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Effect size thresholds to interpret comparisons with exercise interventions for tendinopathy: A systematic review with meta-analysis.

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Supplementary appendix to the manuscript

Contents of supplementary appendix

Supplementary file 1: PRISMA 2020 checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	NA
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	4
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	5
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	7-9
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	9-10
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	SF-4
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	9
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	9
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	8
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	8
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	10
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	12
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	13
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	11-14
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	11-14
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the	11-14

Section and Topic	Item #	Checklist item	Location where item is reported
		model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	11-14
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	NI
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	NI
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	NI
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	16
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	NI
Study characteristics	17	Cite each included study and present its characteristics.	SF-6
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	SF-7
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	SF-8
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	18-19
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	18-19
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	SF-8
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	NI
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	NI
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	NI
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	20
	23b	Discuss any limitations of the evidence included in the review.	24
	23c	Discuss any limitations of the review processes used.	24
	23d	Discuss implications of the results for practice, policy, and future research.	24
OTHER INFORMATION			

Section and Topic	Item #	Checklist item	Location where item is reported
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	NI
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	NI
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	7
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	25
Competing interests	26	Declare any competing interests of review authors.	25
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	NI

Supplementary File 2: Definitions used for categorisation.

Broad classes	Definition	More specific treatment class	Definition
Exercise only	Exercise therapy is defined as a regimen or program of physical activities specifically designed and prescribed to correct impairments, restore musculoskeletal function, and/or maintain a state of wellbeing.	Resistance	Same as broad treatment class
		Flexibility	Exercise designed to increase joint range of motion and extensibility of muscles and/or associated tissues. Also referred to as range-of-motion exercises or stretching.
		Proprioception	Exercise designed to enhance the sensation of the joint relative to body position and movement, sense of force, and to encourage muscular stabilisation of the joint in the absence of external stabilising devices e.g. ankle brace.
		Plyometric	Exercise where a resistance is overcome by a muscle rapidly stretching then shortening.
		Vibration	Exercise where body segments are held stationary or actively displaced as per definitions for other treatment classes whilst applying a rapid oscillating resistance
Non-active (placebo, sham, wait and see)	Includes any appropriate inactive treatment such as waiting list control, sham shockwave, sham laser, sham taping or true placebo.	Same as broad treatment class	Same as broad treatment class
Non-exercise only	Active treatments used to treat tendinopathy that do not meet the criteria to be considered exercise.	Electrotherapy	Modality that delivers therapeutic levels of physical energy into a biologic system e.g. soft tissue. Includes shockwave, laser and other systems.
		Biomechanics	Treatment using external devices that immobilises (e.g. splinting) or alters the kinematics/kinetics of the limb (e.g. taping, bracing and orthotics).
		Manual-therapy	Manual therapy is the skilled application of "hands-on" techniques to treat soft tissues and joint structures for the purpose of improving pain, increasing range of motion, stimulating tissue repair response, and/or improving function.

	Injection therapy	Injection therapy for tendinopathy typically involves direct administration of a pharmacologically active drug, or combination of drugs using a syringe and needle or equivalent. It may or may not be image-guided. Includes Autologous, drug, and volumetric types.
	Surgery	Any relevant surgical intervention for tendinopathy including minimally invasive peritendinous and open intra-tendinous.

Supplementary File 3: Outcome domains and example outcomes included in review.

