Table S1a: Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Line 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Supplementary File: Page 3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 7
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 8
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 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.	Page 8-9
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Table S2
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.	Page 9-10
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.	Page 10
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.	Page 11
	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.	Page 10
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.	Page 10-11
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.	Page 11
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)).	Page 11
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Page 10
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Page 11
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Page 11
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Page 11
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	N/A
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	N/A
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Page 10-11
RESULTS			

Section and Topic	Item #	Checklist item	Location where item is reported
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.	Page 15 and Figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	N/A
Study characteristics	17	Cite each included study and present its characteristics.	Page 15 and Page 19
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Tables S7 and S8
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.	Tables 1-2 and S5-S6
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Table 3
	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.	Figure 2 and Pages 15, 19
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Pages 15 and 19
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	N/A
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	N/A
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Pages 15, 19
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 24-27
	23b	Discuss any limitations of the evidence included in the review.	Page 27-29
	23c	Discuss any limitations of the review processes used.	Page 27-29
	23d	Discuss implications of the results for practice, policy, and future research.	Page 29-30
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 8
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 8
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Page 21-22
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 31-32
Competing interests	26	Declare any competing interests of review authors.	Page 31
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.	Page 30-31

Table S1b: Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) 2020 Abstract Checklist

Section and Topic	Item #	Checklist item	Reported (Yes/No)
TITLE			
Title	1	Identify the report as a systematic review.	Yes
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Yes
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	Yes
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Yes
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	Yes
Synthesis of results	6	Specify the methods used to present and synthesise results.	Yes
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Yes
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	Yes
DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	Yes
Interpretation	10	Provide a general interpretation of the results and important implications.	Yes
OTHER			
Funding	11	Specify the primary source of funding for the review.	Yes
Registration	12	Provide the register name and registration number.	Yes

Table S2: Final Search Strategies (all databases)

Database(s): **Ovid MEDLINE(R) ALL** 1946 to November 01, 2023
Search Strategy:

#	Searches	Results
1	exp Athletes/ or Sports for Persons with Disabilities/	21097
2	Sports/	35223
3	exp baseball/ or exp basketball/ or exp Bicycling/ or exp boxing/ or exp football/ or exp gymnastics/ or exp hockey/ or exp martial arts/ or exp racquet sports/ or exp skating/ or exp Skiing/ or exp snow sports/ or exp soccer/ or exp Swimming/ or exp Tennis/ or exp "track and field"/ or exp volleyball/ or exp water sports/ or exp wrestling/ or exp youth sports/ or Dancing/	83493
4	(athlete* or athletic* or crew or player* or teammate* or team-mate* or varsity).tw,kf.	154520
5	sport*.tw,kf.	108346
6	(baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or "net ball" or "racquet sport*" or racquetball or ringette or "roller derb*" or rollerskat* or rodeo* or rugby or skateboard* or skating or skiing or snowboard* or "snow sport*" or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball or goalball* or Paralympic*).tw,kf.	118532
7	(archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting).tw,kf.	61629
8	(aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or "Martial art*" or taekwondo or "tae kwon do" or "tai ji").tw,kf.	3255
9	(capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*").tw,kf.	1067
10	(biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*).tw,kf.	36048
11	(marathon* or biathlon* or triathlon* or biathlet* or triathlet* or parasport*).tw,kf.	6606
12	(floor ball or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or special olympi* or dance* or dancing or breakdanc* or "hip hop" or ballet or running or orienteering).tw,kf.	169743
13	or/1-12	544017
14	Primary Prevention/ or risk factors/ or Athletic Injuries/pc or Secondary Prevention/	1001030
15	pc.fs.	1466505

16	Risk reduction behavior/	14295
17	Exercise Therapy/ or "Physical Education and Training"/ or Physical Conditioning, Human/	66228
18	Plyometric Exercise/ or Muscle Stretching Exercises/ or Resistance Training/ or Warm-Up Exercise/	15376
19	protective devices/ or personal protective equipment/ or protective clothing/ or Sports Equipment/ or Equipment Design/	173293
20	athletic tape/ or braces/ or external fixators/ or splints/	22127
21	policy/ or public policy/ or health policy/ or organizational policy/ or Legislation/ or Safety Management/	149444
22	"Facility Design and Construction"/ or "Floors and Floorcoverings"/	11347
23	Muscle Strength/ or proprioception/ or postural balance/	60440
24	patient education as topic/	88351
25	Biofeedback, Psychology/ or Psychology, Sports/	7847
26	dietary supplements/ or prebiotics/ or probiotics/ or Sleep/	168847
27	"Recovery of Function"/	59334
28	(risk factor* or prevent*).ti,kf.	585404
29	(prevent* adj4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*)).tw,kf.	395950
30	((reducing or reduction or reduce or mitigat*) adj3 (risk* or injur*)).tw,kf.	172245
31	(injur* adj3 (risk* or burden or prevent*)).tw,kf.	57804
32	((neuromuscular or NM or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) adj4 (train* or control or coordination or exercis* or warmup* or warm-up* or intervention* or program* or drill* or retrain* or program* or condition*)).tw,kf.	195777
33	((muscle or muscular) adj3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*)).tw,kf.	116445
34	((body or neuromuscular) adj3 control).tw,kf.	10165
35	(warmup* or warm up*).tw,kf.	3842
36	(fifa* or "11* Kids").tw,kf.	646
37	(11* adj2 program*).tw,kf.	1741
38	((train* or exercis*) adj3 (strateg* or program*)).tw,kf.	90381
39	(training load or workload).tw,kf.	36355
40	(protect* adj3 (gear* or equipment or device* or cloth* or pad or pads or padding)).tw,kf.	20437
41	(brace* or tape or taping or splint*).tw,kf.	46277
42	((rule* or policy or policies or law or regulation* or legislation) adj3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*)).tw,kf.	64843
43	((rink* or ice or surface or field or court or floor or turf or pitch) adj3 (design* or size*)).tw,kf.	28329

44	((playing or floor or turf or pitch or sport* or court) adj3 surface*).tw,kf.	1163
45	((artificial or grass or synthetic) adj3 (turf or field* or surface*)).tw,kf.	6687
46	(artificial turf or natural grass).tw,kf.	410
47	(coach* adj3 (educat* or train* or skill*)).tw,kf.	3124
48	(education* adj3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*)).tw,kf.	133409
49	((behavior* or behaviour*) adj3 (modif* or chang* or train* or skill*)).tw,kf.	110060
50	((intrinsic or extrinsic) adj3 (variable* or factor* or risk*)).tw,kf.	15003
51	((tackle or tackling or contact or falling or movement) adj3 (technique* or skill* or train* or control or proficien*)).tw,kf.	13902
52	(safety adj3 (management or culture or measure* or educat* or aware* or risk* or improv* or standard*)).tw,kf.	64318
53	(training-overload or overreach* or "over reach*" or overtrain* or "over train*" or high repetition*).tw,kf.	3998
54	((environment* adj3 (factor* or condition*)) or altitude).tw,kf.	202063
55	((hot or cold or warm or cool or game or match) adj3 (weather or temperature or condition*)).tw,kf.	17576
56	(sport* psychology or visualization or visualization or imagery or biofeedback).tw,kf.	138753
57	((diet* or nutritional) adj2 supplement*).tw,kf.	59839
58	(nutrition or diet or sleep).tw,kf.	808789
59	(recovery adj3 (function* or status or physiological or psychological)).tw,kf.	53543
60	(Risk adj3 (propensity or taking)).tw,kf.	11094
61	(sport* adj3 (specialization or specialization)).tw,kf.	292
62	or/14-61	5040397
63	((elbow* or shoulder*) adj3 (pad or pads or padding)).tw,kf.	203
64	((wrist* or hand* or elbow* or shoulder* or finger*) adj3 (brace* or bracing or splint* or guard*)).tw,kf.	1511
65	or/63-64	1693
66	62 or 65	5040537
67	*Athletic Injuries/ or "sprains and strains"/ or cumulative trauma disorders/ or Joint Instability/ or Joint Dislocations/ or fractures, bone/ or Soft tissue injuries/ or Fractures, Stress/ or Contusions/ or tendinopathy/ or tendon entrapment/ or tendon injuries/ or Peripheral Nerve Injuries/	181752
68	upper extremity/ or arm/ or axilla/ or elbow/ or forearm/ or hand/ or shoulder/ or wrist/ or fingers/ or thumb/ or metacarpus/ or acromioclavicular joint/ or elbow joint/ or hand joints/ or carpal joints/ or carpometacarpal joints/ or finger joint/ or metacarpophalangeal joint/ or palmar plate/ or wrist joint/ or triangular fibrocartilage/ or shoulder joint/ or "bones of upper extremity"/ or arm bones/ or humerus/ or humeral head/ or radius/ or ulna/ or olecranon process/ or clavicle/ or hand bones/ or carpal bones/ or	282746

	capitate bone/ or hamate bone/ or lunate bone/ or pisiform bone/ or scaphoid bone/ or trapezium bone/ or trapezoid bone/ or triquetrum bone/ or finger phalanges/ or metacarpal bones/ or scapula/ or acromion/ or coracoid process/ or glenoid cavity/ or Ulnar Nerve/ or Collateral Ligament, Ulnar/ or Median Nerve/ or deltoid muscle/ or pectoralis muscles/ or Rotator Cuff/	
69	67 and 68	33046
70	arm injuries/ or humeral fractures/ or elbow injuries/ or elbow fractures/ or elbow tendinopathy/ or monteggia's fracture/ or tennis elbow/ or forearm injuries/ or radius fractures/ or ulna fractures/ or wrist injuries/ or wrist fractures/ or shoulder injuries/ or rotator cuff injuries/ or shoulder dislocation/ or shoulder fractures/ or shoulder impingement syndrome/ or Finger Injuries/ or Hand Injuries/ or Ulnar Neuropathies/	76837
71	in.fs.	248359
72	68 and 71	24659
73	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) adj4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)).tw,kf.	83763
74	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) adj4 (rotator cuff* or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or pectoral* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*)).tw,kf.	37953
75	((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) adj4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)).tw,kf.	1296
76	69 or 70 or 72 or 73 or 74 or 75	162230
77	13 and 66 and 76	5502
78	Limit 77 to yr=”2001-2024”	4168

Database(s): **Embase** 1974 to 2023 November 01
Search Strategy:

#	Searches	Results
1	athlete/ or basketball player/ or body builder/ or boxer/ or cyclist/ or football player/ or hockey player/ or judoka/ or skier/ or soccer player/ or triathlete/ or wrestler/ or disabled athlete/ or wheelchair athlete/	70233
2	sport/ or aquatic sport/ or exp athletics/ or baseball/ or basketball/ or body building/ or boxing/ or exp combat sport/ or contact sport/ or "cricket (sport)"/ or cycling/ or diving/ or endurance sport/ or extreme sport/ or football/ or hockey/ or horseback riding/ or ice hockey/ or martial art/ or mountaineering/ or exp racquet sport/ or rock climbing/ or roller skating/ or rowing/ or rugby/ or skateboarding/ or skating/	166757

	or skiing/ or soccer/ or swimming/ or team sport/ or exp tennis/ or "track and field"/ or volleyball/ or water skiing/ or winter sport/ or wrestling/ or youth sport/ or dancing/	
3	(athlete* or athletic* or crew or player* or teammate* or team-mate* or varsity).tw,kf.	185777
4	sport*.tw,kf.	138873
5	(baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or "net ball" or "racquet sport*" or racquetball or ringette or "roller derb*" or rollerskat* or rodeo* or rugby or skateboard* or skating or skiing or snowboard* or "snow sport*" or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball or goalball* or Paralympic*).tw,kf.	137510
6	(archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting).tw,kf.	77531
7	(aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or "Martial art*" or taekwondo or "tae kwon do" or "tai ji").tw,kf.	3931
8	(capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*").tw,kf.	1639
9	(biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*).tw,kf.	40521
10	(marathon* or biathlon* or triathlon* or biathlet* or triathlet* or parasport*).tw,kf.	7894
11	(floor ball or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or special olympi* or dance* or dancing or breakdanc* or "hip hop" or ballet or running or orienteering).tw,kf.	197687
12	or/1-11	659664
13	primary prevention/ or secondary prevention/ or risk factor/ or sport injury/pc	1412395
14	pc.fs.	1275138
15	risk reduction/ or kinesiotherapy/ or health behavior/ or harm reduction/	256969
16	plyometrics/ or stretching exercise/ or muscle exercise/ or resistance training/ or warm up/	42223
17	protective clothing/ or protective equipment/	38464
18	equipment design/ or sports equipment/	94416
19	athletic tape/ or brace/ or splint/	19046
20	policy/ or organizational policy/ or public policy/ or health care policy/ or law/ or health legislation/ or safety/	665327
21	"construction work and architectural phenomena"/	8382

22	muscle strength/ or proprioception/ or body equilibrium/ or core stability/	119960
23	patient education/ or athletic training education/	126367
24	sports psychology/ or biofeedback/	4233
25	dietary supplement/ or nutrition supplement/ or prebiotic agent/ or probiotic agent/ or sleep/	201519
26	(risk factor* or prevent*).ti,kf.	747410
27	(prevent* adj4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*)).tw,kf.	512796
28	((reducing or reduction or reduce or mitigat*) adj3 (risk* or injur*)).tw,kf.	242078
29	(injur* adj3 (risk* or burden or prevent*)).tw,kf.	72667
30	((neuromuscular or NM or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) adj4 (train* or control or coordination or exercis* or warmup* or warm-up* or intervention* or program* or drill* or retrain* or program* or condition*)).tw,kf.	246447
31	((muscle or muscular) adj3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*)).tw,kf.	160365
32	((body or neuromuscular) adj3 control).tw,kf.	13552
33	(warmup* or warm up*).tw,kf.	5058
34	(fifa* or "11* Kids").tw,kf.	707
35	(11* adj2 program*).tw,kf.	2625
36	((train* or exercis*) adj3 (strateg* or program*)).tw,kf.	121737
37	(training load or workload).tw,kf.	49586
38	(protect* adj3 (gear* or equipment or device* or cloth* or pad or pads or padding)).tw,kf.	24824
39	(brace* or tape or taping or splint*).tw,kf.	57288
40	((rule* or policy or policies or law or regulation* or legislation) adj3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*)).tw,kf.	78625
41	((rink* or ice or surface or field or court or floor or turf or pitch) adj3 (design* or size*)).tw,kf.	34110
42	((playing or floor or turf or pitch or sport* or court) adj3 surface*).tw,kf.	1371
43	((artificial or grass or synthetic) adj3 (turf or field* or surface*)).tw,kf.	6979
44	(artificial turf or natural grass).tw,kf.	459
45	(coach* adj3 (educat* or train* or skill*)).tw,kf.	3972
46	(education* adj3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*)).tw,kf.	181879
47	((behavior* or behaviour*) adj3 (modif* or chang* or train* or skill*)).tw,kf.	136415
48	((intrinsic or extrinsic) adj3 (variable* or factor* or risk*)).tw,kf.	17930
49	((tackle or tackling or contact or falling or movement) adj3 (technique* or skill* or train* or control or proficien*)).tw,kf.	16976

50	(safety adj3 (management or culture or measure* or educat* or aware* or risk* or improv* or standard*)).tw,kf.	93377
51	(training-overload or overreach* or "over reach*" or overtrain* or "over train*" or high repetition*).tw,kf.	3890
52	((environment* adj3 (factor* or condition*)) or altitude).tw,kf.	234921
53	((hot or cold or warm or cool or game or match) adj3 (weather or temperature or condition*)).tw,kf.	19559
54	(sport* psychology or visualization or visualization or imagery or biofeedback).tw,kf.	176970
55	((diet* or nutritional) adj2 supplement*).tw,kf.	73913
56	(nutrition or diet or sleep).tw,kf.	1093597
57	(recovery adj3 (function* or status or physiological or psychological)).tw,kf.	74775
58	(Risk adj3 (propensity or taking)).tw,kf.	14268
59	(sport* adj3 (specialization or specialization)).tw,kf.	387
60	or/13-59	6497670
61	((elbow* or shoulder*) adj3 (pad or pads or padding)).tw,kf.	225
62	((wrist* or hand* or elbow* or shoulder* or finger*) adj3 (brace* or bracing or splint* or guard*)).tw,kf.	1817
63	or/61-62	2019
64	60 or 63	6497821
65	*sport injury/ or sprain/ or musculoskeletal injury/ or ligament rupture/ or ligament injury/ or cumulative trauma disorder/ or joint instability/ or joint dislocation/ or fracture/ or stress fracture/ or contusion/ or soft tissue injury/ or tendinitis/ or tendon entrapment/ or tendon injury/ or tendon rupture/ or peripheral nerve injury/	206646
66	arm/ or upper limb/ or elbow/ or forearm/ or wrist/ or arm muscle/ or biceps brachii muscle/ or brachialis muscle/ or coracobrachialis muscle/ or forearm muscle/ or hand muscle/ or triceps brachii muscle/ or shoulder/ or shoulder girdle/ or clavicle/ or scapula/ or shoulder girdle muscle/ or levator scapulae muscle/ or pectoral muscle/ or rhomboid muscle/ or serratus anterior muscle/ or trapezius muscle/ or shoulder muscle/ or deltoid muscle/ or rotator cuff/ or elbow/ or forearm/ or hand/ or finger/ or hand joint/ or hand muscle/ or carpal joint/ or carpometacarpal joint/ or finger joint/ or metacarpophalangeal joint/ or wrist/ or humerus/ or arm bone/ or long bone/ or distal humerus/ or humeral shaft/ or proximal humerus/ or radius/ or distal radius/ or proximal radius/ or radial shaft/ or ulna/ or distal ulna/ or proximal ulna/ or ulnar shaft/ or hand bone/ or carpal bone/ or finger phalanx/ or metacarpal bone/ or arm bone/ or capitate bone/ or hamate bone/ or lunate bone/ or pisiform bone/ or scaphoid bone/ or trapezium bone/ or trapezoid bone/ or triquetrum bone/ or metacarpal bone/ or scapula/ or acromion/ or coracoid process/ or glenoid cavity/ or ulnar nerve/ or ulnar collateral ligament/ or "ulnar collateral ligament (elbow)"/ or "ulnar collateral ligament (thumb)"/ or "ulnar collateral ligament (wrist)"/ or deltoid muscle/ or shoulder muscle/	375044
67	65 and 66	25255

68	arm injury/ or arm fracture/ or elbow injury/ or elbow dislocation/ or elbow fracture/ or humeral supracondylar fracture/ or olecranon fracture/ or "radial head and neck fractures"/ or forearm injury/ or forearm fracture/ or radius fracture/ or distal radius fracture/ or proximal radius fracture/ or radius shaft fracture/ or ulna fracture/ or monteggia fracture/ or olecranon fracture/ or wrist fracture/ or wrist injury/ or capitate fracture/ or hamate fracture/ or lunate fracture/ or metacarpal bone fracture/ or pisiform fracture/ or scaphoid fracture/ or trapezium fracture/ or triquetrum fracture/ or humerus fracture/ or distal humeral fracture/ or humerus shaft fracture/ or proximal humerus fracture/ or epicondylitis/ or tennis elbow/ or ulna fracture/ or shoulder injury/ or rotator cuff injury/ or quadrilateral space syndrome/ or rotator cuff rupture/ or rotator cuff tear arthropathy/ or shoulder impingement syndrome/ or shoulder fracture/ or proximal humerus fracture/ or shoulder dislocation/ or elbow dislocation/ or wrist dislocation/ or finger injury/ or ulnar nerve compression/ or nerve compression/ or ulnar neuropathy/	97565
69	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) adj4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)).tw,kf.	102916
70	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) adj4 (rotator cuff* or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or pectoral* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*)).tw,kf.	43308
71	((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) adj4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)).tw,kf.	1636
72	or/67-71	196222
73	12 and 64 and 72	7625
74	limit 73 to (books or chapter or conference abstract or conference paper or "conference review" or "preprint (unpublished, non-peer reviewed)")	1275
75	73 not 74	6350
76	limit 75 to yr="2001 - 2024"	5322

Database(s): **APA PsycInfo** 1806 to October Week 4 2023
Search Strategy:

#	Searches	Results
1	sports/	23462
2	baseball/ or basketball/ or extreme sports/ or football/ or judo/ or martial arts/ or soccer/ or swimming/ or tennis/ or weightlifting/	11812
3	athletes/ or athletic participation/ or athletic performance/ or athletic training/ or college	42081

	athletes/ or competition/ or dance/	
4	(athlete* or athletic* or crew or player* or teammate* or team-mate* or varsity).tw,id.	48996
5	sport*.tw,id.	44007
6	(baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or net ball or racquet sport* or racquetball or ringette or rodeo* or "roller derb*" or rugby or skateboard* or skating or skiing or snowboard* or snow sport* or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball or goalball* or Paralympic*).tw,id.	32999
7	(archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or "roller derb*" or rollerskat* or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting).tw,id.	5645
8	(aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or "Martial art*" or taekwondo or "tae kwon do" or "tai ji").tw,id.	1322
9	(capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*").tw,id.	211
10	(biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*).tw,id.	8946
11	(marathon* or biathlon* or triathlon* or biathlet* or triathlet* or parasport*).tw,id.	1250
12	(floor ball or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or special olympi* or dance* or dancing or breakdanc* or "hip hop" or ballet or running or orienteering).tw,id.	36116
13	or/1-12	147210
14	prevention/ or accident prevention/ or preventive health behavior/	39360
15	harm reduction/ or risk management/ or risk factors/ or health risk behavior/ or protective factors/ or risk assessment/	129082
16	exercise therapy/ or athletic training/	2794
17	personal protective equipment/ or safety devices/ or clothing/	3928
18	laws/ or government policy making/ or law enforcement/ or legislative processes/ or health care policy/ or policy making/ or government policy making/	85810
19	architecture/ or built environment/	3599
20	physical strength/ or physical endurance/ or proprioception/ or posture/	10934

