophalangeal; MHQ, Michigan Hand Questionnaire; N, number; NR, not reported; NRS, numerical rating scale; OA, osteoarthritis; PO, Primary outcome; qDASH, quick DASH, RCT, randomised controlled trial; RoB, risk of bias; Rx, radiography; VAS, visual analogue scale; w, week; WA, wash-out period.

6. GRADING OF EVIDENCE

6.1 Quality of evidence for hand exercises compared to control for hand osteoarthritis

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with control	Risk difference with hand exercises
Pain (short-term)	182 (5 RCTs)	⊕◯◯◯ Very low[a,b,c]	-	-	SMD **0.51 SD lower** (1.42 lower to 0.4 higher)
Pain (long-term)	262 (4 RCTs)	⊕⊕◯◯ Low[d]	-	-	SMD **0.34 SD lower** (0.58 lower to 0.09 lower)
Hand function (short-term)	228 (3 RCTs)	⊕◯◯◯ Very low[a,b,c]	-	-	SMD **0.86 SD lower** (2.35 lower to 0.64 higher)
Hand function (long-term)	364 (4 RCTs)	⊕◯◯◯ Very low[b,c,d]	-	-	SMD **0.26 SD lower** (0.58 lower to 0.05 higher)
Grip strength (short-term)	105 (3 RCTs)	⊕◯◯◯ Very low[d,e]	-	-	SMD **0.65 SD lower** (1.15 lower to 0.14 lower)
Grip strength (long-term)	263 (4 RCTs)	⊕◯◯◯ Very low[b,c,d]	-	-	SMD **0.26 SD lower** (0.84 lower to 0.32 higher)
OMERACT/OARSI response (long-term)	199 (2 RCTs)	⊕◯◯◯ Very low[f,g]	**RR 3.91** (1.52 to 10.05)	118 per 1 000	**342 more per 1 000** (61 more to 1 065 more)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.2. Quality of evidence for proprioceptive hand exercises compared to control for hand osteoarthritis

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with control	Risk difference with proprioceptive hand exercises
Pain (short-term)	128 (3 RCTs)	⊕◯◯◯ Very low[a,b,c]	-	-	SMD **1.38 SD lower** (2.1 lower to 0.66 lower)
Pain (long-term)	155 (4 RCTs)	⊕◯◯◯ Very low[a,b,d]	-	-	SMD **0.71 SD lower** (2.08 lower to 0.65 higher)
Function short-term	130 (3 RCTs)	⊕◯◯◯ Very low[a,b,e]	-	-	SMD **1.24 SD lower** (2.69 lower to 0.21 higher)
Function long-term	143 (3 RCTs)	⊕◯◯◯ Very low[a,b,d]	-	-	SMD **0.74 SD lower** (1.73 lower to 0.24 higher)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.3. Quality of evidence for thumb orthoses compared to no thumb orthoses for hand osteoarthritis

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with no orthoses	Risk difference with orthoses
Pain (short-term)	535 (7 RCTs)	⊕◯◯◯ Very low[a,b,c]	-	-	SMD **0.04 SD higher** (0.68 lower to 0.77 higher)
Pain (long-term)	137 (2 RCTs)	⊕⊕◯◯ Low[d]	-	-	SMD **0.77 SD lower** (1.2 lower to 0.34 lower)
Hand function (short-term)	435 (6 RCTs)	⊕◯◯◯ Very low[a,b,c]	-	-	SMD **0.41 SD higher** (0.88 lower to 1.71 higher)
Hand function (long-term)	40 (1 RCT)	⊕◯◯◯ Very low[c,d]	-	-	SMD **0.42 SD lower** (1.03 lower to 0.2 higher)
Grip strength (short-term)	158 (3 RCTs)	⊕◯◯◯ Very low[d,e]	-	-	SMD **0.33 SD lower** (0.65 lower to 0.02 lower)
Grip strength (long-term)	40 (1 RCT)	⊕◯◯◯ Very low[d,f]	-	-	SMD **0.13 SD lower** (0.73 lower to 0.48 higher)
All adverse events (long-term)	145 (2 RCTs)	⊕◯◯◯ Very low[d,g]	**RR 2.32** (0.66 to 8.10)	42 per 1 000	**56 more per 1 000** (14 fewer to 300 more)
Withdrawals from adverse events (long-term)	142 (2 RCTs)	⊕◯◯◯ Very low[d,g]	**RR 0.98** (0.10 to 9.15)	14 per 1 000	**0 fewer per 1 000** (13 fewer to 116 more)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.4. Quality of evidence for thumb orthoses immobilising the CMC-joint only against orthoses also immobilising the wrist and/or more additional thumb joints

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with CMC orthoses	Risk difference with wrist/MCP orthoses
Pain (short-term)	357 (6 RCTs)	⊕◯◯◯ Very low[a,b,c]	-	-	SMD **0.63 SD lower** (1.57 lower to 0.31 higher)
Pain (long-term)	84 (1 RCT)	⊕◯◯◯ Very low[b,c,d]	-	-	SMD **0.91 SD higher** (0.47 higher to 1.36 higher)
Hand function (short-term)	184 (3 RCTs)	⊕◯◯◯ Very low[c,e]	-	-	SMD **0.1 SD lower** (0.56 lower to 0.37 higher)
Hand function (long-term)	84 (1 RCT)	⊕◯◯◯ Very low[b,e]	-	-	SMD **1.14 SD higher** (0.68 higher to 1.59 higher)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.5. Quality of evidence for assistive devices compared to control according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with control	Risk difference with assistive devices
Pain (short-term)	38 (1 RCT)	⨁⨁◯◯ Low[a,b]	-	-	SMD **0.3 SD lower** (0.93 lower to 0.33 higher)
Pain (long-term)	103 (2 RCTs)	⨁⨁◯◯ Low[b,c]	-	-	SMD **0.24 SD lower** (0.63 lower to 0.14 higher)
Hand function (short-term)	38 (1 RCT)	⨁⨁◯◯ Low[a,b]	-	-	SMD **0.07 SD lower** (0.69 lower to 0.56 higher)
Hand function (long-term)	103 (2 RCTs)	⨁⨁⨁◯ Moderate[c]	-	-	SMD **0.55 SD lower** (0.94 lower to 0.16 lower)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.6. Quality of evidence for thermal modalities compared to control according to the GRADE approach

	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with control	Risk difference with thermal modalities
Pain (short-term)	318 (6 RCTs)	⊕◯◯◯ Very low[a,b]	-	-	SMD **0.87 SD lower** (1.26 lower to 0.48 lower)
Pain (long-term)	193 (4 RCTs)	⊕◯◯◯ Very low[b,c,d]	-	-	SMD **0.88 SD lower** (1.17 lower to 0.59 lower)
Hand function (short-term)	46 (1 RCT)	⊕◯◯◯ Very low[a,e]	-	-	SMD **0.12 SD lower** (0.69 lower to 0.45 higher)
Hand function (long-term)	151 (3 RCTs)	⊕⊕◯◯ Low[d,f]	-	-	SMD **0.78 SD lower** (1.16 lower to 0.4 lower)
Grip strength (short-term)	201 (4 RCTs)	⊕◯◯◯ Very low[a,g,h]	-	-	SMD **0.38 SD lower** (0.87 lower to 0.1 higher)
Grip strength (long-term)	87 (2 RCTs)	⊕◯◯◯ Very low[a,g,i]	-	-	SMD **0.13 SD higher** (1.11 lower to 1.37 higher)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6. 7. Quality of evidence for ultrasound/laser therapy compared to control according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with control	Risk difference with ultrasound/laser therapy
Pain (short-term)	129 (2 RCTs)	⊕◯◯◯ Very low[a,b,c]	-	-	SMD **0.39 SD lower** (1.32 lower to 0.53 higher)
Pain (long-term)	141 (2 RCTs)	⊕⊕◯◯ Low[d,e]	-	-	SMD **0.08 SD higher** (0.24 lower to 0.41 higher)
Grip strength (short-term)	86 (1 RCT)	⊕⊕⊕◯ Moderate[e]	-	-	SMD **0.09 SD lower** (0.51 lower to 0.33 higher)
Grip strength (long-term)	110 (2 RCTs)	⊕⊕◯◯ Low[a,e]	-	-	SMD **0.13 SD lower** (0.5 lower to 0.24 higher)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.8. Quality of evidence for combination therapies compared to control according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with control	Risk difference with combination therapies
Pain, short-term	188 (2 RCTs)	⨁◯◯◯ Very low[a,b,c]	-	-	SMD **5.86 SD lower** (17.04 lower to 5.32 higher)
Pain, long-term	376 (3 RCTs)	⨁◯◯◯ Very low[b,c,d]	-	-	SMD **3.83 SD lower** (10.96 lower to 3.29 higher)
Function, long-term	316 (2 RCTs)	⨁◯◯◯ Very low[b,c,e]	-	-	SMD **0.3 SD lower** (0.82 lower to 0.23 higher)
Grip-strength, long-term	340 (3 RCTs)	⨁◯◯◯ Very low[d,f,g]	-	-	SMD **0.08 SD lower** (0.47 lower to 0.32 higher)
All adverse events, short-term	60 (1 RCT)	⨁◯◯◯ Very low[a,h]	**RR 1.00** (0.02 to 48.82)	0 per 1 000	**0 fewer per 1 000** (0 fewer to 0 fewer)
All adverse events, long-term	151 (1 RCT)	⨁◯◯◯ Very low[a,c]	**RR 2.92** (0.12 to 70.64)	0 per 1 000	**0 fewer per 1 000** (0 fewer to 0 fewer)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.9. Quality of evidence for topical NSAIDs compared to control according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with control	Risk difference with topical NSAIDs
Pain, short-term	572 (2 RCTs)	⨁⨁◯◯ Low[a,b]	-	-	SMD **0.07 SD lower** (0.37 lower to 0.24 higher)
Hand function, short-term	713 (3 RCTs)	⨁⨁⨁⨁ High	-	-	SMD **0.17 SD lower** (0.33 lower to 0.01 lower)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.10. Quality of evidence for oral NSAIDs compared to control according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with placebo	Risk difference with oral NSAIDs
Pain, short-term	461 (2 RCTs)	⨁⨁◯◯ Low[a, e]	-	-	SMD **0.22 SD lower** (0.67 lower to 0.23 higher)
All adverse events	695 (3 RCTs)	⨁⨁⨁⨁ High	**RR 1.03** (0.76 to 1.41)	176 per 1 000	**5 more per 1 000** (42 fewer to 72 more)
Severe adverse events, short-term	654 (2 RCTs)	⨁⨁◯◯ Low[c]	**RR 0.70** (0.04 to 11.12)	0 per 1 000	**0 fewer per 1 000** (0 fewer to 0 fewer)
Withdrawal from adverse events	695 (3 RCTs)	⨁⨁◯◯ Low[c]	**RR 1.82** (0.71 to 4.67)	12 per 1 000	**10 more per 1 000** (4 fewer to 45 more)
Gastrointestinal adverse events	615 (2 RCTs)	⨁⨁⨁◯ Moderate[b]	**RR 1.45** (0.83 to 2.53)	77 per 1 000	**35 more per 1 000** (13 fewer to 118 more)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.11. Quality of evidence for oral glucocorticoids compared to control according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with placebo	Risk difference with oral glucocorticoids
Pain, short-term	245 (3 RCTs)	⨁◯◯◯ Very low[a,b]	-	-	SMD **1.44 SD lower** (3.63 lower to 0.74 higher)
Pain, long-term	67 (1 RCT)	⨁⨁◯◯ Low[b]	-	-	SMD **0.12 SD higher** (0.36 lower to 0.59 higher)
Function, short-term	245 (3 RCTs)	⨁⨁⨁◯ Moderate[c]	-	-	SMD **0.35 SD lower** (0.64 lower to 0.07 lower)
Function, long-term	67 (1 RCT)	⨁⨁◯◯ Low[b]	-	-	SMD **0.11 SD lower** (0.58 lower to 0.37 higher)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.12. Quality of evidence for intra-articular glucocorticoids compared to control according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with placebo	Risk difference with intraarticular glucocorticoids
Pain, long-term	166 (2 RCTs)	⊕◯◯◯ Very low[a,b,c]	-	-	SMD **0.17 SD lower** (0.69 lower to 0.35 higher)
All adverse events, long-term	206 (3 RCTs)	⊕◯◯◯ Very low[a,d]	**RR 2.31** (0.74 to 7.26)	30 per 1 000	**40 more per 1 000** (8 fewer to 190 more)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.13. Quality of evidence for biological disease-modifying anti-rheumatic drugs (bDMARDs)/TNF-inhibitors compared to placebo according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with placebo	Risk difference with DMARDs/TNF-inhibitors
Pain, long-term	226 (3 RCTs)	⨁◯◯◯ Very low[a,b,c]	-	-	SMD **0.04 SD lower** (0.38 lower to 0.3 higher)
All adverse events, long-term	316 (4 RCTs)	⨁⨁⨁◯ Moderate[a]	**RR 0.95** (0.79 to 1.15)	513 per 1 000	**26 fewer per 1 000** (108 fewer to 77 more)
Severe adverse events, long-term	312 (4 RCTs)	⨁◯◯◯ Very low[a,d]	**RR 0.95** (0.26 to 3.44)	26 per 1 000	**1 fewer per 1 000** (19 fewer to 63 more)
Withdrawal from adverse events, long-term	312 (4 RCTs)	⨁◯◯◯ Very low[a,d]	**RR 1.98** (0.63 to 6.19)	26 per 1 000	**25 more per 1 000** (10 fewer to 135 more)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.14. Quality of evidence for synthetic DMARDs anti-rheumatic drugs (Hydroxychloroquine) according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with control	Risk difference with Hydroxychloroquine
Pain, short-term	196 (1 RCT)	⊕⊕◯◯ Low[a,b]	-	-	SMD **0.08 SD higher** (0.2 lower to 0.36 higher)
Pain, long-term	540 (3 RCTs)	⊕⊕⊕◯ Moderate[c]	-	-	SMD **0.01 SD lower** (0.18 lower to 0.16 higher)
Function, long-term	349 (2 RCTs)	⊕◯◯◯ Very low[c,d]	-	-	SMD **0.03 SD lower** (0.24 lower to 0.18 higher)
All adverse events, long-term	361 (2 RCTs)	⊕◯◯◯ Very low[c,e]	**RR 0.66** (0.35 to 1.24)	124 per 1 000	**42 fewer per 1 000** (81 fewer to 30 more)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.15. Quality of evidence for Methotrexate compared to placebo according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with placebo	Risk difference with Methotrexate
Pain (long-term)	161 (2 RCTs)	⨁⨁◯◯ Low[a,b]	-	-	SMD **0.31 SD lower** (0.61 lower to 0)
Function long-term	144 (2 RCTs)	⨁⨁◯◯ Low[a,c]	-	-	SMD **0.17 SD lower** (0.49 lower to 0.15 higher)
All adverse events	161 (2 RCTs)	⨁◯◯◯ Very low[a,d]	**RR 0.80** (0.37 to 1.73)	468 per 1 000	**94 fewer per 1 000** (295 fewer to 342 more)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

6.16. Quality of evidence for Colchicine compared to placebo according to the GRADE approach

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with placebo	Risk difference with Colchicine
Pain	156 (2 RCTs)	⊕◯◯◯ Very low[a,b]	-	-	SMD **0.09 SD higher** (0.22 lower to 0.41 higher)
Function	156 (2 RCTs)	⊕◯◯◯ Very low[a,c]	-	-	SMD **0.09 SD lower** (0.4 lower to 0.23 higher)
Grip strength	156 (2 RCTs)	⊕◯◯◯ Very low[a,b]	-	-	SMD **0.13 SD higher** (0.18 lower to 0.45 higher)
All adverse events	164 (2 RCTs)	⊕⊕⊕◯ Moderate[a]	**RR 1.70** (1.27 to 2.28)	415 per 1 000	**290 more per 1 000** (112 more to 531 more)

The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). **CI:** confidence interval; **SMD:** standardised mean difference.

Explanations: a. Combination of high risk and some concerns, b. Large I-squared, c. Broad confidence interval crossing line of zero effect, d. Most studies have high risk of bias, e. Broad confidence interval, f. All studies have high Risk of bias, g. Very broad confidence interval.