Domain	ICON Definition	Example Tools
Disability	Composite scores of a mix of patient-rated pain & disability due to the pain, usually relating to tendon-specific activities/tasks	VISA scales; DASH; quick DASH; SPADI; Patient-rated tennis-elbow evaluation questionnaire; Constant Murley Score; WORC (Western Ontario Rotator Cuff Index); AOFAS (American Orthopaedic Foot & Ankle Society); Roles and Maudsley score; ASES (American Shoulder & Elbow Surgeons Index; Tegner activity score; Lysholm knee scale; Pain free function questionnaire; Ankle activity score; Subjective elbow Value (SEV); Placzek score; Shoulder disability questionnaire; International Knee Documentation Committee form (IKDC); Penn Shoulder score (university of Pennsylvania shoulder score) (PSS); Brief pain inventory (BPI); UCLA Shoulder Rating Scale; FILLA - functional index of leg and lower limb; Neer Shoulder Score; Nirschl phase rating scale; American Shoulder and Elbow Surgeon's (MASES) questionnaire; Mayo Elbow Performance Score (MEPS); Shoulder rating questionnaire (SRQ)
Function	Patient-rated level of function (and not referring to the intensity of their pain).	Patient-specific functional scale
Pain	Pain on loading/activity: Patient reported intensity of pain performing a task that loads the tendon.	VAS; NRS; Pain experience scale
	Pain over a specified time: Patient-reported pain intensity over period of time e.g. morning/night/24-hours/1-week.	VAS; NRS Painful days in 3 months
	Pain without further specification: Patient asked about pain levels without reference to activity or timeframe.	VAS; NRS; Borg CR10 Scale; Pain status
Physical function capacity	Quantitative measures of physical tasks (e.g. hops, times walk, single leg squat) includes muscle strength	Counter movement jump; One-leg triple hop; Single-leg decline squat; Muscle strength measured by dynamometry (hand-held, isokinetic); Repetition maximum; Manual muscle testing.
Quality of Life	General wellbeing	EQ5D; EQ3D; SF-36 or SF-12; Assessment of Quality of Life (AQoL); Nottingham Health Profile; Gothenburg QoL Instrument
Range of Motion (Shoulder only)	Active or passive range of motion in specified plane, measured in degrees.	Hand-held goniometer; inclinometer

Supplementary file 4: Search terms for all databases

Embase (Ovid)	(exercise OR exercise*.mp OR "isometric exercise" OR kinesiotherapy OR Eccentric.mp OR concentric.mp OR "heavy slow resistance".mp OR "isokinetic exercise" OR plyometrics OR "muscle stretching" OR "muscle training") AND (tendinitis OR Tendinopathy.mp OR "tendon injury" OR "shoulder injury" OR "rotator cuff injury" OR "tennis elbow" OR tendin.mp OR tendon.mp OR bursitis OR "shoulder impingement syndrome" OR 2posterior tibial tendon dysfunction" OR "Greater trochanteric pain syndrome".mp)
CINAHL (EBSCO-host)	(MH Exercise OR AB exercise* OR MH "muscle strengthening" OR MH "rehabilitation" OR MH "eccentric contraction" OR TX "heavy slow resistance exercis*" OR AB eccentric OR AB concentric OR AB isokinetic OR MH "therapeutic exercise") AND (MH tendinopathy OR MH "arm injuries" OR "tendon injuries" OR MH tendons OR TX tendin* OR TX tendon* OR AB bursitis OR MH Bursitis OR MH "Posterior tibial tendon dysfunction" OR MH "shoulder impingement syndrome" OR AB "Greater trochanteric pain syndrome")
Medline (EBSCO-host)	(MH exercise OR AB exercise* OR MH "isometric contraction" OR MH rehabilitation OR TX eccentric OR TX concentric OR TX "heavy slow resistance" OR TX isokinetic) AND (MH tendinopathy OR MH "shoulder injuries" OR MH tendons OR MH "tendon injuries OR TX tendin* OR tendon* OR MH bursitis OR AB bursitis OR MH "posterior tibial tendon dysfunction" OR MH "shoulder impingement syndrome" OR AB "greater trochanteric pain syndrome")
SPORTDiscus (EBSCO-host)	(DE exercise OR DE "exercise therapy" OR AB exercise* OR TX eccentric OR TX concentric OR TX "heavy slow resistance" OR DE "isokinetic exercise" OR DE plyometrics OR DE "strength training" OR DE "stretch (physiology)" OR DE "isometric exercise" OR DE rehabilitation) AND (DE tendinitis OR DE tendinosis OR AB tendinopathy OR DE "tendon injuries" OR "shoulder injuries" OR DE "tennis elbow" OR AB tendin* OR AB tendon* OR DE bursitis OR AB "shoulder impingement syndrome" OR AB "posterior tibial tendon dysfunction" OR AB "greater trochanteric pain syndrome")
Amed (EBSCO-host)	(ZU exercise OR ZU "exercise therapy" OR AB exercise OR ZU "muscle stretching exercises" OR ZU "isometric contraction" OR ZU rehabilitation OR TZ eccentric OR TZ concentric OR TX "heavy slow resistance" OR TX isokinetic OR AB plyometric) AND (ZU tendinopathy OR ZU "tendon injuries" OR ZU tendons OR ZU "shoulder injuries" OR ZU "tennis elbow" OR TX tendin* OR TX tendon* OR ZU bursitis OR AB bursitis OR ZU "shoulder impingement syndrome" OR ZU "posterior tibial tendon dysfunction" OR AB "greater trochanteric pain syndrome")
JBI Evidence Synthesis	Tendinopathy AND exercise
Cochrane Library	Tendinopathy AND exercise Tendin* AND exercise

