HESAV
Haute École de Santé – Vaud

Atelier tronc

Module 2004

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Le tronc post-AVC



Déficit majeur des fléchisseurs et extenseurs du tronc (AVC VS. sujets sains) *(Quintino et al., 2018 ; Karatas et al., 2004)* et très fréquent (96%!) *(Kong et al., 2021)*



Atteintes bilatérales même après un AVC unilatéral (innervation bilatérale) *(Karthikbabu et al., 2011)*



Lien fort entre capacités du tronc et équilibre assis/debout *(Akkurt et al., 2024 ; Yanartaş et al., 2020 ; Karatas et al., 2004)* et marche *(Kong et al., 2021)*

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Ce qu'en dit la littérature …

Cochrane Library

Cochrane Database of Systematic Reviews

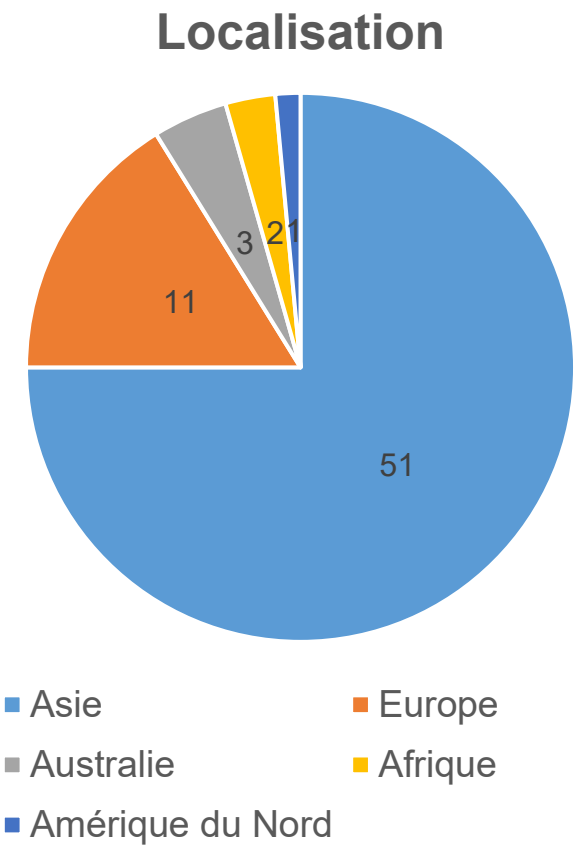
Trunk training following stroke (Review)

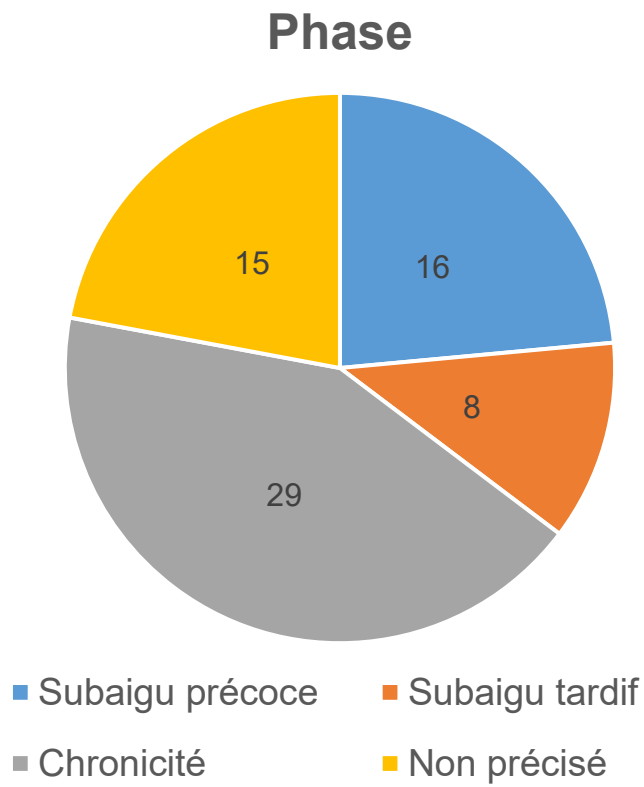
Thijs L, Voets E, Denissen S, Mehrholz J, Elsner B, Lemmens R, Verheyden GSAF.
Trunk training following stroke.
Cochrane Database of Systematic Reviews 2023, Issue 3. Art. No.: CD013712.
DOI: 10.1002/14651858.CD013712.pub2.