21	client education/ or health education/ or health promotion/	45884
22	biofeedback/ or biofeedback training/ or sport psychology/	9752
23	dietary supplements/ or sleep/	31799
24	(risk factor* or prevent*).ti,id.	140482
25	(prevent* adj4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*)).tw,id.	101563
26	((reducing or reduction or reduce or mitigat*) adj3 (risk* or injur*)).tw,id.	27472
27	(injur* adj3 (risk* or burden or prevent*)).tw,id.	7010
28	((neuromuscular or NM or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) adj4 (train* or control or coordination or exercis* or warmup* or warm-up* or intervention* or program* or drill* or retrain* or program* or condition*)).tw,id.	33666
29	((muscle or muscular) adj3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*)).tw,id.	9643
30	((body or neuromuscular) adj3 control).tw,id.	1839
31	(warmup* or warm up*).tw,id.	1000
32	(fifa* or "11* Kids").tw,id.	278
33	(11* adj2 program*).tw,id.	846
34	((train* or exercis*) adj3 (strateg* or program*)).tw,id.	48377
35	(training load or workload).tw,id.	10048
36	(protect* adj3 (gear* or equipment or device* or cloth* or pad or pads or padding)).tw,id.	1474
37	(brace* or tape or taping or splint*).tw,id.	7870
38	((rule* or policy or policies or law or regulation* or legislation) adj3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*)).tw,id.	34003
39	((rink* or ice or surface or field or court or floor or turf or pitch) adj3 (design* or size*)).tw,id.	2872
40	((playing or floor or turf or pitch or sport* or court) adj3 surface*).tw,id.	108
41	((artificial or grass or synthetic) adj3 (turf or field* or surface*)).tw,id.	473
42	(artificial turf or natural grass).tw,id.	21
43	(coach* adj3 (educat* or train* or skill*)).tw,id.	3496
44	(education* adj3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*)).tw,id.	91434
45	((behavior* or behaviour*) adj3 (modif* or chang* or train* or skill*)).tw,id.	85361
46	((intrinsic or extrinsic) adj3 (variable* or factor* or risk*)).tw,id.	2787
47	((tackle or tackling or contact or falling or movement) adj3 (technique* or skill* or train* or control or proficien*)).tw,id.	6278
48	(safety adj3 (management or culture or measure* or educat* or aware* or risk* or improv* or	11904

	standard*)).tw,id.	
49	(training-overload or overreach* or "over reach*" or overtrain* or "over train*" or high repetition*).tw,id.	1405
50	((environment* adj3 (factor* or condition*)) or altitude).tw,id.	38350
51	((hot or cold or warm or cool or game or match) adj3 (weather or temperature or condition*)).tw,id.	1993
52	(sport* psychology or visualization or visualization or imagery or biofeedback).tw,id.	40128
53	((diet* or nutritional) adj2 supplement*).tw,id.	2497
54	(nutrition or diet or sleep).tw,id.	135042
55	(recovery adj3 (function* or status or physiological or psychological)).tw,id.	8245
56	(Risk adj3 (propensity or taking)).tw,id.	13992
57	(sport* adj3 (specialization or specialization)).tw,id.	54
58	or/14-57	880909
59	((elbow* or shoulder*) adj3 (pad or pads or padding)).tw,id.	6
60	((wrist* or hand* or elbow* or shoulder* or finger*) adj3 (brace* or bracing or splint* or guard*)).tw,id.	107
61	or/59-60	112
62	58 or 61	880940
63	athletic injuries/ or injuries/	15596
64	"shoulder (anatomy)"/ or "arm (anatomy)"/ or "hand (anatomy)"/ or wrist/ or "fingers (anatomy)"/ or thumb/	8510
65	63 and 64	157
66	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) adj4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)).tw,id.	3819
67	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) adj4 ("rotator cuff*" or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or pectoral* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*)).tw,id.	219
68	((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) adj4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)).tw,id.	25
69	or/65-68	4022

70	13 and 62 and 69	118
71	limit 70 to yr="2001 - 2024"	114

Database(s): **CINAHL PLUS** with FULL Text
Search modes - Find all my search terms

#	Query	Results
S1	(MH "Sports") OR (MH "Horseback Riding") OR (MH "Animal Sports") OR (MH "Amateur Sports") OR (MH "Aquatic Sports") OR (MH "Diving") OR (MH "Rowing") OR (MH "Swimming") OR (MH "Athletic Performance") OR (MH "Sport Specific Training") OR (MH "Body Building") OR (MH "College Sports") OR (MH "Contact Sports") OR (MH "Boxing") OR (MH "Football") OR (MH "Martial Arts") OR (MH "Rugby") OR (MH "Wrestling") OR (MH "Cycling") OR (MH "Endurance Sports") OR (MH "Extreme Sports") OR (MH "Fencing") OR (MH "Golf") OR (MH "Gymnastics") OR (MH "Handball") OR (MH "Mountaineering") OR (MH "Professional Sports") OR (MH "Racquet Sports") OR (MH "Tennis") OR (MH "Rock Climbing") OR (MH "Skating") OR (MH "Ice Skating") OR (MH "Skateboarding") OR (MH "Skiing") OR (MH "Snow Skiing") OR (MH "Target Sports") OR (MH "Archery") OR (MH "Baseball") OR (MH "Team Sports") OR (MH "Basketball") OR (MH "Cricket (Sports)") OR (MH "Hockey") OR (MH "Soccer") OR (MH "Softball") OR (MH "Volleyball") OR (MH "Track and Field") OR (MH "Weight Lifting") OR (MH "Winter Sports") OR (MH "Snowboarding") OR (MH "Cross Country Skiing") OR (MH "Sports for Persons with Disabilities") OR (MH "Wheelchair Sports") OR (MH "Dancing") OR (MH "Ballet")	72,747
S2	(MH "Athletes+")	35,186
S3	TI sport* OR AB sport*	61,417
S4	TI ((baseball or basketball or biking or bicycling* or bmx or boxing or bullrid* or "bull rid*" or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or “net ball” or “racquet sport*” or racquetball or ringette or rodeo* or "roller derb*" or rollerskat* or rugby or skateboard* or skating or skiing or snowboard* or “snow sport*” or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball)) OR AB ((baseball or basketball or biking or bicycling* or bmx or boxing or bullrid* or "bull rid*" or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or “net ball” or “racquet sport*” or racquetball or ringette or rodeo* or "roller derb*" or rollerskat* or rugby or skateboard* or skating or skiing or snowboard* or “snow sport*” or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball))	42,043
S5	TI ((archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting or goalball* or Paralympic* or biathlon)) OR AB ((archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting or goalball* or Paralympic* or biathlon))	10,920
S6	TI ((aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or “Martial art*” or taekwondo or “tae kwon do” or “tai ji”)) OR AB ((aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or “Martial art*” or taekwondo or “tae kwon do” or “tai ji”))	1,688
S7	TI ((capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*")) OR AB ((capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*"))	214

S8	TI ((athlete* or athletic* or crew or player* or teammate* or “team-mate*” or varsity or biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*)) OR AB ((athlete* or athletic* or crew or player* or teammate* or “team-mate*” or varsity or biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*))	75,674
S9	TI (marathon* or triathlon* or biathlet* or triathlet* or parasport* or “floor ball” or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or "special olympi*" or dance* or dancing or breakdanc* or "hip hop" or ballet or running or orienteering) OR AB (marathon* or triathlon* or biathlet* or triathlet* or parasport* or “floor ball” or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or "special olympi*" or dance* or dancing or breakdanc* or "hip hop" or ballet or running or orienteering)	37,347
S10	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9	185,062
S11	(MH "Safety") or (MH "Risk Assessment") or (MH "Risk Factors")	361,536
S12	(MH "Exercise") or (MH "Physical Education and Training") or (MH "Physical Fitness")	78,744
S13	(MH "Resistance Training") OR (MH "Plyometrics") OR (MH "Neuromuscular Facilitation") OR (MH "Warm-Up Exercise")	9,778
S14	MH "Muscle Strengthening") OR (MH "Isokinetic Exercises") OR (MH "Isometric Exercises") OR (MH "Isotonic Exercises") OR (MH "Balance, Postural") OR (MH "Core Stability") OR (MH "Proprioception")	37,149
S15	(MH "Equipment Safety") OR (MH "Exercise Equipment and Supplies") OR (MH "Protective Devices") OR (MH "Personal Protective Equipment") OR (MH "Protective Clothing") OR (MH "Sports Equipment and Supplies") OR (MH "Equipment Design")	51,789
S16	(MH "Athletic Tape") OR (MH "External Fixators") OR (MH "Orthopedic Fixation Devices") OR (MH "Splints") OR (MH "Orthoses")	28,464
S17	(MH "Public Policy") OR (MH "Health Policy Studies") OR (MH "Policy Making") OR (MH "Health Policy") OR (MH "Policy Studies") OR (MH "Legislation")	114,184
S18	(MH "Facility Design and Construction") OR (MH "Floors and Floorcoverings")	5,244
S19	(MH "Education") OR (MH "Patient Education") OR (MH "Health Behavior")	139,797
S20	(MH "Psychology, Sports") OR (MH "Biofeedback")	5,961
S21	(MH "Dietary Supplements") OR (MH "Probiotics") OR (MH "Prebiotics") OR (MH "Dietary Supplementation") OR (MH "Nutrition") OR (MH "Sleep") OR (MH "Sleep Hygiene")	110,710
S22	(MH "Recovery")	39,541
S23	TI ((“risk factor*” or prevent*))	183,611
S24	TI ((prevent* N4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*))) OR AB ((prevent* N4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*)))	138,008
S25	TI (((reducing or reduction or reduce or mitigat*) N3 (risk* or injur*))) OR AB (((reducing or reduction or reduce or mitigat*) N3 (risk* or injur*)))	73,725

S26	TI ((injur* N3 (risk* or burden or prevent*))) OR AB ((injur* N3 (risk* or burden or prevent*)))	31,148
S27	TI (((neuromuscular or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) N4 (train* or control or coordination or exercis* or warmup* or "warm-up*" or intervention* or program* or drill* or retrain* or program* or condition*))) OR AB (((neuromuscular or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) N4 (train* or control or coordination or exercis* or warmup* or "warm-up*" or intervention* or program* or drill* or retrain* or program* or condition*)))	64,012
S28	TI (((muscle or muscular) N3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*))) OR AB (((muscle or muscular) N3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*)))	38,899
S29	TI (((body or neuromuscular) N3 control)) OR AB (((body or neuromuscular) N3 control))	4,451
S30	TI ((warmup* or "warm up*")) OR AB ((warmup* or "warm up*"))	2,013
S31	TI ((fifa* or "11* Kids")) OR AB ((fifa* or "11* Kids"))	366
S32	TI (11* N2 program*) OR AB (11* N2 program*)	1,179
S33	TI (((train* or exercis*) N3 (strateg* or program*))) OR AB (((train* or exercis*) N3 (strateg* or program*)))	50,026
S34	TI (("training load" or workload)) OR AB (("training load" or workload))	17,624
S35	TI ((protect* N3 (gear* or equipment or device* or cloth* or pad or pads or padding))) OR AB ((protect* N3 (gear* or equipment or device* or cloth* or pad or pads or padding)))	7,729
S36	TI ((brace* or tape or taping or splint*)) OR AB ((brace* or tape or taping or splint*))	15,942
S37	TI (((rule* or policy or policies or law or regulation* or legislation) N3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*))) OR AB (((rule* or policy or policies or law or regulation* or legislation) N3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*)))	33,074
S38	TI (((rink* or ice or surface or field or court or floor or turf or pitch) N3 (design* or size*))) OR AB (((rink* or ice or surface or field or court or floor or turf or pitch) N3 (design* or size*)))	2,917
S39	TI (((playing or floor or turf or pitch or sport* or court) N3 surface*)) OR AB (((playing or floor or turf or pitch or sport* or court) N3 surface*))	444
S40	TI (((artificial or grass or synthetic) N3 (turf or field* or surface*))) OR AB (((artificial or grass or synthetic) N3 (turf or field* or surface*)))	607
S41	TI (("artificial turf" or "natural grass")) OR AB (("artificial turf" or "natural grass"))	177
S42	TI ((coach* N3 (educat* or train* or skill*))) OR AB ((coach* N3 (educat* or train* or skill*)))	2,595
S43	TI ((education* N3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*))) OR AB ((education* N3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*)))	89,147
S44	TI (((behavior* or behaviour*) N3 (modif* or chang* or train* or skill*))) OR AB (((behavior* or behaviour*) N3 (modif* or chang* or train* or skill*)))	42,349
S45	TI (((intrinsic or extrinsic) N3 (variable* or factor* or risk*))) OR AB (((intrinsic or extrinsic) N3 (variable* or factor* or risk*)))	2,649
S46	TI (((tackle or tackling or contact or falling or movement) N3 (technique* or skill* or train* or control or proficien*))) OR AB (((tackle or tackling or contact or falling or movement) N3	5,925

	(technique* or skill* or train* or control or proficien*)))	
S47	TI ((safety N3 (management or culture or measure* or educat* or aware* or risk* or improv* or standard*))) OR AB ((safety N3 (management or culture or measure* or educat* or aware* or risk* or improv* or standard*)))	31,828
S48	TI ((“training-overload” or overreach* or "over reach*" or overtrain* or "over train*" or “high repetition*”)) OR AB ((“training-overload” or overreach* or "over reach*" or overtrain* or "over train*" or “high repetition*”))	809
S49	TI (((environment* N3 (factor* or condition*)) or altitude)) OR AB (((environment* N3 (factor* or condition*)) or altitude))	29,909
S50	TI (((hot or cold or warm or cool or game or match) N3 (weather or temperature or condition*))) OR AB (((hot or cold or warm or cool or game or match) N3 (weather or temperature or condition*)))	3,183
S51	TI ((“sport* psychology” or visualization or visualization or imagery or biofeedback)) OR AB ((“sport* psychology” or visualization or visualization or imagery or biofeedback))	23,209
S52	TI (((diet* or nutritional) N2 supplement*)) OR AB (((diet* or nutritional) N2 supplement*))	14,237
S53	TI (recovery N3 (function* or status or physiological or psychological)) OR AB (recovery N3 (function* or status or physiological or psychological))	12,432
S54	TI ((Risk N3 (propensity or taking))) OR AB ((Risk N3 (propensity or taking)))	5,571
S55	TI ((sport* N3 (specialization or specialization))) OR AB ((sport* N3 (specialization or specialization)))	274
S56	S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 OR S54 OR S55	1,469,151
S57	TI (((elbow* or shoulder*) N3 (pad or pads or padding))) OR AB (((elbow* or shoulder*) N3 (pad or pads or padding)))	117
S58	TI (((wrist* or hand* or elbow* or shoulder* or finger*) N3 (brace* or bracing or splint* or guard*))) OR AB (((wrist* or hand* or elbow* or shoulder* or finger*) N3 (brace* or bracing or splint* or guard*)))	790
S59	S57 OR S58	897
S60	S56 OR S59	1,469,215
S61	(MM "Athletic Injuries") OR (MH "Sprains and Strains") OR (MH "Cumulative Trauma Disorders") OR (MH "Subluxation") OR (MH "Tears and Lacerations") OR (MH "Tendon Injuries") OR (MH "Tendinopathy") OR (MH "Joint Instability") OR (MH "Dislocations") OR (MH "Fractures") OR (MH "Fracture Dislocation") OR (MH "Fractures, Stress") OR (MH "Contusions and Abrasions") OR (MH "Soft Tissue Injuries") \	68,631
S62	(MH "Upper Extremity") OR (MH "Arm") OR (MH "Elbow") OR (MH "Forearm") OR (MH "Hand") OR (MH "Fingers") OR (MH "Thumb") OR (MH "Wrist") OR (MH "Shoulder") OR (MH "Axilla") OR (MH "Arm Bones") OR (MH "Carpal Bones") OR (MH "Clavicle") OR (MH "Humerus") OR (MH "Metacarpal Bones") OR (MH "Radius") OR (MH "Scapula") OR (MH "Acromion") OR (MH "Coracoid Process") OR (MH "Ulna") OR (MH "Cancellous Bone") OR (MH "Cortical Bone") OR (MH "Elbow Joint") OR (MH "Hand Joints") OR (MH "Carpal Joints") OR (MH "Carpometacarpal Joints") OR (MH "Finger Joint") OR (MH "Metacarpophalangeal Joint") OR (MH "Wrist Joint") OR (MH "Shoulder Joint") OR (MH "Glenohumeral Joint") OR (MH "Pectoralis Muscles")	65,446
S63	S61 AND S62	8,000

S64	(MH "Arm Injuries") OR (MH "Elbow Injuries") OR (MH "Elbow Dislocation") OR (MH "Elbow Fractures") OR (MH "Humeral Fractures, Distal") OR (MH "Radial Head and Neck Fractures") OR (MH "Golf Elbow") OR (MH "Medial Epicondyle Apophysitis") OR (MH "Tennis Elbow") OR (MH "Forearm Injuries") OR (MH "Radius Fractures") OR (MH "Radius Fractures, Distal") OR (MH "Ulna Fractures") OR (MH "Ulna Fracture, Proximal") OR (MH "Humeral Fractures") OR (MH "Hill-Sachs Lesion") OR (MH "Shoulder Injuries") OR (MH "Bankart Lesions") OR (MH "Milwaukee Shoulder Syndrome") OR (MH "Rotator Cuff Injuries") OR (MH "Shoulder Dislocation") OR (MH "Shoulder Fractures") OR (MH "Clavicle Fractures") OR (MH "Floating Shoulder") OR (MH "Shoulder Instability, Anterior") OR (MH "Shoulder Instability, Multidirectional") OR (MH "Shoulder Instability, Posterior") OR (MH "Shoulder Labrum Tear") OR (MH "Shoulder Impingement Syndrome") OR (MH "Wrist Dislocation") OR (MH "Lunate Dislocation") OR (MH "Elbow Dislocation") OR (MH "Ulnar Collateral Ligament Injury of the Thumb") OR (MH "Tendon Injuries, Finger") OR (MH "Metacarpal Fractures") OR (MH "Mallet Finger") OR (MH "Finger Fractures") OR (MH "Finger Dislocation") OR (MH "Finger Injuries") OR (MH "Biceps Brachii Muscles") OR (MH "Deltoid Muscles") OR (MH "Triceps Brachii") OR (MH "Trapezius Muscles") OR (MH "Triceps Brachii/IN") OR (MH "Trapezius Muscles/IN") OR (MH "Biceps Brachii Muscles/IN") OR (MH "Deltoid Muscles/IN") OR (MH "Pectoralis Muscles/IN")	24,203
S65	(MH "Upper Extremity/IN") OR (MH "Arm/IN") OR (MH "Axilla/IN") OR (MH "Elbow/IN") OR (MH "Forearm/IN") OR (MH "Hand/IN") OR (MH "Fingers/IN") OR (MH "Thumb/IN") OR (MH "Wrist/IN") OR (MH "Shoulder/IN")	996
S66	TI (((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands))) OR AB (((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)))	30,077
S67	TI (((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) N4 (“rotator cuff*” or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or pectoral* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*))) OR AB (((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) N4 (“rotator cuff*” or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*)))	13,514
S68	TI (((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands))) OR AB (((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)))	471
S69	S63 OR S64 OR S65 OR S66 OR S67 OR S68	53,612
S70	S10 AND S60 AND S69	3,537
S71	S10 AND S60 AND S69 Limiters - Published Date: 20010101-20231231	3,229