	Tendon AND exercise
PEDro	Tendinopathy AND exercise Tendin* AND exercise Tendon AND exercise
Epistemonikos	(tendinopathy OR tendon* OR tendin*) AND exercise
Clinicialtrials.gov	Tendinopathy AND exercise Tendin* AND exercise Tendon AND exercise
ISRCTN	Tendinopathy AND exercise Tendin* AND exercise Tendon AND exercise
EU CTR	Tendinopathy AND exercise Tendin* AND exercise Tendon AND exercise
ANZCTR	Tendinopathy AND exercise Tendin* AND exercise Tendon AND exercise

ISRCTN – the Research Registry; EU CTN – European Clinical Trials Registry; ANZCTR – Australia and New Zealand Clinical Trials Registry

Supplementary file 5: Extraction codebook

Column		Heading	Description
Study Details	A	Initials Reviewer	Identification of individual extracting information
	B	Covidence Identifier	Reference number for Covidence
	C	Author	First author surname *et al.,*
	D	Year	Year of publication
	E	Title	Study title
	F	Country	Country where study was conducted
	G	Journal	Journal name
	H	Aims/Purpose	Study aims/purpose
	I	Tendinopathy type	1=Achilles; 2= Elbow; 3 = Patellar; 4 = Rotator cuff; 5 = Gluteal; 6 = Tibialis posterior; 7 = Hamstring; 8 = Biceps
	J	Study Design	RCT = 1; Quasi-experimental = 2
	K	Age Mean	Mean age of study sample as a whole
	L	Age SD	Standard deviation age of study sample as a whole
	M	Baseline Total N	Total sample across all interventions measured at baseline
	N	Training Status Description	Brief description of training status of study sample as a whole
	O	Training Status Code	1 = Performance; 2 = Sporting; 3 = Other
	P	Sex	Percentage female of study sample as a whole
	Q	BMI Mean	Mean BMI of study sample as a whole
	R	BMI SD	Standard deviation of BMI of study sample as a whole
	S	Symptom Severity Mean	Mean severity measure at baseline of study sample as a whole
	T	Symptom Severity SD	Standard deviation of severity measure at baseline of study sample as a whole
	U	Symptom Duration Mean (Months)	Mean symptom duration reported in months
	V	Symptom Duration SD (Months)	Standard deviation symptom duration reported in months
	W	Population Comments	Any additional information relevant to the participants investigated including diagnostic criteria
Outcomes	X	Outcome Category	1 = Disability; 2 = Pain on loading/activity; 3 = Pain over a specified time; 4 = Pain without further specification; 5 = Function; 6 = Physical function capacity; 7 = Quality of life; 8 = Range of motion
	Y	Outcome Tool	Description of outcome tool
	Z	Reflection	1 = Increase in outcome indicates positive treatment; -1 = Decrease in outcome indicates positive treatment
	AA	Measurement Time (Weeks)	Time of measurement in weeks
Intervention	AB	Dominant Broad Treatment Class	**Only one dominant theme to be selected** 1 = Exercise; 2 = Non-active; 3 = Non-exercise;
	AC	Total Broad Treatment class	**Multiple themes to be selected as required** 1 = Exercise; 2 = Non-active; 3 = Non-exercise;
	AD	Dominant Specific Treatment Class	**Only one dominant theme to be selected** 1 = Exercise; 2 = Non-active; 3 = Electrotherapy; 4 = Biomechanics; 5 = Manual-therapy; 6 = Injection Therapy; 7 = Surgery
	AE	Total Specific Treatment Class	**Multiple themes to be selected as required** 1 = Exercise; 2 = Non-active; 3 = Electrotherapy; 4 = Biomechanics; 5 = Manual Therapy; 6 = Injection Therapy; 7 = Surgery
	AF	Intervention N	Intervention sample size at specified time
	AG	Intervention Total Duration	Total duration of exercise intervention in weeks
	AH	Intervention Adherence %	Reporting of adherence to exercise (reported as a percentage) if applicable
	AI	Intervention Location	Location exercise was performed 1 = Home; 2 = Clinic; 3 = Fitness facility; 4 = NR; 5 = NA
	AJ	Intervention Volume	Numerical value describing volume
	AK	Intervention Volume Category	1 = Duration of session (mins); 2 = sets * repetitions; 3 = number of repetitions; 4 = number of sets