7. FOREST PLOTS

5.1. Exercises

Figure S1. Forest plot of hand exercises versus usual care or no intervention: short- and long-term pain

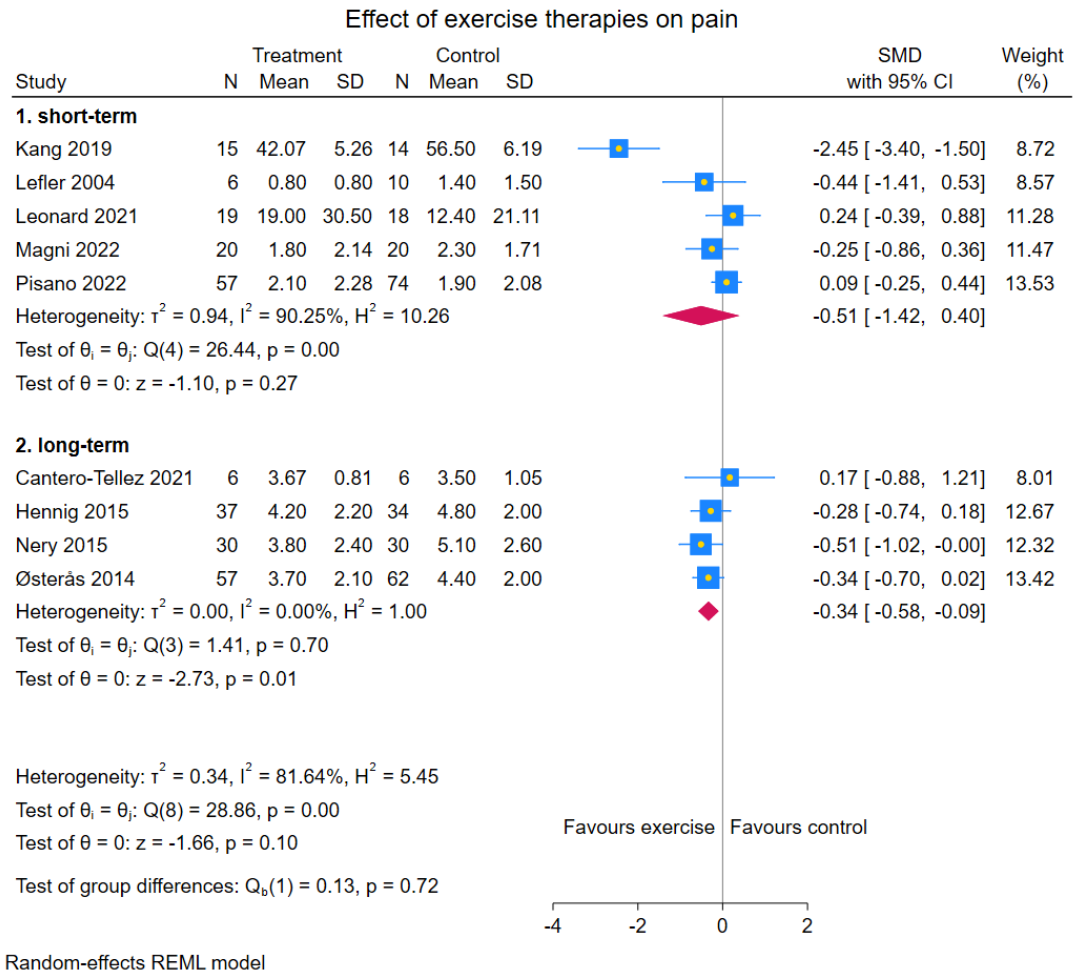


Figure S2. Forest plot of hand exercises versus usual care or no intervention: short- and long-term function

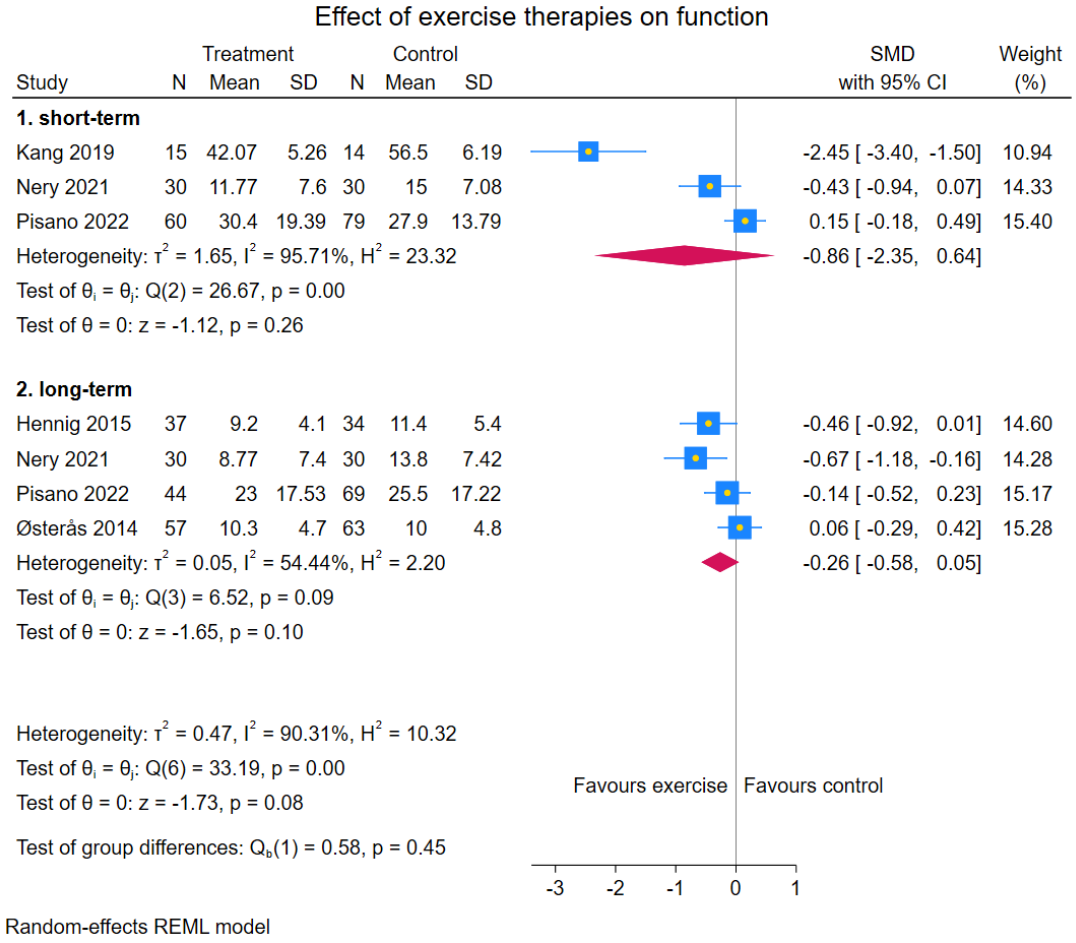


Figure S3. Forest plot of hand exercises versus usual care or no intervention: short- and long-term grip strength

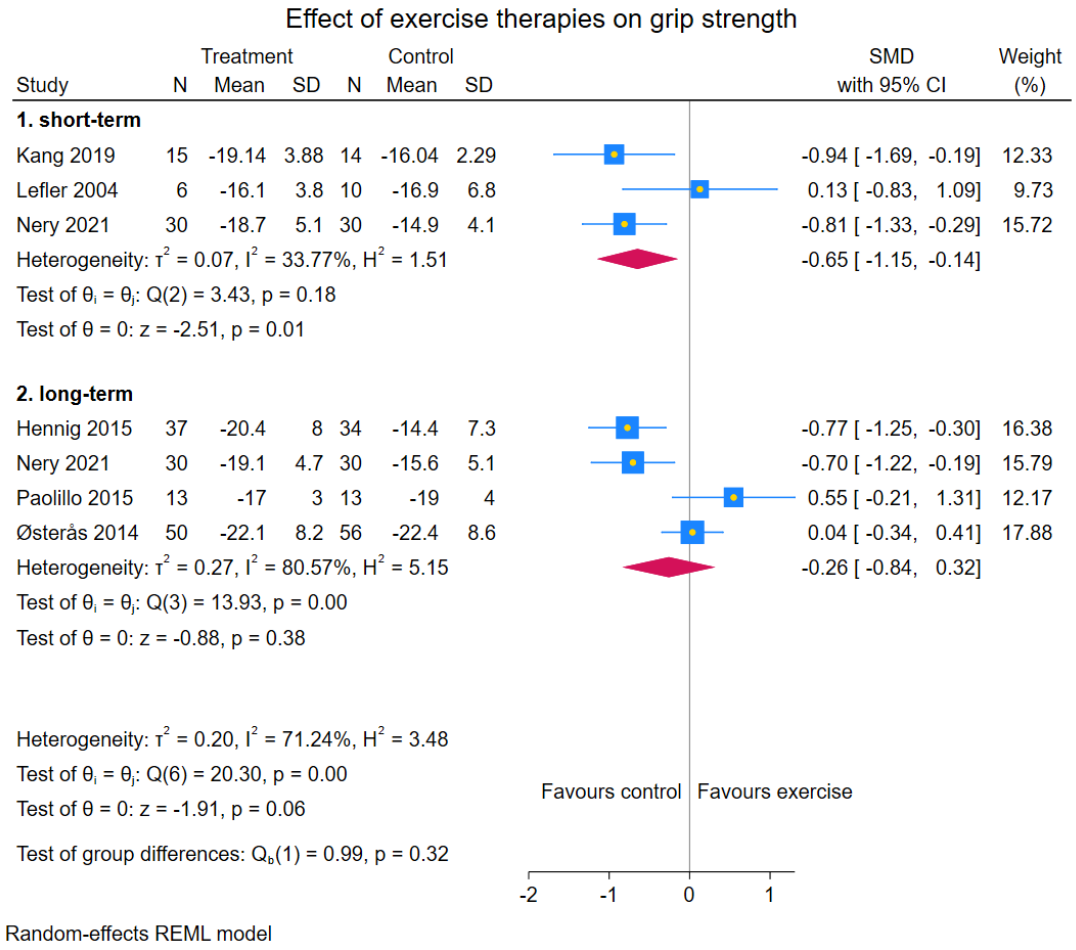


Figure S4. Forest plot of hand exercises versus usual care or no intervention: long-term OMERACT-OARSI response

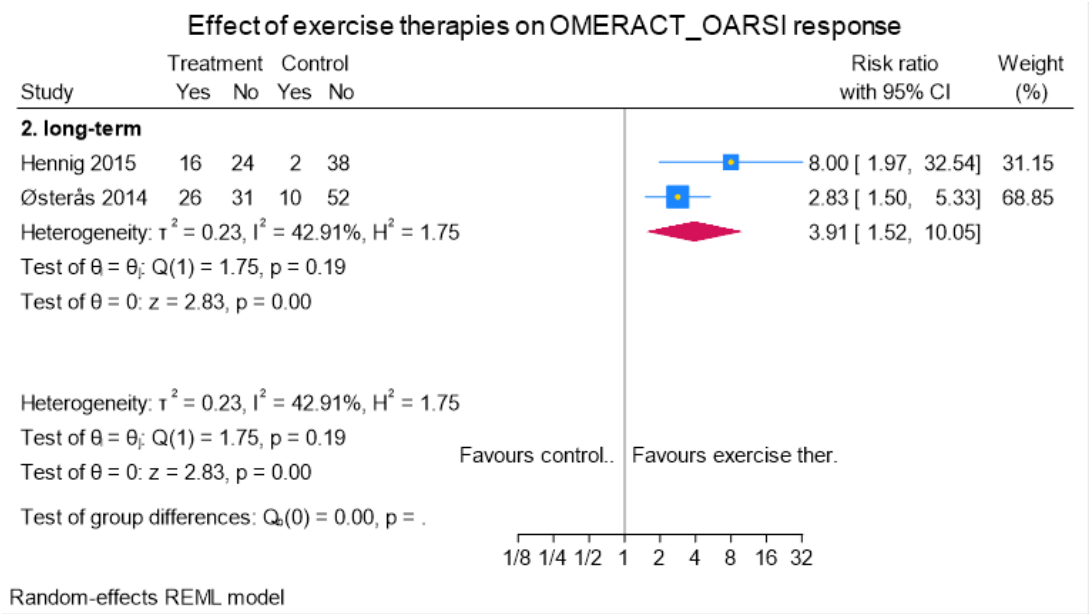


Figure S5. Forest plot of hand exercises versus hand exercises + proprioceptive exercises: short- and long-term pain

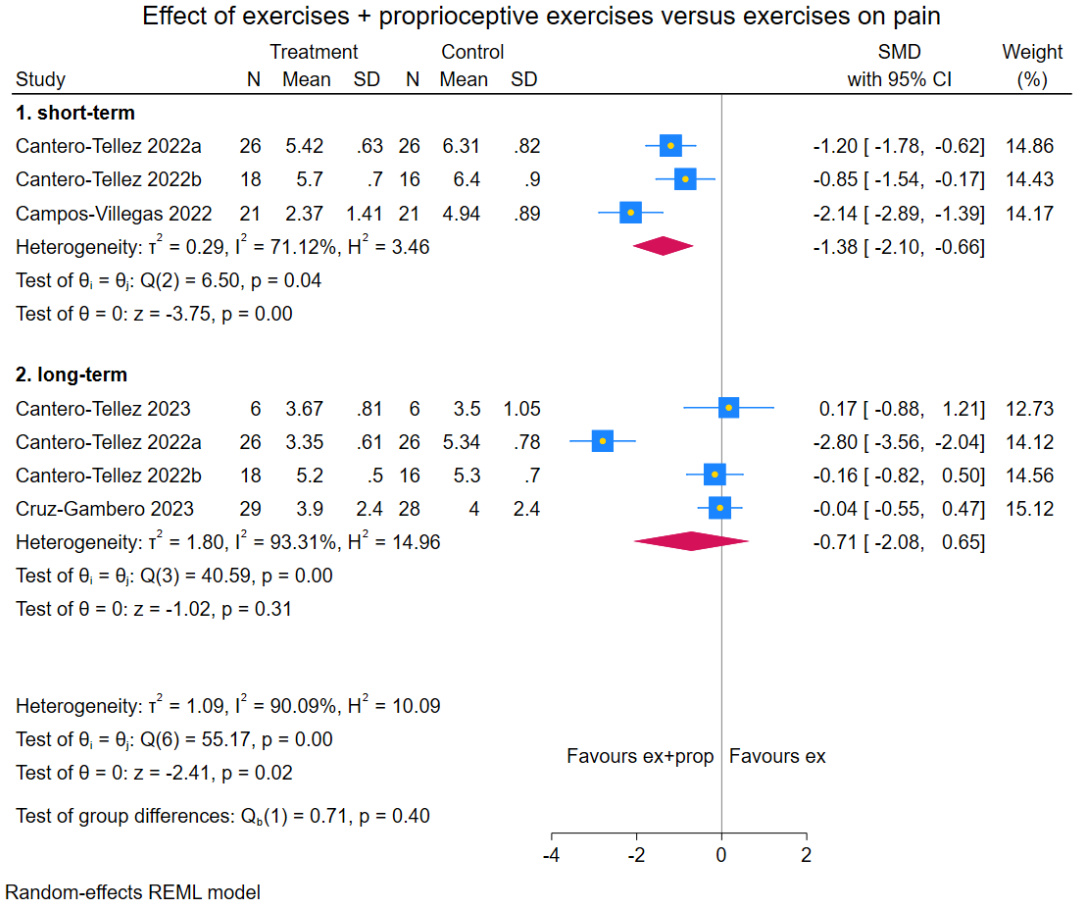
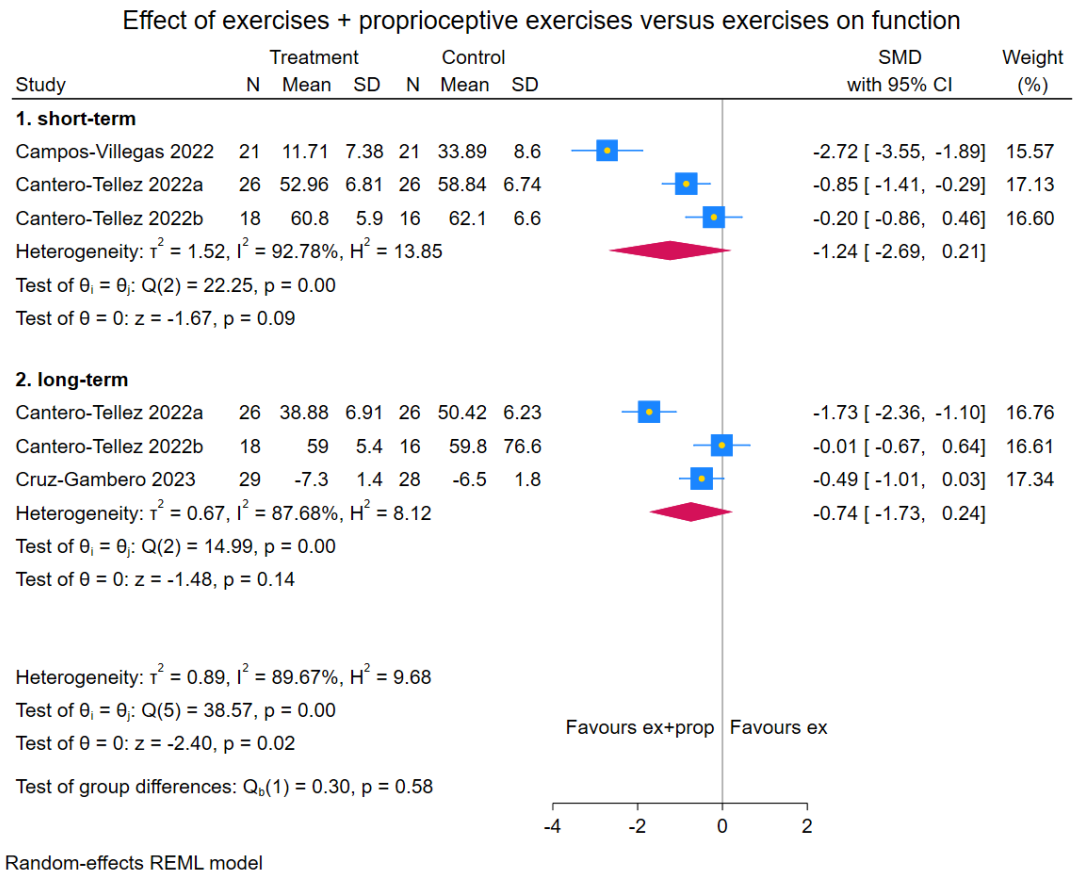


Figure S6. Forest plot of hand exercises versus hand exercises + proprioceptive exercises: short- and long-term function



5.2. Orthoses

Figure S7. Forest plot of thumb orthoses vs. no thumb orthoses or placebo: short- and long-term pain