Database(s): **SPORTDISCUS** with FULL TEXT

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#	Query	Results
S1	DE "SPORTS" OR DE "AMATEUR sports" OR DE "AQUATIC sports" OR DE "BALL games" OR DE "COLLEGE sports" OR DE "CONTACT sports" OR DE "ENDURANCE sports" OR DE "EXTREME sports" OR DE "INDIVIDUAL sports" OR DE "MILITARY sports" OR DE "OLYMPIC Games" OR DE "PROFESSIONAL sports" OR DE "RECREATIONAL sports" OR DE "SCHOOL sports" OR DE "SPORTS competitions" OR DE "TEAM sports" OR DE "WINTER sports" OR DE "DANCE" OR DE "BALLET" OR DE "BREAK dancing" OR DE "HIP-hop dance" OR DE "RUNNING" OR DE "ORIENTEERING"	25,672
S2	DE "ATHLETICS" OR DE "BASEBALL" OR DE "BASKETBALL" OR DE "BICYCLE motocross" OR DE "BICYCLE racing" OR DE "BICYCLE racing training" OR DE "BOXING" OR DE "CYCLING" OR DE "CHEERLEADING" OR DE "ROCK climbing" OR DE "CRACK climbing" OR DE "FACE climbing" OR DE "FREE climbing" OR DE "INDOOR rock climbing" OR DE "CRICKET (Sport)" OR DE "CRICKET competitions" OR DE "INDOOR cricket" OR DE "TWENTY20 cricket" OR DE "ACROBATIC diving" OR DE "SPRINGBOARD diving" OR DE "HORSE sports" OR DE "EQUESTRIAN accidents" OR DE "DRESSAGE tests" OR DE "EVENTING (Horsemanship)" OR DE "GAMES on horseback" OR DE "HORSE racing" OR DE "SHOW jumping" OR DE "SHOW riding" OR DE "VAULTING (Horsemanship)" OR DE "FOOTBALL" OR DE "CANADIAN football" OR DE "COLLEGE football" OR DE "HIGH school football" OR DE "MINOR league football" OR DE "PROFESSIONAL football" OR DE "ARENA football" OR DE "RUGBY football" OR DE "COLLEGE rugby football" OR DE "FLORENTINE football" OR DE "PROFESSIONAL rugby football" OR DE "RUGBY League football" OR DE "RUGBY Union football" OR DE "RUGBY competitions" OR DE "SEVEN-a-side rugby football" OR DE "AUSTRALIAN football" OR DE "TACKLING (Rugby)" OR DE "GOLF" OR DE "COLLEGE golf" OR DE "PROFESSIONAL golf" OR DE "SNOW golf" OR DE "GYMNASTICS" OR DE "ARTISTIC gymnastics" OR DE "SWEDISH gymnastics" OR DE "TEAM aerobics" OR DE "TUMBLING" OR DE "HANDBALL" OR DE "TEAM handball" OR DE "HOCKEY" OR DE "COLLEGE hockey" OR DE "FIELD hockey" OR DE "INDOOR hockey" OR DE "LAWN hockey" OR DE "MINOR league hockey" OR DE "ROLLER hockey" OR DE "BALL hockey" OR DE "PROFESSIONAL hockey" OR DE "LACROSSE" OR DE "MOUNTAINEERING" OR DE "NETBALL" OR DE "RACKET games" OR DE "RACQUETBALL" OR DE "RINGETTE (Game)" OR DE "RODEOS" OR DE "BRONC riding" OR DE "BULL riding" OR DE "CALF roping" OR DE "CHUCKWAGON racing" OR DE "STEER roping" OR DE "STEER wrestling" OR DE "TEAM penning" OR DE "TEAM roping" OR DE "TRICK roping" OR DE "SKATEBOARDING" OR DE "SNOW skating" OR DE "SKATING" OR DE "FIGURE skating" OR DE "FREE skating" OR DE "ICE dancing" OR DE "PROFESSIONAL skating" OR DE "SPEED skating" OR DE "ROLLER skating" OR DE "SKI acrobatics" OR DE "SKI cross" OR DE "SKI mountaineering" OR DE "SKI racing" OR DE "SKIS & skiing" OR DE "SLALOM canoeing" OR DE "SLALOM racing" OR DE "SLALOM skiing" OR DE "SNOWBOARDING" OR DE "BACKCOUNTRY snowboarding" OR DE "SLOPESTYLE snowboarding" OR DE "SKIBOARDING" OR DE "SOCCER" OR DE "COLLEGE soccer" OR DE "HIGH school soccer" OR DE "INDOOR soccer" OR DE "PROFESSIONAL soccer" OR DE "SOFTBALL" OR DE "SLOW pitch softball" OR DE "YOUTH league softball" OR DE "SQUASH (Game)" OR DE "SWIMMING" OR DE "SWIMMING competitions" OR DE "SYNCHRONIZED swimming" OR DE "TENNIS" OR DE "COLLEGE tennis" OR DE "COURT tennis" OR DE "PROFESSIONAL tennis" OR DE "TABLE tennis" OR DE "TENNIS leagues" OR DE "TENNIS tournaments" OR DE "TENNIS training" OR DE "TRACK & field" OR DE "ALL-around (Track & field)" OR DE "COLLEGE track & field" OR DE "HURDLING (Track & field)" OR DE "INDOOR track & field" OR DE "JUMPING" OR DE "STEEPLECHASING (Track & field)" OR DE "VAULTING" OR DE "VOLLEYBALL" OR DE "BEACH volleyball" OR DE "COLLEGE volleyball" OR DE "PROFESSIONAL volleyball" OR DE "VOLLEYBALL competitions" OR DE "WRESTLING" OR DE "COLLEGE wrestling" OR DE "FREESTYLE wrestling" OR DE "HIGH school wrestling" OR DE "PROFESSIONAL wrestling" OR DE "SAMBO wrestling" OR DE "SUMO"	40,544
S3	DE "AIKIDO" OR DE "JUDO" OR DE "SAN-jitsu" OR DE "JIU-jitsu" OR DE "KARATE" OR DE	6,107

	"TAE kwon do" OR DE "KICKBOXING" OR DE "MARTIAL arts" OR DE "CAPOEIRA (Dance)" OR DE "MIXED martial arts" OR DE "ARCHERY" OR DE "BADMINTON (Game)" OR DE "BADMINTON tournaments" OR DE "BADMINTON training" OR DE "CANOE racing" OR DE "CROSS-country ski racing" OR DE "NORDIC combined" OR DE "SPORT fencing" OR DE "FENCING" OR DE "KAYAKING" OR DE "KAYAKING training" OR DE "ICE luge racing" OR DE "SHOOTING contests" OR DE "ROWING" OR DE "SAILING" OR DE "SKELETON" OR DE "SKI jumping" OR DE "SLEDDING" OR DE "SURFING" OR DE "BODYBOARDING" OR DE "KITE surfing" OR DE "STAND-up paddle surfing" OR DE "WINDSURFING" OR DE "TRAMPOLINING" OR DE "WATER polo" OR DE "WEIGHT lifting" OR DE "YACHTING"	
S4	DE "ATHLETES" OR DE "ARCHERS" OR DE "BADMINTON players" OR DE "BASEBALL players" OR DE "BASKETBALL players" OR DE "BOBSLEDDERS" OR DE "BODYBUILDERS" OR DE "BOXERS (Sports)" OR DE "BULLFIGHTERS" OR DE "CANOEISTS" OR DE "COLLEGE athletes" OR DE "CRICKET players" OR DE "CYCLISTS" OR DE "DIVERS" OR DE "ELITE athletes" OR DE "ENDURANCE athletes" OR DE "FENCERS" OR DE "FOOTBALL players" OR DE "GOLFERS" OR DE "GYMNASTS" OR DE "HANDBALL players" OR DE "HIGH school athletes" OR DE "HOCKEY players" OR DE "JUNIOR high school athletes" OR DE "LACROSSE players" OR DE "MARTIAL artists" OR DE "MIDDLE school athletes" OR DE "MOUNTAINEERS" OR DE "NETBALL players" OR DE "OFFENSIVE players" OR DE "OLDER athletes" OR DE "OLYMPIC athletes" OR DE "PROFESSIONAL athletes" OR DE "ROWERS" OR DE "RUGBY football players" OR DE "RUGBY football teams" OR DE "SKATEBOARDERS" OR DE "SKATERS" OR DE "SKIERS" OR DE "SNOWBOARDERS" OR DE "SOCCER players" OR DE "SOFTBALL players" OR DE "SQUASH players" OR DE "SURFERS" OR DE "SWIMMERS" OR DE "TABLE tennis players" OR DE "TEAM handball players" OR DE "TENNIS players" OR DE "TRACK & field athletes" OR DE "TRIATHLETES" OR DE "VOLLEYBALL players" OR DE "WATER polo players" OR DE "WEIGHT lifters" OR DE "WINDSURFERS (Persons)" OR DE "WOMEN athletes" OR DE "WRESTLERS" OR DE "ATHLETES with disabilities" OR DE "BLIND athletes" OR DE "DEAF athletes" OR DE "SKIERS with disabilities" OR DE "WOMEN athletes with disabilities" OR DE "SPORTS for people with disabilities"	16,064
S5	DE "MARTIAL artists" OR DE "ARCHERS" OR DE "BADMINTON players" OR DE "CANOEISTS" OR DE "KAYAKERS" OR DE "SAILORS" OR DE "SURFERS" OR DE "TRAMPOLINISTS" OR DE "WATER polo players" OR DE "WEIGHT lifters"	3
S6	TI ((athlete* or athletic* or crew or player* or teammate* or “team-mate*” or varsity)) OR AB ((athlete* or athletic* or crew or player* or teammate* or “team-mate*” or varsity)) OR ((athlete* or athletic* or crew or player* or teammate* or “team-mate*” or varsity))	94,683
S7	TI sport* OR AB sport* OR KW sport*	61,435
S8	TI ((baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or “net ball” or “racquet sport*” or racquetball or ringette or rodeo* or "roller derb*" or rollerskat* rugby or skateboard* or skating or skiing or snowboard* or “snow sport*” or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball)) OR AB ((baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or “net ball” or “racquet sport*” or racquetball or ringette or rodeo* or "roller derb*" or rollerskat* rugby or skateboard* or skating or skiing or snowboard* or “snow sport*” or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball)) OR KW ((baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or “net ball” or “racquet sport*” or racquetball or ringette or rodeo* or "roller derb*" or rollerskat* rugby or skateboard* or skating or skiing or snowboard* or “snow sport*” or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball))	40,078

S9	TI ((archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting or goalball* or Paralympic*)) OR AB ((archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting or goalball* or Paralympic*)) OR KW ((archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting or goalball* or Paralympic*))	10,894
S10	TI ((aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or “Martial art*” or taekwondo or “tae kwon do” or “tai ji”)) OR AB ((aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or “Martial art*” or taekwondo or “tae kwon do” or “tai ji”)) OR KW ((aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or “Martial art*” or taekwondo or “tae kwon do” or “tai ji”))	1,688
S11	TI ((capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*")) OR AB ((capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*")) OR ((capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*"))	228
S12	TI ((biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*)) OR AB ((biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*)) OR KW ((biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*))	13,867
S13	TI (marathon* or triathlon* or biathlet* or triathlet* or parasport* or “floor ball” or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or "special olympi*" or dance* or dancing or breakdanc* or "hip hop" or ballet or running or orienteering) OR AB (marathon* or triathlon* or biathlet* or triathlet* or parasport* or “floor ball” or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or "special olympi*" or dance* or dancing or breakdanc* or "hip hop" or ballet or running or orienteering) OR KW (marathon* or triathlon* or biathlet* or triathlet* or parasport* or “floor ball” or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or "special olympi*" or dance* or dancing or breakdanc* or "hip hop" or ballet or running or orienteering)	37,360
S14	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13	183,592
S15	DE "SPORTS injury prevention" OR DE "SPORTS injuries risk factors" OR DE "INJURY risk factors" OR DE "PREVENTION" OR DE "ACCIDENT prevention" OR DE "SAFETY"	30,954
S16	DE "WARMUP" OR DE "COOLDOWN" OR DE "PHYSICAL training & conditioning" OR DE "OVERTRAINING" OR DE "PRACTICE (Sports)" OR DE "REPETITION training" OR DE "RESISTANCE training" OR DE "STRENGTH training" OR DE "EXERCISE therapy" OR DE "TRAINING"	7,030

S17	DE "PROTECTIVE equipment (Sporting goods)" OR DE "BASEBALL equipment" OR DE "FENCING equipment" OR DE "FOOTBALL equipment" OR DE "HOCKEY equipment" OR DE "LACROSSE equipment" OR DE "RODEO equipment" OR DE "RUGBY football equipment" OR DE "WRESTLING equipment" OR DE "HOCKEY goalkeeping equipment" OR DE "FOOTBALL equipment" OR DE "ATHLETIC equipment" OR DE "ATHLETIC shoes" OR DE "FENCING equipment" OR DE "GYMNASTICS equipment" OR DE "MARTIAL arts equipment" OR DE "SPORTS injury prevention equipment" OR DE "TRACK & field equipment" OR DE "WRESTLING equipment"	1,668
S18	DE "PROTECTIVE clothing" OR DE "ORTHOPEDIC apparatus" OR DE "ATHLETIC tape" OR DE "ORTHOPEDIC braces"	4,401
S19	DE "SPORTS -- Law & legislation" OR DE "AQUATIC sports laws" OR DE "COLLEGE sports -- Law & legislation" OR DE "LEGAL status of soccer players" OR DE "PRODUCT liability -- Athletic equipment & supplies" OR DE "PROFESSIONAL sports -- Law & legislation" OR DE "TELEVISED sports -- Law & legislation" OR DE "VIOLENCE in sports -- Law & legislation"	42,670
S20	DE "SPORTS facility design & construction" OR DE "SPORTS facilities" OR DE "ARENAS" OR DE "ATHLETIC fields ORDE "RESILIENT flooring"	232
S21	DE "MUSCLE strength" OR DE "GRIP strength" OR DE "STRENGTH training" ORDE "PROPRIOCEPTION" OR DE "MUSCULAR sense" OR DE "POSTURAL balance"	30,499
S22	DE "EDUCATION of athletic coaches" OR DE "EDUCATION" OR DE "HEALTH behavior" OR DE "HEALTH education"	99,987
S23	DE "BIOFEEDBACK training" OR DE "SPORTS psychology" OR DE "SPORTS teams -- Psychology"	1,743
S24	DE "DIETARY supplements" OR DE "NUTRITION" OR DE "PROBIOTICS" OR DE "PROTEIN powders" OR DE "SLEEP" OR DE "SLEEP hygiene"	89,323
S25	DE "ACTIVE recovery"	10,359
S26	TI ((“risk factor*” or prevent*)) OR KW ((“risk factor*” or prevent*))	184,360
S27	TI ((prevent* N4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*))) OR AB ((prevent* N4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*))) OR KW ((prevent* N4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*)))	138,010
S28	TI (((reducing or reduction or reduce or mitigat*) N3 (risk* or injur*))) OR AB (((reducing or reduction or reduce or mitigat*) N3 (risk* or injur*))) OR KW ((prevent* N4 (((reducing or reduction or reduce or mitigat*) N3 (risk* or injur*))* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*)))	73,803
S29	TI ((injur* N3 (risk* or burden or prevent*))) OR AB ((injur* N3 (risk* or burden or prevent*))) OR KW ((injur* N3 (risk* or burden or prevent*)))	31,159
S30	TI (((neuromuscular or “NM” or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) N4 (train* or control or coordination or exercis* or warmup* or “warm-up*” or intervention* or program* or drill* or retrain* or program* or condition*))) OR AB (((neuromuscular or “NM” or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) N4 (train* or control or coordination or exercis* or warmup* or “warm-up*” or intervention* or program* or drill* or retrain* or program* or condition*))) OR KW (((neuromuscular or “NM” or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) N4 (train* or control or coordination or exercis* or warmup* or “warm-up*” or intervention* or program* or drill* or retrain* or program* or condition*)))	64,327

S31	TI (((muscle or muscular) N3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*))) OR AB (((muscle or muscular) N3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*))) OR KW (((muscle or muscular) N3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*)))	38,922
S32	TI (((body or neuromuscular) N3 control)) OR AB (((body or neuromuscular) N3 control)) OR KW (((body or neuromuscular) N3 control))	4,453
S33	TI ((warmup* or “warm up*”)) OR AB ((warmup* or “warm up*”)) OR KW ((warmup* or “warm up*”))	2,013
S34	TI ((fifa* or "11* Kids")) OR AB ((fifa* or "11* Kids")) OR KW ((fifa* or "11* Kids"))	366
S35	TI (11* N2 program*) OR AB (11* N2 program*) OR KW (11* N2 program*)	1,179
S36	TI (((train* or exercis*) N3 (strateg* or program*))) OR AB (((train* or exercis*) N3 (strateg* or program*))) OR KW (((train* or exercis*) N3 (strateg* or program*)))	50,026
S37	TI ((“training load” or workload)) OR AB ((“training load” or workload)) OR KW ((“training load” or workload))	17,634
S38	TI ((protect* N3 (gear* or equipment or device* or cloth* or pad or pads or padding))) OR AB ((protect* N3 (gear* or equipment or device* or cloth* or pad or pads or padding))) OR KW ((protect* N3 (gear* or equipment or device* or cloth* or pad or pads or padding)))	7,732
S39	TI ((brace* or tape or taping or splint*)) OR AB ((brace* or tape or taping or splint*)) OR KW ((brace* or tape or taping or splint*))	15,944
S40	TI (((rule* or policy or policies or law or regulation* or legislation) N3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*))) OR AB (((rule* or policy or policies or law or regulation* or legislation) N3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*))) OR KW (((rule* or policy or policies or law or regulation* or legislation) N3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*)))	33,074
S41	TI (((rink* or ice or surface or field or court or floor or turf or pitch) N3 (design* or size*))) OR AB (((rink* or ice or surface or field or court or floor or turf or pitch) N3 (design* or size*))) OR KW (((rink* or ice or surface or field or court or floor or turf or pitch) N3 (design* or size*)))	2,917
S42	TI (((playing or floor or turf or pitch or sport* or court) N3 surface*)) OR AB (((playing or floor or turf or pitch or sport* or court) N3 surface*)) OR KW (((playing or floor or turf or pitch or sport* or court) N3 surface*))	444
S43	TI (((artificial or grass or synthetic) N3 (turf or field* or surface*))) OR AB (((artificial or grass or synthetic) N3 (turf or field* or surface*))) OR KW (((artificial or grass or synthetic) N3 (turf or field* or surface*)))	607
S44	TI ((“artificial turf” or “natural grass”)) OR AB ((“artificial turf” or “natural grass”)) OR KW ((“artificial turf” or “natural grass”))	177
S45	TI ((coach* N3 (educat* or train* or skill*))) OR AB ((coach* N3 (educat* or train* or skill*))) OR KW ((coach* N3 (educat* or train* or skill*)))	2,595
S46	TI ((education* N3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*))) OR AB ((education* N3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*))) OR KW ((education* N3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*)))	89,154
S47	TI (((behavior* or behaviour*) N3 (modif* or chang* or train* or skill*))) OR AB (((behavior* or behaviour*) N3 (modif* or chang* or train* or skill*))) OR KW (((behavior* or behaviour*) N3	42,354

	(modif* or chang* or train* or skill*)))	
S48	TI (((intrinsic or extrinsic) N3 (variable* or factor* or risk*))) OR AB (((intrinsic or extrinsic) N3 (variable* or factor* or risk*))) OR KW (((intrinsic or extrinsic) N3 (variable* or factor* or risk*)))	2,649
S49	TI (((tackle or tackling or contact or falling or movement) N3 (technique* or skill* or train* or control or proficien*))) OR AB (((tackle or tackling or contact or falling or movement) N3 (technique* or skill* or train* or control or proficien*))) OR KW (((tackle or tackling or contact or falling or movement) N3 (technique* or skill* or train* or control or proficien*)))	5,925
S50	TI ((safety N3 (management or culture or measure* or educat* or aware* or risk* or improv* or standard*))) OR AB ((safety N3 (management or culture or measure* or educat* or aware* or risk* or improv* or standard*))) OR KW ((safety N3 (management or culture or measure* or educat* or aware* or risk* or improv* or standard*)))	31,829
S51	TI ((“training-overload” or overreach* or "over reach*" or overtrain* or "over train*" or “high repetition*”)) OR AB ((“training-overload” or overreach* or "over reach*" or overtrain* or "over train*" or “high repetition*”)) OR KW ((“training-overload” or overreach* or "over reach*" or overtrain* or "over train*" or “high repetition*”))	809
S52	TI (((environment* N3 (factor* or condition*)) or altitude)) OR AB (((environment* N3 (factor* or condition*)) or altitude)) OR KW (((environment* N3 (factor* or condition*)) or altitude))	29,911
S53	TI (((hot or cold or warm or cool or game or match) N3 (weather or temperature or condition*))) OR AB (((hot or cold or warm or cool or game or match) N3 (weather or temperature or condition*))) OR KW (((hot or cold or warm or cool or game or match) N3 (weather or temperature or condition*)))	3,183
S54	TI ((“sport* psychology” or visualization or visualization or imagery or biofeedback)) OR AB ((“sport* psychology” or visualization or visualization or imagery or biofeedback)) OR KW ((“sport* psychology” or visualization or visualization or imagery or biofeedback))	23,210
S55	TI (((diet* or nutritional) N2 supplement*)) OR AB (((diet* or nutritional) N2 supplement*)) OR KW (((diet* or nutritional) N2 supplement*))	14,261
S56	TI ((nutrition or diet or sleep)) OR AB ((nutrition or diet or sleep)) OR KW ((nutrition or diet or sleep))	249,764
S57	TI ((Risk N3 (propensity or taking))) OR AB ((Risk N3 (propensity or taking))) OR KW ((Risk N3 (propensity or taking)))	5,599
S58	TI ((sport* N3 (specialization or specialization))) OR AB ((sport* N3 (specialization or specialization))) OR KW ((sport* N3 (specialization or specialization)))	274
S59	TI ((recovery N3 (function* or status or physiological or psychological))) OR AB ((recovery N3 (function* or status or physiological or psychological))) OR KW ((recovery N3 (function* or status or physiological or psychological)))	12,432
S60	S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 OR S54 OR S55 OR S56 OR S57 OR S58 OR S59	1,110,526
S61	TI (((elbow* or shoulder*) N3 (pad or pads or padding))) OR AB (((elbow* or shoulder*) N3 (pad or pads or padding))) OR (((elbow* or shoulder*) N3 (pad or pads or padding)))	117
S62	TI (((wrist* or hand* or elbow* or shoulder* or finger*) N3 (brace* or bracing or splint* or guard*))) OR AB (((wrist* or hand* or elbow* or shoulder* or finger*) N3 (brace* or bracing or splint* or guard*))) OR (((wrist* or hand* or elbow* or shoulder* or finger*) N3 (brace* or bracing or splint* or guard*)))	790
S63	S61 OR S62	897

