

Table 1. Risk of bias assessment and GRADE of clinical tests for diagnosing hamstring injuries.

Diagnosis Hamstring injuries				QUADAS 2 Items*											GRADE (outcome level)								
Index test	Reference standard	Study	Likelihood ratio	1	2	3	4	5	6	7	8	9	10	11	Study design	Risk of bias	Indirectness	Inconsistency	Imprecise evidence	Publication bias	Downgrade**		
Aktiv slump	MRI	Wangenstein et al. (1)	LR+	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	?	✓	?	↓	
			LR-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	↓
Pain during SLR	MRI		LR+	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	?	✓	?	↓	
			LR-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	↓
Pai during 90deg R KF	MRI		LR+	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	?	✓	?	↓
			LR-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	↓
Pai during 30deg R KF	MRI		LR+	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	?	✓	?	↓
			LR-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	↓
Pain during active KF	MRI		LR+	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	?	↔
			LR-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	↔
Pain during active KE	MRI		LR+	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	?	✓	?	↓
			LR-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	↓
Pain during trunk F	MRI	LR+	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	?	✓	?	↓	
		LR-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	↓	
Taking off shoe	US	Zeren et al. (2)	LR+: N/A	×	✓	?	×	✓	✓	×	×	✓	?	?	✓	×	×	×	?	N/A	?	N/A	
			LR-	×	✓	?	×	✓	✓	×	×	✓	?	?	✓	×	×	×	?	?	?	?	↓↓↓
Resisted range of motion test	US		LR+: N/A	×	✓	?	×	✓	✓	×	×	✓	?	?	✓	×	×	×	?	N/A	?	N/A	
			LR-	×	✓	?	×	✓	✓	×	×	✓	?	?	✓	×	×	×	?	✓	?	?	↓↓↓
Passive range of motion test	US		LR+: N/A	×	✓	?	×	✓	✓	×	×	✓	?	?	✓	×	×	×	?	N/A	?	N/A	
			LR-	×	✓	?	×	✓	✓	×	×	✓	?	?	✓	×	×	×	?	✓	?	?	↓↓↓
Active range of motion test	US		LR+: N/A	×	✓	?	×	✓	✓	×	×	✓	?	?	✓	×	×	×	?	N/A	?	N/A	
			LR-	×	✓	?	×	✓	✓	×	×	✓	?	?	✓	×	×	×	?	✓	?	?	↓↓↓
Composit	MRI		Schneider-Kolsky et al. (3)	LR+	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	×	?	✓	?	?	↓
				LR-: N/A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	×	?	N/A	?	?

Abbreviations: MRI (magnetic resonance imaging); US (ultrasound); LR+ (Positive likelihood ratio); LR- (negative likelihood ratio); N/A (not applicable)

*Item 1: Was a consecutive or random sample of patients enrolled? Item 2: Was a case-control design avoided? Item 3: Did the study avoid inappropriate exclusions? Item 4: Were the index test results interpreted without knowledge of the results of the reference standard? Item 5: If a threshold was used, was it pre-specified? Item 6: Is the reference standard likely to correctly classify the target condition? Item 7: Were the reference standard results interpreted without knowledge of the results of the index test? Item 8: Was there an appropriate interval between index test(s) and reference standard? Item 9: Did all patients receive a reference standard? Item 10: Did patients receive the same reference standard? Item 11: Were all patients included in the analysis?

Quadas 2 risk of bias assessment: ✘ item not fulfilled; ✔ = item fulfilled; ? unclear or unknown if item is fulfilled

GRADE assessments: ✘ = item cause for possible downgrade once; ✘✘ = item cause for possible downgrade twice; ✔ = item fulfilled, no downgrading; ? = item unclear or not available, no upgrading or downgrading.

** ↓ = downgrade quality by one level; ↓↓ = downgrade quality by two levels; ↓↓↓ = downgrade quality by three levels; ↔ = no downgrade

Table 2. Risk of bias assessment and GRADE of clinical tests for diagnosing adductor injuries.