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Populations

Nb d'études	68
Taille totale de l'échantillon	2585 (GE : 1366 ; GC : 1219)
Taille médiane par groupe	15 [5-90]





(Thijs et al., 2023)

Interventions

Interventions	Nb études (participants)	Détails
Stabilité du tronc*	18 (757)	Exercices d'activation et de renforcement isométrique des muscles du tronc
Surface instable*	17 (637)	Exercices sur surfaces instables (coussins, ballons, plateformes). Réactions d'équilibration
Entraînement sélectif tronc*	15 (443)	Dissociation du tronc supérieur et inférieur (flexion, rotation, inclinaison). Mobilité et coordination.
NMES	7 (211)	Stimulation électrique neuromusculaire (NMES) ciblant un ou plusieurs muscles du tronc.
Atteintes en position assise (reaching)	6 (184)	Exercices d'atteintes multidirectionnelles en position assise. Réactions d'équilibration.
Transfert de poids	4 (97)	Déplacements du poids du corps jusqu'aux limites de stabilité dans des directions données. Réactions d'équilibration
Plateforme inclinée	2 (58)	Plateforme inclinée à 10° vs horizontale. Objectif : stimuler les ajustements posturaux via déplacement du centre de gravité.
Autres	3 (96)	Video-training orienté tronc (Cano-Mañas, 2020) Sitting-boxing (Park, 2017) Exercices du tronc + imagerie motriec (Shah, 2016)

(Thijs et al., 2023)

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Durée médiane : 4 semaines [1-12]

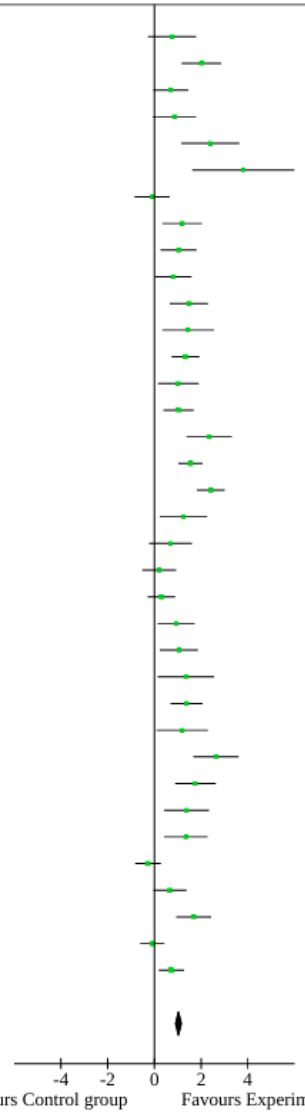
Temps total médian : 600 minutes [30-2700]

Résultats

Analysis 2.2. Comparison 2: Experimental training vs control group (Dose-matched therapy in control group), Outcome 2: Trunk function