	AL	Intervention Volume Comments	Any additional information relevant.
	AM	Intervention Intensity	Numerical value describing intensity
	AN	Intervention Intensity Category	1 = Absolute; 2 = Relative
	AO	Intervention Frequency	Number of sessions per week. Where there is progression, average value is to be entered.
	AP	Intervention Frequency Comments	Any additional information relevant.
	AQ	Intervention Progression	**Multiple themes to be selected as required** 1 = No progression; 2 = NR; 3 = Progression volume; 4 = Progression intensity; 5 = Progression frequency; 6 = Progression specificity; 7 = Progression capacity; 8 = Other
	AR	Intervention Progression Comments	Any additional information relevant.
Data	AS	Intervention Baseline Mean	Baseline mean for exercise therapy
	AT	Intervention Baseline SD	Baseline standard deviation for exercise therapy
	AU	Intervention Measurement Mean	Mean of outcome for exercise therapy at stated time point
	AV	Intervention Measurement SD	Standard deviation of outcome for exercise therapy at stated time point
	AW	Control Baseline Mean	Baseline mean for control
	AX	Control Baseline SD	Baseline standard deviation for control
	AY	Control Measurement Mean	Mean of outcome for control at stated time point
	AZ	Control Measurement SD	Standard deviation of outcome for control at stated time point
	BA	Measurement Comments	State if a different value has been entered for means (e.g. median), a different value for standard deviations (e.g. standard error, IQR, percentiles, distance from mean to upper bound). Provide the relevant statistic (width of CI's, width of percentiles). Also state if data has extracted by digitization

Supplementary file 6: Reference list of included studies

1. Agergaard AS, Svensson RB, Hoeffner R, Hansen P, Couppé C, Kjaer M, Magnusson SP. Mechanical properties and UTE-T2* in Patellar tendinopathy: The effect of load magnitude in exercise-based treatment. Scandinavian Journal of Medicine & Science in Sports. 2021 Oct;31(10):1981-90.
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Supplementary file 7: Summary risk of bias of included studies

Risk of bias assessments were made for each outcome and time point in a study. The results presented here represent a summary, with the mode value selected.