Diagnosis				QUADAS Items											GRADE (outcome level)							
Adductor injuries																						
Index test	Reference standard	Study	Likelihood ratio	1	2	3	4	5	6	7	8	9	10	11	Study design	Risk of bias	Indirectness	Inconsistency	Imprecise evidence	Publication bias	Downgrade**	
Palpation	MRI	Serner et al. (4)	LR +	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	✔	✔	✔	✘	?	✔	?	↓	
			LR -	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✘	?	?	↓↓
Squeeze 0°	MRI		LR +	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	✔	✔	✔	✘	?	✘	?	↓↓
			LR -	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	?	↓
Squeeze 45°	MRI		LR +	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	✔	✔	✔	✘	?	✔	?	↓
			LR -	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	?	↓
Isometric adduction (outer range)	MRI		LR +	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	✔	✔	✔	✘	?	✘	?	↓↓
			LR -	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	?	↓
Adductor stretching	MRI		LR +	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	✔	✔	✔	✘	?	✘	?	↓↓
			LR -	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	?	↓
Flexion Abduction External Rotation (FABER)	MRI		LR +	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	✔	✔	✔	✘	?	✔	?	↓
			LR -	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	?	?	↓

Abbreviations: MRI (magnetic resonance imaging); LR+ (Positive likelihood ratio); LR- (negative likelihood ratio).

*Item 1: Was a consecutive or random sample of patients enrolled? Item 2: Was a case-control design avoided? Item 3: Did the study avoid inappropriate exclusions? Item 4: Were the index test results interpreted without knowledge of the results of the reference standard? Item 5: If a threshold was used, was it pre-specified? Item 6: Is the reference standard likely to correctly classify the target condition? Item 7: Were the reference standard results interpreted without knowledge of the results of the index test? Item 8: Was there an appropriate interval between index test(s) and reference standard? Item 9: Did all patients receive a reference standard? Item 10: Did patients receive the same reference standard? Item 11: Were all patients included in the analysis?

Quadas 2 risk of bias assessment: ✘ item not fulfilled; ✔ = item fulfilled; ? unclear or unknown if item is fulfilled

GRADE assessments: ✘ = item cause for possible downgrade once; ✘✘ = item cause for possible downgrade twice; ✔ = item fulfilled, no downgrading; ? = item unclear or not available, no upgrading or downgrading.

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Table 3. Risk of bias assessment and GRADE of clinical tests for diagnosing rectus femoris injuries.																						
Diagnosis				QUADAS Items											GRADE (outcome level)							
Rectus femoris injuries																						
Index test	Reference standard	Study	Likelihood ratio	1	2	3	4	5	6	7	8	9	10	11	Study design	Risk of bias	Indirectness	Inconsistency	Imprecise evidence	Publication bias	Downgrade **	
Palpation	MRI	Serner et al. (4)	LR +	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	×	?	×	?	↓↓	
			LR -																	?	?	↓
Isometric hip flexion 0°	MRI		LR +	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	×	?	✓	?	↓
			LR -																	×	?	↓↓
Isometric hip flexion 90°	MRI		LR +	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	×	?	✓	?	↓
			LR -																	×	?	↓↓
Isometric hip flexion (modified Thomas Test)	MRI		LR +	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	×	?	✓	?	↓
			LR -																	×	?	↓↓
Isometric knee extension (modified Thomas Test)	MRI		LR +	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	×	?	✓	?	↓
			LR -																	?	?	↓
Hip extension (stretching; modified Thomas Test)	MRI		LR +	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	×	?	✓	?	↓
			LR -																	×	?	↓↓
Knee flexion (stretching; modified Thomas Test)	MRI	LR +	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	×	?	×	?	↓↓	
		LR -																	×	?	↓↓	

Abbreviations: MRI (magnetic resonance imaging); LR+ (Positive likelihood ratio); LR- (negative likelihood ratio).

*Item 1: Was a consecutive or random sample of patients enrolled? Item 2: Was a case-control design avoided? Item 3: Did the study avoid inappropriate exclusions? Item 4: Were the index test results interpreted without knowledge of the results of the reference standard? Item 5: If a threshold was used, was it pre-specified? Item 6: Is the reference standard likely to correctly classify the target condition? Item 7: Were the reference standard results interpreted without knowledge of the results of the index test? Item 8: Was there an appropriate interval between index test(s) and reference standard? Item 9: Did all patients receive a reference standard? Item 10: Did patients receive the same reference standard? Item 11: Were all patients included in the analysis?