S64	S60 OR S63	1,110,630
S65	DE "SPORTS injuries" OR DE "SPRAINS" OR DE "JOINT injuries" OR DE "OVERUSE injuries" OR DE "JOINT instability" OR DE "JOINT dislocations" OR DE "SUBLUXATION" OR DE "BONE fractures" OR DE "BONE injuries" OR DE "STRESS fractures (Orthopedics)" OR DE "BRUISES" OR DE "HEMATOMA" OR DE "TENDINOPATHY" OR DE "TENDON injuries" OR DE "SOFT tissue injuries" OR DE "LIGAMENT injuries"	28,386
S66	DE "AQUATIC sports injuries" OR DE "BASEBALL injuries" OR DE "BASKETBALL injuries" OR DE "BOXING injuries" OR DE "CRICKET injuries" OR DE "EQUESTRIAN accidents" OR DE "FOOTBALL injuries" OR DE "GOLF injuries" OR DE "GYMNASTICS injuries" OR DE "HOCKEY injuries" OR DE "HORSE sports injuries" OR DE "JUDO injuries" OR DE "KARATE injuries" OR DE "MARTIAL arts injuries" OR DE "NETBALL injuries" OR DE "RACKET game injuries" OR DE "RUGBY football injuries" OR DE "RUNNING injuries" OR DE "SKATEBOARDING injuries" OR DE "SOCCER injuries" OR DE "TENNIS injuries" OR DE "VAULTING injuries" OR DE "VOLLEYBALL injuries" OR DE "WEIGHT training injuries" OR DE "WINTER sports injuries"	3,909
S67	S65 OR S66	32,050
S68	DE "ARM" OR DE "ELBOW" OR DE "FOREARM" OR DE "HAND" OR DE "WRIST" OR DE "SHOULDER" OR DE "ACROMIOCLAVICULAR joint" OR DE "CLAVICLE" OR DE "SHOULDER joint" OR DE "TERES major" OR DE "TERES minor" OR DE "FINGERS" OR DE "FINGER joint" OR DE "PHALANGES" OR DE "THUMB" OR DE "METACARPUS" OR DE "ACROMIOCLAVICULAR joint" OR DE "SCAPULA" OR DE "FINGER joint" OR DE "METACARPOPHALANGEAL joint" OR DE "WRIST joint" OR DE "HUMERUS" OR DE "RADIAL bone" OR DE "ULNA" OR DE "ULNAR collateral ligament" OR DE "SCAPHOID bone" OR DE "CARPAL bones" OR DE "DELTOID muscles" OR DE "PECTORALIS muscle" OR DE "TRICEPS" OR DE "BICEPS brachii" OR DE "SHOULDER girdle" OR DE "ROTATOR cuff" OR DE "SUPRASPINATUS muscles"	52,895
S69	S67 AND S68	4,234
S70	DE "ARM injuries" OR DE "HAND injuries" OR DE "ELBOW injuries" OR DE "ELBOW dislocation" OR DE "GOLF elbow" OR DE "TENNIS elbow" OR DE "DISTAL radius fractures" OR DE "CLAVICLE injuries" OR DE "FOREARM injuries" OR DE "SCAPULA injuries" OR DE "FINGER injuries" OR DE "FINGER dislocation" OR DE "FINGER joint injuries" OR DE "SHOULDER injuries" OR DE "ROTATOR cuff injuries" OR DE "SHOULDER joint injuries" OR DE "ULNA injuries" OR DE "RADIUS bone injuries"	14,399
S71	TI (((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands))) OR AB (((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands))) OR KW (((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)))	30,083
S72	TI (((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) N4 (“rotator cuff*” or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or	13,579

	pectoral* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*))) OR AB (((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) N4 (“rotator cuff*” or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or pectoral* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*))) OR KW (((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) N4 (“rotator cuff*” or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or pectoral* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*)))	
S73	TI (((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands))) OR AB (((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands))) OR (((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)))	471
S74	S69 OR S70 OR S71 OR S72 OR S73	47,588
S75	S14 AND S64 AND S74	2,742
S76	S14 AND S64 AND S74 Limiters - Published Date: 20010101-20231231	2,488

Database(s): **ERIC**
Search modes - Find all my search terms

#	Query	Results
S1	TI ((athlete* or athletic* or crew or player* or teammate* or “team-mate*” or varsity)) OR AB ((athlete* or athletic* or crew or player* or teammate* or “team-mate*” or varsity)) OR KW ((athlete* or athletic* or crew or player* or teammate* or “team-mate*” or varsity))	14,250
S2	TI sport* OR AB sport* OR KW sport*	13,318
S3	TI ((baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or “net ball” or “racquet sport*” or racquetball or ringette or rodeo* or "roller derb*" or rollerskat* rugby or skateboard* or skating or skiing or snowboard* or “snow sport*” or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball)) OR AB ((baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or “net ball” or “racquet sport*” or racquetball or ringette or rodeo* or "roller derb*" or rollerskat* rugby or skateboard* or skating or skiing or snowboard* or “snow sport*” or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball)) OR KW ((baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or “net ball” or “racquet sport*” or racquetball or ringette or rodeo* or "roller derb*" or rollerskat* rugby or skateboard* or skating or skiing or snowboard* or “snow sport*” or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball))	7,663
S4	TI ((archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or	2,260

	"water polo" or "weight lifting" or windsurfing or yachting or goalball* or Paralympic*)) OR AB ((archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting or goalball* or Paralympic*)) OR KW ((archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting or goalball* or Paralympic*))	
S5	TI ((aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or “Martial art*” or taekwondo or “tae kwon do” or “tai ji”)) OR AB ((aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or “Martial art*” or taekwondo or “tae kwon do” or “tai ji”)) OR KW ((aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or “Martial art*” or taekwondo or “tae kwon do” or “tai ji”))	282
S6	TI ((capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*")) OR AB ((capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*")) OR KW ((capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*"))	27
S7	TI ((biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*)) OR AB ((biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*)) OR KW ((biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*))	1,431
S8	TI (marathon* or triathlon* or biathlet* or triathlet* or parasport* or “floor ball” or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or "special olympi*" or dance* or dancing or breakdanc* or "hip hop" or ballet) OR AB (marathon* or triathlon* or biathlet* or triathlet* or parasport* or “floor ball” or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or "special olympi*" or dance* or dancing or breakdanc* or "hip hop" or ballet) OR KW (marathon* or triathlon* or biathlet* or triathlet* or parasport* or “floor ball” or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or "special olympi*" or dance* or dancing or breakdanc* or "hip hop" or ballet)	7,065
S9	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8	37,028
S10	(“risk factor*” or prevent*)	55,579
S11	(prevent* N4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*))	16,689
S12	((reducing or reduction or reduce or mitigat*) N3 (risk* or injur*))	2,750
S13	(injur* N3 (risk* or burden or prevent*))	848
S14	((neuromuscular or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) N4 (train* or control or coordination or exercis* or warmup* or “warm-up*” or intervention* or program* or drill* or retrain* or program* or condition*))	11,355

S15	((muscle or muscular) N3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*))	1,346
S16	((body or neuromuscular) N3 control)	232
S17	(warmup* or “warm up*”)	601
S18	(fifa* or "11* Kids")	30
S19	(11* N2 program*)	1,579
S20	((train* or exercis*) N3 (strateg* or program*))	41,655
S21	(“training load” or workload)	6,130
S22	(protect* N3 (gear* or equipment or device* or cloth* or pad or pads or padding))	324
S23	(brace* or tape or taping or splint*)	10,830
S24	((rule* or policy or policies or law or regulation* or legislation) N3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*))	23,933
S25	((rink* or ice or surface or field or court or floor or turf or pitch) N3 (design* or size*))	1,870
S26	((playing or floor or turf or pitch or sport* or court) N3 surface*)	59
S27	((artificial or grass) N3 (turf or field* or surface*))	111
S28	(“artificial turf” or “natural grass”)	20
S29	(coach* N3 (educat* or train* or skill*))	2,230
S30	(education* N3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*))	185,907
S31	((behavior* or behaviour*) N3 (modif* or chang* or train* or skill*))	34,462
S32	((intrinsic or extrinsic) N3 (variable* or factor* or risk*))	644
S33	((tackle or tackling or contact or falling or movement) N3 (technique* or skill* or train* or control or proficien*))	1,887
S34	(safety N3 (management or culture or measure* or educat* or aware* or risk* or improv* or standard*))	5,207
S35	(“training-overload” or overreach* or "over reach*" or overtrain* or "over train*" or “high repetition*”)	181
S36	((environment* N3 (factor* or condition*)) or altitude)	6,259
S37	((hot or cold or warm or cool or game or match) N3 (weather or temperature or condition*))	378
S38	(“sport* psychology” or visualization or visualization or imagery or biofeedback)	10,394
S39	((diet* or nutritional) N2 supplement*)	131
S40	(nutrition or diet or sleep)	15,271
S41	(recovery N3 function*)	61
S42	(Risk N3 (propensity or taking))	2,513
S43	(sport* N3 (specialization or specialization))	38
S44	S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43	365,262

S45	((elbow* or shoulder*) N3 (pad or pads or padding))	1
S46	((wrist* or hand* or elbow* or shoulder* or finger*) N3 (brace* or bracing or splint* or guard*))	31
S47	S45 OR S46	32
S48	S44 OR S47	365,274
S49	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or pain or sublux*) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands))	165
S50	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or pain or sublux*) N4 (“rotator cuff*” or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or pectoral* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*))	18
S51	((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) N4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands))	2
S52	S49 OR S50 OR S51	180
S53	S9 and S48 AND S52	24
S54	S9 and S48 AND S52 Limiters - Date Published: 20010101-20231231	10

Database(s): **EBM Reviews - Cochrane Central Register of Controlled Trials** <October 2023>

#	**Query**	**Results from 25 Nov 2023**
1	exp Athletes/ or Sports for Persons with Disabilities/	1,489
2	Sports/	1,103
3	exp baseball/ or exp basketball/ or exp Bicycling/ or exp boxing/ or exp football/ or exp gymnastics/ or exp hockey/ or exp martial arts/ or exp racquet sports/ or exp skating/ or exp Skiing/ or exp snow sports/ or exp soccer/ or exp Swimming/ or exp Tennis/ or exp "track and field"/ or exp volleyball/ or exp water sports/ or exp wrestling/ or exp youth sports/ or Dancing/	5,891
4	(athlete* or athletic* or crew or player* or teammate* or team-mate* or varsity).tw,kw.	14,017
5	sport*.tw,kw.	12,037
6	(baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or "net ball" or "racquet sport*" or racquetball or ringette or "roller derb*" or rollerskat* or rodeo* or rugby or skateboard* or skating or skiing or snowboard* or "snow sport*" or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball or	10,470

	goalball* or Paralympic*).tw,kw.	
7	(archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting).tw,kw.	2,648
8	(aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or "Martial art*" or taekwondo or "tae kwon do" or "tai ji").tw,kw.	573
9	(capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC or "ultimate fighting champion*").tw,kw.	181
10	(biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*).tw,kw.	3,645
11	(marathon* or biathlon* or triathlon* or biathlet* or triathlet* or parasport*).tw,kw.	736
12	(floor ball or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or special olympi* or dance* or dancing or breakdanc* or "hip hop" or ballet or running or orienteering).tw,kw.	15,891
13	or/1-12	43,715
14	Primary Prevention/ or risk factors/ or Athletic Injuries/pc or Secondary Prevention/	37,218
15	pc.fs.	114,637
16	Risk reduction behavior/	2,149
17	Exercise Therapy/ or "Physical Education and Training"/ or Physical Conditioning, Human/	15,899
18	Plyometric Exercise/ or Muscle Stretching Exercises/ or Resistance Training/ or Warm-Up Exercise/	6,575
19	protective devices/ or personal protective equipment/ or protective clothing/ or Sports Equipment/ or Equipment Design/	6,995
20	athletic tape/ or braces/ or external fixators/ or splints/	1,561
21	policy/ or public policy/ or health policy/ or organizational policy/ or Legislation/ or Safety Management/	940
22	"Facility Design and Construction"/ or "Floors and Floorcoverings"/	95
23	Muscle Strength/ or proprioception/ or postural balance/	10,517
24	patient education as topic/	9,892
25	Biofeedback, Psychology/ or Psychology, Sports/	1,224
26	dietary supplements/ or prebiotics/ or probiotics/ or Sleep/	23,523
27	"Recovery of Function"/	6,323
28	(risk factor* or prevent*).ti,kw.	124,903
29	(prevent* adj4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or	49,438

	factor*)).tw,kw.	
30	((reducing or reduction or reduce or mitigat*) adj3 (risk* or injur*)).tw,kw.	31,913
31	(injur* adj3 (risk* or burden or prevent*)).tw,kw.	4,880
32	((neuromuscular or NM or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) adj4 (train* or control or coordination or exercis* or warmup* or warm-up* or intervention* or program* or drill* or retrain* or program* or condition*)).tw,kw.	57,776
33	((muscle or muscular) adj3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*)).tw,kw.	31,542
34	((body or neuromuscular) adj3 control).tw,kw.	2,952
35	(warmup* or warm up*).tw,kw.	3,672
36	(fifa* or "11* Kids").tw,kw.	141
37	(11* adj2 program*).tw,kw.	394
38	((train* or exercis*) adj3 (strateg* or program*)).tw,kw.	34,621
39	(training load or workload).tw,kw.	4,392
40	(protect* adj3 (gear* or equipment or device* or cloth* or pad or pads or padding)).tw,kw.	1,379
41	(brace* or tape or taping or splint*).tw,kw.	11,215
42	((rule* or policy or policies or law or regulation* or legislation) adj3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*)).tw,kw.	1,864
43	((rink* or ice or surface or field or court or floor or turf or pitch) adj3 (design* or size*)).tw,kw.	718
44	((playing or floor or turf or pitch or sport* or court) adj3 surface*).tw,kw.	99
45	((artificial or grass or synthetic) adj3 (turf or field* or surface*)).tw,kw.	173
46	(artificial turf or natural grass).tw,kw.	33
47	(coach* adj3 (educat* or train* or skill*)).tw,kw.	1,137
48	(education* adj3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*)).tw,kw.	28,736
49	((behavior* or behaviour*) adj3 (modif* or chang* or train* or skill*)).tw,kw.	20,909
50	((intrinsic or extrinsic) adj3 (variable* or factor* or risk*)).tw,kw.	379
51	((tackle or tackling or contact or falling or movement) adj3 (technique* or skill* or train* or control or proficien*)).tw,kw.	2,833
52	(safety adj3 (management or culture or measure* or educat* or aware* or risk* or improv* or standard*)).tw,kw.	11,019
53	(training-overload or overreach* or "over reach*" or overtrain* or "over train*" or high repetition*).tw,kw.	309
54	((environment* adj3 (factor* or condition*)) or altitude).tw,kw.	4,954

55	((hot or cold or warm or cool or game or match) adj3 (weather or temperature or condition*)).tw,kw.	1,505
56	(sport* psychology or visualization or visualisation or imagery or biofeedback).tw,kw.	12,426
57	((diet* or nutritional) adj2 supplement*).tw,kw.	16,114
58	(nutrition or diet or sleep).tw,kw.	130,216
59	(recovery adj3 (function* or status or physiological or psychological)).tw,kw.	8,308
60	(Risk adj3 (propensity or taking)).tw,kw.	1,136
61	(sport* adj3 (specialization or specialisation)).tw,kw.	4
62	or/14-61	548,117
63	((elbow* or shoulder*) adj3 (pad or pads or padding)).tw,kw.	21
64	((wrist* or hand* or elbow* or shoulder* or finger*) adj3 (brace* or bracing or splint* or guard*)).tw,kw.	558
65	or/63-64	578
66	62 or 65	548,127
67	*Athletic Injuries/ or "sprains and strains"/ or cumulative trauma disorders/ or Joint Instability/ or Joint Dislocations/ or fractures, bone/ or Soft tissue injuries/ or Fractures, Stress/ or Contusions/ or tendinopathy/ or tendon entrapment/ or tendon injuries/ or Peripheral Nerve Injuries/	6,381
68	upper extremity/ or arm/ or axilla/ or elbow/ or forearm/ or hand/ or shoulder/ or wrist/ or fingers/ or thumb/ or metacarpus/ or acromioclavicular joint/ or elbow joint/ or hand joints/ or carpal joints/ or carpometacarpal joints/ or finger joint/ or metacarpophalangeal joint/ or palmar plate/ or wrist joint/ or triangular fibrocartilage/ or shoulder joint/ or "bones of upper extremity"/ or arm bones/ or humerus/ or humeral head/ or radius/ or ulna/ or olecranon process/ or clavicle/ or hand bones/ or carpal bones/ or capitate bone/ or hamate bone/ or lunate bone/ or pisiform bone/ or scaphoid bone/ or trapezium bone/ or trapezoid bone/ or triquetrum bone/ or finger phalanges/ or metacarpal bones/ or scapula/ or acromion/ or coracoid process/ or glenoid cavity/ or Ulnar Nerve/ or Collateral Ligament, Ulnar/ or Median Nerve/ or deltoid muscle/ or pectoralis muscles/ or Rotator Cuff/	20,226
69	67 and 68	761
70	arm injuries/ or humeral fractures/ or elbow injuries/ or elbow fractures/ or elbow tendinopathy/ or monteggia's fracture/ or tennis elbow/ or forearm injuries/ or radius fractures/ or ulna fractures/ or wrist injuries/ or wrist fractures/ or shoulder injuries/ or rotator cuff injuries/ or shoulder dislocation/ or shoulder fractures/ or shoulder impingement syndrome/ or Finger Injuries/ or Hand Injuries/ or Ulnar Neuropathies/	3,739
71	in.fs.	3,871
72	68 and 71	457
73	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or	14,516

	bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) adj4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)).tw,kw.	
74	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) adj4 (rotator cuff* or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or pectoral* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*)).tw,kw.	3,641
75	((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) adj4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)).tw,kw.	323
76	69 or 70 or 72 or 73 or 74 or 75	18,619
77	13 and 66 and 76	790
78	limit 77 to yr="2001 - 2024"	768

Database: **EBM Reviews - Cochrane Database of Systematic Reviews** <2005 to November 15, 2023>

#	**Query**	**Results from 25 Nov 2023**
1	(athlete* or athletic* or crew or player* or teammate* or team-mate* or varsity).ti,ab,kw.	24
2	sport*.ti,ab,kw.	94
3	(baseball or basketball or biking or bicycling* or bmx or boxing or "bull rid*" or bullrid* or cheerleading or "cheer leading" or climbing or cricket or diving or equestrian or football or golf or gymnastics or handball or "horse* riding" or hockey or lacrosse or mountaineering or netball or "net ball" or "racquet sport*" or racquetball or ringette or "roller derb*" or rollerskat* or rodeo* or rugby or skateboard* or skating or skiing or snowboard* or "snow sport*" or soccer or softball or squash or swimming or tennis or "track and field" or wrestling or volleyball or goalball* or Paralympic*).ti,ab,kw.	39
4	(archery or badminton or bobsled* or bobsleigh* or canoe* or "cross country" or fencing or kayak* or luge or rifle or rowing or sailing or skeleton or "ski jump*" or sledding or surfing or trampolin* or "water polo" or "weight lifting" or windsurfing or yachting).ti,ab,kw.	110
5	(aikido or judo or jiujitsu or "jiu-jitsu" or jujitsu or "ju jitsu" or karate or kickbox* or "Martial art*" or taekwondo or "tae kwon do" or "tai ji").ti,ab,kw.	9
6	(capoeira or "Dim mak" or kenpo or "kung fu" or "pencak silat" or pitfight* or savate or "submission fight*" or UFC	0

	or "ultimate fighting champion*").ti,ab,kw.	
7	(biker* or boxer* or "cheer leader*" or cheerleader* or climber* or cyclist* or diver or divers or fencer* or fighter* or footballer* or goalie* or golfer* or gymnast or gymnasts or "horse* rider*" or jockey* or judoka* or mountaineer* or rower* or sailor* or skater* or skier* or sledder* or snowboarder* or surfer* or swimmer* or "weight lifter*" or wrestler*).ti,ab,kw.	7
8	(marathon* or biathlon* or triathlon* or biathlet* or triathlet* or parasport*).ti,ab,kw.	1
9	(floor ball or floorball or parkour or scrambling or bouldering or scootering or rollerblad* or x-game* or curling or tumbling or kitesurf* or cycling or camogie or bowling or bowler* or skulling or skuller* or special olympi* or dance* or dancing or breakdanc* or "hip hop" or ballet or running or orienteering).ti,ab,kw.	60
10	or/1-9	290
11	(risk factor* or prevent*).ti,kw.	2,994
12	(prevent* adj4 (program* or intervention* or train* or strateg* or measure* or effort* or effect* or factor*)).ti,ab,kw.	909
13	((reducing or reduction or reduce or mitigat*) adj3 (risk* or injur*)).ti,ab,kw.	723
14	(injur* adj3 (risk* or burden or prevent*)).ti,ab,kw.	140
15	((neuromuscular or NM or balance or strength* or aerobic or agility or propriocept* or stability or instability or stable or sensorimotor or plyometric* or resistance or stretch* or flexibility or dynamic) adj4 (train* or control or coordination or exercis* or warmup* or warm-up* or intervention* or program* or drill* or retrain* or program* or condition*)).ti,ab,kw.	180
16	((muscle or muscular) adj3 (strength* or stretch* or control* or endurance or fatigue or activation or size or atrophy or weak*)).ti,ab,kw.	135
17	((body or neuromuscular) adj3 control).ti,ab,kw.	3
18	(warmup* or warm up*).ti,ab,kw.	2
19	(fifa* or "11* Kids").ti,ab,kw.	0
20	(11* adj2 program*).ti,ab,kw.	0
21	((train* or exercis*) adj3 (strateg* or program*)).ti,ab,kw.	170
22	(training load or workload).ti,ab,kw.	18
23	(protect* adj3 (gear* or equipment or device* or cloth* or pad or pads or padding)).ti,ab,kw.	42
24	(brace* or tape or taping or splint*).ti,ab,kw.	115
25	((rule* or policy or policies or law or regulation* or legislation) adj3 (chang* or amendment* or modification* or modify or modified or enforc* or introduc* or implement*)).ti,ab,kw.	41
26	((rink* or ice or surface or field or court or floor or turf or pitch) adj3 (design* or size*)).ti,ab,kw.	3
27	((playing or floor or turf or pitch or sport* or court) adj3 surface*).ti,ab,kw.	0
28	((artificial or grass or synthetic) adj3 (turf or field* or	0

	surface*)).ti,ab,kw.	
29	(artificial turf or natural grass).ti,ab,kw.	0
30	(coach* adj3 (educat* or train* or skill*)).ti,ab,kw.	4
31	(education* adj3 (program* or intervention* or application* or train* or course* or initiative* or material* or module* or tutorial* or lesson* or workshop*)).ti,ab,kw.	275
32	((behavior* or behaviour*) adj3 (modif* or chang* or train* or skill*)).ti,ab,kw.	215
33	((intrinsic or extrinsic) adj3 (variable* or factor* or risk*)).ti,ab,kw.	0
34	((tackle or tackling or contact or falling or movement) adj3 (technique* or skill* or train* or control or proficien*)).ti,ab,kw.	24
35	(safety adj3 (management or culture or measure* or educat* or aware* or risk* or improv* or standard*)).ti,ab,kw.	73
36	(training-overload or overreach* or "over reach*" or overtrain* or "over train*" or high repetition*).ti,ab,kw.	0
37	((environment* adj3 (factor* or condition*)) or altitude).ti,ab,kw.	19
38	((hot or cold or warm or cool or game or match) adj3 (weather or temperature or condition*)).ti,ab,kw.	16
39	(sport* psychology or visualization or visualisation or imagery or biofeedback).ti,ab,kw.	83
40	((diet* or nutritional) adj2 supplement*).ti,ab,kw.	210
41	(nutrition or diet or sleep).ti,ab,kw.	780
42	(recovery adj3 (function* or status or physiological or psychological)).ti,ab,kw.	98
43	(Risk adj3 (propensity or taking)).ti,ab,kw.	17
44	(sport* adj3 (specialization or specialisation)).ti,ab,kw.	0
45	or/11-44	4,629
46	((elbow* or shoulder*) adj3 (pad or pads or padding)).ti,ab,kw.	0
47	((wrist* or hand* or elbow* or shoulder* or finger*) adj3 (brace* or bracing or splint* or guard*)).ti,ab,kw.	9
48	or/46-47	9
49	45 or 48	4,629
50	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) adj4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)).ti,ab,kw.	134
51	((injur* or tear or tears or torn* or sprain* or strain* or dislocat* or dis-locat* or imping* or instability or ruptur* or fracture* or break or broke or lacerat* or contusion* or bruis* or hematoma* or haematoma* or damage* or compression or lesion* or entrapment or sublux* or pain) adj4 (rotator cuff* or ulna or humerus or scaphoid or trapezoid or metacarp* or carpal or bicep* or tricep* or	36

	pectoral* or scapula* or clavicle* or acromioclavicular* or labral* or labrum* or overhead*)).ti,ab,kw.	
52	((tendonopath* or tendonitis or tendinitis or tendinosis or tenosynovitis) adj4 ("upper extremit*" or "upper limb*" or arm* or forearm* or elbow* or wrist* or thumb* or finger* or shoulder* or phalanx* or digit or digits or hand or hands)).ti,ab,kw.	1
53	or/50-52	145
54	10 and 49 and 53	16
55	limit 54 to yr="2001 - 2024"	13