Author, Year	Random sequence generation	Allocation concealment	Blinding of participants /personnel	Blinding of outcome assessment	Incomplete outcome bias	Selective reporting	Other bias
Agergaard 2021 [1]	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Unclear
Agergaard 2021 [2]	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Akkaya et al 2016 [3]	Low risk	Unclear	High risk	High risk	Low risk	Unclear	Low risk
Alfredson et al 1998 [4]	High risk	Unclear	High risk	Unclear	Low risk	Unclear	High risk
Alfredson et al 1999 [5]	Not applicable (quasi)	Not applicable (quasi)	High risk	High risk	Low risk	Unclear	High risk
Bae et al 2011 [6]	Not applicable (quasi)	Not applicable (quasi)	Unclear	Unclear	Unclear	Unclear	High risk
Bagcier et al. 2021 [7]	Low risk	Unclear	Low risk	Low risk	Low risk	Low risk	Low risk
Balius et al 2016 [8]	Low risk	Low risk	Unclear	Low risk	Low risk	Unclear	Low risk
Başkurt et al 2011 [9]	Low risk	Unclear	High risk	Unclear	Low risk	Unclear	Low risk
Berg et al. 2021 [10]	Low risk	Unclear	Unclear	Unclear	Low risk	Low risk	High risk
Beyer et al 2015 [11]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	High risk
Blume et al 2015 [12]	Unclear	Low risk	Low risk	Low risk	Low risk	Unclear	Low risk
Boudreau et al. 2019 [13]	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Breda 2022 [14]	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Breda et al 2020 [15]	Low risk	Low risk	High risk	Low risk	Low risk	High risk	High risk
Brox et al 1999 [16]	High risk	High risk	High risk	High risk	Unclear	Unclear	Unclear
Chaconas et al 2017 [17]	Low risk	Unclear	Unclear	Low risk	High risk	Unclear	High risk
Cheng et al 2007 [18]	High risk	High risk	Unclear	Unclear	Unclear	Unclear	High risk
Cho et al 2017 [19]	High risk	High risk	Unclear	Unclear	Low risk	Low risk	Unclear
Christiansen 2021 [20]	Low risk	Low risk	Unclear	Unclear	Low risk	Low risk	High risk

Author, Year	Random sequence generation	Allocation concealment	Blinding of participants /personnel	Blinding of outcome assessment	Incomplete outcome bias	Selective reporting	Other bias
Corum et al. 2021 [21]	Low risk	Low risk	High risk	Low risk	High risk	Low risk	High risk
Dejaco et al 2017 [22]	Low risk	Low risk	Low risk	Low risk	Low risk	High risk	Low risk
Devereaux et al 2016 [23]	Low risk	High risk	High risk	High risk	High risk	Unclear	Low risk
Dimitrios et al 2012 [24]	Not applicable (quasi)	Not applicable (quasi)	Low risk	Low risk	Low risk	Unclear	High risk
Dimitrios et al 2013 [25]	Not applicable (quasi)	Not applicable (quasi)	Low risk	Low risk	Low risk	Unclear	High risk
Dupuis et al 2018 [26]	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Eliason et al. 2021 [27]	High risk	Low risk	Low risk	Low risk	Low risk	Low risk	High risk
Engebretsen et al 2009 [28]	Low risk	Low risk	High risk	Low risk	Low risk	Unclear	Low risk
Engebretsen et al 2011 [29]	Low risk	Low risk	High risk	Low risk	Low risk	Unclear	Low risk
Ganderton et al 2018 [30]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	High risk
Gatz et al 2020 [31]	Low risk	Low risk	Low risk	Low risk	Unclear	Unclear	High risk
Granviken et al 2015 [32]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Habets et al. 2021 [33]	Low risk	Low risk	Unclear	Low risk	Low risk	Low risk	Low risk
Hallgren 2017 [34]	Unclear	Unclear	Low risk	Low risk	Low risk	Low risk	Low risk
Hallgren et al 2014 [35]	High risk	Low risk	High risk	Low risk	Unclear	Low risk	Low risk
Heron et al 2017 [36]	Low risk	Low risk	Low risk	Low risk	High risk	High risk	Low risk
Hopewell et al. 2021 [37]	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk
Hotta et al 2020 [38]	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Jonsson et al 2005 [39]	Unclear	Unclear	Low risk	Unclear	High risk	Unclear	High risk
Juul-Kristensen et al 2019 [40]	Low risk	Low risk	Low risk	Low risk	Low risk	Unclear	Low risk
Kim et al 2017 [41]	Low risk	Unclear	Unclear	Low risk	Unclear	Low risk	Low risk
Kim et al 2020 [42]	Low risk	Low risk	High risk	High risk	Low risk	Unclear	High risk
Knobloch et al 2007 [43]	Low risk	Low risk	Unclear	Unclear	High risk	Unclear	High risk