Quadas 2 risk of bias assessment: × item not fulfilled; ✓ = item fulfilled; ? unclear or unknown if item is fulfilled

GRADE assessments: × = item cause for possible downgrade once; ×× = item cause for possible downgrade twice; ✓ = item fulfilled, no downgrading; ? = item unclear or not available, no upgrading or downgrading.

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Table 4. Risk of bias assessment and GRADE for treatment of hamstring injuries.

Treatment Hamstring		Risk of Bias assessment Item*							Outcome	GRADE (outcome level)						
Interventions	Study	1	2	3	4	5	6	7		Study design	Risk of bias	Inconsistency	Indirectness	Imprecise evidence	Publication bias	Downgrade**
Multifactorial criteria-based algorithm vs. lengthening hamstring exercises	Mendiguchia et al. (5)	?	x	x	?	✓	?	✓	Return to play	RCT ✓	?	?	✓	xx	?	↓↓
									Reinjuries	RCT ✓	?	?	✓	xx	?	↓↓
Lengthening hamstring exercises versus to conventional hamstring exercises (6)	Askling et al. (7,8)	x	x	x	x	✓	?	?	Return to play	RCT ✓	xx	✓	✓	✓	?	↓↓
		x	x	x	x	✓	?	?	Reinjuries		xx	✓	✓	xx	?	↓↓↓
Running and eccentric hamstring strengthening versus agility and trunk stabilization	Silder et al. (9)	?	?	x	?	✓	?	?	Return to play	RCT ✓	x	?	x	xx	?	↓↓↓
Agility and trunk stabilization vs. hamstring stretching and strengthening	Sherry et al. (10)	?	?	x	x	?	?	x	Return to play	RCT ✓	xx	?	x	x	?	↓↓↓
									Reinjuries	RCT ✓	xx	?	x	x	?	↓↓↓
Hamstring stretching four times/day versus hamstring stretching once daily	Malliaropoulos et al. (11)	?	?	x	?	?	?	x	Return to play	RCT ✓	xx	?	x	✓	?	↓↓↓
Platelet-rich plasma versus placebo or rehabilitation (6)	Reurink et al. (12)	✓	✓	✓	✓	✓	?	✓	Return to play	RCT ✓	✓	x	✓	✓	?	↓
	Hamilton et al. (13)	?	?	✓	✓	✓	x	✓								
	Hamid et al. (14)	✓	✓	x	✓	✓	x	✓	Reinjuries	RCT ✓	✓	✓	✓	x	?	↓
Pain-threshold (≤4 on the 0-10 NRS) versus Pain-free (0 on the 0-10 NRS) rehabilitation	Hickey et al. (15)	x	✓	✓	✓	?	?	✓	Return to play	RCT ✓	✓	?	x	x	?	↓↓
									Reinjuries		✓	?	✓	xx	?	↓↓

Abbreviations: RCT (randomized controlled trial)

*Item 1: Random sequence generation; Item 2: Allocation concealment; Item 3: Blinding of participants and personal; Item 4: Blinding of outcome assessor; Item 5: Incomplete outcome data; Item 6: Selective reporting; Item 7: Other sources of bias.

Risk of bias assessment: x = item not fulfilled; ✓ = item fulfilled; ? unclear or unknown if item is fulfilled

GRADE assessments: x = item cause for possible downgrade once; xx = item cause for possible downgrade twice; ✓ = item fulfilled, no downgrading; ? = item unclear or not available, no upgrading or downgrading.

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Treatment Rectus femoris/quadriceps		SIGN Checklist 3*														Outcome	GRADE (outcome level)						
Interventions	Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Study design	Risk of bias	Inconsistency	Indirectness	Imprecise evidence	Publication bias	Downgrade**
A two-phase criteria-based intervention	Cross et al. (16)	✓	N/A	✗	N/A	?	N/A	✗	✗	✗	?	✗	N/A	?	✗	Return to play	Cohort ✗✗	✗	?	✗	✗	?	↓↓↓
																Reinjuries	Cohort ✗✗	✗	?	✓	✓	?	↓↓↓

Abbreviations: N/A (not applicable).