Table S3: Downs and Black Quality Assessment Tool

REPORTING	1	*1. Is the hypothesis/aim/objective of the study clearly described? (yes = 1; no = 0)*
	2	*2. Are the main outcomes measured clearly described in the Introduction or Methods section? (yes = 1; no = 0): Including exposure and outcome variable measures. All definitions must be operationalized.*
	3	*3. Are the characteristics of the patients included in the study clearly described? (yes = 1; no = 0): Need to describe age, sex characteristics (measure of central tendency and distribution) at a minimum. Ideally, they will include more, length of disease, etc. You should not be left wondering who the participants were.*
	4	*4. Are the interventions of interest clearly described? (yes = 1; no = 0): If the study is not an intervention study, then score 0.*
	5	*5. Are the distributions of principal confounders in each group of subjects to be compared clearly described? (yes = 2; partially = 1; no = 0): Need to indicate that the magnitude of the true effect of the exposure variable on the outcomes variable may be distorted due to a mixing of effects between the exposure variable and an extraneous factor (confounding) and then provide a summary of this extraneous factor (e.g. measure of central tendency and distribution).*
	6	*6. Are the main findings of the study clearly described? (yes = 1; no = 0)*

	7	*7. Does the study provide estimates of the random variability in the data for the main outcomes? (yes = 1; no = 0): Need to include a measure of distribution (e.g. range, standard deviation or 95% confidence interval).*
	8	*8. Have all important adverse events that may be a consequence of the intervention been reported? (yes = 1; no = 0): If the study is not an intervention study, then score 0.*
	9	*9. Have the characteristics of patients lost to follow-up been described? (yes = 1; no = 0): Need to tell you more than just the numbers lost to follow-up. You need to know their age, sex etc. so you can determine if by leaving the study they have introduced a bias to the results. If the study design does not include follow-up (i.e. cross-sectional) then score 0.*
	10	*10. Have actual probability values been reported (e.g. 0.035 rather than <0.05) for the main outcomes except where the probability value is less than 0.001? (yes = 1; no = 0): Confidence intervals are also acceptable.*
EXTERNAL VALIDITY	11	*11. Were the subjects asked to participate in the study representative of the entire population from which they were recruited? (yes = 1; no/unable to determine = 0): Need to identify the source population and describe how the participants were selected (e.g. convenience = 0; random = 1, inclusive = 1 sampling).*
	12	*12. Were those subjects who were prepared to participate representative of the entire population from which they were recruited? (yes = 1; no/unable to determine = 0): Need to provide information about who was asked to participate and who actually did participate so it can be determined if the sample was biased (e.g. did those that chose to participate differ from those who were asked).*
	13	*13. Were the staff, places, and facilities where the patients were treated, representative of the treatment the majority of patients receive? (yes = 1; no/unable to determine = 0): Did all the intervention occur in a typical manner = 1 vs in a lab or artificial situation = 0. If the study is not an intervention study, then score 0.*
INTERNAL VALIDITY (BIAS)	14	*14. Was an attempt made to blind study subjects to the intervention they have received? (yes = 1; no/unable to determine = 0): If the study is not an intervention study, then score 0.*
	15	*15. Was an attempt made to blind those measuring the main outcomes of the intervention? (yes = 1; no/unable to determine = 0. If the study is not an intervention study, then score 0.*
	16	*16. If any of the results of the study were based on "data dredging", was this made clear? (yes = 1; no/unable to determine = 0) Is there an a priori analysis plan and did they stick to it (yes = 1, no = 0)*
	17	*17. In trials and cohort studies, do the analyses adjust for different lengths of follow-up of patients, or in case-control studies, is the time period between the intervention and outcome the same for cases and controls? (yes = 1; no/unable to determine = 0). If the study design does not include follow-up (i.e. cross sectional) then score 0.*
	18	*18. Were the statistical tests used to assess the main outcomes appropriate? (yes = 1; no/unable to determine = 0). Test for normality = parametric statistics; if there is matching then the analysis needs to account for it (i.e. paired t-test, within pair differences, conditional regression etc.); assumptions for regression met.*
	19	*19. Was compliance with the intervention/s reliable? (yes = 1; no/unable to determine = 0): If the study is not an intervention study, then score 0.*
	20	*20. Were the main outcome measures used accurate (valid and reliable)? (yes = 1; no/unable to determine = 0). Need to comment and provide a reference for validity and reliability for main outcome. If the assessor is part of the measurement system, then referring to reliability in another study with a different assessor is not sufficient. In this case they need to show reliability in their measurement system.*
INTERNAL VALIDITY (CONFOUNDING)	21	*21. Were the patients in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited from the same population? (yes = 1; no/unable to determine = 0).*
	22	*22. Were study subjects in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited over the same period of time? (yes = 1; no/unable to determine = 0): If this is a cross-sectional study, score = 0.*
	23	*23. Were study subjects randomised to intervention groups? (yes = 1; no/unable to determine = 0): If the study is not an intervention study, then score 0.*
	24	*24. Was the randomised intervention assignment concealed from both patients and health care staff (delivering intervention) until recruitment was complete and irrevocable? (yes = 1; no/unable to determine = 0): If the study is not an intervention study, then score 0.*
	25	*25. Was there adequate adjustment for confounding in the analyses from which the main findings were drawn? (yes = 1; no/unable to determine = 0): Multivariate or stratified analyses = 1, other = 0.*
	26	*26. Were losses of patients to follow-up taken into account? (yes = 1; no/unable to determine = 0): Were participants and their data removed from the study and analyses at an appropriate time based on loss to follow-up (e.g. data is only included for the time points in which the participant was still in the study).*
POWER	27	*27. Did the study have sufficient power to detect a clinically important effect where the probability value for a difference being due to chance is less than 5%? (Size of smallest intervention group: <n1 = 0; n1-n2 = 1; n3-n4 = 2; n5-n6 =3; n7-n8 = 4; n8+ = 5): Need to state their a priori sample size calculation based on a power calculation. If power set at = 70% or less = 0, 80% = 1, 85% = 2, 90% = 3, 95% = 4, 99% = 5. If there is no a-priori sample size calculation or it is inadequate score 0.*

Light grey: removed for intervention and modifiable risk factor studies risk of bias score; dark grey: removed only for modifiable risk factor studies risk of bias score.

Approach to Semi-quantitative Grading of Recommendations Assessment, Development and Evaluation (GRADE)

Semi-quantitative syntheses involved rating the certainty of evidence for prevention strategies (interventions; Table S4a) or potential modifiable risk factors (Table S4b) using the GRADE[38] or modified GRADE approach[37] for pooled data (based on meta-analyses) with adaptations to assess non-pooled data across all six domains and considerations for upgrading.

Table S4a: Approach to Semi-quantitative GRADE for prevention interventions risk factors

Domain	Rating	Approach
Study Design	• +3 (no randomization) • +4 (randomization)	• no randomization to control for confounding • randomization to control for confounding
Methodological Weakness[a]	• -0 (no serious ROB) • -1 (serious ROB) • -2 (very serious ROB)	• ≤50% overall mean of DB[96] ROB items • 51-74% overall mean of DB[96] ROB items • ≥75% overall mean of DB[96] ROB items
Inconsistency	• 0 (consistent) • -1 (inconsistent)	• inconsistency was rated as present when estimates varied in direction, with minimal 95%CI overlap[38] • inconsistency was rated as absent when estimates were similar in direction with 95%CI overlap[38]
Indirectness	• 0 (direct) • -1 (indirect)	• indirectness was considered based on the reviews' aim, intervention description, control condition, and sample features[38] • Indirectness was rated as present if an intervention was assessed only in combined (FWG and MMB) samples and no FWG-specific estimates were reported[38]
Imprecision	• 0 (precise) • -1 (unclear) • -1 (imprecise)	• imprecision was rated as present when 95%CI were wide, there was a small sample size (~n<100) and/or small injury numbers (~n<20). • imprecision was rated as unclear if 95%CI were not reported • imprecision was rated as absent when 95%CI were narrow, there was a large sample size (~n≥100) and/or large injury numbers (~n≥20)
Publication Bias	• 0 (no bias) • -1 (unclear) • -1 (bias)	• publication bias was rated present when an intervention and injury outcome relationship was assessed, and either the estimate and p-value were not reported due to a lack of statistical significance[32] or, a moderate to large effect was reported based on a reasonably small (n<100) sample size[34]
Upgrading	• +2 (upgrade) • +1 (upgrade) • 0 (no upgrade)	• quality of evidence was upgraded for a consistent moderate (e.g., OR≥2) or large (e.g., OR≥5) effect,[53] or consistent evidence of an exposure-gradient response[32]
Overall Rating	• ≥5 (high certainty) • 3-4 (moderate certainty) • 2 (low certainty) • ≤1 (very low certainty)	• all domain ratings were considered when assigning an overall certainty of evidence rating[37] and a corresponding statement of confidence in the direction (considering consistency reported across studies) and magnitude of the intervention and injury relationship was generated

[a]A score was assigned for intervention studies based on 22-items (omitting items 1, 4, 6, 8) and for risk factor studies based on 16-items (omitting items 1, 4, 6, 8, 13-15, 17, 19, 23, 24, 27 for non-intervention studies) as appropriate. Consideration was given (no downgrading) if there were ≥2 phase 2 or 3 studies for a given risk factor with no serious limitations regardless of phase 1 studies with serious or very serious limitations.

CI (confidence interval), DB (Downs and Black Quality Assessment Tool), FWG (females, women and/or girls), MMB (males, men and/or boys), OR (odds ratio), ROB (risk of bias)

Table S4b: Approach to Semi-quantitative GRADE for potential modifiable risk factors

Domain	Rating	Approach
Study Design	• +2 (≥1 phase 1 study) • +3 (≥1 phase 2 study) • +4 (≥1 phase 3 study)	• Phase 1: exploratory design to identify associations[39] • Phase 2: explanatory design to test an independent prognostic/risk factor and outcome association[39] • Phase 3: explanatory design to understand or explain a prognostic/risk pathway[39]
Methodological Weakness[a]	• -0 (no serious ROB) • -1 (serious ROB) • -2 (very serious ROB)	• ≤50% overall mean of DB[96] ROB items • 51-74% overall mean of DB[96] ROB items • ≥75% overall mean of DB[96] ROB items
Inconsistency	• 0 (consistent) • -1 (inconsistent)	• inconsistency was rated as present when estimates varied in direction, with minimal 95%CI overlap[38] • inconsistency was rated as absent when estimates were similar in direction with 95%CI overlap[38]
Indirectness	• 0 (direct) • -1 (indirect)	• indirectness was based on the reviews' aim, risk factor definition and comparison, and sample features[38] • Indirectness was rated as present if a risk factor was assessed only in combined (FWG and MMB) samples and no FWG-specific estimates were reported[38]
Imprecision	• 0 (precise) • -1 (unclear) • -1 (imprecise)	• imprecision was rated as present if a sample size calculation for a risk factor and injury outcome relationship was not presented, or wide 95%CIs indicated important opposite directions of effect[37] • imprecision was rated as absent if there was an adequate sample size and narrow 95%CIs
Publication Bias	• 0 (no bias) • -1 (unclear) • -1 (bias)	• publication bias was rated present when a risk factor and injury outcome relationship was assessed, and either the estimate and p-value were not reported due to a lack of statistical significance[5] or, a moderate to large effect was reported based on a reasonably small (n≤100) sample size[34]
Upgrading	• +2 (upgrade) • +1 (upgrade) • 0 (no upgrade)	• quality of evidence was upgraded for a consistent moderate (e.g., OR≥2) or large (e.g., OR≥5) effect,[32] or consistent evidence of an exposure-gradient response[32]
Overall Rating	• ≥5 (high certainty) • 3-4 (moderate certainty) • 2 (low certainty) • ≤1 (very low certainty)	• All domain ratings were considered when assigning an overall certainty of evidence rating[37] and a corresponding statement of confidence in the direction (considering consistency reported across studies) and magnitude of the risk factor and injury relationship was generated

[a]A score was assigned for intervention studies based on 22-items (omitting items 1, 4, 6, 8) and for risk factor studies based on 16-items (omitting items 1, 4, 6, 8, 13-15, 17, 19, 23, 24, 27 for non-intervention studies) as appropriate. Consideration was given (no downgrading) if there were ≥2 phase 2 or 3 studies for a given risk factor with no serious limitations regardless of phase 1 studies with serious or very serious limitations.

DB (Downs and Black Quality Assessment Tool), FWG (females, women and/or girls), ROB (risk of bias)

Table S5: Characteristics of Prevention Studies by Prevention Type (n=20)

Author year **Country** **Study design**	**Participant characteristics** **Sport** **Sample characteristics**	**Definition of Upper Extremity Injury & Intervention**	**Results**	**Effect estimates** **(calculated point estimate where data allowed)**
			Exercise Interventions	
Achenbach 2018[53] Germany Cluster RCT	Handball Total: n=279 players IG: n=168 players CG: n=111 players FWG%: 62% Paediatric participants: yes	Injury: Shoulder, elbow/forearm, wrist/hand, finger, total UE (time loss, medical staff) Intervention: Shoulder exercise programme	**Aggregate Data – n, IR per 1000 hours** IG: Shoulder: 4, 0.15 Elbow/forearm: 3, 0.11 Wrist/hand: 4, 0.15 Finger: 5, 0.19 Total UE: 16, 0.61 CG: Shoulder: 2, 0.11 Elbow/forearm: 0, 0.00 Wrist/hand: 4, 0.22 Finger: 1, 0.06 Total UE: 7, 0.39	**Aggregate Data – IRR (95% CI)** Shoulder: 1.36 (0.20-15.09)^ Elbow/forearm: N/A Wrist/hand: 0.68 (0.13-3.66)^ Finger: 3.41 (0.38-161.35)^ Total UE: 1.56 (0.61-4.48)^
Achenbach 2022[41] Germany Cluster RCT	Handball Total: n=579 players IG: n=284 players CG: n=295 players FWG%: 45% Paediatric participants: yes	Injury: Shoulder and elbow (self report) Intervention: Shoulder exercise programme	**Women & Aggregate Data – Season Prevalence** *Women* IG: Elbow: 7/123 Severe elbow: 5/123 CG: Elbow: 12/136 Severe elbow: 10/136 *Aggregate* IG: Shoulder: 109/284 Severe shoulder: 90/284 Elbow: 20/284 Severe elbow: 16/284 CG: Shoulder: 106/295 Severe shoulder: 78/295 Elbow: 24/295 Severe elbow: 18/295	**Women & Aggregate Data – OR (95% CI, p-value)** *Women* Elbow: 0.583 (0.227-1.507, p=0.334)^ Severe elbow: 1.375 (0.563-3.392, p=0.496)^ *Aggregate* Shoulder: 0.987 (0.705-1.382, p=0.858)^ Severe Shoulder injuries: 1.158 (0.808-1.655, p=0.739)^ Elbow injuries: 0.833 (0.487-1.405, p=0.620)^ Severe Elbow injuries: 0.889 (0.487-1.628, p=0.811)^

Andersson 2017[42] Norway Cluster RCT	Handball Total: n=660 players IG: n=331 players CG: n=329 players FWG%: 49% Paediatric participants: no	Injury: Shoulder (all complaint, self report) Intervention: Shoulder exercise programme	**Aggregate Data – Average season prevalence (95% CI)** IG: Any overuse shoulder: 17% (16-19%) Substantial shoulder: 5% (4-6%) CG: Any overuse shoulder: 23% (21-26%) Substantial shoulder: 8% (7-9%)	**Aggregate Data – OR (95% CI, p-value)** Overuse shoulder: 0.72 (0.52-0.98, p=0.038)* Substantial shoulder: 0.78 (0.53-1.16, p=0.23) *Compliance (sessions per week)* Overuse shoulder 0.1-1.0/week: 0.49 (0.20-1.21, p=0.125) 1.1-2.0/week: 0.69 (0.27-1.75, p=0.435) >2.0/week: 0.58 (0.22-1.52, p=0.271) Substantial shoulder 0.1-1.0/week: 0.36 (0.16-0.82, p=0.02)* 1.1-2.0/week: 0.25 (0.10-0.60, p=0.002)* >2.0/week: 0.35 (0.15-0.82, p=0.02)*
Asker 2022[43] Sweden Cluster RCT	Handball Total: n=418 players IG: n=201 players CG: n=217 players FWG%: 45% Paediatric participants: yes	Injury: Shoulder (time loss & all complaint) Intervention: Shoulder exercise programme	**Female Data – IR per 1000 hours (95% CI)** IG: Shoulder injury: 0.32 (0.15-0.59)^ Time loss shoulder injury: 0.22 (0.09-0.46)^ Substantial shoulder problem: 0.48 (0.27-0.79)^ Any shoulder problems: 0.83 (0.54-1.22)^ CG: Shoulder injury: 0.57 (0.35-0.86)^ Time loss shoulder injury: 0.44 (0.25-0.70)^ Substantial shoulder problem: 0.67 (0.44-0.98)^ Any shoulder problem: 1.18 (0.87-1.58)^ **Aggregate Data – IR per 1000 hours (95% CI) or Prevalence (95% CI)** IG: Shoulder: IR 0.8 (0.5-1.2) Prevalence of any shoulder problem (average/week): 3% (1-7%) Prevalence of substantial shoulder injury (average/week): 1% (0-4%) CG: Shoulder: IR 1.8 (1.3-2.4) Prevalence of any shoulder problem (average/week): 8% (5-13%) Prevalence of substantial shoulder injury (average/week): 2% (1-5%)	**Female Data – IRR (95% CI, p-value)** Shoulder injury: 0.57 (0.24-1.25, p=0.18)^ Time loss shoulder injury: 0.51 (0.18-1.30, p=0.19)^ Substantial shoulder problem: 0.72 (0.35-1.41, p=0.39)^ Any shoulder problem: 0.70 (0.42-1.16, p=0.19)^ **Aggregate Data – HRR (95% CI, p-value)** Shoulder injury: 0.44 (0.29-0.68, p=<0.001)* Time-loss shoulder injury: 0.44 (0.30-0.65, p=<0.001)* Substantial shoulder problem: 0.51 (0.30-0.87, p=0.01)* Any shoulder problem: 0.49 (0.29-0.83, p=0.01)*
Broadbent 2016[44] Australia Quasi-experimental	Dragon boat paddlers Total: n=22 athletes IG: n=22 athletes CG: n=22 athletes FWG%: 100% Paediatric participants: no	Injury: Shoulder and wrist (self report) Intervention: Strengthening and stretching exercise programme	IG: NR CG: NR	**Female Data – p-value** Shoulder: p<0.001* Wrist: p=0.031

Ding 2023[54] China Cluster RCT	Multisport Total: 419 students IG: n=210 students CG: n=209 students FWG%: 46% Paediatric participants: yes	Injury: Upper extremity (medical attention and/or time loss) Intervention: Neuromuscular training warmup	**Aggregate Data – n, IR (95% CI)** IG: UE: 8, 1.19 (0.36-2.01) CG: UE: 15, 2.04 (1.01-3.07)	**Aggregate Data – IRR (95% CI, p-value)** UE injuries: 0.60 (0.25-1.44, p=0.254)
Østerås 2015[47] Norway Quasi-experimental	Handball Total: n=109 players IG: n=53 players CG: n=56 players FWG%: 100% Paediatric participants: yes	Injury: Shoulder (self report) Intervention: Strength training exercise programme	**Female Data – Prevalence** IG: Shoulder: 11% CG: Shoulder: 36%	**Female Data – Prevalence Ratio** Shoulder injury: 0.31
Sakata 2018[48] Japan Quasi-experimental	Baseball Total: n=354 players IG: n=160 players CG: n=194 players FWG%: 7% Paediatric participants: yes	Injury: Elbow and shoulder (self report and clinical assessment) Intervention: Exercise programme	**Aggregate Data – IR per 1000 AEs (n, prevalence)** IG: Elbow pain: 1.1 (15, 16.2%) Medial elbow injury: 0.8 (17, 12.5 High compliance: 0.5 Low compliance: 1.2 Throwing shoulder injury: 0.7 (15, 11%) CG: Elbow pain: 1.9 (47, 27.8%) Medial elbow injury: 1.7 (43, 25.4%) Throwing shoulder injury: 0.9 (22, 13%)	**Aggregate Data – HRR (95% CI)** *Intent-to-treat* Medial elbow injury: 0.58 (0.292-0.882)*^
Sakata 2019[49] Japan Cluster RCT	Baseball Total: n=237 players IG: n=117 players CG: n=120 players FWG%: 8% Paediatric participants: yes	Injury: Elbow and shoulder (self report and clinical assessment) Intervention: Exercise programme	**Aggregate Data – IR per 1000 AEs (n, prevalence)** IG: Elbow injury: 1.2 (18, 16.5%) High compliance: 1.2 Low compliance: 3.3 Shoulder injury: 0.6 (9, 8.3%) CG: Elbow injury: 2.1 (29, 26.4%) Shoulder injury: 1.2 (38, 34.5%)	**Aggregate Data – HRR (95% CI)** *Intent-to-treat* Elbow and shoulder injury: 0.52 (0.31-0.85)* Shoulder injury: 0.56 (0.21-1.08) Elbow injury: 0.56 (0.31-1.01) *Per Protocol* High vs low compliant players: 0.43 (0.19-0.98)*