Study or Subgroup	Experimental training Mean	SD	Total	Control group Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI	Risk of Bias A B C D E F G
Bae 2013	3.7	2.46	8	1.8	2.23	8	1.5%	0.77 [-0.26 , 1.79]	? ? ? ? ? ? +
Chan 2015	5.13	2	25	1.3	1.5	12	2.2%	2.02 [1.17 , 2.86]	? + ? + + + +
Choi 2014	6.1	5.9	15	2.4	4.2	15	2.9%	0.70 [-0.04 , 1.44]	? ? ? − + − +
De Sèze 2001	33.7	11.5	10	20	18.3	10	1.9%	0.86 [-0.07 , 1.78]	? ? − + + + +
Dean 1997	0.08	0.05	10	-0.023	0.028	9	1.0%	2.39 [1.15 , 3.63]	+ − ? + + − +
Dean 2007	0.13	0.05	6	-0.04	0.03	6	0.3%	3.81 [1.63 , 5.98]	+ + ? + + − +
DeLuca 2020	1.92	2.26	14	2.15	2.37	13	2.8%	-0.10 [-0.85 , 0.66]	? ? ? + + + +
Dubey 2018	3.96	1.47	13	1.84	1.96	13	2.2%	1.19 [0.34 , 2.03]	? + ? + − + +
Fujino 2016	12.6	9.46	15	4.13	6.06	15	2.7%	1.04 [0.27 , 1.81]	? + ? + + + +
Fukata 2019	4.75	2.35	14	2.81	2.34	14	2.7%	0.80 [0.03 , 1.58]	? + ? + ? + +
Haruyama 2017	4.13	2.31	16	1.19	1.42	15	2.4%	1.48 [0.67 , 2.29]	+ + ? + + + +
Jung 2014	2.4	1.2	9	0.1	1.8	8	1.3%	1.45 [0.34 , 2.55]	? + ? + + + +
Jung 2016a	4.65	2.6	40	1.58	1.4	20	4.6%	1.33 [0.74 , 1.92]	? ? ? ? ? + +
Jung 2016b	4.83	2.17	12	2.42	2.36	12	2.1%	1.03 [0.17 , 1.89]	? ? ? ? ? ? ?
Jung 2017	29.61	24.66	21	10.23	8.59	22	3.9%	1.04 [0.40 , 1.68]	+ ? ? + + + +
Karthikbabu 2011	7.93	1.28	15	4.87	1.25	15	1.7%	2.35 [1.39 , 3.31]	? + ? + + + +
Karthikbabu 2018a	4.24	2.4	58	0.4	2.58	27	6.0%	1.55 [1.03 , 2.06]	? + ? ? − − +
Karthikbabu 2021	4.65	1.52	56	0.6	1.9	28	4.6%	2.42 [1.84 , 3.01]	+ + − ? + − +
Kilinç 2016	2.1	1.28	10	0.66	0.86	9	1.6%	1.25 [0.24 , 2.25]	+ ? ? + − + +
Ko 2016	7.1	4.5	10	3.8	4.6	10	1.9%	0.69 [-0.21 , 1.60]	? ? − + − ? ?
Lee 2017a	3.7	3.2	15	3.1	2.2	15	3.1%	0.21 [-0.51 , 0.93]	+ + ? ? + + ?
Lee 2017b	1.4	2.51	23	0.6	2.63	23	4.7%	0.31 [-0.28 , 0.89]	? ? ? ? ? ? ?
Lee 2020a	3.3	1.75	12	1.7	1.6	17	2.6%	0.94 [0.15 , 1.72]	+ ? − + + + +
Park 2018a	6.8	3.65	20	3.1	2.83	10	2.4%	1.06 [0.24 , 1.87]	? ? − ? + ? +
Park 2018b	4.3	1.59	7	1.7	2.01	7	1.1%	1.34 [0.14 , 2.54]	− − ? ? − ? ?
Park 2020	1.67	0.79	21	0.57	0.78	21	3.5%	1.37 [0.70 , 2.05]	+ ? ? ? − ? +
Renald 2016	6.5	1.84	8	4.38	1.5	8	1.3%	1.19 [0.10 , 2.28]	? ? ? + + − ?
Saeys 2012	8.72	1.965	18	2.87	2.386	15	1.7%	2.64 [1.67 , 3.60]	? + ? + + + +
Sarwar 2019	6	1.65	15	3.5	1.05	15	2.2%	1.76 [0.90 , 2.62]	? ? ? ? + − ?
Shah 2016	18	2.44	10	12	5.2	12	1.8%	1.38 [0.43 , 2.33]	? + ? + + + +
Sharma 2017	4.54	0.78	13	3.1	1.29	10	1.8%	1.35 [0.42 , 2.28]	+ + ? + + + +
Sheehy 2020	3.4	7.33	26	5.3	6.21	27	5.4%	-0.28 [-0.82 , 0.27]	+ + − + − − ?
Shim 2020	4.41	1.58	17	3.44	1.21	16	3.2%	0.67 [-0.03 , 1.37]	? ? − − − − ?
Van Criekinge 2020	4.37	2.37	19	0.4	2.24	20	2.9%	1.69 [0.95 , 2.43]	? + − + + + +
Viswaja 2015	5.07	1.12	30	5.17	1.13	30	6.2%	-0.09 [-0.59 , 0.42]	? ? ? ? ? − ?
Yoo 2010	4.78	3.99	28	2.45	2.11	31	5.7%	0.73 [0.20 , 1.26]	? ? ? ? ? + +
Total (95% CI)			**659**			**558**	**100.0%**	**1.03 [0.91 , 1.16]**	