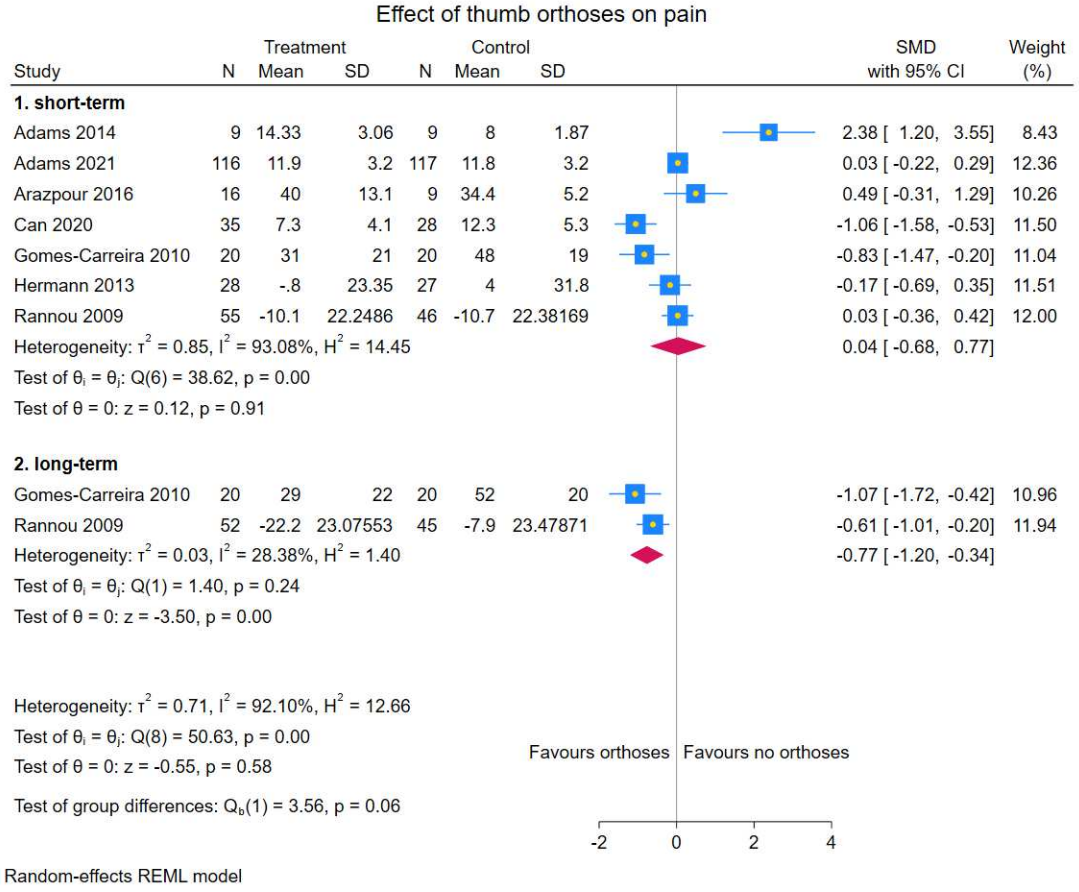


Figure S8. Forest plot of thumb orthoses vs. no thumb orthoses or placebo: short- and long-term function

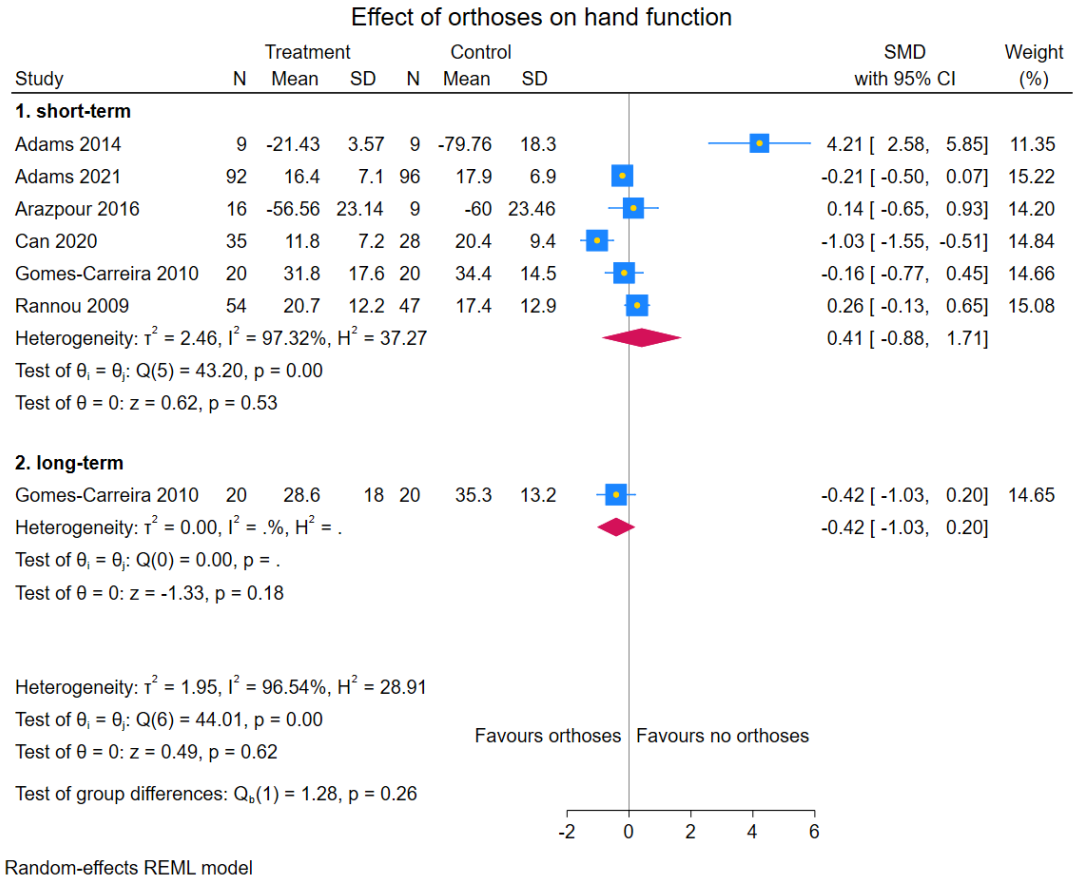


Figure S9. Forest plot of thumb orthoses vs. no thumb orthoses or placebo: short- and long-term grip strength

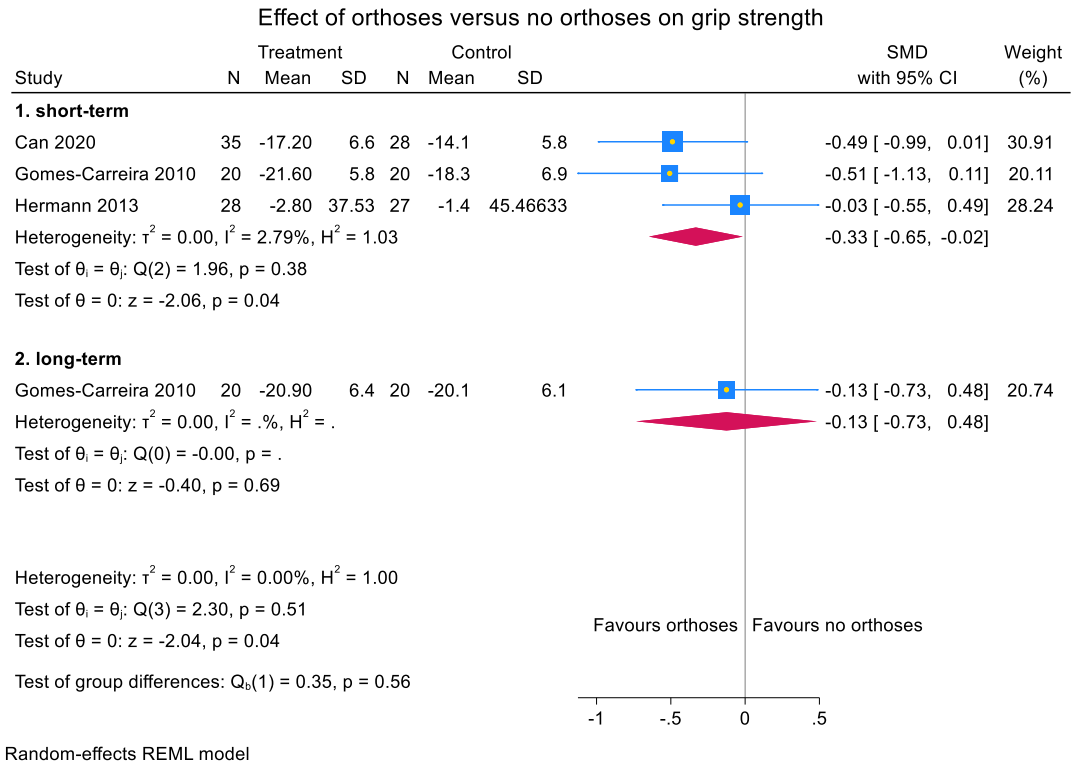


Figure S10. Forest plot of thumb orthoses vs. no thumb orthoses or placebo: all adverse events

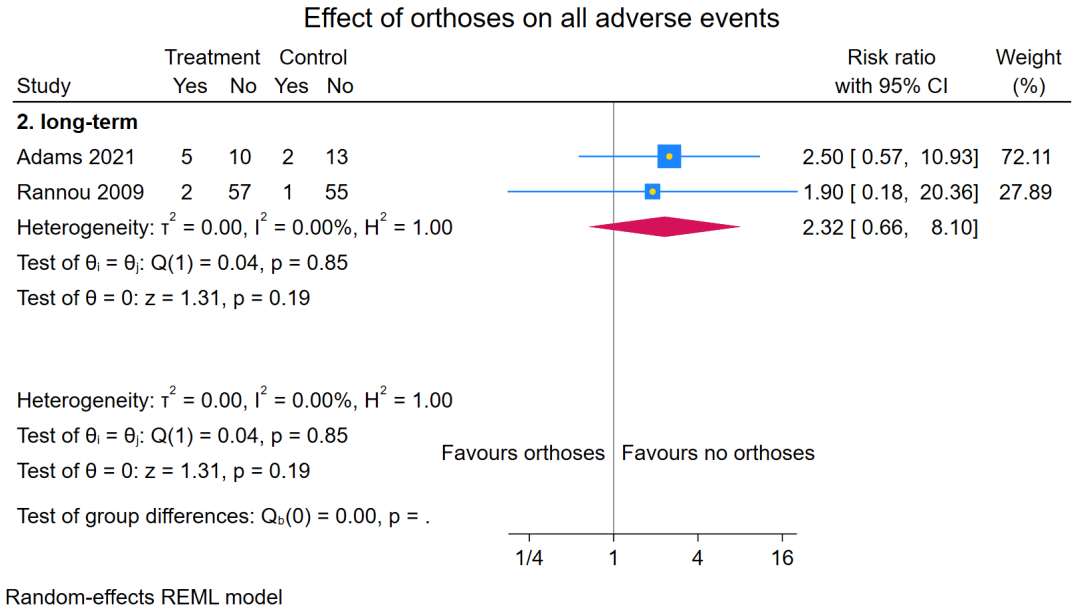


Figure S11. Forest plot of thumb orthoses vs. no thumb orthoses or placebo: withdrawals from adverse events

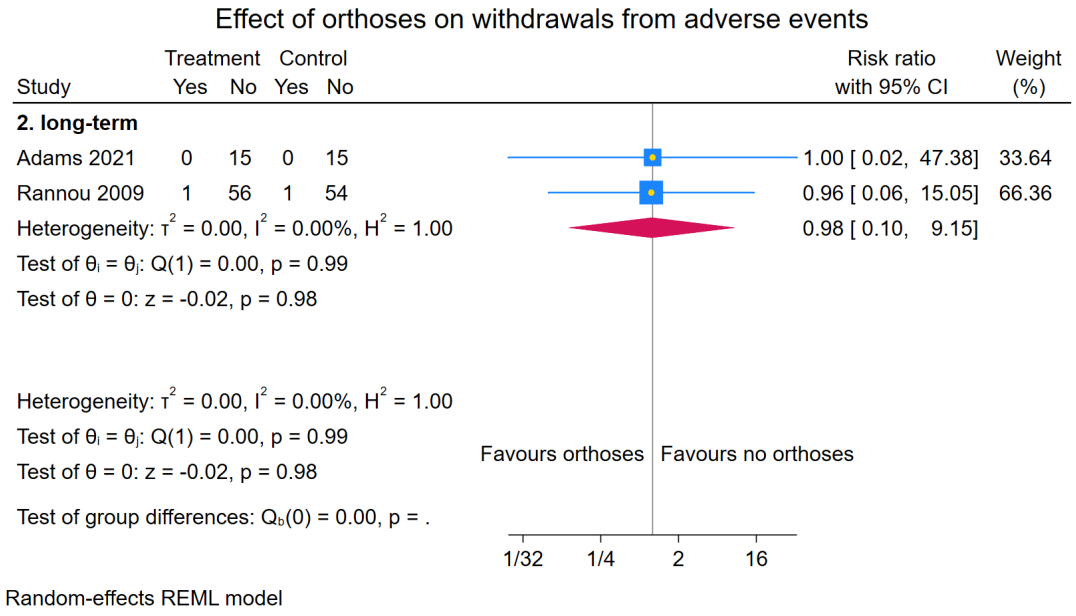


Figure S12. Forest plot of orthoses immobilising the CMC-joint only vs orthoses also immobilising the wrist and/or one or more additional thumb joints: short- and long-term pain

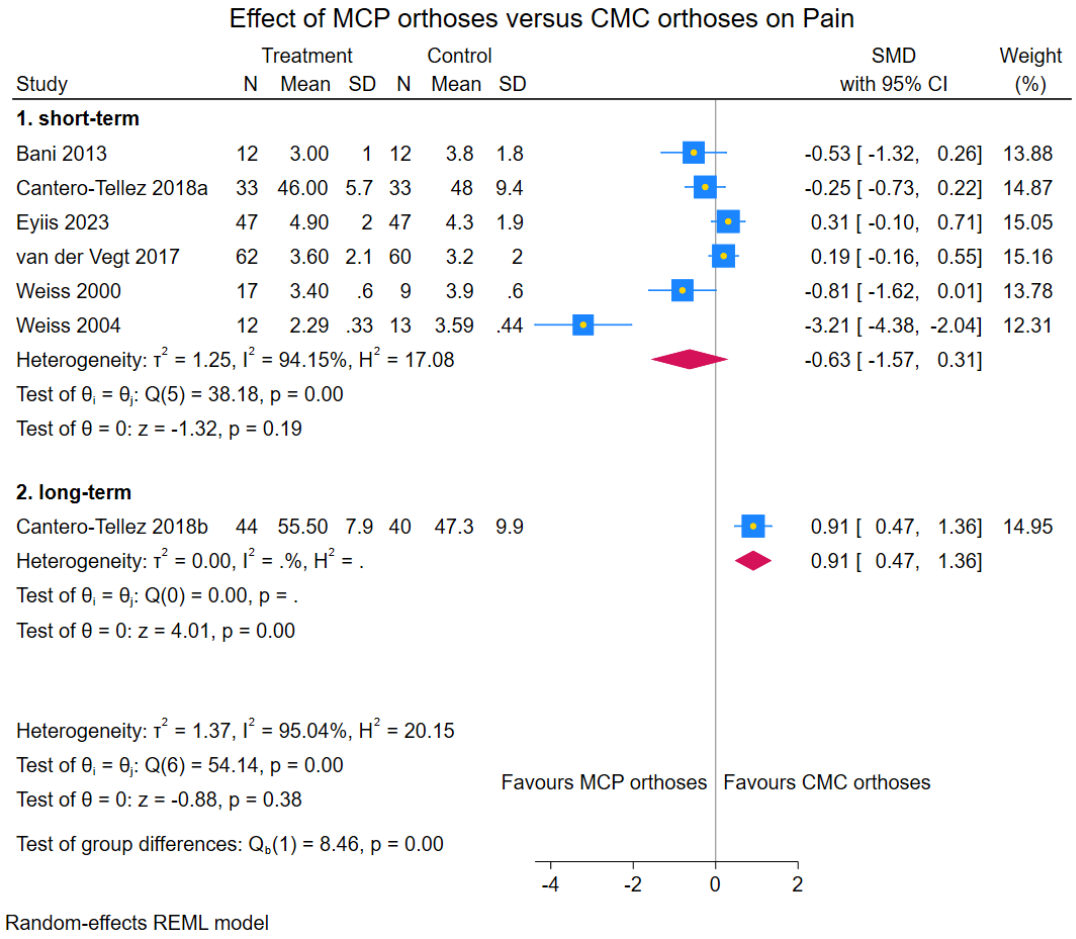
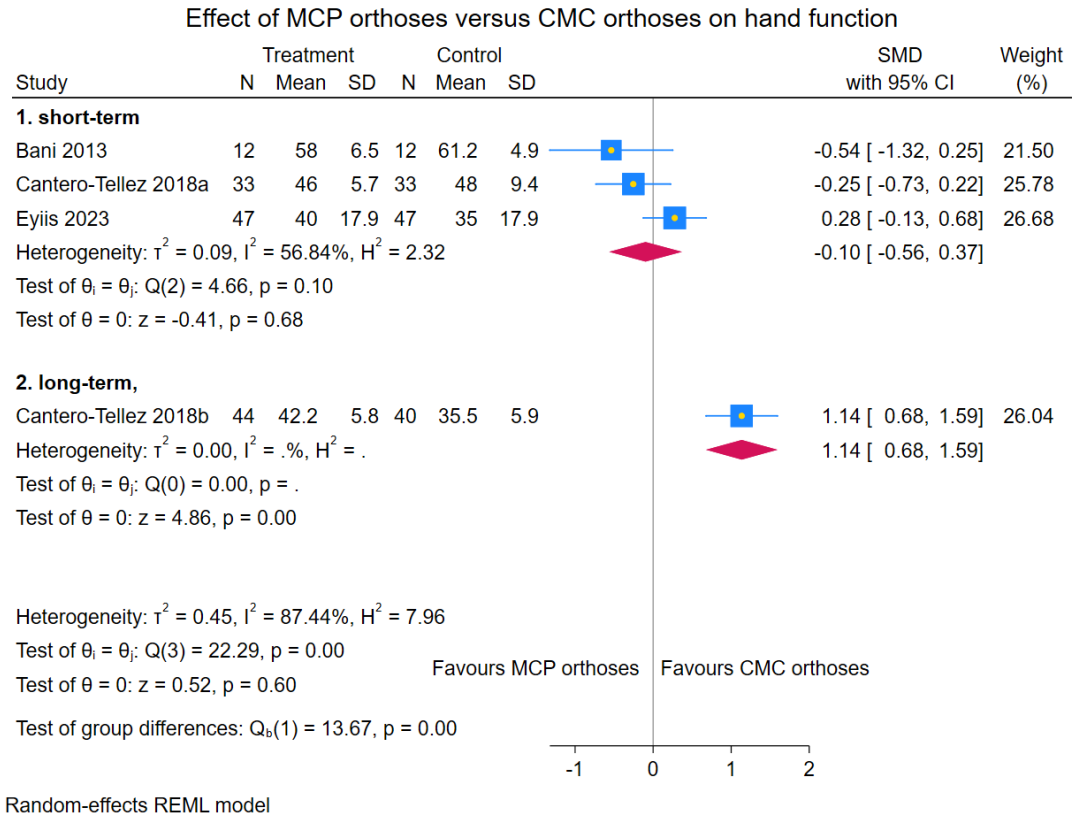