Tooth 2023[51] Belgium RCT	Volleyball Total: n=93 players IG: n=50 players CG: n=43 players FWG%: 53% Paediatric participants: yes	Injury: Shoulder (self report) Intervention: Exercise programme	**Female and Aggregate Data – Prevalence** *Female* IG: Shoulder: 16.0% CG: Shoulder: 20.8% *Aggregate* IG: Shoulder: 12.8% CG: Shoulder: 26.8%	**Female and Aggregate Data – RR (95% CI, p-value)** *Female* Shoulder injury: 0.768 (0.234-2.52, p>0.05) *Aggregate* Shoulder injury: 0.476 (0.193-1.173, p=0.096)
Verhagen 2023[50] Netherlands Quasi-experimental	Volleyball Total: n=518 players IG: n=282 players CG: n=236 players FWG%: 85% Paediatric participants: yes	Injury: UE (time loss) Intervention: Warm up programme	**Aggregate Data – IR or days lost per 1000 AE (95% CI)** IG: UE injuries: 0.61 (0.27-0.96) UE injury burden: 0.76 days lost (0.38-1.15) CG: UE injuries: 1.44 (0.84-2.04) UE injury burden: 2.03 days lost (1.32-2.75)	**Aggregate Data – HR (95% CI)** UE injuries: 0.41 (0.20-0.83)* Relative burden: 0.38 (0.20-0.70)
von Gerhardt[52] 2023 Netherlands Cluster RCT	Judo Total: n=269 players IG: n=117 athletes CG: n=152 athletes FWG%: 32% Paediatric participants: yes	Injury: Shoulder (self report) Intervention: Warm up programme	**Aggregate Data – Prevalence** IG: Shoulder: 3% CG: Shoulder: 5%	**Aggregate Data – OR** Shoulder injury: 0.6^
Equipment Interventions				
Bowers 2008[59] USA Cohort (historical)	Field Hockey, Ice Hockey, Lacrosse Total: N=146 schools IG: N=40 schools CG: N=106 schools FWG%: NR Paediatric population: no	Injury: Hand and phalangeal (medical attention and/or time loss) Intervention: Wearing gloves	**Aggregate Data - IR per 1000 AE** IG: Hand injury: 0.482 Hand Fracture: 0.214 Phalangeal injury: 0.412 Phalangeal fracture: 0.130 CG: Hand injury: 0.227 Hand Fracture: 0.111 Phalangeal injury: 0.098 Phalangeal fracture: 0.032	**Aggregate Data – OR (95% CI, p-value)** Hand injury: 2.12 (1.86-2.41, p<0.01)* Hand Fracture: 1.93 (1.60-2.34, p<0.01)* Phalangeal injury: 4.19 (3.56-4.92, p<0.01)* Phalangeal fracture: 4.04 (3.04-5.36, p<0.01)*

Falvey 2013[60] Reland Cohort (historical)	Hurling Total: n=163 players IG: n=57 players CG: n=106 players FWG%: 10% Paediatric population: yes	Injury: Hand (emergency department visit) Intervention: Not wearing a helmet with faceguard	**Aggregate Data – Number of injuries** IG: Hand injury: 26 CG: Hand injury: 74	**Aggregate Data – OR (95% CI, p-value)** Hand injury: 0.32 (0.15-0.66, p=0.002)*^
Kaplan 2014[45] Israel Quasi-experimental	American Flag Football Total: n=1470 players IG: n=724 players CG: n=746 players FWG%: 16% Paediatric population: no	Injury: Finger (time loss) Intervention: No pockets allowed in pants	IG: NR CG: NR	**Aggregate Data – p-value** Finger/thumb injury: p<0.05*
Kaplan 2016[46] Israel Quasi-experimental	American Flag Football Total: n=2669 players IG: n=1257 players CG: n=1412 players FWG%: 16% Paediatric population: no	Injury: Finger (time loss) Intervention: No pockets allowed in pants	**Aggregate Data – n, IR (95% CI)** IG: Finger: 12, 0.01 (0.004-0.01) CG: Finger: 22, 0.02 (0.01-0.02)	**Aggregate Data – IRR (p-value)** Finger injury: 0.5^ (p<0.05)*
Rules/Policy Interventions				
Emery 2010[55] Canada Cohort (prospective)	Ice Hockey Total: n=2154 players IG: n=1046 players CG: n=1108 players FWG%: 2% Paediatric population: yes	Injury: Shoulder/clavicle, arm/elbow/forearm, and wrist/hand (medical attention and/or time loss) Intervention: Body checking policy	**Aggregate Data – IR per 1000 Game hours (95% CI)** IG: Shoulder/clavicle: 0.04 (0.01-0.15) Arm/elbow/forearm: 0.04 (0.01-0.15) Wrist/hand: 0.04 (0.01-0.16) CG: Shoulder/clavicle: 0.44 (0.26-0.75) Arm/elbow/forearm: 0.16 (0.08-0.34) Wrist/hand: 0.16 (0.08-0.31)	**Aggregate Data – IRR** Shoulder/clavicle: 0.09^ Arm/elbow/forearm: 0.25^ Wrist/hand: 0.25^
Emery 2020[56] Canada Cohort (prospective)	Ice Hockey Total: n=1004 players IG: n=396 players CG: n=608 players FWG%: 2% Paediatric population: yes	Injury: Shoulder/clavicle, arm/elbow/forearm, and wrist/hand (medical attention and/or time loss) Intervention: Body checking policy	**Aggregate Data – n, IR per 1000 Game hours (95% CI)** IG: Shoulder/clavicle: n=0, 0.00 (0-0) Arm/elbow/forearm: n=3, 0.24 (0.05-0.71) Wrist/hand: n=1, 0.08 (0.00-0.63) CG: Shoulder/clavicle: n=12, 0.51 (0.00-1.52) Arm/elbow/forearm: n=3, 0.13 (0.03-0.38) Wrist/hand: n=10, 0.43 (0.00-1.35)	**Aggregate Data – IRR (95% CI)** Shoulder/clavicle: N/A Arm/elbow/forearm: 1.89 (0.25-14.08)^ Wrist/hand: 0.19 (0.01-1.33)^

Emery 2022[57] Canada Cohort (prospective)	Ice Hockey Total: n=1127 player seasons IG: n=453 player seasons CG: n=674 player seasons FWG%: 1% Paediatric population: yes	Injury: Shoulder/clavicle, arm/elbow/forearm, and wrist/hand (medical attention and/or time loss) Intervention: Body checking policy	**Aggregate Data – n, IR per 1000 Game hours (95% CI)** IG: Shoulder/clavicle: n=2, 0.13 (0.02-0.48) Arm/elbow/forearm: n=1, 0.07 (0.00-0.37) Wrist/hand: n=2, 0.13 (0.02-0.48) CG: Shoulder/clavicle: n= 38, 1.46 (1.03-2.00) Arm/elbow/forearm: n= 8, 0.31 (0.13-0.06) Wrist/hand: n= 21, 0.81 (0.50-1.23)	**Aggregate Data – IRR (95% CI)** Shoulder/clavicle: 0.09 (0.01-0.35)*^ Arm/elbow/forearm: 0.22 (0.05-1.61)^ Wrist/hand: 0.16 (0.02-0.67)*^
Gibson 2023[58] Canada Cohort (prospective)	Ice Hockey Total: n=6398 players IG: n=3214 players CG: n=3184 players FWG%: 9% Paediatric population: yes	Injury: Shoulder (medical attention and/or time loss) Intervention: Body checking policy	**Aggregate Data – number of injuries** IG: 17 shoulder injuries CG: 113 shoulder injuries	**Aggregate Data – IRR (95% CI)** Shoulder: 0.17 (0.09-0.33)*

*Indicates significant finding; ^calculated from data provided; IG: Intervention group; CG: Control Group; FWG: Female, woman, and/or girl; RCT: Randomized control trial; OR: Odds ratio; CI: Confidence interval; RR: Risk ratio; IR: Incidence rate; IRR: Incidence rate ratio; NR: Not reported; AE: Athletic exposures; UE: Upper extremity.

Table S6: Characteristics of Modifiable Risk Factor Studies (n=35)

Author year **Country** **Study design**	**Participant characteristics** **Sport** **Sample characteristics**	**Definition of Upper Extremity Injury & Intervention**	**Results**	**Effect estimates** **(calculated point estimate where data allowed)**
Achenbach 2020[61] Germany Cohort (prospective)	Handball Total: n=138 players IG: n=16 players UG: n=122 players FWG%: 49% Paediatric population: yes	Injury: Shoulder (overuse, self report) MRF: ROM, Scapular dyskinesia, strength and function	**Aggregate Results - Mean + SD or absolute frequencies (%)** IG: <u>Absolute muscle strength</u> Isometric ER (N): 119 ±32 Eccentric ER (N): 219±52 <u>Normalised muscle strength</u> Isometric ER (N/kg): 1.8±0.4 Eccentric ER (N/kg): 3.2±0.7 Eccentric ER < 2.90 N/kg: 6 (38%) <u>Ratio of ER:IR muscle strength</u> Isometric ER: isometic IR: 0.70±0.15 Isometric ER:isometric IR <0.75: 11 (69%) Eccentric ER:isometric IR: 1.32±0.22 Eccentric ER:isometric IR < 1.30: 10 (63%) <u>Passive glenohumeral range of motion</u> ER gain (°): 12 ± 8 ER gain > 7.5°: 13 (81%) GIRD (°): 3 ± 6 GIRD > 7.5°: 6 (38%) TROM gain (°): 8 ± 9 UG: <u>Absolute muscle strength</u> Isometric ER (N): 133 ± 30 Eccentric ER (N): 219 ± 46 <u>Normalised muscle strength</u> Isometric ER (N/kg): 2.1 ± 0.5 Eccentric ER (N/kg): 3.4 ± 0.6 Eccentric ER < 2.90 N/kg: 17 (14%) <u>Ratio of ER:IR muscle strength</u> Isometric ER: isometic IR: 0.84 ± 0.19 Isometric ER:isometric IR <0.75: 45 (37%) Eccentric ER:isometric IR: 1.38 ± 0.22 Eccentric ER:isometric IR < 1.30: 44 (36%) <u>Passive glenohumeral range of motion</u> ER gain (°): 8 ± 14 ER gain > 7.5°: 58 (47%) GIRD (°): 4 ± 11 GIRD > 7.5°: 41 (33%) TROM gain (°): 4 ± 18	**Women & Aggregate Results – OR (95% CI, p-value)** *Women* <u>Normalised muscle strength</u> Eccentric ER < 2.90 N/kg: 1.38 (0.1–13.3, n.s.) <u>Passive glenohumeral range of motion</u> GIRD > 7.5°: 12.50 (1.4–114.6, 0.014)* ER gain > 7.5°: 15.20 (1.1–185.3, 0.025)* *Aggregate* <u>Absolute muscle strength</u> Isometric ER (N): 10.70 per 10 N (1.2–95.6, 0.034)* Eccentric ER (N): 1.00 (0.9–1.1, n.s.) <u>Normalised muscle strength</u> Isometric ER (N/kg): 1.2 (1.0–1.4, 0.015)* per 0.1 N/kg Eccentric ER (N/kg): 0.56 (0.2–1.6, n.s.) Eccentric ER < 2.90 N/kg: 3.53 (1.1–11.8, 0.047)* <u>Ratio of ER:IR muscle strength</u> Isometric ER: isometic IR: 1.20 (1.1–1.5, 0.012)* (per 0.1) Isometric ER:isometric IR <0.75: 4.29 (1.3–14.5, 0.019)* Eccentric ER:isometric IR: 1.22 (0.8–1.9, n.s.) Eccentric ER:isometric IR < 1.30: 3.20 (1.0–10.1, 0.047)* <u>Passive glenohumeral range of motion</u> ER gain (°): 1.0 (1.0–1.1, n.s.) ER gain > 7.5°: 4.1 (1.1–15.4, 0.045)* GIRD (°): 1.00 (0.9–1.1, n.s.) GIRD > 7.5°: 1.00 (0.4–3.5, n.s.) TROM gain (°): 0.99 (1.0–1.0, n.s.) <u>Scapular Dyskinesia</u> OR 1.1, n.s

Andersson 2018[62] Norway Cohort (prospective)	Handball Total: n=329 players IG: NR UG: NR FWG%: 49% Paediatric population: no	Injury: Shoulder (overuse, self report) MRF: ROM, strength and function, scapular dyskinesis	IG: NR UG: NR	**Aggregate Data – OR (95% CI)** Total rotation: 1.05 per 5° change (0.98-1.13) Greater IR: 1.16 per 5° change (1.00-1.34)* ER strength: 1.05 per 10N change (0.92-1.20) Obvious scapular dyskinesis: 1.23 (0.25-5.99)
Asker 2020[63] Sweden Cohort (prospective)	Handball Total: n=344 players IG: n=296 players UG: n=48 players FWG%: 59% Paediatric population: yes	Injury: Dominant shoulder (first incidence, self report) MRF: ROM, strength and function, scapular dyskinesis	IG: NR UG: NR	**Female Results - Crude HRR, Adjusted HRR (playing position) (95% CI)** <u>Strength, N/kg</u> Isometric ER: 2.37 (1.03, 5.45), 2.37 (1.03, 5.44)* Isometric IR: 2.43 (1.06, 5.58), 2.44 (1.06, 5.61)* Eccentric ER: 1.25 (0.58, 2.71), 1.21 (0.57, 2.62) Isometric abduction: 1.14 (0.53, 2.47), 1.10 (0.50, 2.38) Isometric ER/isometric IR <0.75: 0.87 (0.40, 1.87), 0.85 (0.39, 1.83) Eccentric ER/isometric IR <0.75: 0.45 (0.11, 1.88), 0.41 (0.10, 1.73) <u>ROM, deg</u> ER: 0.71 (0.33, 1.55), 0.74 (0.34, 1.62) IR: 1.56 (0.70, 3.51), 1.59 (0.70, 3.54) Total ROM: 0.70 (0.32, 1.53), 0.70 (0.32, 1.53) Total ROM (dominant/nondominant):1.21 (0.56, 2.62), 1.30 (0.59, 2.83) <u>Scapular dyskinesis</u> During flexion: 0.50 (0.17, 1.45), 0.49 (0.17, 1.44) During abduction: 1.65 (0.39, 6.98), 1.53 (0.36, 6.52) <u>Join position sense</u> Mean error from target angle: 1.06 (0.49, 2.29), 1.06 (0.49, 2.29)
Augustsson 2023[85] Sweden Cross-sectional	Padel Total: n=274 players IG: n=NR (222 UE injuries) UG: n=NR FWG%: 38% Paediatric population:	Injury: Shoulder, hand/wrist/forearm, elbow (time loss) MRF: Equipment	IG: NR UG: NR	**Female Data – P-value** Racket shape (Round vs diamond and teardrop) – hand injury: 0.02* Racket type (soft vs hard) – hand injury: 0.04* Racket type (soft vs hard) – elbow injury: 0.01* Racket weight – elbow injury: 0.64

Biese 2021[64] USA Cross-sectional	Multisport Total: n=412 players IG: n=22 players UG: n=390 players FWG%: 59% Paediatric population: no	Injury: UE (self report) MRF: Sport Specialization	**Aggregate Data – n (%)** IG: Same high school and club sport? Yes - UE overuse: 18 (5%) / UE acute: 17 (5%) No - UE overuse: 2 (3%) / UE acute: 5 (8%) High school multisport athlete? Yes - UE overuse: 15 (5%) / UE acute: 17 (5%) No - UE overuse: 5 (6%) / UE acute: 5 (6%) Number of highly specialized years in high school 0 - UE overuse: 11 (5%) / UE acute: 10 (5%) 1–2 - UE overuse: 4 (8%) / UE acute: 3 (6%) 3–4 - UE overuse: 5 (4%) / UE acute: 8 (6%) UG: Same HS and club sport? Yes - No UE overuse: 327 (95%) / UE acute: 328 (95%) No - No UE overuse: 65 (97%) / UE acute: 62 (92%) HS multisport athlete? Yes - No UE overuse: 310 (95%) / UE acute: 308 (95%) No - No UE overuse: 82 (94%) / UE acute: 82 (94%) Number of highly specialized years in HS 0 - No UE overuse: 199 (95%) / UE acute: 200 (95%) 1–2 - No UE overuse: 48 (92%) / UE acute: 49 (94%) 3–4 - No UE overuse: 129 (96%) / UE acute: 126 (94%)	**Aggregate Data – p-value** Same HS and club sport UE overuse: 0.462/ UE acute: 0.364 HS multisport athlete UE overuse: 0.663 / UE acute: 0.849 Number highly specialized years in HS UE overuse: 0.533/ UE acute: 0.876

Croteau 2021[65] Canada Cohort (prospective)	Water Polo Total: n=39 athletes IG: n=19 athletes UG: n=20 athletes FWG%: 51% Paediatric population: no	Injury: Shoulder (medical attention) MRF: ROM, strength and function, scapular dyskinesis	**Aggregate Data** IG: <u>ROM (degrees)</u> ER: 104.9 IR: 49.9 Total Rotation: 154.8 ER Gain: 7.7 IR Loss :9.8 <u>Strength (Nm/kg)</u> ER: 0.40 IR: 0.59 ER/IR: 0.68 <u>Scapular alignment (degrees)</u> Upward Rotation (UR): 13.0 UG: <u>ROM (degrees)</u> ER: 105.1 IR: 54.4 Total Rotation: 160.0 ER Gain: 5.0 IR Loss: 4.0 <u>Strength (Nm/kg)</u> ER: 0.41 IR: 0.56 ER/IR: 0.74 <u>Scapular alignment (degrees)</u> Upward Rotation (UR): 10.4	**Aggregate Data – Effect size (g) (95% CI, p-value)** <u>ROM (degrees)</u> ER: -0.02 (-0.65-0.62, 0.96) IR: -0.45 (-1.09-0.19, 0.16) Total Rotation: -0.37 (-1.01-0.27, 0.24) ER Gain: 0.31 (-0.33-0.95, 0.33) IR Loss: 0.68 (0.03-1.33)* <u>Strength (Nm/kg)</u> ER: -0.14 (-0.77-0.50, 0.92) IR: 0.18 (-0.46-0.81, 0.52) ER/IR: -0.61 (-1.26-0.04, 0.09) <u>Scapular alignment (degrees)</u> Upward Rotation (UR): 0.81 (0.15-1.47, 0.01)*
Drigny 2021[66] France Cohort (prospective)	Swimming Total: n=16 athletes IG: n=9 athletes UG: n=7 athletes FWG%: 44% Paediatric population: yes	Injury: Shoulder (medical attention and/or time loss) MRF: Strength and function	IG: NR CG: NR	**Aggregate Data – Relative risk (95% CI)** conER:conIR <0.66: 1.71 (0.47-6.30) eccER;eccIR <0.66: 5.83 (0.92-37.08;) eccER:conIR <0.68: 4.50 (1.33-15.28)* eccIR:conER >1.37: 3.75 (0.89-11.48) Global muscular imbalance (> or = 2 criteria): 3.20 (0.89-11.48)

Edouard 2013[67] France Cohort (prospective)	Handball Total: n=16 players IG: n=9 players UG: n=7 players FWG%: 100% Paediatric population: yes	Injury: Shoulder (time loss) MRF: Strength and function	**Female Data – IR per 1000 training hours or mean + SD (range)** IG: NR UG: NR	**Female Data - Relative Risk of Shoulder Injury (95% CI)** <u>Dominant Side Deficit:</u> In concentric (at 60, 120 or 240 °/s): 1.88 (0.71-3.04) in eccentric (at 60 °/s): 1.24 (0.76-1.72) <u>Conventional Ratios:</u> ERcon/IRcon at 60 °/s <0.63: 1.76 (0.95-2.57) ERcon/IRcon at 120 °/s <0.64: 1.24 (0.76-1.72) ERcon/IRcon at 240 °/s <0.69: 2.57 (1.60 -3.54)* <u>Functional Ratios:</u> ERecc/IRcon at 60 °/s <0.67: 1.50 (0.83 - 2.17) IRecc/ERcon at 60 °/s >1.61: 2.08 (1.18-2.98)* <u>Muscle Imbalance Criteria: at least 2 of the previous parameters:</u> 2.57 (1.60 - 3.54)*
Gosheger 2003[68] Germany Cohort (historical)	Golf Total: n=1406 IG: n=688 players UG: n=718 players FWG%: 27% Paediatric population: yes	Injury: Shoulder (self report) MRF: Equipment	IG: NR UG: NR	**Aggregate Data – p-value** Carrying own bag (regularly): <0.05*