Author, Year	Random sequence generation	Allocation concealment	Blinding of participants /personnel	Blinding of outcome assessment	Incomplete outcome bias	Selective reporting	Other bias
Kongsgaard et al 2009 [44]	Low risk	Low risk	High risk	Low risk	Low risk	Unclear	Low risk
Ludewig et al 2003 [45]	Low risk	Unclear	High risk	Unclear	Low risk	Unclear	Low risk
Luginbuhl et al 2008 [46]	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	High risk
Maenhout et al 2013 [47]	Unclear	High risk	High risk	High risk	Low risk	Unclear	Low risk
Mafi et al 2001 [48]	Low risk	Unclear	Unclear	Unclear	Unclear	Unclear	High risk
Manias et al 2006 [49]	High risk	High risk	High risk	High risk	Low risk	Unclear	Unclear
Martinez-Silvestrini et al 2005 [50]	Unclear	Unclear	Unclear	Unclear	Low risk	Unclear	High risk
Marzetti et al 2014 [51]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Melegati et al 2000 [52]	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	High risk
Nørregaard et al 2007 [53]	Low risk	Low risk	Unclear	Unclear	Unclear	Unclear	High risk
Østerås et al 2009 [54]	Low risk	Low risk	Unclear	High risk	Low risk	Unclear	Low risk
Østerås et al 2010 [55]	Low risk	Low risk	High risk	High risk	Low risk	Unclear	High risk
Paavola et al 2018 [56]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Pearson et al 2018 [57]	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Petersen et al 2007 [58]	Low risk	Unclear	Unclear	Unclear	Unclear	Unclear	High risk
Peterson et al 2011 [59]	Low risk	Low risk	Unclear	High risk	Low risk	Low risk	Low risk
Peterson et al 2014 [60]	Low risk	Unclear	Low risk	High risk	Low risk	Low risk	Low risk
Rabusin et al 2020 [61]	Low risk	Low risk	High risk	High risk	Low risk	Low risk	High risk
Rabusin et al. 2021 [62]	Low risk	Low risk	High risk	High risk	Low risk	Low risk	High risk
Rio et al 2017 [63]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	High risk
Romero-Morales et al 2020 [64]	Unclear	Unclear	Unclear	Unclear	Low risk	Low risk	High risk
Rompe et al 2007 [65]	Low risk	Low risk	Unclear	Low risk	Low risk	Unclear	Low risk