*Item 1: The study addresses an appropriate and clearly focused question?; Item 2: The two groups being studied are selected from source populations that are comparable in all respects other than the factor under investigation?; Item 3: The study indicates how many of the people asked to take part did so, in each of the groups being studied?; Item 4: The likelihood that some eligible subjects might have the outcome at the time of enrolment is assessed and taken into account in the analysis?; Item 5: What percentage of individuals or clusters recruited into each arm of the study dropped out before the study was completed?; Item 6: Comparison is made between full participants and those lost to follow up, by exposure status?; Item 7: The outcomes are clearly defined?; Item 8: The assessment of outcome is made blind to exposure status. If the study is retrospective this may not be applicable?; Item 9: Where blinding was not possible, there is some recognition that knowledge of exposure status could have influenced the assessment of outcome?; Item 10: The method of assessment of exposure is reliable?; Item 11: Evidence from other sources is used to demonstrate that the method of outcome assessment is valid and reliable?; Item 12: Exposure level or prognostic factor is assessed more than once?; Item 13: The main potential confounders are identified and taken into account in the design and analysis?; Item 14: Have confidence intervals been provided?

Risk of bias assessment: ✗ = item not fulfilled; ✓ = item fulfilled; ? unclear or unknown if item is fulfilled

GRADE assessments: ✗ = item cause for possible downgrade once; ✗✗ = item cause for possible downgrade twice; ✓ = item fulfilled, no downgrading; ? = item unclear or not available, no upgrading or downgrading.

**↓↓↓=downgrade quality by three levels

Table 6. Risk of bias assessment and GRADE for treatment of calf injuries.																							
Treatment Calf		SIGN Checklist 3 and 4*														Outcome	GRADE (outcome level)						
Interventions	Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Study design	Risk of bias	Inconsistency	Indirectness	Imprecise evidence	Publication bias	Downgrade***
Multimodal treatment program	Millar (17)	✗	N/A	✗	N/A	?	?	?	✗	N/A	?	N/A	✗	✗	✗	Return to play	Cohort ✗✗	✗✗	?	✓	?	?	↓↓↓
																Reinjuries	Cohort ✗✗	✗✗	?	✓	?	?	↓↓↓
Multimodal treatment program	Pedret et al. (18)	✓	N/A	✗	N/A	✓	N/A	✗	✗	?	?	✗	?	?	✗	Reinjuries	Cohort ✗✗	✗	?	✓	?	?	↓↓↓
Platelet-rich plasma**	Borrione et al. (19)	✗	✓	✓	?	✓	✓	✓	✗	?	✗	✗	-	-	-	Return to play	Case-control ✗✗	✗✗	?	✓	✓	?	↓↓↓

Abbreviations: N/A (not applicable).

*SIGN 3: Item 1: The study addresses an appropriate and clearly focused question?; Item 2: The two groups being studied are selected from source populations that are comparable in all respects other than the factor under investigation?; Item 3: The study indicates how many of the people asked to take part did so, in each of the groups being studied?; Item 4: The likelihood that some eligible subjects might have the outcome at the time of enrolment is assessed and taken into account in the analysis?; Item 5: What percentage of individuals or clusters recruited into each arm of the study dropped out before the study was completed?; Item 6: Comparison is made between full participants and those lost to follow up, by exposure status?; Item 7: The outcomes are clearly defined?; Item 8: The assessment of outcome is made blind to exposure status. If the study is retrospective this may not be applicable?; Item 9: Where blinding was not possible, there is some recognition that knowledge of exposure status could have influenced the assessment of outcome?; Item 10: The method of assessment of exposure is reliable?; Item 11: Evidence from other sources is used to demonstrate that the method of outcome assessment is valid and reliable?; Item 12: Exposure level or prognostic factor is assessed more than once?; Item 13: The main potential confounders are identified and taken into account in the design and analysis?; Item 14: Have confidence intervals been provided?

SIGN 4: Item 1: The study addresses an appropriate and clearly focused question?; Item 2: The cases and controls are taken from comparable populations?; Item 3: The same exclusion criteria are used for both cases and controls?; Item 4: What percentage of each group (cases and controls) participated in the study?; Item 5: Comparison is made between participants and non-participants to establish their similarities or differences?; Item 6: Cases are clearly defined and differentiated from controls?; Item 7: It is clearly established that controls are non-cases?; Item 8: Measures will have been taken to prevent knowledge of primary exposure influencing case ascertainment?; Item 9: Exposure status is measured in a standard, valid and reliable way?; Item 10: The main potential confounders are identified and taken into account in the design and analysis?; Item 11: Confidence intervals are provided.