Griffin 2020[69] Australia Cross-sectional	Paddle Sports Total: n=583 paddlers IG: NR UG: NR FWG%: 21% Paediatric population: yes	Injury: Shoulder, wrist (self report) MRF: ROM, training load, equipment	**Aggregate Data - Injuries/1000h (95% CI) by injury location (shoulder & wrist):** IG: <u>Flexibility (sit and reach)</u> mid shin: shoulder: 29.3(21.3-40.5); wrist: 19.0 (12.8-28.4) toes: shoulder: 26.4 (21.1-33.1); wrist: 15.5 (11.5-20.8) <u>Flexibility (thoracic rot right) 0-60 degrees:</u> shoulder: 30.3 (24.2-37.8); wrist: 18.1 (13.5-24.1) <u>Flexibility (thoracic rot left) 0-60 degrees:</u> shoulder: 29.3 (23.5-36.6); wrist: 16.0 (11.8-21.5) <u>On water training</u> 0-3hours/week: Shoulder: 36.0 (26.5-48.8); wrist: 16.7 (10.6-26.1) 3.01-8 h/week: shoulder: 29.7 (24.4-36.2); wrist: 16.7(12.8-21.6) <u>Off water training</u> ≤5: Shoulder: 36.7 (30.1-44.7); wrist: 20.2 (15.5-26.4) <u>Off water strength training</u> 0 h/week: shoulder: 31.3 (23.8-41.2); wrist=21.5 (15.4-29.9) 1-2 h/week: shoulder: 31.4 (24.7-40.0); wrist: 12.8 (8.8-18.7) <u>Off water aerobic training</u> 0 h/week: shoulder: 42.9 (30.8-59.8); wrist: 23.3 (14.9-36.5) 1-2 h/week: shoulder: 30.5 (24.3-38.3); wrist: 16.3 (11.9-22.2) <u>Off water stretch training</u> 0 h/week: shoulder: 31.5 (25.2-39.2); wrist: 17.9 (13.4-24.0) 1 h/week: shoulder: 28.2 (22.1-36.0); wrist: 14.5 (10.3-20.4) <u>Training surface:</u> ocean: shoulder=26.3 (20.2-34.2); wrist=12.4 (8.5-18.3) <u>Paddle offset angle</u> 0-30: shoulder: 24.1 (15.2-38.2); wrist: 16.0 (9.1-28.2) 31-60: shoulder: 28.5 (22.6-36.0); wrist: 14.3 (10.5-19.8) <u>Paddle length to heigh ratio</u> <1.1: shoulder: 28.9(17.4-47.9); wrist: 13.5 (6.4-28.2) 1.11-1.25: shoulder: 28.5(23.8-34.2); wrist:16.6 (13.1-21.0) UG: <u>Flexibility (sit and reach)</u> beyond toes: shoulder: 25.6 (20.2-32.4); wrist: 10.4 (7.2-15.0) <u>Flexibility (thoracic rot right) >61 degrees:</u> shoulder: 24.6 (20.3-29.9); wrist: 11.8 (9.0-15.7) <u>Flexibility (thoracic rot left) >61 degrees:</u> shoulder: 24.8 (20.4-30.1); wrist: 12.9 (9.9-16.9) <u>On water training</u> >8hours/week: Shoulder: 17.4 (12.8-23.7); wrist: 9.1 (6.0-14.0) <u>Off water training</u> >5: Shoulder: 20.1 (16.2-24.9); wrist: 10.2 (7.5-13.8) Off water strength training	**Aggregate Data - RR Adjusted for on-water training hours (95% CI) by injury location (shoulder & wrist)** <u>Flexibility (sit and reach)</u> mid shin: shoulder: 1.15 (0.77-1.71); wrist: 1.83 (1.06-3.16)* toes: shoulder: 1.03 (0.75-1.43); wrist: 1.49 (0.93-2.40) <u>Flexibility (thoracic rot right) 0-60 degrees:</u> shoulder: 1.23 (0.91-1.65); wrist: 1.53 (1.02-2.28)* <u>Flexibility (thoracic rot left) 0-60 degrees:</u> shoulder: 1.18 (0.88-1.59); wrist: 1.24 (0.83-1.85) <u>On water training</u> 0-3hours/week: shoulder: 2.07 (1.71-2.47)*; wrist: 1.82 (0.98-3.39) 3.01-8 h/week: shoulder: 1.71 (1.18-2.47); wrist: 1.82 (1.10-3.01)* <u>Off water training</u> ≤5: Shoulder: 1.83 (1.36-2.45)*; wrist: 1.99 (1.33-2.98)* <u>Off water strength training</u> 0 h/week: shoulder: 1.50 (1.04-2.17)*; wrist: 1.94 (1.21-3.10)* 1-2 h/week: shoulder: 1.50 (1.06-2.12)*; wrist: 1.16 (0.70-1.91) <u>Off water aerobic training</u> 0 h/week: shoulder: 2.13 (1.14-3.20)*; wrist: 2.22 (1.28-3.86)* 1-2 h/week: shoulder: 1.52 (1.10-2.10)*; wrist: 1.55 (0.99-2.43) <u>Off water stretch training</u> 0 h/week: shoulder: 1.68 (1.14-2.46)*; wrist: 2.01 (1.16-3.47)* 1 h/week: shoulder: 1.50 (1.00-2.23); wrist: 1.63 (0.92-2.90) <u>Training surface</u> ocean: shoulder: 0.99 (0.71-1.36); wrist: 0.86 (0.54-1.35) <u>Paddle offset angle</u> 0-30: shoulder: 0.87 (0.52-1.45); wrist: 1.12 (0.58-2.13) 31-60: shoulder: 1.03 (0.74-1.43); wrist: 0.99 (0.62-1.56) <u>Paddle length to heigh ratio</u> <1.1: shoulder: 1.14 (0.61-2.12); wrist: 1.45 (0.56-3.74) 1.11-1.25: shoulder: 1.13 (0.76-1.69); wrist: 1.79 (0.95-3.38)

Guermont 2023 France Cohort (prospective)	Badminton Total: n=19 players IG: n=8 players UG: n=11 players FWG%: 32% Paediatric population: yes	Injury: Shoulder (medical attention and/or time loss) MRF: ROM, strength and function	**Aggregate Data – Mean (SD)** IG: GIRD: 14.00 (3.46) eccER:conIR (FR_{240}): 0.68 (0.11) UG GIRD 9.05 (5.30) eccER:conIR (FR240): 0.84 (0.16)	**Aggregate Data – Effect estimate (p-value) (Multiple logistic regression)** GIRD: G^2 =12.45 (< .001)* FR_{240}: G^2 = 6.38 (0.012)*
Hadžić 2022[71] Slovenia Cohort (prospective)	Volleyball Total: n=181 players IG: n=15 players UG: n=166 players FWG%: 45% Paediatric population: no	Injury: Shoulder (NR) MRF: Strength and function	**Women Data – Mean (SD)** IG: D IR: 0.56 Nm/kg (0.01) ND IR: 0.58 Nm/kg (0.11) D ER: 0.37 Nm/kg (0.06) ND ER: 0.36 Nm/kg (0.03) Strength ratio D: 0.67 (0.11) Strength ratio ND: 0.85 (0.35) UG: D IR: 0.58 Nm/kg (0.11) ND IR: 0.55 Nm/kg (0.09) D ER: 0.42 Nm/kg (0.08) ND ER: 0.38 Nm/kg (0.07) Strength ratio D: 0.74 (0.15) Strength ratio ND: 0.71 (0.14)	**Aggregate Data – Exp (B) (95% CI, p-value) controlled for sex and previous injury** Strength ratio ER/IR: Exp (B) = 0.217 (0.058–0.811, 0.023)*
Hams 2019a[72] Australia Cohort (prospective)	Water Polo Total: n=76 players IG: n=14 players UG: n= 62 players FWG%: 63% Paediatric population: yes	Injury: Shoulder (medical attention) MRF: ROM, strength and function	**Aggregate Data – Mean (SD)** IG: Total ROM difference: 17.22° (30.43) D ER ROM: 97.22° (21.67) ND ER ROM: 96.67° (6.61) GIRD: 17.78° (16.22) D ER %BW: 11.7 (2.4) D IR %BW: 16.5 (3.0) IR strength: 14.60 (4.60) ER strength: 9.82 (2.35) ER/IR Ratio: 0.70 (0.14) UG: Total ROM difference: 0.81° (13.34) D ER ROM 105.89° (12.76) ND ER ROM: 97.02° (10.50) GIRD: 9.84° (12.67) D ER %BW: 14.5 (2.8) D IR %BW: 21.6 (4.9) IR strength: 17.31 (4.57) ER strength: 11.31 (2.71) ER/IR Ratio: 0.67 (0.11)	**Aggregate Data – P-value** Total ROM difference: 0.05* D ER ROM: 0.30 ND ER ROM: 0.38 GIRD: 0.13 Dominant ER %BW: 0.95 D IR %BW: 0.03* IR strength: 0.01* ER strength: 0.17 ER/IR Ratio: 0.63

Hams 2019b[73] Australia Cohort (prospective)	Water Polo Total: n=15 players IG: n=NR UG: n=NR FWG%: 40% Paediatric population: yes	Injury: Shoulder (medical attention) MRF: Strength and function	**Aggregate Data – Mean** IG: <u>Mean Strength in neutral position (kgf)</u> IR: 14.56 ER: 10.29 ER:IR ratio: 0.72 *Mean strength as % of BMI* IR: 64.52 ER: 45.77 <u>Mean strength in 90-90 position (kgf)</u> IR: 9.26 ER: 7.35 ER:IR ratio: 0.81 *Mean strength as % of BMI* IR: 40.89 ER: 32.72 UG: <u>Mean strength in neutral position (kgf)</u> IR: 19.62 ER: 14.50 ER:IR ratio: 0.75 *Mean strength as % of BMI* IR: 80.72 ER: 59.54 <u>Mean strength in 90-90 position (kgf)</u> IR: 14.57 ER: 10.97 ER:IR ratio: 0.77 *Mean strength as % of BMI* IR: 60.11 ER: 45.27	**Aggregate Data – Effect estimate (p-value)** <u>Mean Strength in neutral position (kgf)</u> IR: F(1,13) = 8.58 (0.012)* ER: F(1,13) = 9.90 (0.008)* ER:IR ratio: n.s. *Mean strength as % of BMI* IR: n.s. ER: n.s. <u>Mean strength in 90-90 position (kgf)</u> IR: F(1,13) = 8.30 (0.013)* ER: F(1,13) = 8.19 (0.013)* ER:IR ratio: n.s. *Mean strength as % of BMI* IR: n.s. ER: n.s.

Harrington 2014[74] USA Cross-sectional	Swimming Total: n=37 athletes (74 shoulders) IG: n=26 shoulders UG: n=48 shoulders FWG%: 100% Paediatric population: no	Injury: Shoulder (self report) MRF: ROM, strength and function	**Female data – Mean, SD (range)** IG: ER ROM: 101.92, 7.84 (96.99 - 106.84) IR ROM: 69.25, 10.19 (63.65 - 74.86) Bridge prone (s): 84.87, 18.19 (69.17 - 100.57) Bridge dominant arm (s): 55.85, 16.56 (45.38 - 66.32) IR strength, %BW: 0.20, 0.03 (0.18-0.22) ER strength, %BW: 0.16, 0.03 (0.14-0.17) Scapular depression and ABD strength, %BW: 0.19, 0.04 (0.17-0.21) Scapular ADD strength, %BW: 0.19, 0.04 (0.17-0.21) Pectoralis rest, cm: 9.54, 0.49 (9.26 - 9.82) Pectoralis stretch, cm: 11.57, 0.59 (11.07 - 12.07) UG: ER ROM: 99.40, 8.65 (95.99 - 102.81) IR ROM: 64.96, 9.26 (61.08 - 68.84) Bridge prone (s): 88.95, 29.72 (78.07 - 99.83) Bridge dominant arm (s): 58.55, 18.4 (51.30 - 65.81) IR strength, %BW: 0.20, 0.03 (0.19-0.21) ER strength, %BW: 0.16, 0.02 (0.15-0.17) Scapular depression and ABD strength, %BW: 0.20, 0.04 (0.18-0.21) Scapular ADD strength, %BW: 0.20, 0.03 (0.19-0.22) Pectoralis rest, cm: 10.07, 0.47 (9.88 - 10.27) Pectoralis stretch, cm: 12.25, 0.96 (11.91 - 12.60)	**Female data – Effect size (p-value)** <u>Dominant arm</u> ER ROM: 0.30 (0.40) IR ROM: 0.44 (0.21) IR strength: 0.11 (0.76) ER strength: 0.14 (0.68) <u>Non-dominant arm</u> ER ROM: 0.10 (0.76) IR ROM: 0.49 (0.16) IR strength: 0.09 (0.79) ER strength: 0.14 (0.71)

Heck 2021[75] USA Cohort (prospective)	Gymnastics Total: n=31 athletes IG: n=12 athletes UG: n=19 athletes FWG%: 100% Paediatric population: no	Injury: UE (medical attention and/or time loss) MRF: ROM, strength and function	**Female Data – Mean (SD)** IG: Wrist extension – D: 71.1 (11.5); ND: 67.8 (13.5) Elbow extension, degrees – D: –8.3 (6.3); ND: –9.3 (7.6) Shoulder ER, degrees – D: 102.4 (14.5); ND: 107.5 (17.8) Shoulder IR, degrees – D: 29.0 (8.9); ND: 30.6 (8.1) Shoulder flexion, degrees – D: 166.6 (16.1); ND: 167.2 (11.4) Shoulder ER strength, Nm – D: 10.9 (3.9); ND: 10.2 (3.5) Shoulder IR strength, Nm – D: 16.6 (4.9); ND: 17.3 (5.2) Shoulder scaption, kg – D: 4.6 (1.7); ND: 5.0 (1.8) Lower trapezius, kg – D: 2.2 (0.9); ND: 2.2 (0.8) Middle trapezius, kg – D: 2.3 (0.9); ND: 2.5 (0.8) Shoulder ER:IR ratio, % - D: 0.66 (0.12); ND: 0.61 (0.14) UG: Wrist extension – D: 62.5 (12.0); ND: 65.6 (16.7) Elbow extension, degrees – D: -7.4 (6.5); ND: -7.8 (8.8) Shoulder ER, degrees – D: 111.1 (13.7); ND: 104.3 (12.4) Shoulder IR, degrees – D: 30.9 (5.4); ND: 32.0 (5.7) Shoulder flexion, degrees – D: 170.5 (12.0); ND: 171.7 (9.3) Shoulder ER strength, Nm – D: 10.2 (2.9); ND: 9.8 (2.2) Shoulder IR strength, Nm – D: 17.0 (4.4); ND: 16.2 (4.8) Shoulder scaption, kg – D: 4.7 (2.1); ND: 4.7 (2.2) Lower trapezius, kg – D: 2.2 (1.2); ND: 2.3 (1.2) Middle trapezius, kg – D: 2.4 (1.1); ND: 2.3 (1.2) Shoulder ER:IR ratio, % - D: 0.60 (0.10); ND: 0.63 (0.11)	**Female Data – Cohens D, p-value** Wrist extension - D: 0.7, n.s.; ND: 0.1, n.s Elbow extension - D: 0.1, n.s.; ND: 0.2, n.s. Shoulder ER - D: 0.5, n.s.; ND: 0.3, n.s. Shoulder IR - D: 0.3, n.s.; ND: 0.2, n.s. Shoulder flexion - D: 0.3, n.s.; ND: 0.4, n.s. Shoulder ER strength - D: 0.2 n.s.; ND: 0.1 n.s. Shoulder IR strength - D: 0.1 n.s.; ND: 0.2 n.s. Shoulder scaption - D: 0.1 n.s.; ND: 0.2 n.s. Lower trapezius - D: < 0.1, n.s.; ND: 0.1 n.s. Middle trapezius - D: 0.1 n.s.; ND: 0.2 n.s. Shoulder ER:IR - D: 0.5, n.s.; ND: 0.2, n.s.
Hjelm 2012[76] Sweden Cohort (prospective)	Tennis Total: n=65 athletes IG: n=39 athletes UG: n=16 athletes FWG%: 36% Paediatric population: yes	Injury: UE (time loss) MRF: ROM, scapular dyskinesis, equipment, playing experience	**Aggregate Data – Mean (SD)** IG: Singles play, hours/week: 8.8 (6.8) Doubles play, hours/week: 1.6 (1.79) Total play, hours/year: 446 (331.7) Years of tennis play: 8.6 (3.39) UG: Singles play, hours/week: 3.8 (1.9) Doubles play, hours/week: 1.5 (1.33) Total play, hours/year: 246 (119.4) Years of tennis play: 8.0 (2.64)	**Aggregate Data – OR (95% CI, p-value), Adjusted OR (95% CI, p-value)** Years of tennis play: 0.8 (0.6–1.0, 0.041)*, 0.7 (0.6–1.0, 0.017)* Different shoes on different surfaces: 0.3 (0.1–1.0, 0.053), 0.2 (0.04–0.81, 0.026)* Difference between D and ND side in dorsal flexion of the wrist: 3.1 (0.9–11.0, 0.080) Difference between D and ND side in scapular winging: 2.8 (0.9–9.2, 0.088)

Johansson 2022[77] Sweden Cohort (prospective)	Tennis Total: n=252 players IG: n=134 players UG: n=118 players FWG%: 56% Paediatric population: yes	Injury: Shoulder (self report) MRF: Training load, equipment, sleep	**Aggregate Data – Mean (SD)** IG: Quality of sleep: 7.6 (2.0) Number of hours of sleep/night: 7.7 (1.6) Number of matches in previous year: 75.9 (44.7) Hours/week of tennis training in previous year: 10.6 (4.0) Hours/week of fitness training in previous year: 4.2 (2.4) Normal racket tension: 23.8 (1.3) Regularly performing rotation exercises for shoulder: 65 (20) UG: Quality of sleep: 8.0 (1.7) Number of hours of sleep/night: 8.2 (1.5) Number of matches in previous year: 63.1 (33.7) Hours/week of tennis training in previous year: 9.4 (3.8) Hours/week of fitness training in previous year: 3.8 (2.5) Normal racket tension: 23.4 (1.3) Regularly performing rotation exercises for shoulder: 56 (152)	**Aggregate Data – p-value** Quality of sleep: 0.22 Number of hours of sleep/night: 0.08 Number of matches in previous year: 0.05 Hours/week of tennis training in previous year: 0.10 Hours/week of fitness training in previous year: 0.40 Normal racket tension: 0.11 Regularly performing rotation exercises for shoulder: 0.34 **Aggregate Data – HRR (95% CI) adjusted for age, sex, level of competition, number of days with training/match per week in the preceding 4 weeks** Accumulated external workload spikes in tennis training/match play: 1.26 (1.15-1.39)* Accumulated external workload spikes in fitness training: 1.18 (1.09-1.27)* Accumulated external workload spikes in fitness training and/or tennis training/match play: 1.22 (1.12-1.34)* Work load ratio (the ratio between number of training hours in the preceding 4 weeks and age) lower ratio (less than 0.9): 0.66 (0.36-1.21), higher ratio (greater than 1.1) 1.77 (0.39-1.54)
Lau 2023[78] Singapore Cross-sectional	Overhead sports Total: n=426 athletes IG: n=176 athletes UG: n=250 FWG%: 48% Paediatric population: yes	Injury: Shoulder, elbow (time loss) MRF: Training load	**Aggregate Data – n (%)** IG: <u>Weekly training hours 6-11</u> Overuse shoulder: 70 (30.0%), substantial: 12 (5.2%) Overuse elbow: 21 (8.8%), substantial: 9 (3.8%) <u>Weekly training hours >11</u> Overuse shoulder: 53 (39.3%), substantial: 16 (11.9%) Overuse elbow: 15 (11.5%), substantial: 3 (2.3%) UG: <u>Weekly training hours 1-5</u> Overuse shoulder: 13 (19.7%), substantial: 2 (3.0%) Overuse elbow: 4 (6.2%), substantial: 1 (1.5%)	**Aggregate Data – OR (95% CI)** Weekly training hours overuse shoulder 6-11: 1.74 (0.38-7.97) >11: 4.30 (0.96-19.30) Weekly training hours overuse elbow 6-11: 2.52 (0.31-20.22) >11: 1.50 (0.15-14.71)
Lear 2023[79] USA Cross-sectional	Softball Total: n=1309 players IG: n=254 players (high specialization) UG1: n=912 players (moderate specialization) UG2: n=143 players (low specialization) FWG%: 100% Paediatric population: yes	Injury: Shoulder, elbow (time loss) MRF: Sport specialization, training load	IG: NR UG: NR	**Female Data – adjusted OR (95% CI)** Playing >30 games per year: 1.74 (1.26-2.40)* Playing ≤8 months of softball per year: 4.00 (1.96-8.33)* Pitchers ≤8 months of softball per year: 3.03 (1.04-9.09)* High specialization: 2.33 (0.97-5.60) Moderate specialization: 0.39 (0.17-0.92)

Ling 2020[80] USA Cohort (prospective)	Gymnastics Total: n=100 athletes IG: n=78 athletes UG: n=22 females FWG%: 100% Paediatric population: no	Injury: UE (time loss) MRF: Strength and function, conditioning	IG: NR UG: NR	**Female Data- OR (95% CI, p-value)** Total score: 1.00 (0.95-1.05, 0.99) Rope climb: 1.05 (0.88-1.25, 0.57) Vertical jump: 1.07 (0.87-1.31, 0.54) Hanging Pikes: 0.93 (0.75-1.15, 0.50) Shoulder flexibility angle: 1.00 (0.90-1.11, 0.99) Agility Sprint time: 0.97 (0.77-1.22, 0.70) Over-grip pullups: 1.02 (0.84-1.24, 0.82) Split sum: 0.98 (0.87-1.10, 0.70) Push-ups: 1.06 (0.88-1.27, 0.55) 20-yard sprint: 0.93 (0.68-1.27, 0.65) 20-yard sprint: 0.93 (0.68-1.27, 0.65) Handstand hold time: 0.93 (0.84-1.02, 0.13)
Møller 2017[81] Denmark Cohort (prospective)	Handball Total: n=671 players (14684 weeks) IG: n=68 players UG: n=603 players FWG%: 44% Paediatric population: yes	Injury: Dominant shoulder (self report) MRF: ROM, strength and function, scapular dyskinesis, training load	**Aggregate Data – number of injuries** IG: <u>Changes in weekly handball load</u> 20–60% increase: 11 injuries, 2540 weeks at risk >60% increase: 15 injuries, 2239 weeks at risk UG: <u>Changes in weekly handball load</u> Min to 20% increase: 26 injuries, 7261 weeks at risk	**Aggregate Data – HR (95% CI, p-value)** Crude analysis: 20–60%: 1.22 (0.62-2.40) >60%: 1.91 (1.00-3.70) Adjusted analysis: Scapular normal control and dyskinesia 20-60%: 4.8 (1.3-18.3, 0.02)* >60%: 1.3 (0.4-3.7, 0.66) Rotational strength 0 degrees 20-60%: 0.8 (0.2-3.8, 0.77) >60%: 1.0 (0.3-3.3, 0.99) Rotational strength 30 degrees 20-60%: 4.0 (1.1-15.2, 0.04)* >60%: 4.2 (1.4-12.8, 0.01)* ABD strength 20-60%: 0.8 (0.2-2.9, 0.73) >60%: 1.1 (0.4-3.4, 0.84) Total ROM 20-60%: 1.9 (0.4-9.3, 0.42) >60%: 1.1 (0.4-3.4, 0.84) IR ROM 20-60%: 1.1 (0.1-9.1, 0.92) >60%: 0.8 (0.1-6.0, 0.80) ER ROM 20-60%: 0.7 (0.2-2.7, 0.61) >60%: 1.2 (0.4-3.8, 0.79) I:E ROM 20-60%: NA >60%: 0.8 (0.1-6.7, 0.87)