Author, Year	Random sequence generation	Allocation concealment	Blinding of participants /personnel	Blinding of outcome assessment	Incomplete outcome bias	Selective reporting	Other bias
Rompe et al 2008 [66]	Low risk	Low risk	Unclear	Low risk	Low risk	Unclear	Unclear
Rompe et al 2009 [67]	Low risk	Low risk	High risk	Low risk	Low risk	Unclear	Low risk
Roos et al 2004 [68]	Low risk	Unclear	Unclear	Low risk	Low risk	Unclear	Low risk
Ruffino et al. 2021 [69]	Low risk	Low risk	High risk	Low risk	Low risk	Unclear	High risk
Schiffke-Juhasz et al. 2021 [70]	Low risk	Low risk	High risk	Unclear	High risk	Low risk	Unclear
Schydlowsky et al. 2022 [71]	Unclear	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Şenbursa et al 2011 [72]	Low risk	Unclear	Unclear	Unclear	Low risk	Unclear	Low risk
Silbernagel et al 2001 [73]	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	High risk
Silbernagel et al 2007 [74]	Low risk	Low risk	High risk	High risk	Low risk	Unclear	Low risk
Slider et al 2013 [75]	Low risk	Unclear	Low risk	Low risk	Low risk	Unclear	Unclear
Stasinopoulos et al 2006 [76]	Not applicable (quasi)	Not applicable (quasi)	Unclear	Low risk	Low risk	Unclear	High risk
Stasinopoulos et al 2010 [77]	Not applicable (quasi)	Not applicable (quasi)	Low risk	Low risk	Low risk	Unclear	High risk
Stasinopoulos et al 2013 [78]	High risk	High risk	High risk	Low risk	Low risk	Unclear	High risk
Stasinopoulos et al 2017 [79]	Low risk	Unclear	Low risk	Low risk	Low risk	Unclear	High risk
Stefansson et al 2019 [80]	Low risk	Unclear	High risk	Low risk	High risk	Unclear	Low risk
Stevens et al 2014 [81]	Unclear	Unclear	High risk	High risk	Unclear	Unclear	High risk
Tahran et al 2020 [82]	Low risk	Unclear	Low risk	Low risk	Low risk	Unclear	Low risk
Tonks et al 2007 [83]	Low risk	Low risk	Low risk	High risk	High risk	Low risk	Low risk
Tonks 2012 [84]	Low risk	Low risk	Low risk	High risk	High risk	Low risk	Low risk
Turgut et al 2017 [85]	Low risk	Unclear	Unclear	Unclear	High risk	Unclear	Low risk
Vallés-Carrascosa et al 2018 [86]	Low risk	Low risk	Low risk	High risk	Low risk	Low risk	High risk
vanArk et al 2016 [87]	Low risk	Low risk	Low risk	Unclear	Unclear	Low risk	Low risk
Visnes et al 2005 [88]	Low risk	Low risk	High risk	Low risk	Unclear	Unclear	Unclear

Author, Year	Random sequence generation	Allocation concealment	Blinding of participants /personnel	Blinding of outcome assessment	Incomplete outcome bias	Selective reporting	Other bias
Vuvan et al 2019 [89]	Low risk	Low risk	High risk	High risk	Low risk	Low risk	Low risk
Walther et al 2004 [90]	Unclear	Unclear	Unclear	Unclear	Low risk	Unclear	Unclear
Werner et al 2002 [91]	Low risk	Unclear	Unclear	Unclear	Unclear	Unclear	High risk
Wiedmann et al 2017 [92]	Low risk	Low risk	Unclear	Unclear	Unclear	Unclear	High risk
Yelland et al 2011 [93]	Low risk	Low risk	High risk	Low risk	Low risk	Unclear	Low risk
Yilmaz et al. 2022 [94]	Low risk	Low risk	Low risk	Low risk	Low risk	Unclear	Unclear
Young et al 2005 [95]	Unclear	Unclear	High risk	Low risk	High risk	Unclear	High risk
Yu et al 2013 [96]	Low risk	Low risk	Low risk	Unclear	Low risk	Unclear	Unclear

Supplementary file 8: Model details for all meta-analyses

Table 1: Model details for exercise versus non-active comparison.

Data	Outcome Domain (# data points)	Tendinopathies (# data points)	Small threshold [95%CrI]	Medium threshold [95%CrI]	Large threshold [95%CrI]	VPC2 [75%CrI]	VPC3 [75%CrI]
98 effect sizes/ 12 studies/ 12 comparisons	Disability: 43 Pain: 32 PFC: 8 Function: 6 QoL: 5 ROM: 4	RCRSP: 41 Elbow: 23 Patellar: 16 Gluteal: 15 Achilles: 3	0.05 [-0.07 to 0.17]	0.34 [0.24 to 0.45]	0.66 [0.54 to 0.79]	0.89 [0.73 to 0.98]	0.11 [0.02 to 0.27]

Table 2: Model details for exercise versus exercise comparisons, including outcome domain specific models.