** Risk of bias using SIGN 4

Risk of bias assessment: ✗ = item not fulfilled; ✓ = item fulfilled; ? = unclear or unknown if item is fulfilled

GRADE assessments: ✗ = item cause for possible downgrade once; ✗✗ = item cause for possible downgrade twice; ✓ = item fulfilled, no downgrading; ? = item unclear or not available, no upgrading or downgrading.

*** ↓↓↓ = downgrade quality by three levels

Prevention Hamstring		Risk of Bias assessment Item*							Outcome	GRADE (outcome level)						
Interventions	Study	1	2	3	4	5	6	7		Study design	Risk of bias	Inconsistency	Indirectness	Imprecise evidence	Publication bias	Downgrade**
Interventions including the Nordic Hamstring exercise (20)	Gabbe et al. (21)	✓	✓	✗	✗	✓	✓	✓	Injuries	RCT ✓	?/✓	✗	✓	✓	✓	↓
	Soligard et al. (22)	?	?	✗	✗	✗	✓	✓								
	Engebretsen et al. (23)	?	?	✗	✗	?	?	✗								
	Petersen et al. (24)	✓	✓	✗	✗	✓	✓	✓								
	Del Ama Espinosa et al. (25)	✓	✓	✗	✗	✓	✓	✓								
	Silvers-Granelli et al. (26)	✓	?	✗	✗	✗	?	✗								
	Van der Horst et al. (27)	✓	✓	✗	✗	✓	✓	✓								
Mixed eccentric hamstring training (28)	Aksling et al. (29)	?	?	✗	?	?	?	✗	Injuries	RCT ✓	✓	✗	✓	✗	?	↓↓
	Gabbe et al. (21)	✓	✓	✗	✗	✓	✓	✓								
	Engebretsen et al. (23)	?	?	✗	✗	?	?	✗								
	Petersen et al. (24)	✓	✓	✗	✗	✓	✓	✓								
FIFA 11+ (30)	Soligard et al. (22)	?	?	✗	✗	✗	✓	✓	Injuries	RCT ✓	✗	✓	✓	✓	?	↓
	Silvers-Granelli et al. (26)	✓	?	✗	✗	✗	?	✗								
Nordic Hamstring Exercise Protocol (meta-analysis performed as part of this statement)	Petersen et al. (24)	✓	✓	✗	✗	✓	✓	✓	Injuries	RCT ✓	✓	✓	✓	✓	?	↔
	Van der Horst et al. (27)	✓	✓	✗	✗	✓	✓	✓								
Bounding exercise program	Van de Hoef et al. (31)	✓	?	✗	✗	✓	✓	✓	Injuries	RCT ✓	✓	?	✓	✗	?	↓
FIFA 11+ program pre- and post-football	Al Attar et al. (32)	✓	?	✗	✗	✓	✓	✗	Injuries	RCT ✓	✗	?	✓	✗✗	?	↓↓↓
Modified FIFA 11+ with rescheduling of Part 2 versus standard FIFA 11+	Whalan et al. (33)	?	?	✗	✗	✓	?	✓	Injuries	RCT ✓	?	?	✓	✗	?	↓
Balance board training	Soderman et al. (34)	?	?	✗	✗	✓	?	✗	Injuries	RCT ✓	✗	?	✓	✗✗	?	↓↓↓

Abbreviations: RCT (randomized controlled trial)

*Item 1: Random sequence generation; Item 2: Allocation concealment; Item 3: Blinding of participants and personal; Item 4: Blinding of outcome assessor; Item 5: Incomplete outcome data; Item 6: Selective reporting; Item 7: Other sources of bias.

Risk of bias assessment: ✗ item not fulfilled; ✓ = item fulfilled; ? unclear or unknown if item is fulfilled

GRADE assessments: × = item cause for possible downgrade once; ×× = item cause for possible downgrade twice; ✓ = item fulfilled, no downgrading; ? = item unclear or not available, no upgrading or downgrading.