Heterogeneity: Chi² = 135.54, df = 35 (P < 0.00001); I² = 74%
Test for overall effect: Z = 16.04 (P < 0.00001)
Test for subgroup differences: Not applicable



Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

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(Thijs et al., 2023)

Résultats

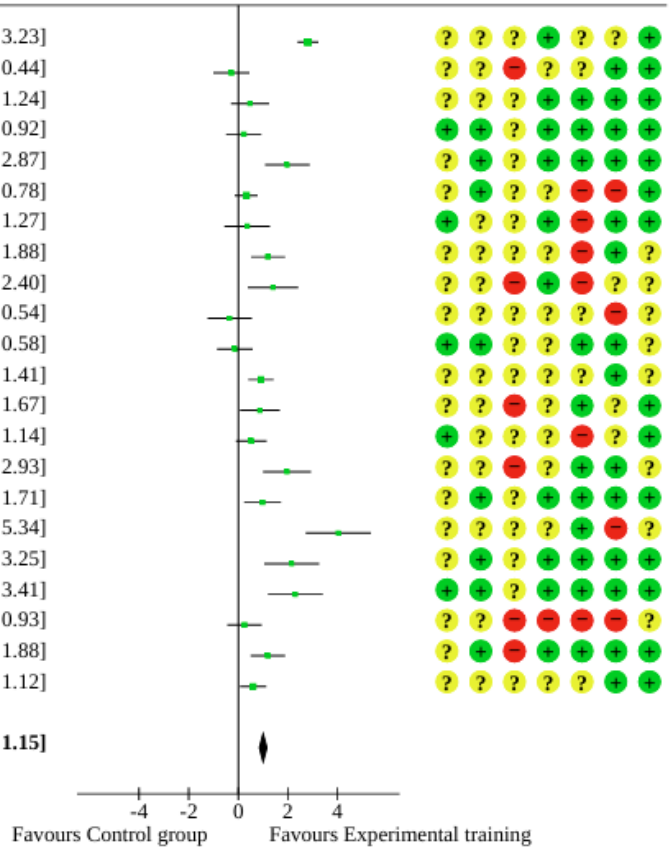
Analysis 2.5. Comparison 2: Experimental training vs control group (Dose-matched therapy in control group), Outcome 5: Standing balance

Study or Subgroup	Experimental training Mean	SD	Total	Control group Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Chen 2020	16.24	2.08	90	10.65	1.87	90	12.6%	2.81 [2.40 , 3.23]
Chitra 2015	8.53	5.58	15	10.07	5.23	15	4.2%	-0.28 [-1.00 , 0.44]
DeLuca 2020	2.71	3.26	14	1.23	2.71	13	3.7%	0.48 [-0.29 , 1.24]
Haruyama 2017	3.38	5.3	16	2.28	4.5	15	4.3%	0.22 [-0.49 , 0.92]
Karthikbabu 2011	6.2	0.94	15	4.4	0.83	15	2.7%	1.98 [1.08 , 2.87]
Karthikbabu 2018a	2.3	5.12	58	0.8	3.22	27	10.2%	0.32 [-0.14 , 0.78]
Kilinç 2016	0.4	0.51	10	0.22	0.44	9	2.6%	0.36 [-0.55 , 1.27]
Kim 2011	4.6	4.18	20	0.1	3.09	20	4.7%	1.20 [0.52 , 1.88]
Ko 2016	25.1	11	10	10.7	8.5	10	2.2%	1.40 [0.40 , 2.40]
Lee 2014a	1	3.31	10	2.6	5.38	10	2.8%	-0.34 [-1.23 , 0.54]
Lee 2017a	2.1	2.2	15	2.6	4.5	15	4.2%	-0.14 [-0.85 , 0.58]
Park 2013	5.41	2.73	34	3.17	2.09	34	8.6%	0.91 [0.41 , 1.41]
Park 2018a	19.2	13.13	20	8.4	9.34	10	3.4%	0.87 [0.08 , 1.67]
Park 2020	1.95	2.55	21	0.62	2.43	21	5.7%	0.52 [-0.09 , 1.14]
Park J 2017	6.08	2.1	13	1.9	2.02	13	2.3%	1.96 [1.00 , 2.93]
Saeys 2012	19.39	11.241	18	9.2	8.612	15	4.0%	0.98 [0.25 , 1.71]
Sarwar 2019	24.3	2.51	15	14.8	2.05	15	1.3%	4.03 [2.73 , 5.34]
Shah 2016	9.1	1.42	10	5.42	1.8	12	1.8%	2.16 [1.06 , 3.25]
Sharma 2017	4.53	0.99	13	2.1	1.05	10	1.8%	2.30 [1.20 , 3.41]
Shim 2020	5.35	1.97	17	4.81	2.26	16	4.6%	0.25 [-0.44 , 0.93]
Van Criekinge 2020	5.89	3.29	19	1.8	3.42	20	4.6%	1.19 [0.51 , 1.88]
Yoo 2010	11.29	9.19	28	6.23	7.47	31	7.9%	0.60 [0.08 , 1.12]
Total (95% CI)			**481**			**436**	**100.0%**	**1.00 [0.86 , 1.15]**