Data	Outcome Domain (# data points)	Tendinopathies (# data points)	Small threshold [95%CrI]	Medium threshold [95%CrI]	Large threshold [95%CrI]	VPC2 [75%CrI]	VPC3 [75%CrI]
636 effect sizes/ 61 studies/ 82 comparisons	Pain: 223 Disability: 179 PFC: 136 ROM: 50 QoL: 37 Function: 11	RCRSP: 317 Achilles: 188 Elbow: 72 Patellar: 53 Gluteal: 6	0.11 [0.09 to 0.13]	0.25 [0.23 to 0.27]	0.46 [0.44 to 0.49]	0.99 [0.97 to 1.00]	0.01 [0.00 to 0.02]
223 effect sizes/ 43 studies/	Pain: 223	RCRSP: 85 Achilles: 78	0.15 [0.11 to 0.19]	0.33 [0.28 to 0.37]	0.61 [0.54 to 0.67]	0.98 [0.90 to 1.00]	0.03 [0.00 to 0.10]

63 comparisons		Elbow: 33 Patellar: 27					
179 effect sizes/ 48 studies/ 68 comparisons	Disability: 179	RCRSP: 95 Achilles: 62 Elbow: 7 Patellar: 15	0.12 [0.09 to 0.15]	0.27 [0.23 to 0.31]	0.49 [0.44 to 0.54]	0.99 [0.97 to 1.00]	0.01 [0.00 to 0.03]
136 effect sizes/ 21 studies/ 23 comparisons	PFC: 136	RCRSP: 60 Achilles: 46 Elbow: 16 Patellar: 8 Gluteal: 6	0.10 [0.07 to 0.14]	0.22 [0.19 to 0.26]	0.41 [0.36 to 0.46]	0.99 [0.93 to 1.00]	0.01 [0.00 to 0.07]
50 effect sizes/ 11 studies/ 11 comparisons	ROM: 50	RCRSP: 50	0.09 [0.03 to 0.15]	0.19 [0.13 to 0.25]	0.33 [0.26 to 0.40]	0.79 [0.15 to 0.99]	0.21 [0.01 to 0.85]

Table 3: Model details for exercise versus non-exercise comparisons, including outcome domain specific models.

Data	Outcome Domain (# data points)	Tendinopathies (# data points)	Small threshold [95%CrI]	Medium threshold [95%CrI]	Large threshold [95%CrI]	VPC2 [75%CrI]	VPC3 [75%CrI]
254 effect sizes/ 23 studies/ 29 comparisons	Pain: 89 Disability: 54 PFC: 50 ROM: 15 QoL: 18 Function: 28	RCRSP: 92 Achilles: 78 Elbow: 54 Patellar: 24 Gluteal: 6	0.17 [0.13 to 0.21]	0.37 [0.33 to 0.41]	0.70 [0.64 to 0.75]	0.99 [0.95 to 1.00]	0.01 [0.00 to 0.04]

89 effect sizes/ 17 studies/ 22 comparisons	Pain: 89	RCRSP: 27 Achilles: 26 Elbow: 22 Patellar: 8 Gluteal: 6	0.17 [0.12 to 0.22]	0.37 [0.31 to 0.42]	0.66 [0.58 to 0.73]	0.95 [0.84 to 1.00]	0.05 [0.01 to 0.16]
54 effect sizes/ 20 studies/ 24 comparisons	Disability: 54	RCRSP: 20 Achilles: 20 Elbow: 8 Patellar: 6	0.19 [0.12 to 0.26]	0.40 [0.33 to 0.47]	0.71 [0.61 to 0.84]	0.99 [0.94 to 1.00]	0.01 [0.00 to 0.05]
50 effect sizes/ 15 studies/ 19 comparisons	PFC: 50	RCRSP: 20 Achilles: 6 Elbow: 14 Patellar: 10	0.24 [0.14 to 0.34]	0.36 [0.28 to 0.44]	0.51 [0.40 to 0.62]	0.99 [0.94 to 1.00]	0.01 [0.00 to 0.06]

Abbreviations: PFC: Physical function capacity; ROM: Range of Motion; QoL: Quality of life; RCRSP: Rotator cuff related shoulder pain; CrI: Credible interval. VPC: Variance partition coefficient, expressing the relative proportion of variance across the hierarchical model levels.