** ↓ = downgrade quality by one level; ↓↓ = downgrade quality by two levels; ↓↓↓ = downgrade quality by three levels; ↔ = no downgrade

Prevention Adductor (Groin)		Risk of Bias assessment Item*							Outcome	GRADE (outcome level)						
Interventions	Study	1	2	3	4	5	6	7		Study design	Risk of bias	Inconsistency	Indirectness	Imprecise evidence	Publication bias	Downgrade **
Mixed groin prevention programs (35)	Arnason et al. (36)	?	?	x	x	?	?	x	Injuries	RCT ✓	x	✓	x	x	?	↓↓
	Beijsterveldt et al. (37)	?	?	x	x	✓	x	?								
	Engebretsen et al. (23)	?	?	x	x	?	?	x								
	Holmich et al. (38)	✓	✓	x	x	✓	?	x								
	Soderman et al. (34)	?	?	x	x	✓	?	x								
	Steffen et al. (39)	?	?	x	x	✓	?	x								
Specific adductor strength training (35)	Holmich et al. (38)	✓	✓	x	x	✓	?	x	Injuries	RCT ✓	x	✓	x	x	?	↓↓
	Engebretsen et al. (23)	?	?	x	x	?	?	x								
FIFA 11 (35)	Steffen et al. (39)	?	?	x	x	✓	?	x	Injuries	RCT ✓	x	x	x	x	?	↓↓↓
	Beijsterveldt et al. (37)	?	?	x	x	✓	x	?								
FIFA 11+ programme in football (30)	Silvers-Granelli et al. (26)	✓	?	x	x	x	?	x	Injuries	RCT ✓	x	✓	x	✓	?	↓↓
	Soligard et al. (22)	?	?	x	x	x	✓	✓								
FIFA 11+ programme in mixed sports	Longo et al. (40)	✓	?	x	x	✓	✓	✓	Injuries	RCT ✓	✓	x	x	xx	?	↓↓↓
	Slauterbeck et al. (41)	✓	?	x	x	✓	?	✓								
Adductor strengthening program	Haroy et al. (42)	✓	?	x	x	✓	✓	✓	Injuries	RCT ✓	✓	?	x	✓	?	↓
FIFA 11+ program pre- and post-football	Al Attar et al. (32)	✓	?	x	x	✓	✓	x	Injuries	RCT ✓	x	?	x	xx	?	↓↓↓
Modified FIFA 11+ with rescheduling of Part 2 versus standard FIFA 11+	Whalan et al. (33)	?	?	x	x	✓	?	✓	Injuries	RCT ✓	?	?	x	✓	?	↓

Abbreviations: RCT (randomized controlled trial)

*Item 1: Random sequence generation; Item 2: Allocation concealment; Item 3: Blinding of participants and personal; Item 4: Blinding of outcome assessor; Item 5: Incomplete outcome data; Item 6: Selective reporting; Item 7: Other sources of bias.

Risk of bias assessment: x item not fulfilled; ✓ = item fulfilled; ? unclear or unknown if item is fulfilled

GRADE assessments: x = item cause for possible downgrade once; xx = item cause for possible downgrade twice; ✓ = item fulfilled, no downgrading; ? = item unclear or not available, no upgrading or downgrading.

** ↓ = downgrade quality by one level; ↓↓ = downgrade quality by two levels; ↓↓↓ = downgrade quality by three levels; ↔ = no downgrade

Table 9. Risk of bias assessment and GRADE for prevention of anterior thigh/quadriceps injuries.

Prevention anterior thigh/quadriceps		Risk of Bias assessment Item							Outcome	GRADE (outcome level)						
Interventions	Study	1	2	3	4	5	6	7		Study design	Risk of bias	Inconsistency	Indirectness	Imprecise evidence	Publication bias	Downgrade
FIFA 11+ (meta-analysis performed as part of this statement)	Silvers-Granelli et al. (26)	✓	?	×	×	×	?	×	Injuries	RCT ✓	×	✓	✓	×	?	↓
	Soligard et al. (22)	?	?	×	×	×	✓	✓								
FIFA 11+ program pre- and post-football	Al Attar et al. (32)	✓	?	×	×	✓	✓	×	Injuries	RCT ✓	×	?	✓	×	?	↓↓↓
Modified FIFA 11+ with rescheduling of Part 2 versus standard FIFA 11+	Whalan et al. (33)	?	?	×	×	✓	?	✓	Injuries	RCT ✓	?	?	✓	✓	?	↔
Balance board training	Soderman et al. (34)	?	?	×	×	✓	?	×	Injuries	RCT ✓	×	?	✓	×	?	↓↓↓