Heterogeneity: Chi² = 170.41, df = 21 (P < 0.00001); I² = 88%

Test for overall effect: Z = 13.38 (P < 0.00001)

Test for subgroup differences: Not applicable



(Thijs et al., 2023)

Résultats

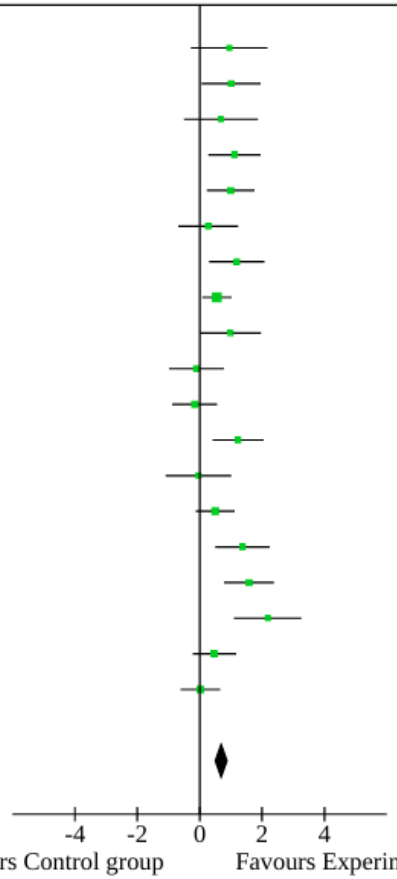
Analysis 2.7. Comparison 2: Experimental training vs control group (Dose-matched therapy in control group), Outcome 7: Walking ability

Study or Subgroup	Experimental training Mean	SD	Total	Control group Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Chung 2014	13.1	7.5	6	5.9	6.5	6	2.2%	0.95 [-0.28 , 2.17]
De Sèze 2001	2.2	1	10	1.1	1.1	10	3.7%	1.00 [0.06 , 1.94]
Dean 2007	0.4	0.35	6	0.2	0.16	6	2.4%	0.68 [-0.50 , 1.86]
Dubey 2018	0.2	0.19	13	0.04	0.05	13	4.7%	1.12 [0.28 , 1.95]
Haruyama 2017	13.67	12.62	16	1.33	11.5	15	5.8%	0.99 [0.24 , 1.75]
Jung 2014	5	9.85	9	2.6	6.29	8	3.6%	0.27 [-0.69 , 1.23]
Jung 2016b	5.4	3.5	12	1.6	2.6	12	4.2%	1.19 [0.31 , 2.07]
Karthikbabu 2018a	0.11	0.1	58	0.04	0.17	27	15.2%	0.55 [0.09 , 1.01]
Kilinç 2016	5.68	6.34	10	0.71	1.95	9	3.5%	0.99 [0.02 , 1.96]
Lee 2014a	1.18	8.57	10	2.15	9.53	10	4.3%	-0.10 [-0.98 , 0.77]
Lee 2017a	0.4	0.5	15	0.5	0.7	15	6.4%	-0.16 [-0.88 , 0.56]
Lee 2020a	12.4	9.04	12	-2	12.78	17	5.0%	1.23 [0.41 , 2.04]
Park 2018b	16.4	31.21	7	17.9	38.69	7	3.0%	-0.04 [-1.09 , 1.01]
Park 2020	2.52	3.14	21	1	2.81	21	8.7%	0.50 [-0.11 , 1.12]
Park J 2017	5.78	4.47	13	0.96	1.76	13	4.3%	1.37 [0.50 , 2.24]
Saeys 2012	5.89	2.88	18	1.8	2.007	15	5.2%	1.58 [0.78 , 2.38]
Sharma 2017	7.01	1.2	13	4.09	1.4	10	2.8%	2.18 [1.11 , 3.26]
Shim 2020	4	1.54	17	3.31	1.3	16	6.8%	0.47 [-0.22 , 1.16]
Van Criekinge 2020	0.12	4.05	19	0.05	2.3	20	8.3%	0.02 [-0.61 , 0.65]
Total (95% CI)			**285**			**250**	**100.0%**	**0.69 [0.51 , 0.87]**

