

Additional file 4A. Detailed GRADE description for the evidence level assessment in meta-analyses for Q1.

Analysis		Level of Evidence	Reason to downgrade the level (GRADE)
AP postural stability; 19 studies		⊕⊕⊕⊕ Very Low	Included >25% of studies with high RoB (5 studies), heterogenic outcomes, presence of publication bias
Adjustment for publication bias	Trim-and-fill; 21 studies	⊕⊕⊕⊕ Low	Included >25% of studies with high RoB (5 studies + 2 imputed), heterogenic outcomes
	Removing outliers; 17 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
Subgroup analyses	by sex		
	Females; 8 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
	Mixed; 10 studies	⊕⊕⊕⊕ Very Low	Included >25% of studies with high RoB (3 studies), heterogenic outcomes, presence of publication bias
	by assessment method		
	SEBT Anterior; 8 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
	Posturography; 4 studies	⊕⊕⊕⊕ Moderate	Included less than 100 participants per group
	CoP; 7 studies	⊕⊕⊕⊕ Low	Included >25% of studies with high RoB (2 studies), heterogenic outcomes
	by task		
	Dynamic; 14 studies	⊕⊕⊕⊕ Very Low	Included >25% of studies with high RoB (4 studies), heterogenic outcomes, presence of publication bias
	Static; 5 studies	⊕⊕⊕⊕ Low	Heterogenic outcomes, included less than 100 participants per group
ML postural stability; 13 studies		⊕⊕⊕⊕ Moderate	Heterogenic outcomes
Adjustment for publication bias	Trim-and-fill; 14 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
	Removing outliers; 12 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
Subgroup analyses	by sex		
	Females; 5 studies	⊕⊕⊕⊕ Low	Heterogenic outcomes, included less than 100 participants per group
	Mixed; 7 studies	⊕⊕⊕⊕ Low	Included >25% of studies with high RoB (2 studies), heterogenic outcomes
	by assessment method		
	Posturography; 4 studies	⊕⊕⊕⊕ Low	Heterogenic outcomes, included less than 100 participants per group
	CoP; 8 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
	by task		
	Dynamic; 9 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
	Static; 4 studies	⊕⊕⊕⊕ Low	Heterogenic outcomes, included less than 100 participants per group
Overall postural stability; 15 studies		⊕⊕⊕⊕ Moderate	Heterogenic outcomes
Subgroup analyses	by sex		
	Females; 10 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
	Mixed; 4 studies	⊕⊕⊕⊕ High	-
	by assessment method		
	SEBT; 2 studies	⊕⊕⊕⊕ Low	Heterogenic outcomes, included less than 100 participants per group
	Posturography; 5 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
	CoP; 8 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
	by task		
	Dynamic; 10 studies	⊕⊕⊕⊕ Moderate	Heterogenic outcomes
	Static; 5 studies	⊕⊕⊕⊕ Low	Heterogenic outcomes, included less than 100 participants per group

SEBT Posterolateral; 4 studies	⊕⊕⊕⊖ Moderate	Heterogenic outcomes
SEBT Posteromedial; 3 studies	⊕⊕⊕⊖ Moderate	Heterogenic outcomes
AP CoP velocity; 6 studies	⊕⊕⊕⊖ Moderate	Included >25% of studies with high RoB (2 studies)
ML CoP velocity; 5 studies	⊕⊕⊕⊖ Moderate	Heterogenic outcomes
Overall CoP velocity; 4 studies	⊕⊕⊕⊖ Moderate	Heterogenic outcomes

Abbreviations: AP = anteroposterior; CoP = centre of pressure; ML = mediolateral; RoB = risk of bias; SEBT = Star Excursion Balance Test.

Additional file 4B. Detailed GRADE description for the evidence level assessment in meta-analyses for Q2 (Intervention x Control).