Figure S13. Forest plot of short- and long-term orthoses immobilising the CMC-joint only vs orthoses also immobilising the wrist and/or one or more additional thumb joints: function



5.3. Assistive devices

Figure S14. Forest plot of assistive devices vs. usual care or no intervention: short- and long-term pain

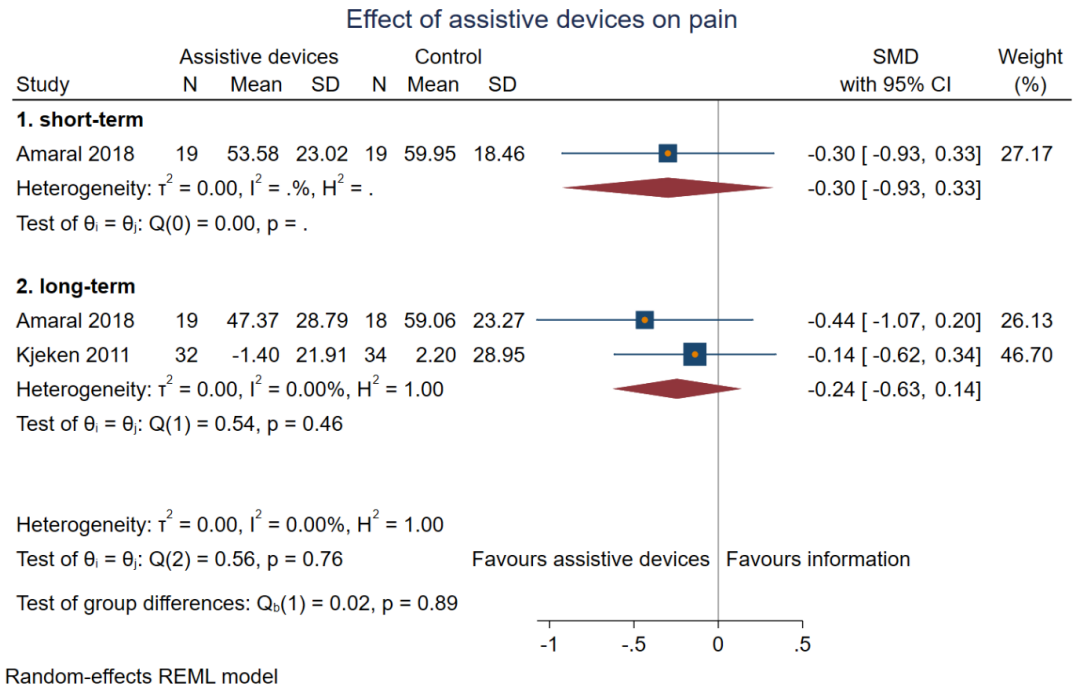
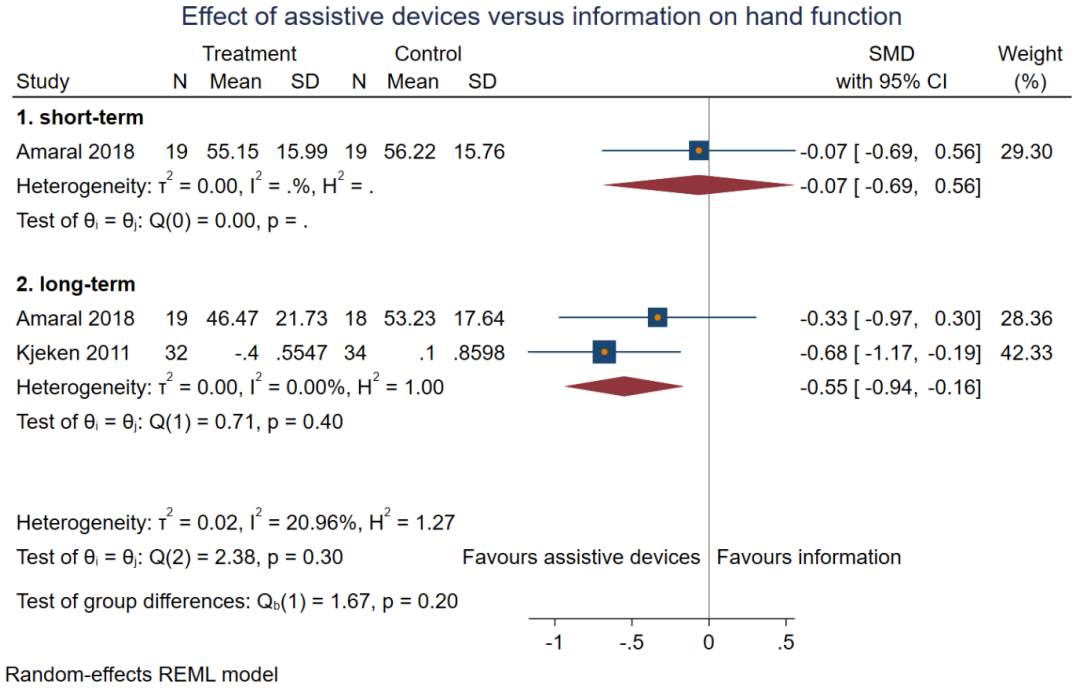


Figure S15. Forest plot of assistive devices vs. usual care or no intervention: short- and long-term function



5.4. Thermal modalities

Figure S16. Forest plot of thermal modalities vs. usual care or no intervention: short- and long-term pain

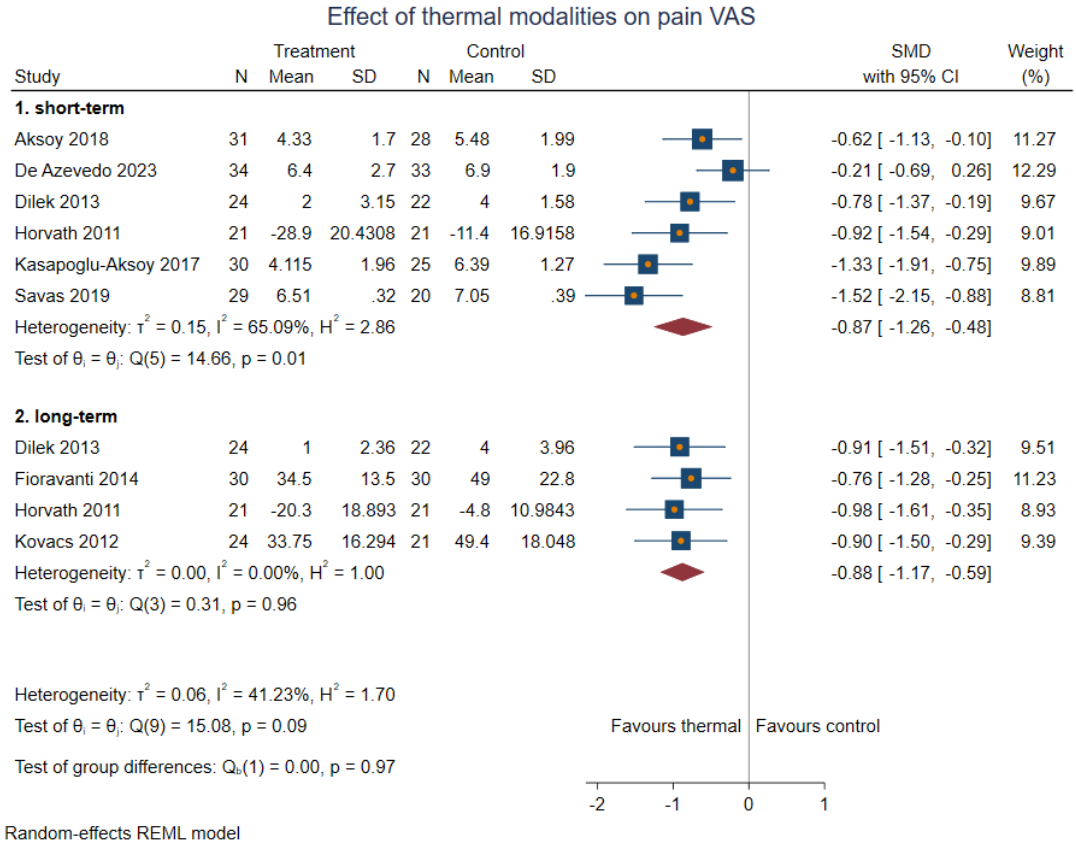


Figure S17. Forest plot of thermal modalities vs. usual care or no intervention: short- and long-term function

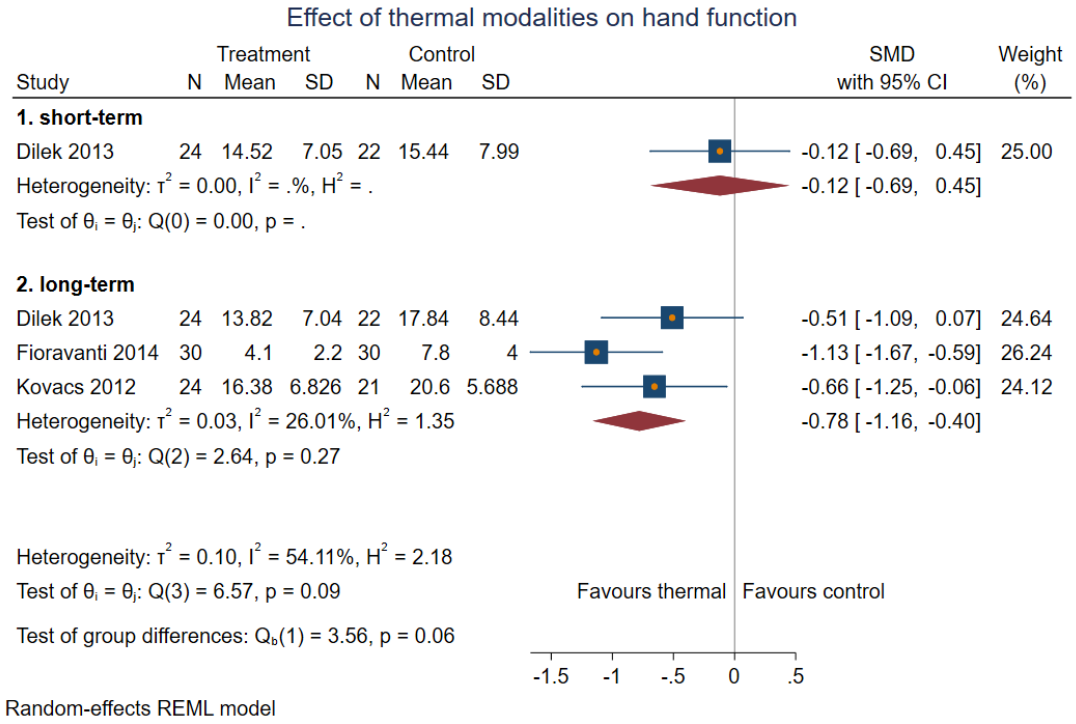
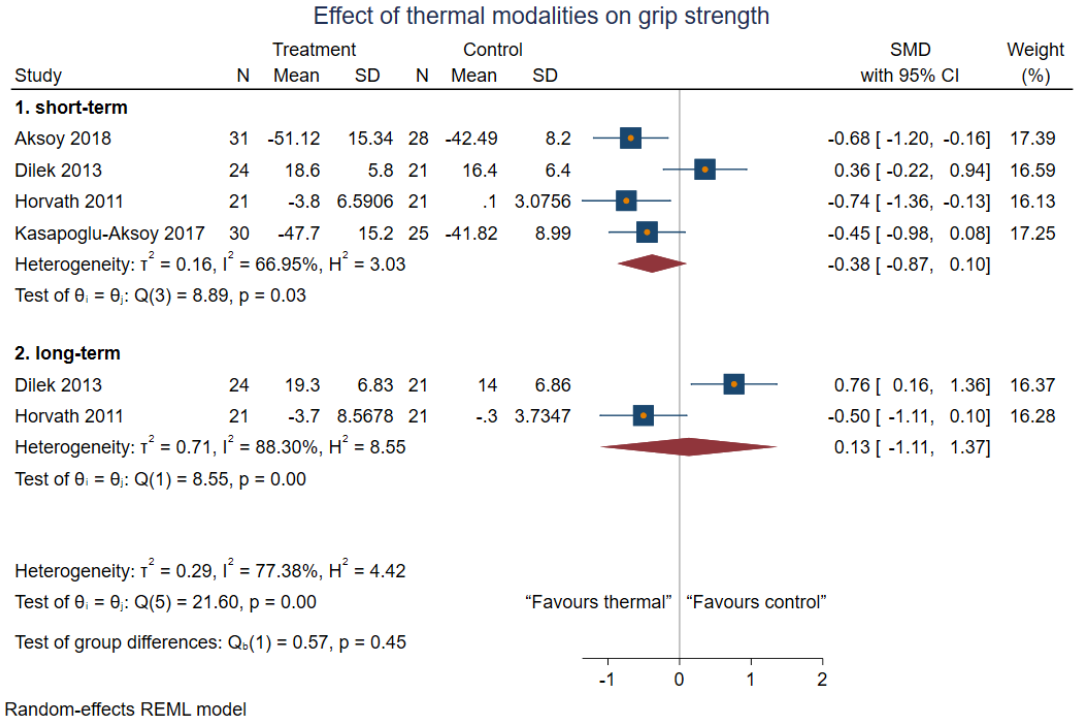


Figure S18. Forest plot of thermal modalities vs. usual care or no intervention: short- and long-term grip strength



5.5. Ultrasound/laser therapy

Figure S19. Forest plot of ultrasound/laser therapy vs. sham or no intervention: short- and long-term pain