Heterogeneity: Chi² = 36.65, df = 18 (P = 0.006); I² = 51%

Test for overall effect: Z = 7.44 (P < 0.00001)

Test for subgroup differences: Not applicable





(Thijs et al., 2023)

Résultats

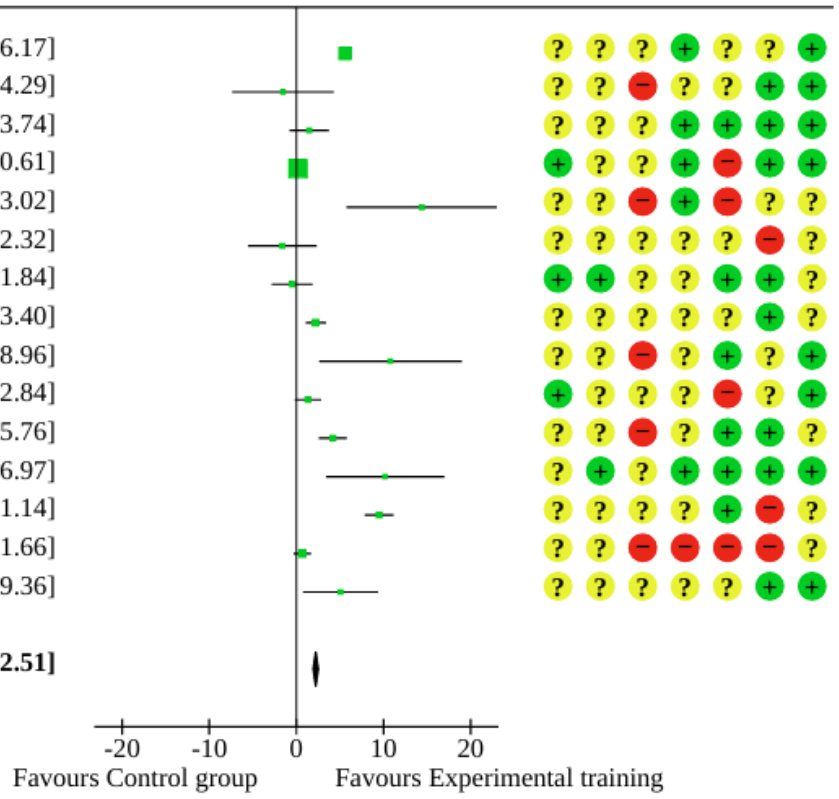
Analysis 2.13. Comparison 2: Experimental training vs control group (Dose-matched therapy in control group), Outcome 13: Berg Balance Scale