Abbreviations: RCT (randomized controlled trial)

*Item 1: Random sequence generation; Item 2: Allocation concealment; Item 3: Blinding of participants and personal; Item 4: Blinding of outcome assessor; Item 5: Incomplete outcome data; Item 6: Selective reporting; Item 7: Other sources of bias.

Risk of bias assessment: × item not fulfilled; ✓ = item fulfilled; ? unclear or unknown if item is fulfilled

GRADE assessments: × = item cause for possible downgrade once; ×× = item cause for possible downgrade twice; ✓ = item fulfilled, no downgrading; ? = item unclear or not available, no upgrading or downgrading.

**↓ = downgrade quality by one level; ↓↓ = downgrade quality by two levels; ↓↓↓ = downgrade quality by three levels; ↔ = no downgrade

Prevention Calf		SIGN Checklist 3*														Outcome	GRADE (outcome level)						
Interventions	Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Study design	Risk of bias	Inconsistency	Indirectness	Imprecise evidence	Publication bias	Downgrade**
soccer-specific balance program	Kraemer et al. (43)	✓	N/A	N/A	?	✗	?	✓	✗	✗	✓	✓	?	?	✗	Injuries	Cohort ✗✗	✗	?	✓	?	?	↓↓↓

Abbreviations: N/A (not applicable).

*SIGN 3: Item 1: The study addresses an appropriate and clearly focused question?; Item 2: The two groups being studied are selected from source populations that are comparable in all respects other than the factor under investigation?; Item 3: The study indicates how many of the people asked to take part did so, in each of the groups being studied?; Item 4: The likelihood that some eligible subjects might have the outcome at the time of enrolment is assessed and taken into account in the analysis?; Item 5: What percentage of individuals or clusters recruited into each arm of the study dropped out before the study was completed?; Item 6: Comparison is made between full participants and those lost to follow up, by exposure status?; Item 7: The outcomes are clearly defined?; Item 8: The assessment of outcome is made blind to exposure status. If the study is retrospective this may not be applicable?; Item 9: Where blinding was not possible, there is some recognition that knowledge of exposure status could have influenced the assessment of outcome?; Item 10: The method of assessment of exposure is reliable?; Item 11: Evidence from other sources is used to demonstrate that the method of outcome assessment is valid and reliable?; Item 12: Exposure level or prognostic factor is assessed more than once?; Item 13: The main potential confounders are identified and taken into account in the design and analysis?; Item 14: Have confidence intervals been provided?

Risk of bias assessment: ✗ = item not fulfilled; ✓ = item fulfilled; ? unclear or unknown if item is fulfilled

GRADE assessments: ✗ = item cause for possible downgrade once; ✗✗ = item cause for possible downgrade twice; ✓ = item fulfilled, no downgrading; ? = item unclear or not available, no upgrading or downgrading.

**↓↓↓=downgrade quality by three levels

ROBIS: Tool to assess risk of bias in systematic reviews

Table 11. Suggested Tabular Presentation for ROBIS Results

Review	Phase 2				Phase 3
	1. STUDY ELIGIBILITY CRITERIA	2. IDENTIFICATION AND SELECTION OF STUDIES	3. DATA COLLECTION AND STUDY APPRAISAL	4. SYNTHESIS AND FINDINGS	RISK OF BIAS IN THE REVIEW
Van Dyk 2019 (20)	😊	😞	😊	?	?
Thorborg 2017 (30)	😊	😊	😊	?	?
Esteve 2015 (35)	?	?	😊	?	?
Goode 2015 (28)	?	😊	?	?	?
Pas 2015 (6)	?	😊	😊	?	?
Rieman 2013 (44)	?	?	😊	?	?

😊 = low risk; 😞 = high risk; ? = unclear risk

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