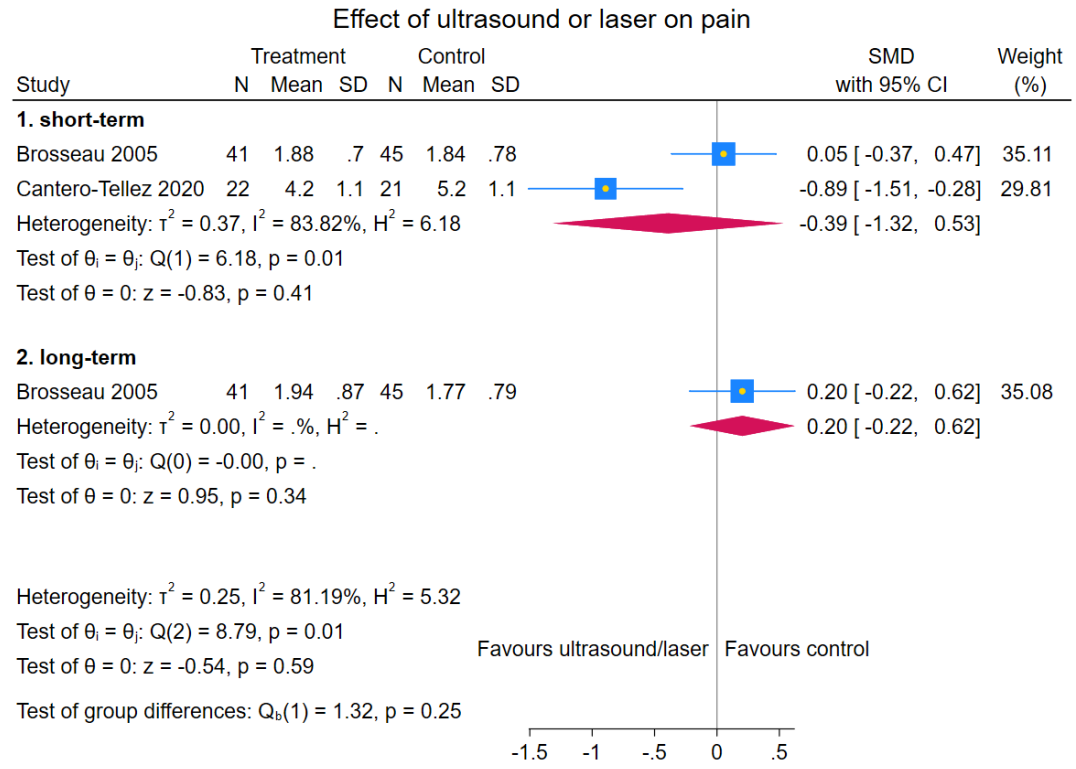
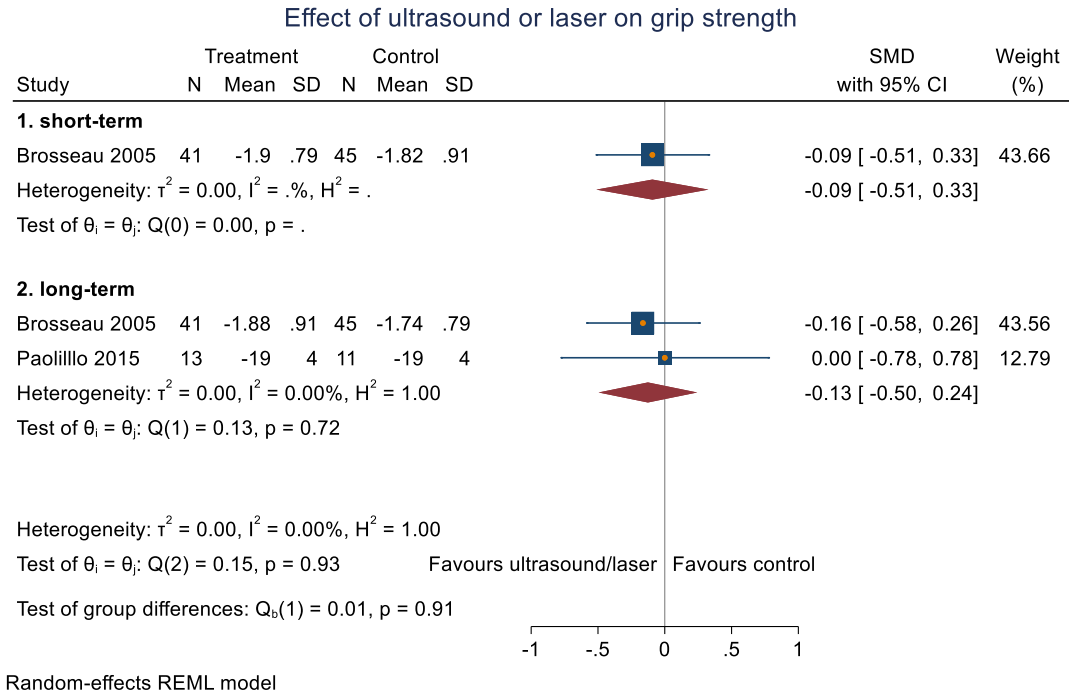


Figure S20. Forest plot of ultrasound/laser therapy vs. sham or no intervention: short- and long-term grip strength



5.6. Combination programmes

Figure S21. Forest plot of combination programmes vs. sham or no intervention: short- and long-term pain

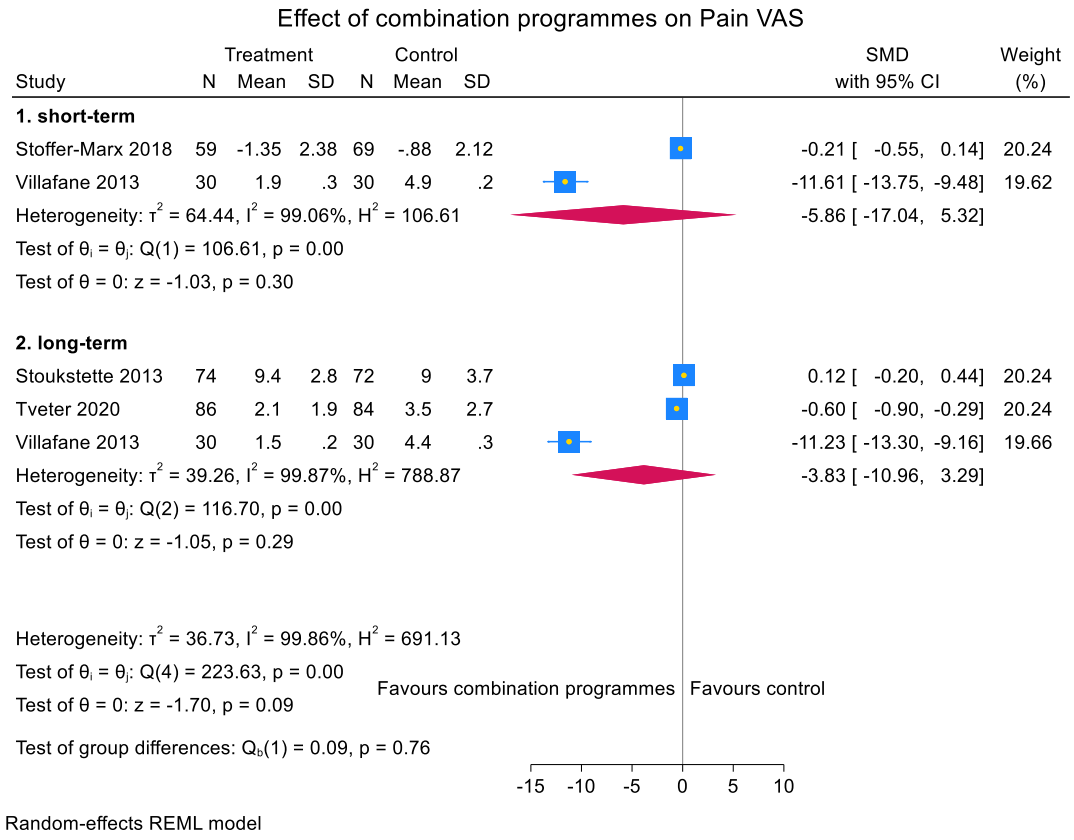


Figure S22. Forest plot of combination programmes vs. sham or no intervention: long-term function

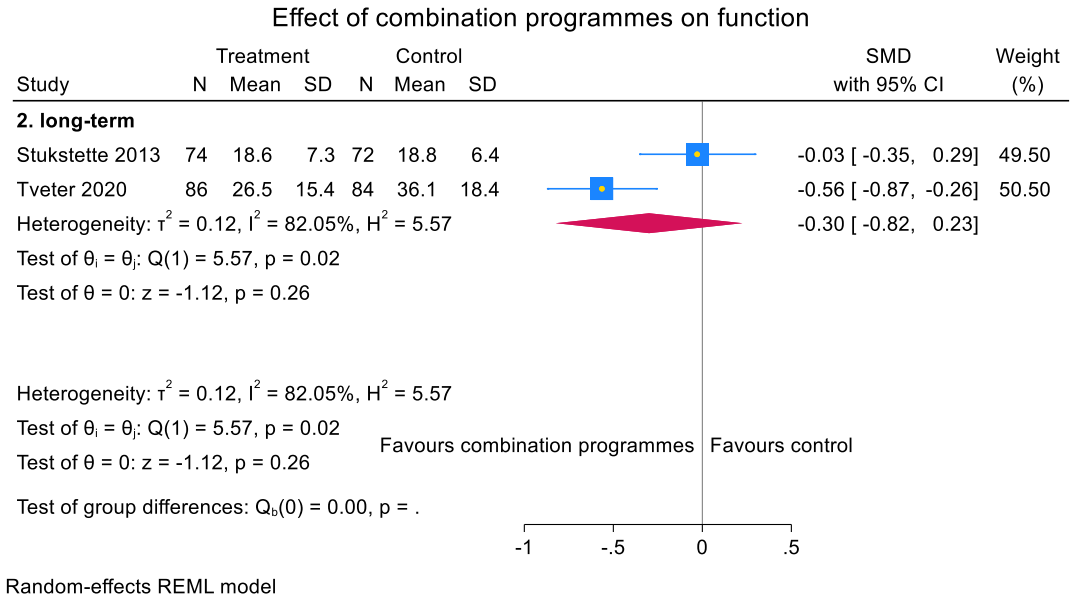


Figure S23. Forest plot of combination programmes vs. sham or no intervention: long-term grip strength

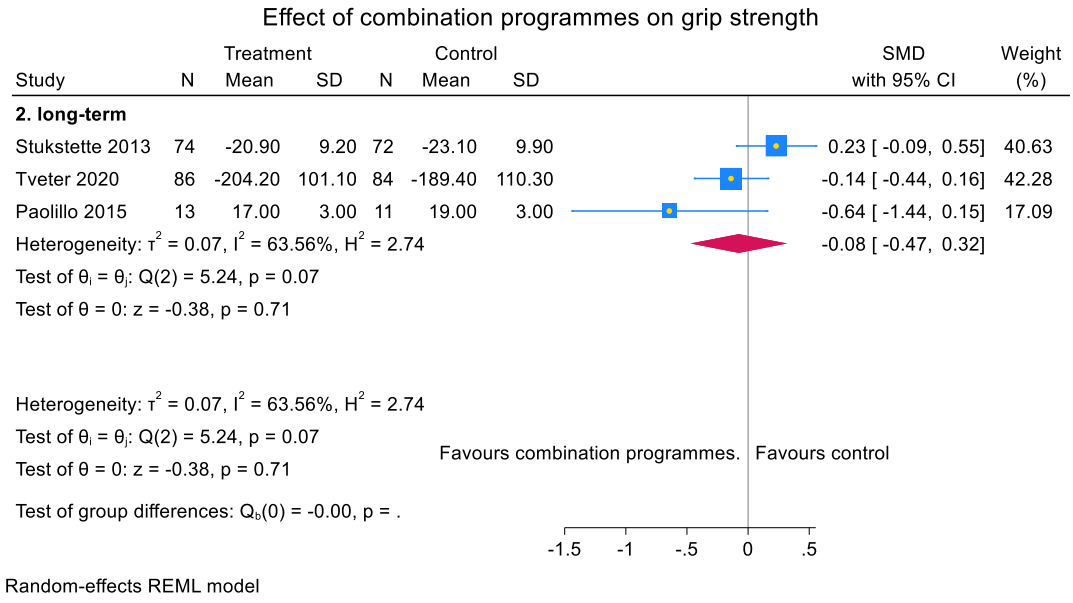
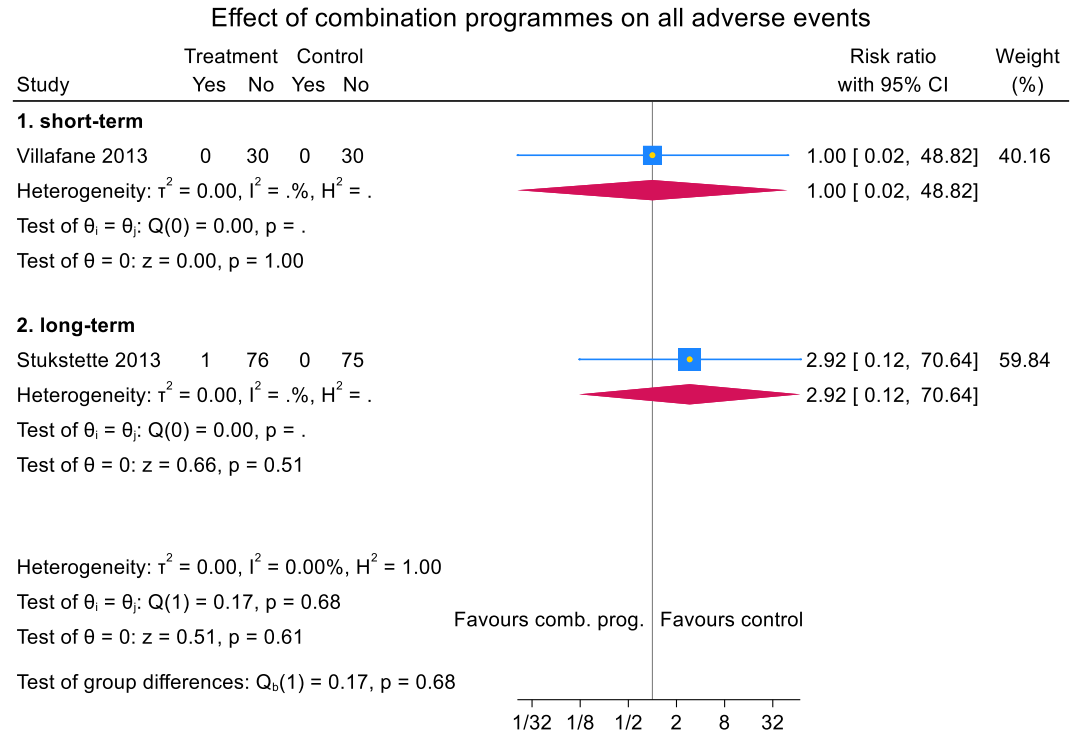


Figure S24. Forest plot of combination programmes vs. sham or no intervention: all adverse events