Study or Subgroup	Experimental training Mean	SD	Total	Control group Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Chen 2020	16.24	2.08	90	10.65	1.87	90	24.8%	5.59 [5.01 , 6.17]
Chitra 2015	8.53	5.58	15	10.07	10.07	15	0.2%	-1.54 [-7.37 , 4.29]
DeLuca 2020	2.71	3.26	14	1.23	2.71	13	1.6%	1.48 [-0.78 , 3.74]
Kilinç 2016	0.4	0.51	10	0.22	0.44	9	45.4%	0.18 [-0.25 , 0.61]
Ko 2016	25.1	11	10	10.7	8.5	10	0.1%	14.40 [5.78 , 23.02]
Lee 2014a	1	3.31	10	2.6	5.38	10	0.5%	-1.60 [-5.52 , 2.32]
Lee 2017a	2.1	1.1	15	2.6	4.5	15	1.5%	-0.50 [-2.84 , 1.84]
Park 2013	5.41	2.73	34	3.17	2.09	34	6.2%	2.24 [1.08 , 3.40]
Park 2018a	19.2	13.13	20	8.4	9.34	10	0.1%	10.80 [2.64 , 18.96]
Park 2020	1.95	2.55	21	0.62	2.43	21	3.6%	1.33 [-0.18 , 2.84]
Park J 2017	6.08	2.1	13	1.9	2.02	13	3.3%	4.18 [2.60 , 5.76]
Saeys 2012	19.39	11.241	18	9.2	8.612	15	0.2%	10.19 [3.41 , 16.97]
Sarwar 2019	24.3	2.51	15	14.8	2.05	15	3.1%	9.50 [7.86 , 11.14]
Shim 2020	4	1.54	17	3.31	1.3	16	8.8%	0.69 [-0.28 , 1.66]
Yoo 2010	11.29	9.19	28	6.23	7.47	31	0.4%	5.06 [0.76 , 9.36]
Total (95% CI)			**330**			**317**	**100.0%**	**2.22 [1.93 , 2.51]**

Heterogeneity: Chi² = 340.44, df = 14 (P < 0.00001); I² = 96%

Test for overall effect: Z = 15.13 (P < 0.00001)

Test for subgroup differences: Not applicable



(Thijs et al., 2023)

Résultats

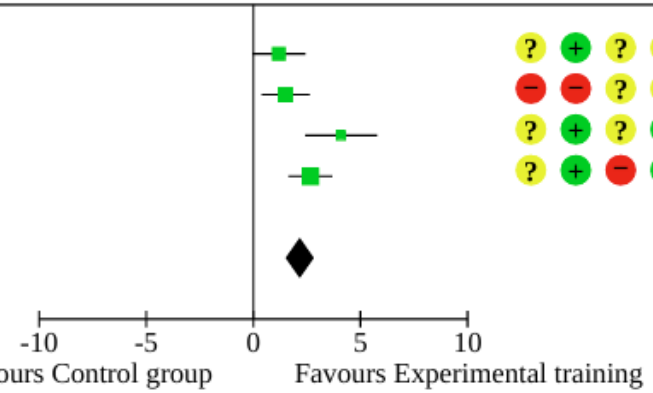
Analysis 2.15. Comparison 2: Experimental training vs control group (Dose-matched therapy in control group), Outcome 15: Tinetti Gait

Study or Subgroup	Experimental training Mean	SD	Total	Control group Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI	Risk of Bias A	B	C	D	E	F	G
Karthikbabu 2018a	1.69	3.74	58	0.5	2.06	27	23.6%	1.19 [-0.05 , 2.43]	?	+	?	?	−	−	+
Park 2018b	2.4	0.91	7	0.9	1.2	7	29.0%	1.50 [0.38 , 2.62]	−	−	?	?	−	?	?
Saeys 2012	5.89	2.88	18	1.8	2.007	15	12.9%	4.09 [2.42 , 5.76]	?	+	?	+	+	+	+
Van Criekinge 2020	3.26	1.79	19	0.6	1.43	20	34.6%	2.66 [1.64 , 3.68]	?	+	−	+	+	+	+
Total (95% CI)			**102**			**69**	**100.0%**	**2.16 [1.56 , 2.76]**							

Heterogeneity: Chi² = 9.74, df = 3 (P = 0.02); I² = 69%

Test for overall effect: Z = 7.06 (P < 0.00001)

Test for subgroup differences: Not applicable



(Thijs et al., 2023)

Construction d’un protocole

Réfléchissez aux exercices à intégrer dans un protocole de rééducation du tronc post-AVC et préparez-vous à les présenter au reste de la classe.

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