Muñoz 2022[82] Multi-country Cross-sectional	Padel Total: n=950 players IG: n=NR UG: n=NR FWG%: 15% Paediatric population: no	Injury: UE (self report) MRF: Sport specialization, training load, equipment, playing experience	**Aggregate Data – n (%)** IG: Hours/week: 0-3: 129(26.8%) 3-6hrs: 234 (48.5%) >6hrs: 119 (24.7%) Time practicing: <5yrs: 289(60.0%) ≥5 yrs: 193(40.0%) Play another sport: Yes: 351 (72.8%) No: 131 (27.2%) Padel racket shape: round: 121(25.1%) tear: 192 (39.8%) diamond: 169 (35.1%) Type of core: soft: 202 (41.9%) hard: 280 (58.1%) Padel racket weight: <350g: 82 (17.0%) ≥350g: 400 (83.0%) # of over grips: none or 1: 263 (54.6%) 2 or more: 219 (45.4%) Composition: glass fiber: 46(9.5%) carbon fiber: 346 (71.8%) unknown: 90 (18.7%) UG: Hours/week: 0-3: 163 (34.8%) 3-6hrs: 223 (47.6%) >6hrs: 82 (17.5%) Time practicing: <5yrs: 241 (51.5%) ≥5 yrs: 227 (48.5%) Play another sport: Yes: 334 (71.4%) No: 134 (28.6%) Padel racket shape: round: 140 (29.9%) tear: 176 (37.6%) diamond: 152 (32.5%) Type of core: soft: 221 (47.2%) hard: 247 (52.8%) Padel racket weight: <350g: 107 (22.9%) ≥350g: 361 (77.1%) # of over grips: none or 1: 279 (59.6%) 2 or more: 189 (40.4%) Composition:	**Aggregate Data – Chi-square, p-value, Cramer's V coefficient (Vc)** More than 6 hours/week: $X^2 = 10.831$, p=0.004, Vc =0.107* Fewer experience years: $X^2 = 6.895$, p=0.009, Vc = 0.085* No other significant differences found

Murphy 2020[83] Australia Cohort (prospective)	Cricket Total: n=115 athletes IG: n=14 athletes UG: n=111 athletes FWG%: 100% Paediatric population: no	Injury: Dominant shoulder (time loss) MRF: ROM, strength and function, scapular dyskinesis	**Female Data – mean ± (SD)** IG: 2 km Time Trial Speed (km/h): 13.0 ± 0.4 Bench Pull (kg): 53.2 ± 7.8 Shoulder Passive IR–Dom (°): 62.6 ± 18.3 Shoulder Passive ER–Dom (°): 105.3 ± 16.6 Total Shoulder Passive Rotation–Dom (°): 173.2 ± 20.8 Passive Shoulder IR Deficit: 10.2 ± 10.8 Shoulder IR Strength–Dom (N): 166.9 ± 38.4 Shoulder ER Strength–Dom (N): 137.9 ± 39.4 Shoulder IR: ER Strength Ratio–Dom: 1.2 ± 0.2 Hip ABD Strength–BF (N): 146.0 ±20.3 Hip ADD Strength–BF (N): 149.3 ± 29.0 Hip ADD: ABD Strength Ratio–BF: 1.0 ± 0.2 Hip FLE Strength–BF (N): 269.9 ± 51.2 Hip EXT Strength–BF (N): 298.4 ± 65.6 Hip FLE: EXT Strength Ratio–BF: 0.9 ± 0.2 Hypermobility: 2.1 ± 2.0 Scapula Dyskinesis: 3.0 ±1.5 Combined Elevation (cm): 23.5 ± 6.5 UG: 2 km Time Trial Speed (km/h): 13.3 ± 1.2 Bench Pull (kg): 52.8 ± 7.5 Shoulder Passive IR–Dom (°): 71.9 ± 20.5 Shoulder Passive ER–Dom (°): 105.0 ± 15.5 Total Shoulder Passive Rotation–Dom (°): 182.2 ±31.3 Passive Shoulder IR Deficit: 8.6 ± 14.0 Shoulder IR Strength–Dom (N): 167.0 ± 40.6 Shoulder ER Strength–Dom (N): 157.1 ± 39.1 Shoulder IR: ER Strength Ratio–Dom: 1.1 ± 0.2 Hip ABD Strength–BF (N): 164.2 ± 28.3 Hip ADD Strength–BF (N): 150.8 ± 40.4 Hip ADD: ABD Strength Ratio–BF: 0.9 ± 0.2 Hip FLE Strength–BF (N): 292.3 ± 53.5 Hip EXT Strength–BF (N): 292.8 ± 65.2 Hip FLE: EXT Strength Ratio–BF: 1.0 ± 0.3 Hypermobility: 2.1 ± 2.4 Scapula Dyskinesis: 3.3 ± 1.1 Combined Elevation (cm): 21.6 ± 7.9	**Female Data – OR (95% CI, p-value)** Un-adjusted Shoulder IR:ER rotation strength ratio:1.84 (1.16-2.93, 0.010)* Hip ABD strength: 0.97 (0.95-1.00, 0.049)* Hip ADD:ABD strength ratio: 1.44 (1.01-2.06, 0.047)* Adjusted OR (adjusted for the 3 significant results from univariate analysis): Shoulder IR:ER rotation strength: 1.79 (95% CI 1.12-2.88, 0.016)* No other significant results.
Paliobeis 2021[93] USA Cohort (prospective)	Multisport Total: n=3896 athletes IG: n=953 athletes UG: n=2943 athletes FWG%: 11% Paediatric population: yes	Injury: UE (athletic trainer identified) MRF: Training surface	**Aggregate Data – IR (per player; 95% CI)** IG (artificial turf): All sports: 0.0330 (0.0274-0.0386) UG (grass): All sports: 0.0228 (0.0181-0.0274)	**Aggregate Data – RR (95% CI)** All sports: 0.6899 (0.5286-0.9006)*

Post 2017[84] USA Case-control	Multisport Total: n=2011 participants IG: n=992 participants UG: n=946 participants FWG%: 49% Paediatric population: yes	Injury: UE (self report) MRF: Sport specialization, training load	**Aggregate Data – Mean (SD)** IG: <u>Specialization</u> Low: 211 (21.3) Moderate: 370 (37.3) High: 411 (41.4) Playing >8months (n(%)) – No: 206 (20.8); Yes; 786 (79.2) <u>Sport Volume</u> Hours/week: 16.0 (6.7) More hours/week of organized sports than age (n (%)) – No: 451 (45.5); Yes: 541 (54.5) Organized sport:free play ratio >2:1 (n(%)) – No: 430 (43.3); Yes: 562 (56.7) UG: <u>Specialization</u> Low: 279 (29.5) Moderate: 356 (37.6) High: 311 (32.9) Playing >8months (n(%)) – No: 314 (33.2); Yes; 632 (66.8) <u>Sport Volume</u> Hours/week: 14.5 (6.9) More hours/week of organized sports than age (n (%)) – No: 507 (53.6); Yes: 439 (46.4) Organized sport:free play ratio >2:1 (n(%)) – No: 428 (45.2); Yes: 518 (54.8)	**Aggregate Data - OR (95% CI, p-value) adjusted for sex, age and hours/week in organized sport** <u>Specialization:</u> Moderate: 1.46 (0.85-2.61, >0.05) High: 1.91 (1.14-3.35, <0.05)* Playing >8 months: 1.68 (1.06-2.80, <0.05)* <u>Volume Recommendations:</u> Organized sports >16 h/wk: 1.43 (0.98-2.09, >0.05) More hours/week of organized sports than age: 1.41 (0.97-2.08, >0.05) Organized sport:free play ratio >2:1: 0.83 (0.57-1.21, >0.05)
Sakata 2017[94] Japan Cohort (prospective)	Baseball Total: n=353 players IG: n=176 players UG: n=177 players FWG%: 7% Paediatric population: yes	Injury: Elbow (physiotherapist and ultrasonography) MRF: ROM, training load	**Aggregate Data – Mean (SD)** IG: # practices per week 3.9 (2.0) Passive shoulder total rotation of dominant side (degrees) 156.3 (11.9) UG: # practices per week 3.4 (1.9) Passive shoulder total rotation of dominant side (degrees) 160.5 (14)	**Aggregate Data – OR (95% CI)** >50 vs ≤50 throws per day: 3.434 (1.306-9.026)* >80 vs ≤80 throws per day: 2.147 (1.216-3.792)* >100 vs ≤100 throws per day: 2.446 (1.411-4.242)* Multivariable Logistic Regression 100 throws per day: 1.936 (1.072-3.497) Elbow extension deficit ≥5°: 1.973 (1.022-3.809) Univariate # practices per week: p=0.028* Passive shoulder total rotation of dominant side (degrees) p=0.018* No difference between groups for elbow flex/ext, shoulder add/IR/ER, hip IR/ER (D/ND) No difference between groups for shoulder IR/ER strength ratios or lower trapezius muscle strength ratio or serratus anterior muscle strength ratio

Sakata 2022[95] Japan Case-control	Baseball Total: n=3651 players IG: n=1930 players UG: n=1721 players FWG%: 4% Paediatric population: yes	Injury: MRF: ROM	**Aggregate Data – Mean (SD)** IG: Rohrer index: 131.7 (19.7) IR ROM ND hip: 31.5 (11.5) UG: Rohrer index: 123.7 (16.2) IR ROM ND hip: 35.0 (12.4)	**Aggregate Data – P-value** Rohrer index: 0.001* IR ROM ND hip: 0.041*
Šeme 2013[86] Slovenia Cross-sectional	Badminton Total: n=26 players IG: n=NR UG: n=NR FWG%: 31% Paediatric population: no	Injury: Shoulder (self report) MRF: Training load	IG: NR UG: NR	**Aggregate Data – OR (p-value)** Less training hours: 1.37 (<0.05)*
Shanley 2011[87] USA Cross-sectional	Softball & Baseball Total: n=103 softball players IG: n=9 players UG: n=94 players FWG%: 42% Paediatric population: yes	Injury: Shoulder, elbow (all complaint) MRF: ROM	**Female & Aggregate Data – Mean (SD)** *Female* IG: Passive IR loss, degrees: 5.5 (8.7) Passive total rotation loss, degrees: 4.9 (12.5) UG: Passive IR loss, degrees: 6.6 (9.0) Passive total rotation loss, degrees: 3.7 (11.7) *Aggregate* IG: Passive IR loss, degrees: 9.9 (11.2) Passive total rotation loss, degrees: 4.7 (13.6) UG: Passive IR loss, degrees: 7.1 (8.8) Passive total rotation loss, degrees: 1.3 (11.8)	**Female & Aggregate Data – P-value** *Female* Passive IR loss, degrees: 0.72 Passive total rotation loss, degrees: 0.75 *Aggregate* Passive IR loss, degrees: 0.12 Passive total rotation loss, degrees: 0.16
Soligard 2012[88] Norway Cohort (prospective)	Football Total: ~60000 players IG: n=NR UG: n=NR FWG%: 30% Paediatric population: yes	Injury: Upper body, arm/hand/fingers, shoulder/clavicle (all complaint) MRF: Training surface	**Aggregate Data – n, mean (SD)** IG (Turf): Upper body: 88, 14.6 (1.6) Arm/hand/fingers: 11, 1.8 (0.6) Shoulder/clavicle: 7, 1.2 (0.4) UG (Grass): Upper body: 601, 10.6 (0.4) Arm/hand/fingers: 65, 1.1 (0.1) Shoulder/clavicle: 29, 0.5 (0.1)	**Aggregate Data – RR (95% CI), adjusted RR (95% CI) for age and gender** Upper body: 0.72 (0.58-0.91)*, 0.81 (0.62-1.08) Arm/hand/fingers: 0.63 (0.33-1.19), 0.86 (0.46-1.61) Shoulder/clavicle: 0.44 (0.19-1.01), 0.43 (0.19-0.99)*

Tagliafico 2009[89] Italy Cross-sectional	Tennis Total: n=370 players IG: n=50 players UG: n=320 players FWG%: 19% Paediatric population: yes	Injury: Wrist (self report) MRF: Training load, equipment, playing experience	**Aggregate Data – Mean (SD)** IG: Eastern grip: n=12 Years of practice: 22 (8) Hours of training/week: 6 (4) Racket weight: 330 (31)g Western and South West grip: n= 38 Years of practice: 8 (8) Hours of training/week: 7 (3) Racket weight: 304 (23)g UG: Grip: Eastern= 80, Western= 38, South West=202 Years of practice: 14 (8) Hours of training/week: 6 (4) Racket weight: 309 (30)g	**Aggregate Data – Exp (B) (95% CI, p-value)** Grip: 0.032 (0.003-0.333, 0.004)* Years of activity: 0.943 (0.821-1.083, 0.408)
Walker 2012[90] Australia Cohort (prospective)	Swimming Total: n=74 swimmers IG: n=28 swimmers UG: n=46 swimmers FWG%: 50% Paediatric population: yes	Injury: Shoulder (time loss) MRF: ROM	**Aggregate Data – n (%)** IG: Shoulder Injury ER ROM Middle: 3 (4%) Low < 93◦: 15 (20%) High ≥ 100◦: 10 (14%) Severe Shoulder Injury ER ROM: Middle: 1 (1%) Low < 93◦: 8 (11%) High ≥ 100◦: 8 (11%) UG: Shoulder Injury ER ROM Middle: 20 (27%) Low < 93◦: 12 (16%) High ≥ 100◦: 14 (19%) Severe Shoulder Injury ER ROM: Middle: 24 (32%) Low < 93◦: 17 (23%) High ≥ 100◦: 16 (22%)	**Aggregate Data – adjusted OR (95% CI, p-value) for swim km** Shoulder Injury ER ROM low: 12.5 (2.5-62.4, 0.008)* ER ROM high: 8.1 (1.5-42.0, 0.008)* Severe Shoulder Injury ER ROM low: 32.5 (2.7-389.6, 0.02)* ER ROM high: 35.4 (2.8-441.9, 0.02)*
Wasser 2021[91] USA Cross-sectional	Volleyball Total: n=276 players IG: n=188 players UG: n=88 players FWG%: 100% Paediatric population: yes	Injury: Arm, elbow, fingers (time loss) MRF: Sport specialization	IG: NR UG: NR	**Female Data – OR (95% CI, p-value)** Beginner-intermediate players only playing volleyball (compared to multisport) - arm and elbow: 4.75 (1.27-17.73, 0.02)* Advanced players only playing volleyball (compared to multisport) – fingers: 1.85 (0.99-3.45, 0.05)

Yuine 2023[92] Japan Cross-sectional	Wheelchair basketball Total: n=9 players (18 wrists) IG: n=7 wrists UG: n=11 wrists FWG%: 100% Paediatric population: no	Injury: Wrist (MRI findings) MRF: Strength and function	**Female Data – median (range), mean (SD)** IG: Grip Strength: 309.9 (235.8–362.8), 303.9 (65.6) Applied Force: 4.47 (4.28–4.78), 4.53 (0.28) UG: Grip Strength: 323.6 (281.9–339.8), 305.8 (54.7) Applied Force: 4.36 (3.39–4.46), 3.92 (0.96)	**Female Data – Effect size (r; p-value)** Applied Force (N): r = -0.37 (0.13) Grip Strength (N): r = -0.01 (1.0)

*Denotes significant finding; ^calculated from data provided; IG: Injured/exposed group; UG: Uninjured/unexposed Group; FWG: Female, woman, and/or girl; RCT: Randomized control trial; ROM: Range of motion; SD: Standard deviation; ER: External rotation; IR: Internal rotation; N: Newton; OR: Odds ratio; CI: Confidence interval; n.s.: non-significant; RR: Risk ratio; IR: Incidence rate; IRR: Incidence rate ratio; NR: Not reported; AE: Athletic exposures; UE: Upper extremity; ABD: abduction; ADD: adduction; BW: body weight.

Table S7. Quality assessment and Risk of Bias scores for Prevention intervention studies.

Study	Quality assessment score (out of 32), n (%)	Risk of Bias score (out of 28), n (%)
Achenbach et al. 2018	16 (50)	13 (46)
Achenbach et al. 2022	19 (59)	16 (57)
Andersson et al. 2017	25 (78)	21 (75)
Asker et al. 2022	25 (78)	22 (79)
Bowers et al. 2008	10 (31)	8 (29)
Broadbent et al. 2016	6 (19)	4 (14)
Ding et al. 2023	23 (72)	20 (71)
Emery et al. 2010	18 (56)	16 (57)
Emery et al. 2020	18 (56)	16 (57)
Emery et al. 2022	18 (56)	16 (57)
Falvey et al. 2013	9 (28)	7 (25)
Gibson et al. 2023	17 (53)	15 (54)
Kaplan et al. 2014	12 (38)	9 (32)
Kaplan et al. 2016	13 (41)	10 (36)
Østerås et al. 2015	13 (41)	10 (36)
Sakata et al. 2018	20 (63)	17 (61)
Sakata et al. 2019	25 (78)	22 (79)
Tooth et al. 2023	17 (53)	14 (50)
Verhagen et al. 2023	22 (69)	19 (68)
von Gerhardt et al. 2023	22 (69)	19 (68)

Table S8. Quality assessment and Risk of Bias scores for Modifiable Risk Factor studies.

Study	Quality assessment score (out of 32), n (%)	Risk of Bias score (out of 16), n (%)
Achenbach et al. 2020	13 (41)	11 (69)
Andersson et al. 2018	12 (38)	10 (63)
Asker et al. 2020	12 (38)	9 (56)
Augustsson et al. 2023	16 (50)	14 (88)
Biese et al. 2021	9 (28)	7 (44)
Croteau et al. 2021	13 (41)	11 (69)
Drigny et al. 2021	12 (38)	10 (63)
Edouard et al. 2013	11 (34)	9 (56)
Gosheger et al. 2003	5 (16)	3 (19)
Griffin et al. 2020	11 (34)	9 (56)
Guermont et al. 2023	14 (44)	11 (69)
Hadzic et al. 2022	11 (34)	9 (56)
Hams et al. 2019 - a	9 (28)	7 (44)
Hams et al. 2019 – b	13 (41)	10 (63)
Harrington et al. 2014	9 (28)	7 (44)
Heck et al. 2021	11 (34)	9 (56)
Hjelm et al. 2012	10 (31)	8 (50)
Johansson et al. 2022	16 (50)	13 (81)
Lau et al. 2023	26 (81)	14 (88)
Lear et al. 2023	27 (84)	15 (94)
Ling et al. 2020	26 (81)	14 (88)
Møller et al. 2017	27 (84)	15 (94)
Munoz et al. 2022	27 (84)	15 (94)
Murphy et al. 2020	27 (84)	15 (94)
Paliobeis et al. 2021	14 (44)	10 (63)
Post et al. 2017	13 (41)	11 (69)
Sakata et al. 2017	26 (81)	14 (88)
Sakata et al. 2022	9 (28)	7 (44)
Seme et al. 2013	10 (31)	8 (50)
Shanley et al. 2011	13 (41)	10 (63)
Soligard et al. 2012	14 (44)	12 (75)
Tagliafico et al. 2009	9 (28)	7 (44)
Walker et al. 2012	12 (38)	10 (63)
Wasser et al. 2021	8 (25)	6 (38)
Yuine et al. 2023	10 (31)	8 (50)

Table S9: GRADE Summary for Prevention Strategies and Potential Modifiable Risk Factors for Female/Woman/Girl Upper Extremity Injuries

GRADE based on quantitative syntheses (pooled data)												
Prevention Strategy	**Injury Type**	**Number of Studies**	**Participants (n)**	**Phase of Investigation**	**Study Limitations**	**Inconsistency**	**Indirectness**	**Imprecision**	**Publication Bias**	**Upgrading Factors**	**Modified GRADE Rating**	**Confidence Statement**
Exercise	Shoulder	3[42,44,45]	447	Randomized (2), non-randomized (1)	X	X	✓	X	✓	X	+	Very low certainty that exercise interventions **reduce** shoulder injuries by 51%
GRADE based on semi-quantitative syntheses (non-pooled data)												
Risk Factor	**Injury Type**	**Number of Studies**	**Participants (n)**	**Phase of Investigation**	**Study Limitations**	**Inconsistency**	**Indirectness**	**Imprecision**	**Publication Bias**	**Upgrading Factors**	**Modified GRADE Rating**	**Confidence Statement**
Shoulder Range of Motion	Shoulder	4[61,62,64,70]	474	Phase 1 (1), Phase 2 (3)	X	X	X	X	✓	X	+	Very low certainty of an **unclear** association between shoulder range of motion and shoulder injuries
Shoulder Muscle Strength	Shoulder	5[61–64,68]	502	Phase 1 (1), Phase 2 (4)	X	X	X	X	✓	X	+	Very low certainty of an association between lower shoulder muscle strength and shoulder injuries

X serious limitations, XX very serious limitations, ✓ no limitations; FWG: Female, woman, and/or girl athletes.

++++ (high quality), +++ (moderate quality), ++ (low quality), + (very low)