5.7. Topical NSAIDs

Figure S25. Forest plot of topical NSAIDs versus placebo: short term pain

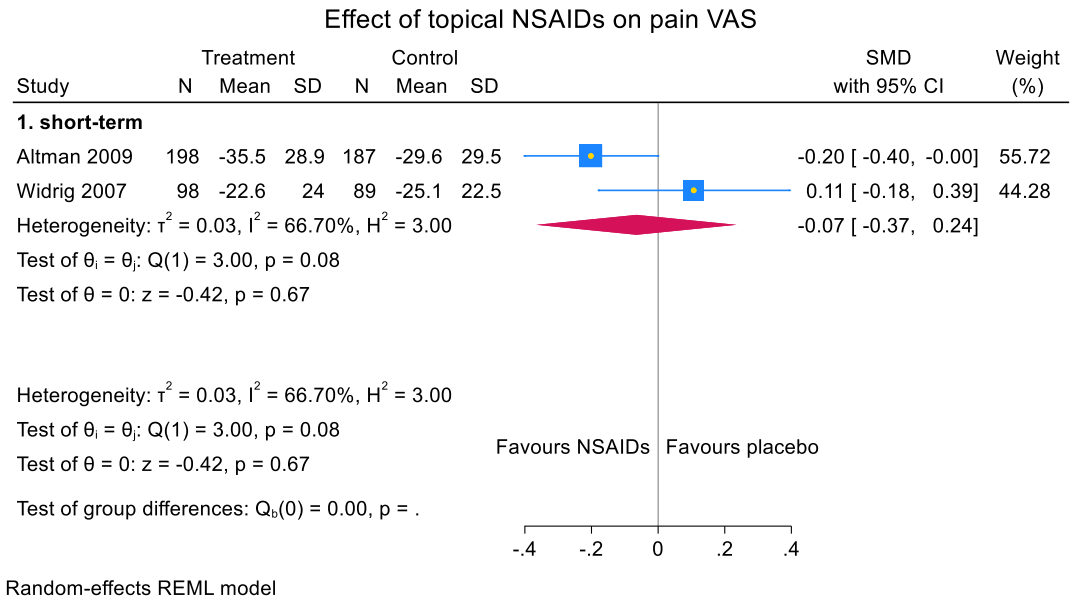


Figure S26. Forest plot of topical NSAIDs versus placebo: short term function

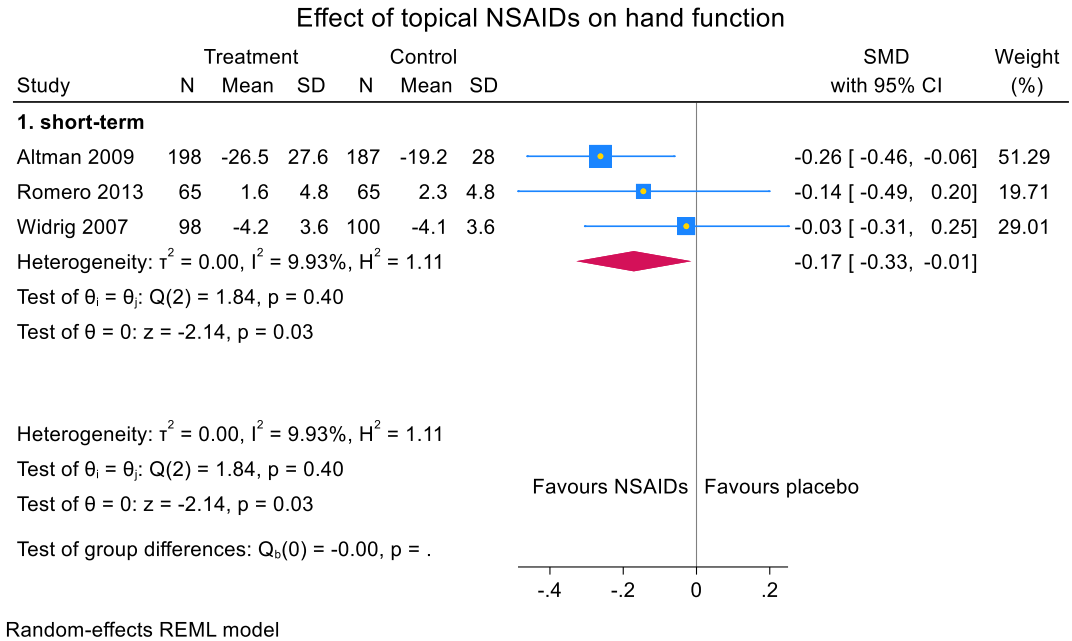


Figure S27. Forest plot of oral NSAIDs versus placebo: pain

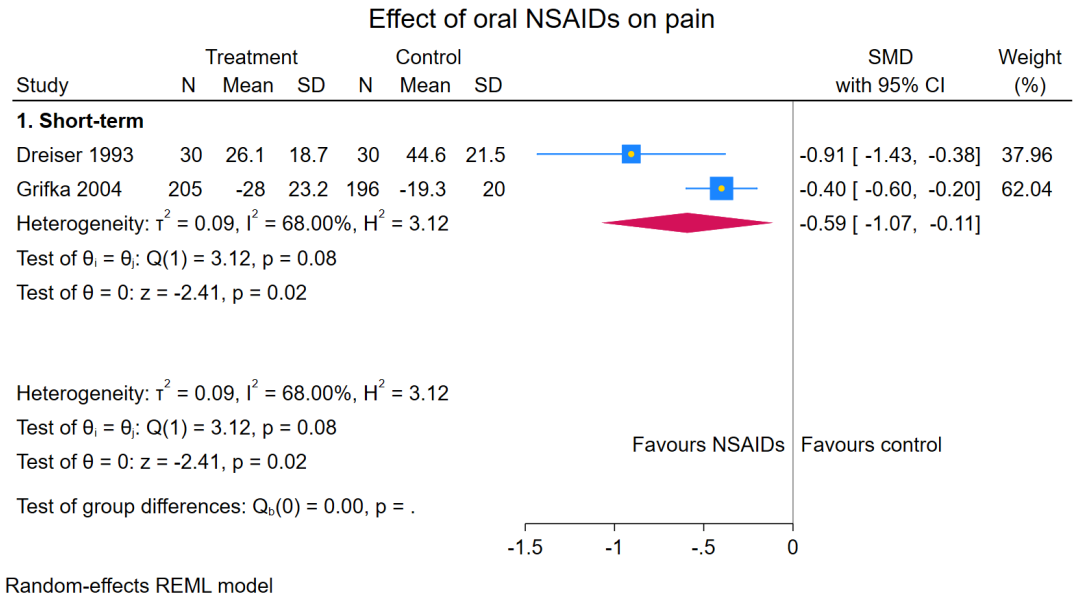


Figure S28. Forest plot of oral NSAIDs versus placebo: all adverse events

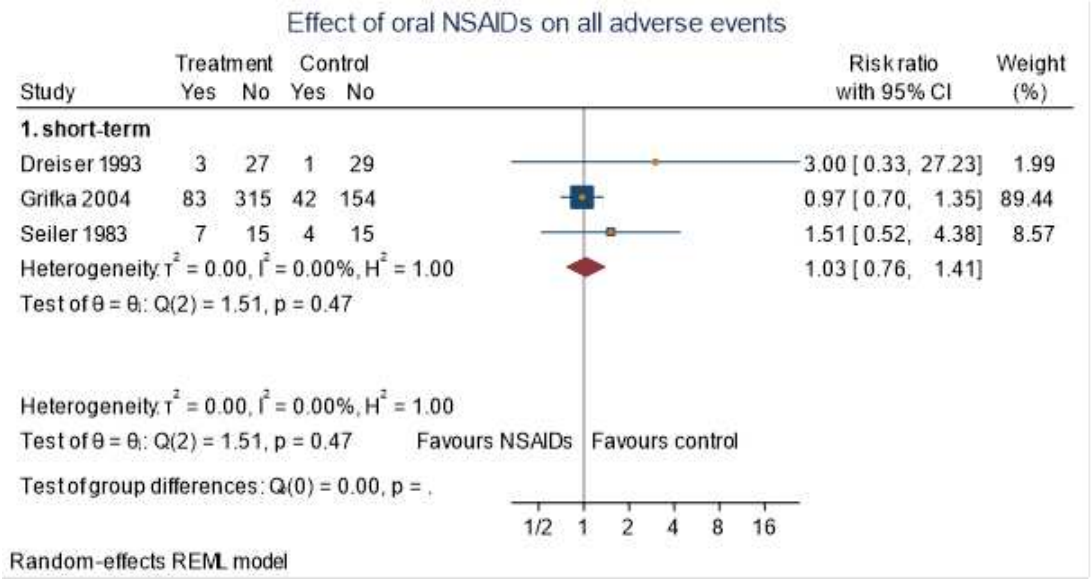


Figure S29. Forest plot of oral NSAIDs versus placebo: severe adverse events

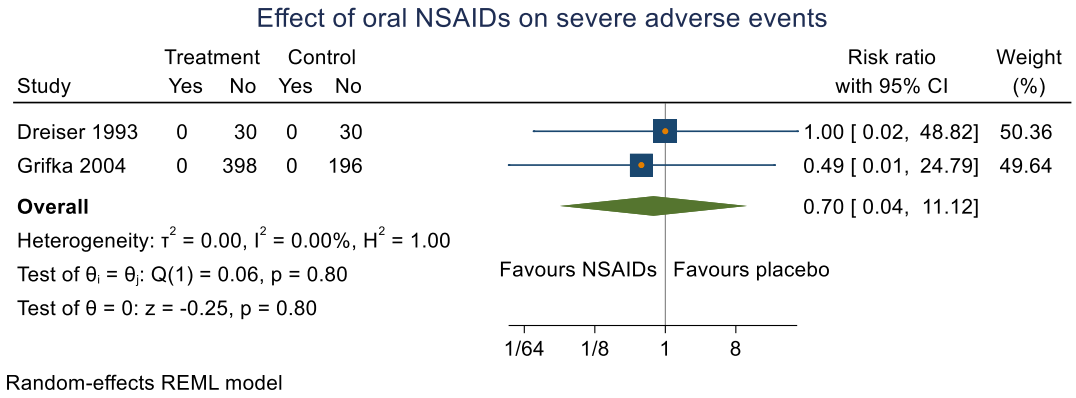


Figure S30. Forest plot of oral NSAIDs versus placebo: withdrawal from adverse events

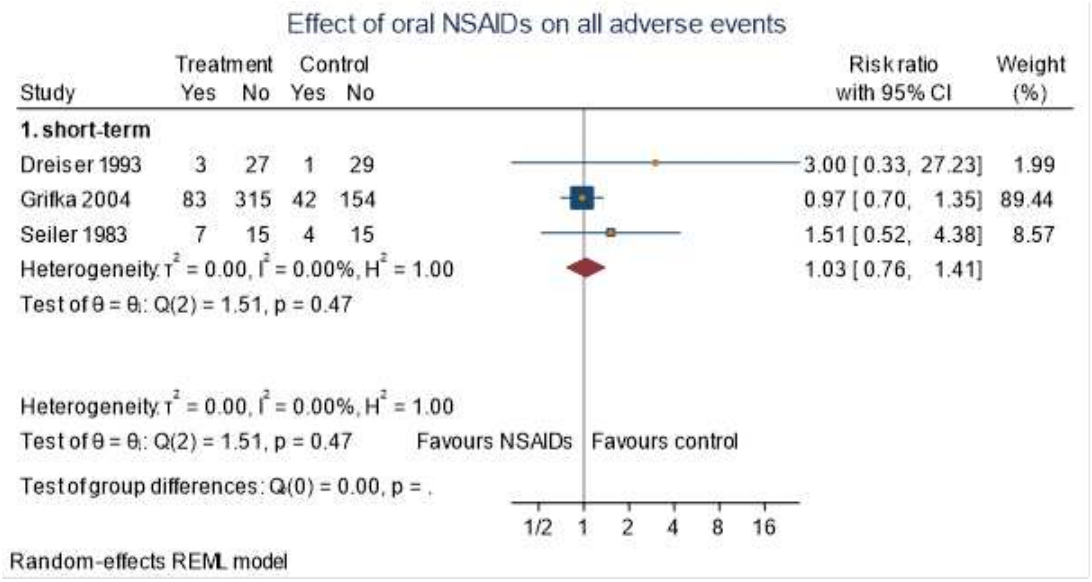
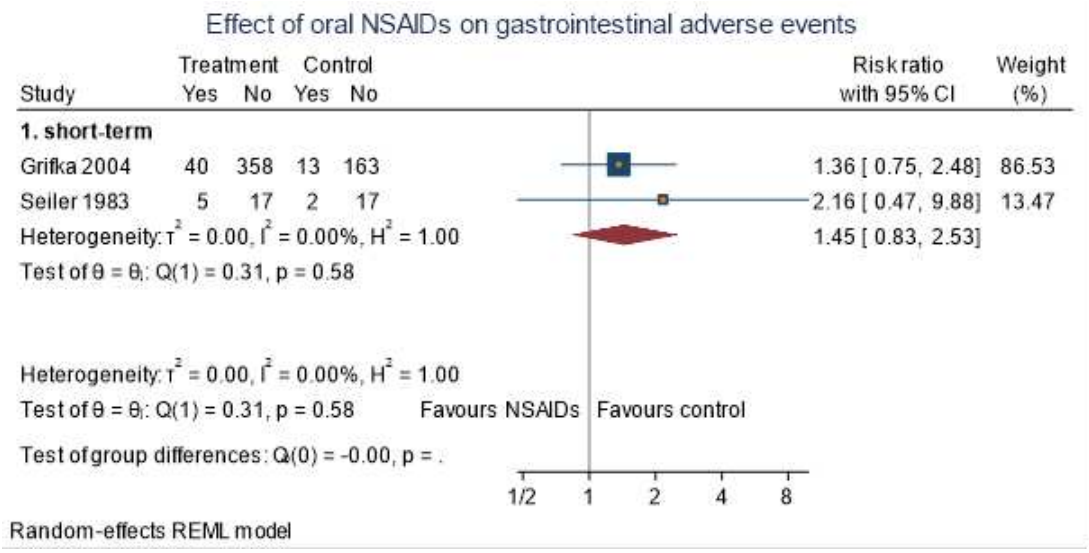


Figure S31. Forest plot of oral NSAIDs versus placebo: gastrointestinal adverse events



5.8. Oral glucocorticoids

Figure S32. Forest plot of oral glucocorticoids versus placebo: short- and long-term pain

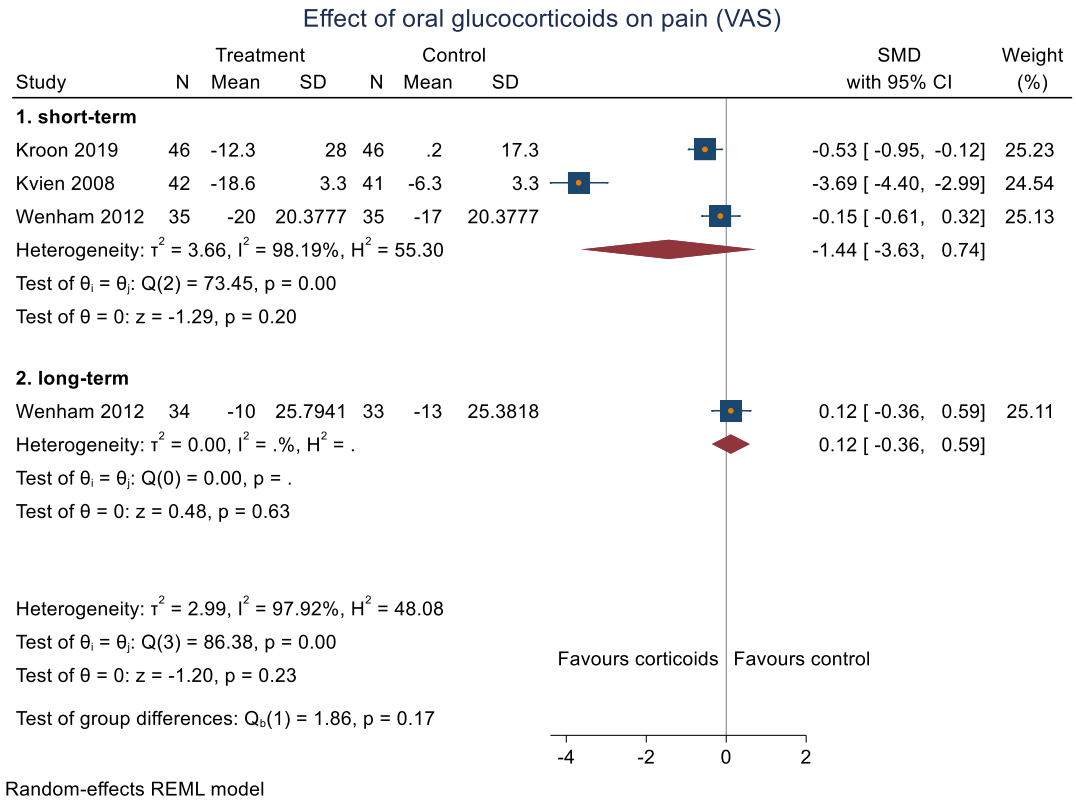
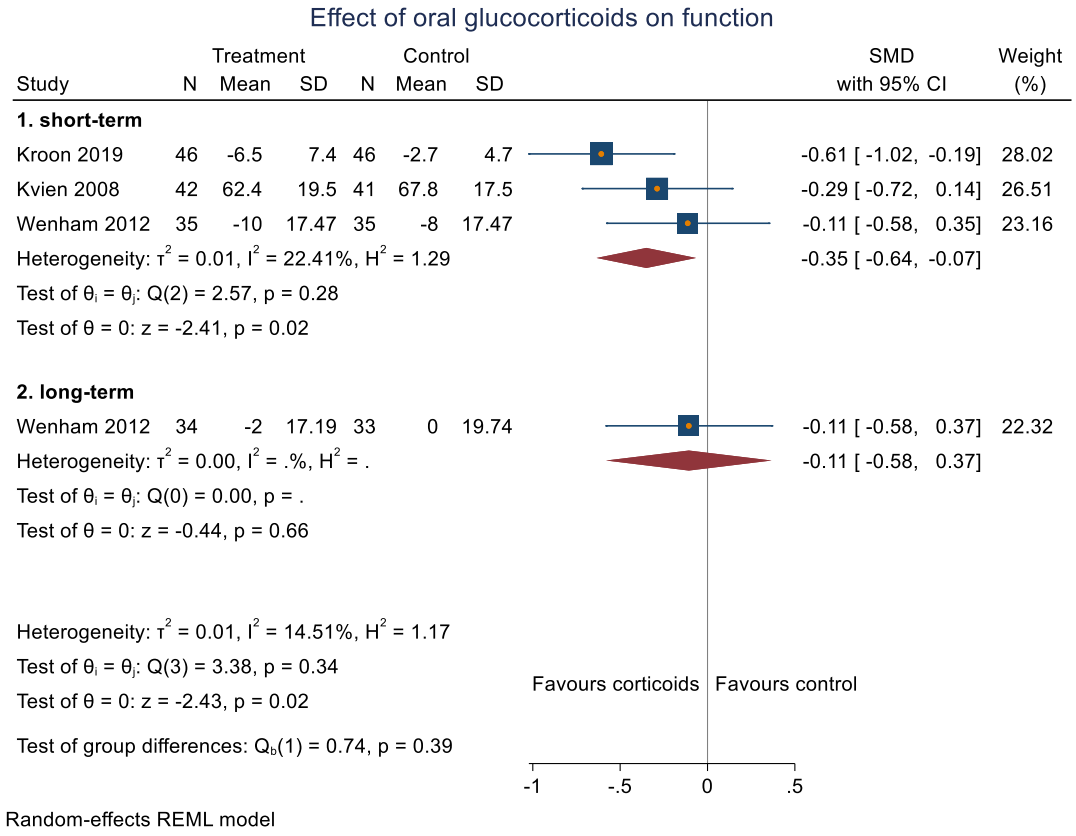


Figure S33. Forest plot of oral glucocorticoids versus placebo: short- and long-term function



5.9. Intra-articular glucocorticoids

Figure S34.