Analysis		Level of Evidence	Reason to downgrade the level (GRADE)
AP postural stability; 11 studies		⊕⊕⊕⊕ Low	Included >25% of studies with high RoB (6 studies), heterogenic outcomes
Subgroup analyses	<i>by intervention characteristic</i>		
	Passive; 7 studies	⊕⊕⊕⊕ Low	Included >25% of studies with high RoB (4 studies), heterogenic outcomes
	Exercise; 4 studies	⊕⊕⊕⊕ Very Low	Included >25% of studies with high RoB (2 studies), heterogenic outcomes, included <100 participants per group
	<i>by comparator</i>		
	Sham/no intervention; 8 studies	⊕⊕⊕⊕ Low	Included >25% of studies with high RoB (5 studies), heterogenic outcomes
	Exercise; 3 studies	⊕⊕⊕⊕ Low	Included >25% of studies with high RoB (1 studies), included less than 100 participants per group
	<i>by design</i>		
	Parallel; 7 studies	⊕⊕⊕⊕ Moderate	Included >25% of studies with high RoB (3 studies)
	Crossover; 4 studies	⊕⊕⊕⊕ Very Low	Included >25% of studies with high RoB (3 studies), heterogenic outcomes, included <100 participants per group
	<i>by study interventions</i>		
	Balance specific; 2 studies	⊕⊕⊕⊕ Very Low	Included only studies with high RoB (-2 levels), included less than 100 participants per group
	Not specific; 9 studies	⊕⊕⊕⊕ Low	Included >25% of studies with high RoB (4 studies), heterogenic outcomes
ML postural stability; 4 studies		⊕⊕⊕⊕ Very Low	Included >25% of studies with high RoB (3 studies), heterogenic outcomes, included <100 participants per group
Overall postural stability; 7 studies		⊕⊕⊕⊕ Low	Included >25% of studies with high RoB (3 studies), heterogenic outcomes
SEBT Posterolateral; 5 studies		⊕⊕⊕⊕ Moderate	Included less than 100 participants per group
SEBT Posteromedial; 5 studies		⊕⊕⊕⊕ Moderate	Included less than 100 participants per group

Abbreviations: AP = anteroposterior; ML = mediolateral; RoB = risk of bias; SEBT = Star Excursion Balance Test.

Additional file 4C. Detailed GRADE description for the evidence level assessment in meta-analyses for Q3 (Balance x No Balance).

Analysis		Level of Evidence	Reason to downgrade the level (GRADE)
Pain; 14 studies		⊕⊕⊕⊖ Low	Included >25% of studies with high RoB (5 studies), heterogenic outcomes
Adjustment for publication bias	Trim-and-fill; 17 studies	⊕⊕⊕⊖ Low	Included >25% of studies with high RoB (5 studies + 1 imputed), heterogenic outcomes
	Removing outliers; 11 studies	⊕⊕⊕⊖ Low	Included >25% of studies with high RoB (4 studies), heterogenic outcomes
Subgroup analyses	by study aim		
	Balance specific; 4 studies	⊕⊕⊕⊖ Very Low	Included only studies with high RoB, heterogenic outcomes, included less than 100 participants per group
	Not specific; 10 studies	⊕⊕⊕⊖ Moderate	Heterogenic outcomes
	by comparator		
	Minimal interventions; 9 studies	⊕⊕⊕⊖ Low	Included >25% of studies with high RoB (3 studies), heterogenic outcomes
	Exercise; 5 studies	⊕⊕⊕⊖ Low	Included >25% of studies with high RoB (2 studies), heterogenic outcomes
	by interventions		
	Balance only; 2 studies	⊕⊕⊕⊖ Very Low	Included only studies with high RoB, heterogenic outcomes, included less than 100 participants per group
Balance + exercise; 12 studies		⊕⊕⊕⊖ Moderate	Heterogenic outcomes
Function (PROMs); 10 studies		⊕⊕⊕⊖ Moderate	Heterogenic outcomes
Subgroup analyses	by study aim		
	Balance specific; 1 study		Not applicable
	Not specific; 9 studies	⊕⊕⊕⊖ Moderate	Heterogenic outcomes
	by comparator		
	Minimal interventions; 6 studies	⊕⊕⊕⊖ Moderate	Heterogenic outcomes
	Exercise; 4 studies	⊕⊕⊕⊖ Low	Included >25% of studies with high RoB (1 study), heterogenic outcomes
	by interventions		
	Balance only; no study		Not applicable
Balance + exercise; 10 studies			
Function (tests); 5 studies		⊕⊕⊕⊖ Very Low	Included >25% of studies with high RoB (2 studies), heterogenic outcomes, included <100 participants per group

Abbreviations: PROMs = patient-reported outcome measures; RoB = risk of bias.