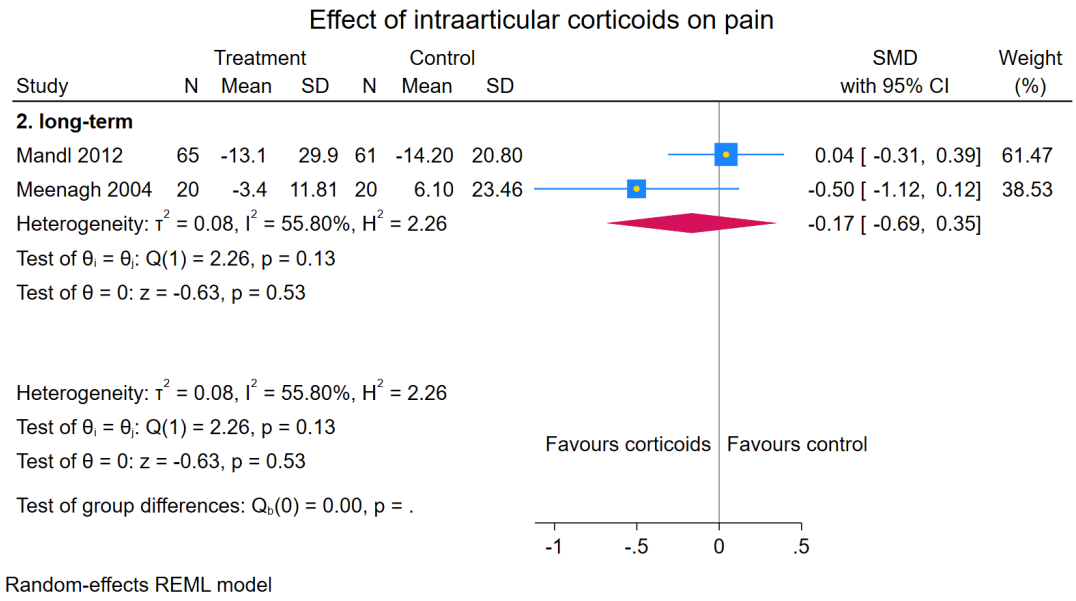
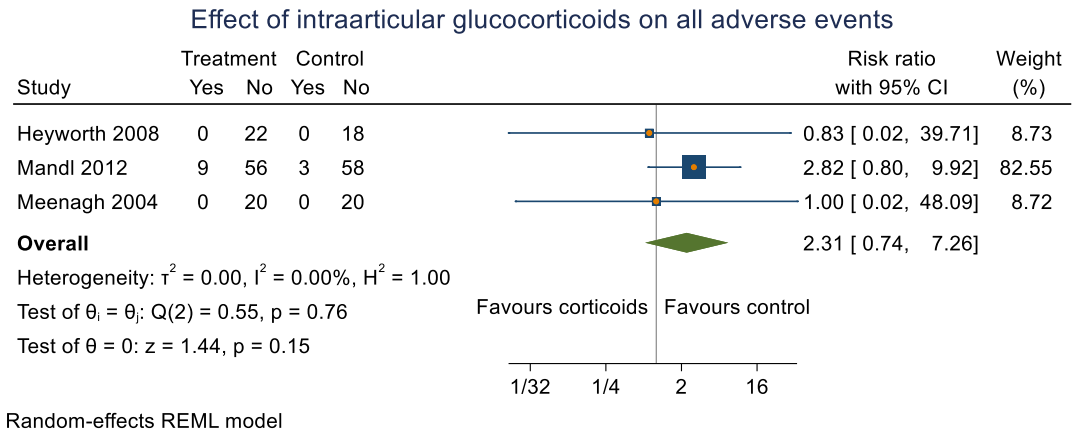


Figure S35. Forest plot of intraarticular glucocorticoids versus placebo: all adverse events



5.10. bDMARDs/TNF-inhibitors

Figure S36. Forest plot of DMARDs/TNF-inhibitors vs placebo on long-term pain

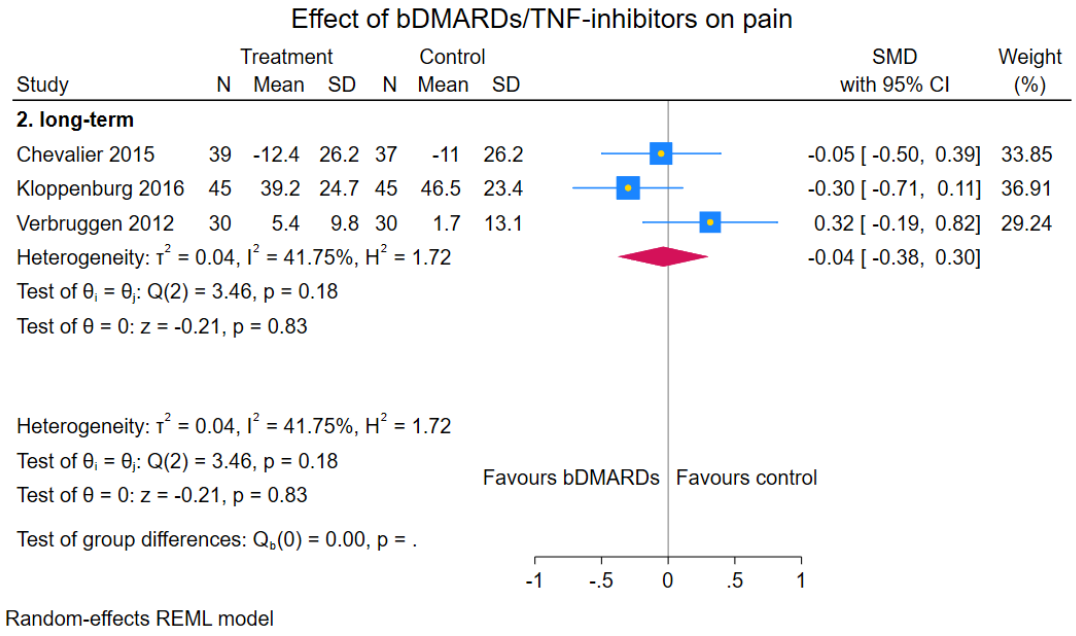


Figure S37. Forest plot of bDMARDs/TNF-inhibitors vs placebo all adverse events

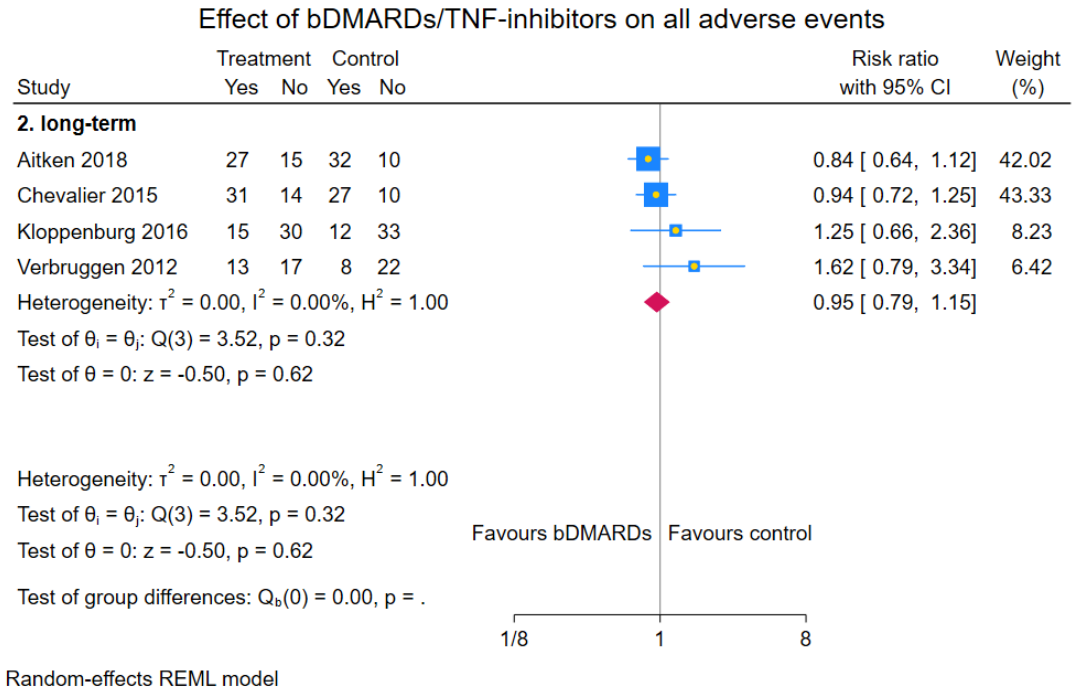


Figure S38. Forest plot of bDMARDs/TNF-inhibitors vs placebo on severe adverse events

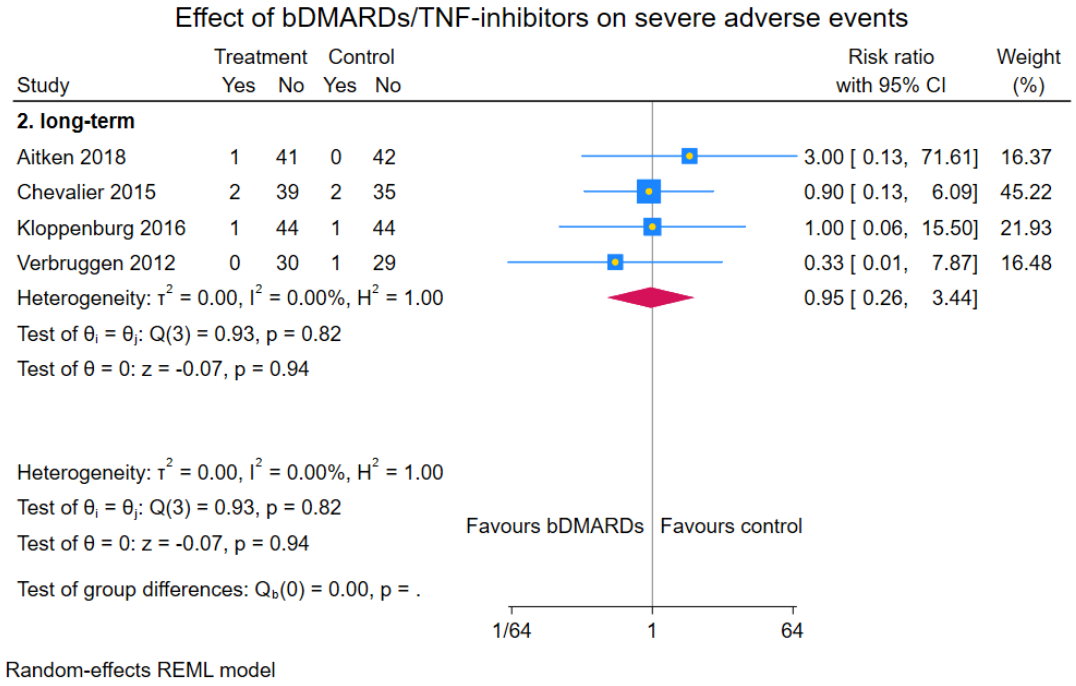
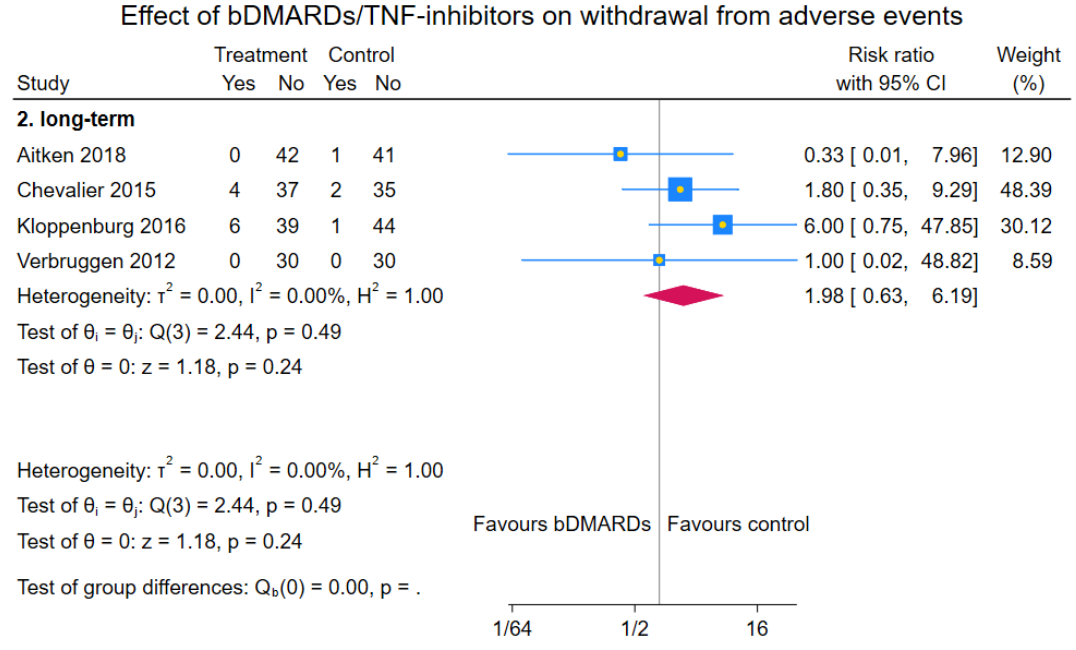


Figure S39. Forest plot of bDMARDs/TNF-inhibitors vs placebo on withdrawal from adverse events



5.11. Synthetic DMARDs (hydroxychloroquine)

Figure S40. Forest plot of synthetic DMARDs (hydroxychloroquine) vs placebo on short- and long-term pain

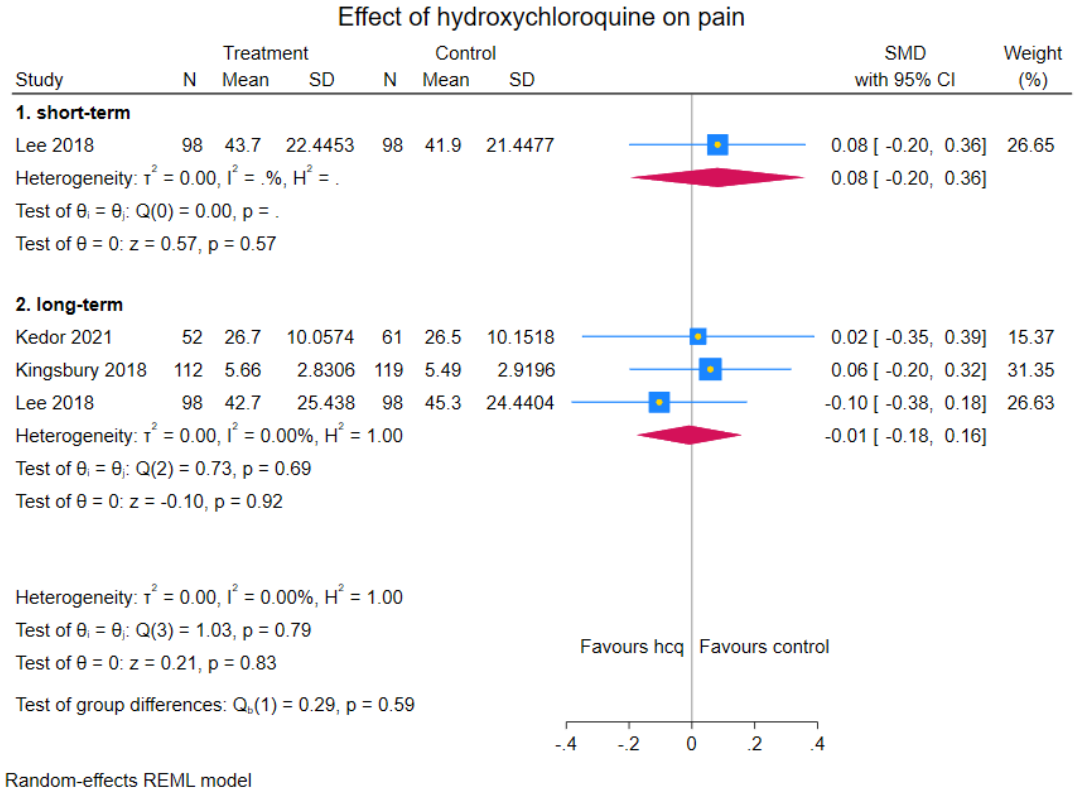


Figure S41 Forest plot of synthetic DMARDs (hydroxychloroquine) vs placebo on long-term function

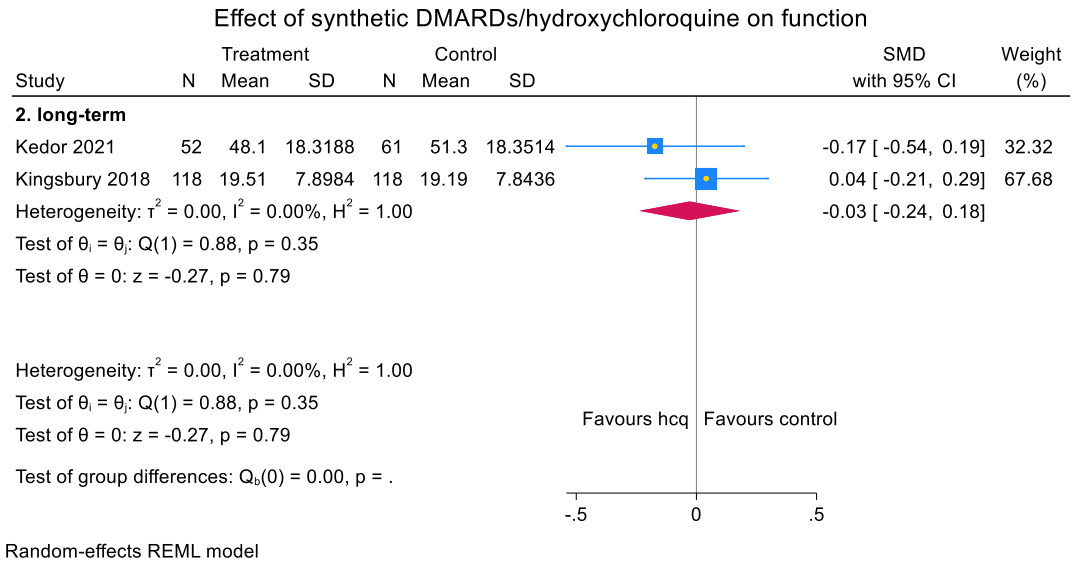


Figure S42. Forest plot of synthetic DMARDs (hydroxychloroquine) vs placebo on all adverse events

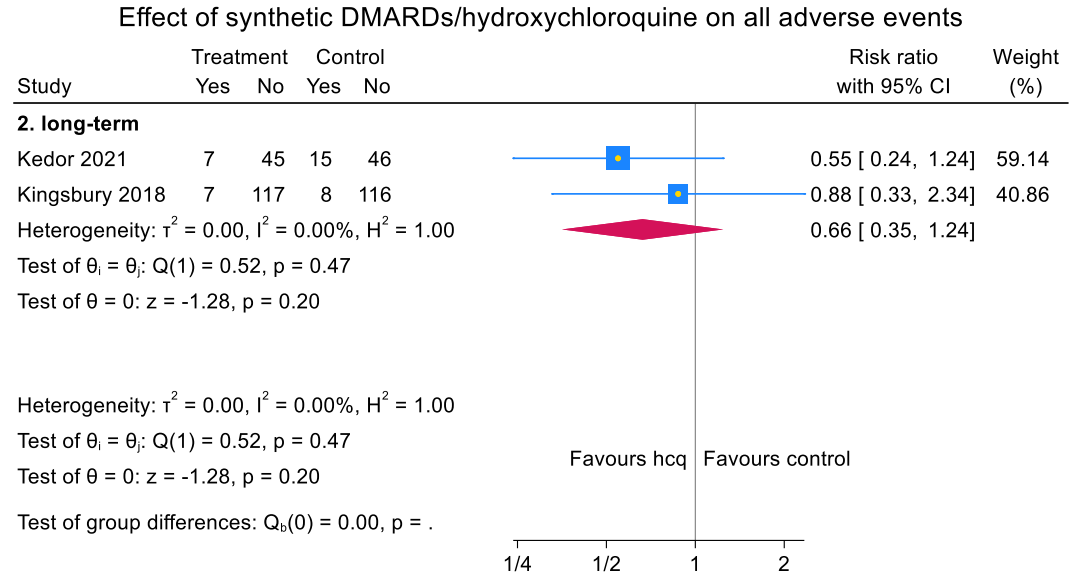


Figure S43. Forest plot of synthetic DMARDs (Methotrexate) vs placebo pain

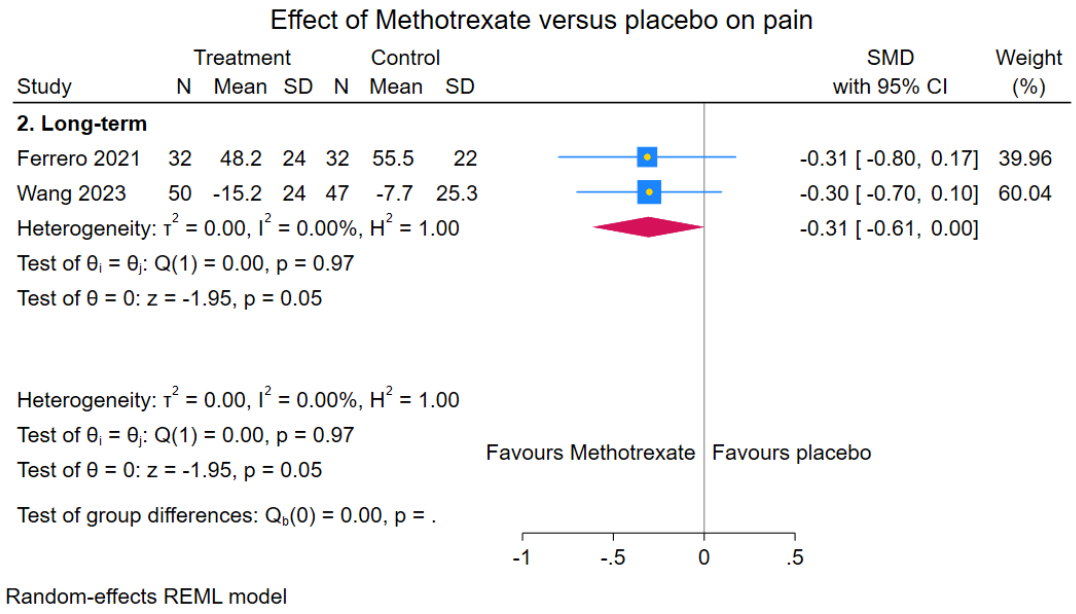


Figure S44. Forest plot of synthetic DMARDs (Methotrexate) vs placebo on function

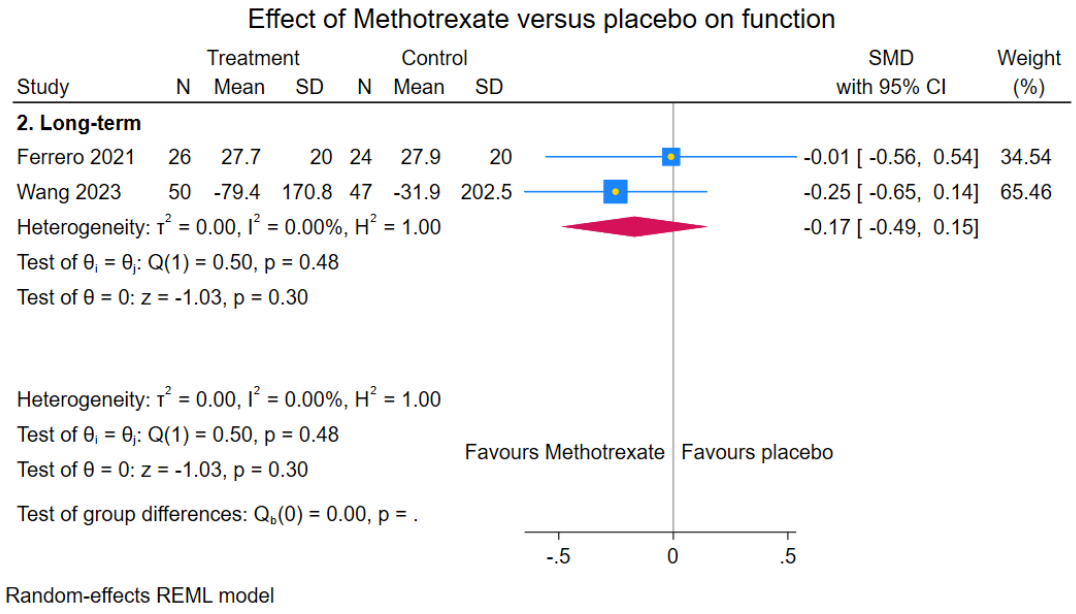


Figure S45. Forest plot of synthetic DMARDs (Methotrexate) vs placebo on all adverse events

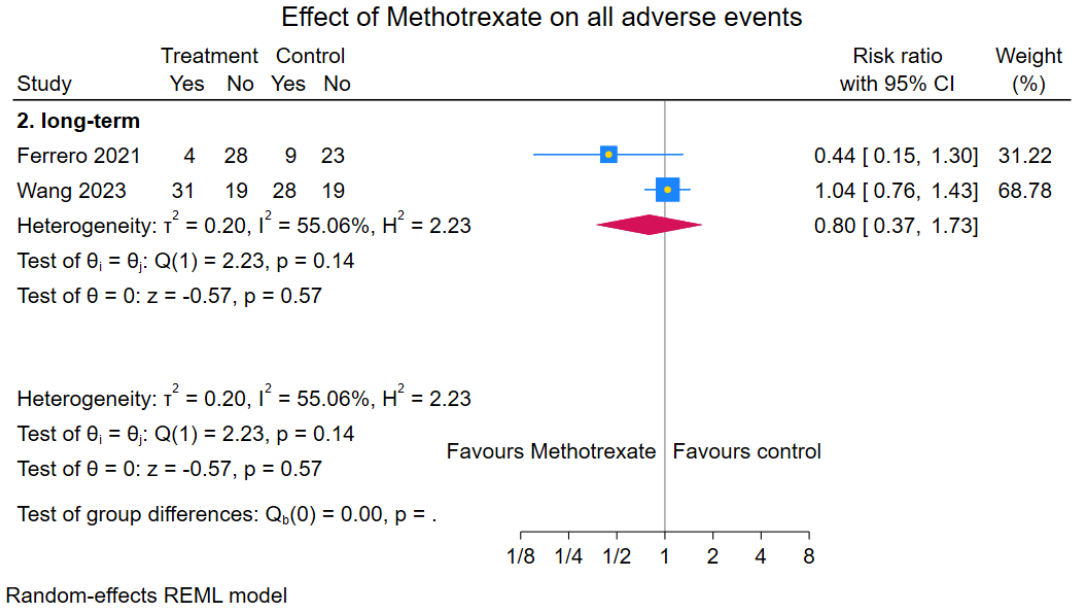


Figure S46. Forest plot of **Colchicine** vs placebo pain

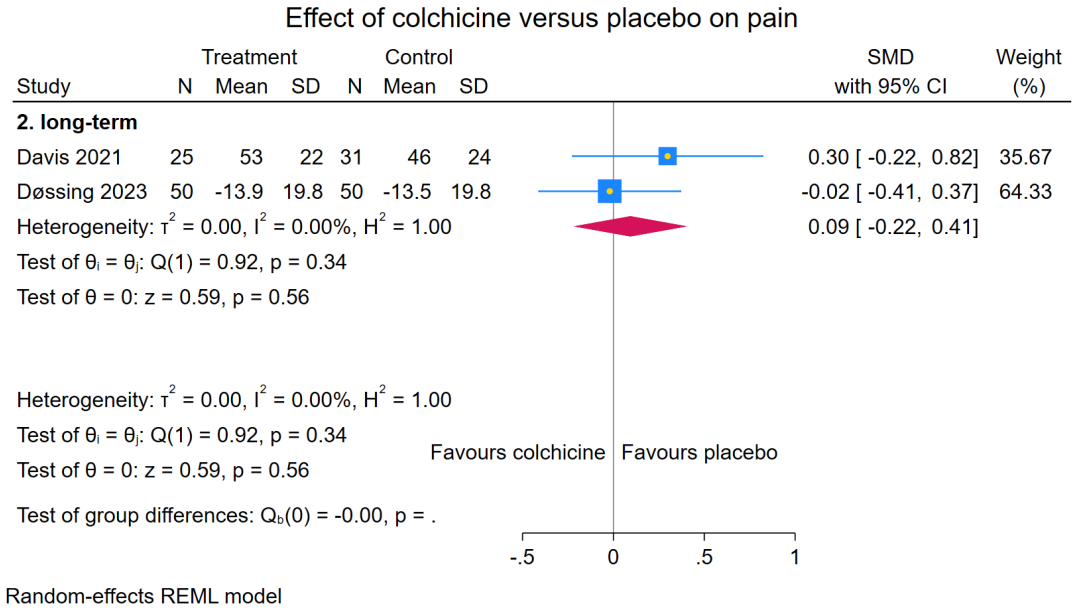


Figure S47. Forest plot of **Colchicine** vs placebo function

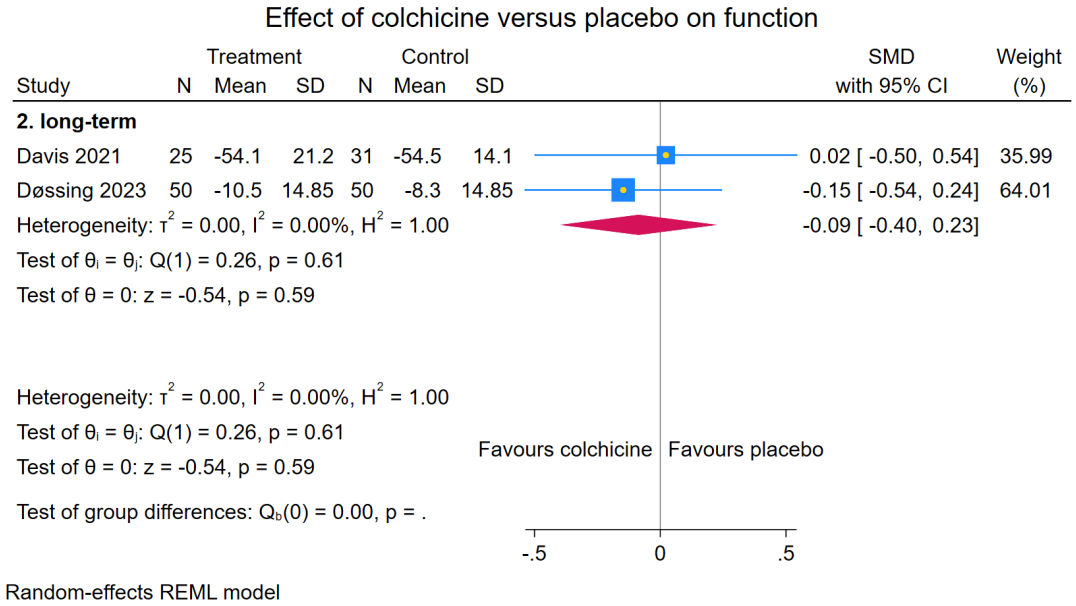


Figure S48. Forest plot of **Colchicine** vs placebo on grip strength

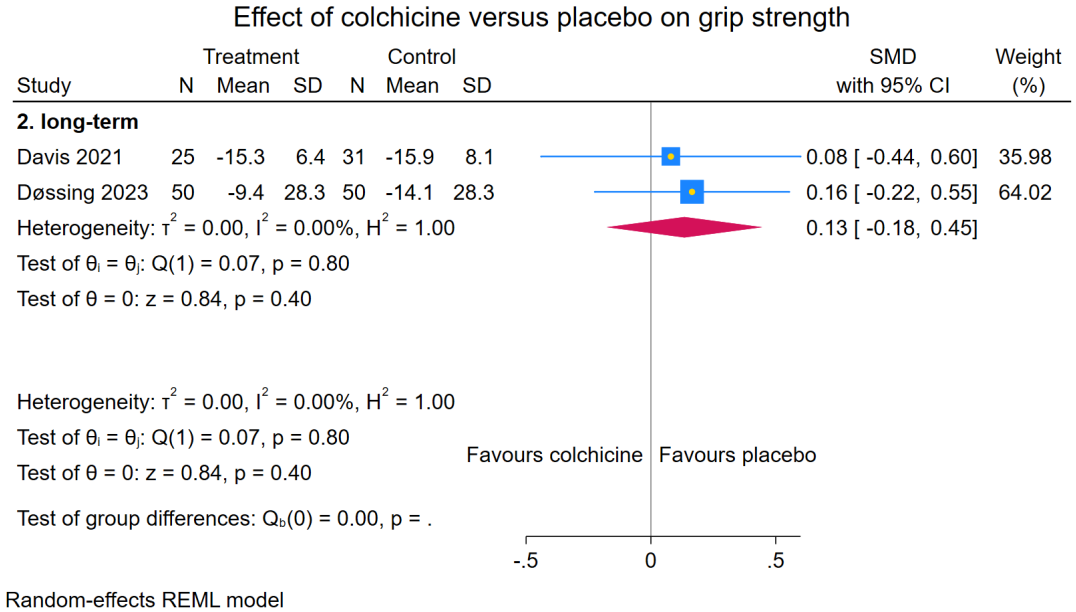
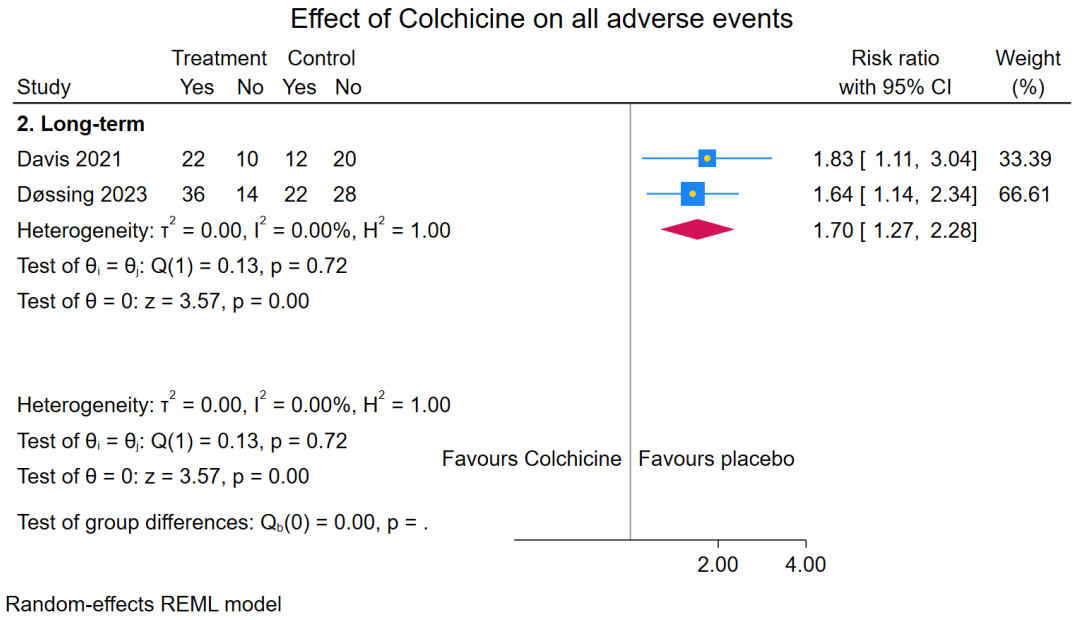


Figure S49. Forest plot of **Colchicine** vs placebo on all adverse events



7. LIST OF ABBREVIATIONS

A	Conference abstract
ACR	American College of Rheumatology
ADLs	Activities of daily living
AE	Adverse event
AUSCAN	Australian/Canadian Hand Osteoarthritis Index
CMC	First carpometacarpal
CO	Cross-over trial
d	Day(s)
E-L GRADE	Eaton-Litter Grading of Recommendations Assessment, Development and Evaluation
h	Hour(s)
H	High risk of bias
HAQ	Health assessment questionnaire
IL-1	Interleukin-1
IPs	Interphalangeal joints
L	Low risk of bias
mg	Milligram
µg	Microgram
min	Minute(s)
ml	Millilitre
Mo	Month(s)
N	Number
nm	Nanometer
NR	Not reported

NRS	Numerical rating scale
NSAID	Non-steroidal anti-inflammatory drug
OA	Osteoarthritis
RA	Rheumatoid arthritis
RCT	Randomised controlled trial
RoB	Risk of bias
Rx	Radiography
TNF	Tumour necrosis factor
U	Unclear risk of bias
VAS	Visual analogue scale
WA	Wash-out period
w	Week(s)
y	Year(s)

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