Supplementary Material 16: Characteristics of participants in included studies

Characteristics of participants in included studies							
Study ID	**Group**	**Participants randomised (n)**	**Male/ Female (n)**	**Age in years Mean (SD)**	**Stroke details** Type: Hemisphere (r/): Severity: Time post onset:	**Perceptual impairment** Sense(s) Name: Diagnosis: Severity:	**Concurrent impairments reported Mean (SD) and method of diagnosis**
An 2019 [1]	1. Game-based vertical posture training	7	4/3	59.3(4.6)	Ischaemic/haemorrhage:5/2 Hemisphere (r/l):6/1 Severity: not reported Time post onset: 31.4(7.4) days	Somatosensory: Pusher Syndrome Diagnosis: Burke Lateropulsion Scale (>2) Severity: not stated	not stated
	2. Standard vertical posture training	7	3/4	64.4(7.5)	Ischaemia/haemorrhage:4/3 Hemisphere (r/l): 7/0 Severity: not reported Time post onset:29.0(6.1) days	Somatosensory: Pusher Syndrome Diagnosis: Burke Lateropulsion Scale (>2) Severity: not stated	not stated
An 2020 [2]	1. Whole-body tilting postural training	15	11/4	60.5 (6.0)	Ischaemia/haemorrhage: 8/7 Hemisphere (r/l): 12/3 time post-onset : 21.5 (3.4) days	Somatosensation Pusher's syndrome Severity: 4.3 (1.4)(SCP)	Neglect %: 53% (method of diagnosis unclear) K-MMSE: 26.3 (2.1)
	2.General postural training	15	10/5	64.7 (6.9)	Ischaemia/haemorrhage:7/8 Hemisphere (r/l): 11/4 Time post-onset: 21.9 (5.9) days?	Somatosensation Pusher's syndrome Severity: 4.3 (1.4) SCP	Neglect %: 60%(method of diagnosis unclear) K-MMSE: 25.7(1.5)

Bergmann 2018 [3]	1. Robot-assisted gait training	21	10/5 (data not provided for 6 participants who did not complete the intervention)	72 (9)	Ischaemia/haemorrhage: 8/7 Hemisphere (r/l): 11/4 Severity: not reported Time post onset: 7.5 (2.6) weeks	Somatosensory: Pusher Syndrome Diagnosis: Scale for Contraversive Pushing >0 per component assessed by physiotherapist.Orthostatic tolerance for 30 mins of passive standing Severity: Not stated	All patients showed cognitive deficits with ACE-R scores <84. Several patients had severe cognitive deficits
	2. Physiotherapy	17	7/8 (data not provided for 2 participants who did not complete the intervention)	71 (10)	Ischaemia/haemorrhage: 9/6 Hemisphere (r/l): 12/3 Severity: not reported Time post onset: 8.0 (3.8) weeks	Somatosensory: Pusher Syndrome Diagnosis: Scale for Contraversive Pushing >0 per component assessed by physiotherapist.Orthostatic tolerance for 30 mins of passive standing Severity: Not stated	All patients showed cognitive deficits with ACE-R scores <84. Several patients had severe cognitive deficits particularly in control group
Carey 2011 [4]	1. Sensory discrimination training	25	17/8	61.08 (14.38)	Infarct/haemorrhage/infarct and haemorrhage(%):64/36/0 Hemisphere (r/l): 18/0 Severity (NIHSS): median 4, [IQR 2-7.25] Time post onset: median	Mixed: tacile and somatosensory Diagnosis: unclear Severity: -41.14 (35.79)(standardised somatosensory deficit)	none stated

				32.57 [IQR16.29-148.29] weeks			
	2. Exposure to tactile stimuli	25	20/5	60.96(11.17)	Infarct/haemorrhage/infarct and haemorrhage)(%):64/36/0 Hemisphere (r/l): 18/0 Severity (NIHSS): median 4, [IQR 2-7.25] Time post onset: median 32.57, IQR16.29-148.29 weeks	Mixed: tacile and somatosensory Diagnosis: unclear Severity: -31.24 (27.07)(standardised somatosensory deficit)	none stated
Chen 2012 [5]	1. image drawing - global processing training	6	2/4	73.8 (8.8)	Type not stated (see inclusion criteria) hemisphere (r/l): 6/0 (inclusion criterion) Severity: not stated Time: 48.0 (17.2) days	Vision: Visualspatial memory deficit Diagnosis: IR of MTCF $\leq$ 9/36 Severity unclear	GDS ($\leq$10/30): 4.8(3.5) BIT ($\geq$129/126):139.5(5.6) MMSE ($\geq$24/30):27.5(2.1) (none meet criteria for depression, spatial neglect or dementia)
	2. Image drawing - rote repetition training	5	3/2	74.0 (8.4)	Type not stated (see inclusion criteria) Hemisphere (r/l): 5/0 (inclusion criterion) Severity: not stated Time: 35.0 (20.2) days	Vision: Visualspatial memory deficit Diagnosis: IR of MTCF $\leq$ 9/36 Severity unclear	GDS ($\leq$10/30):5.4(4.4) BIT ($\geq$129/126):136.8(7.7) MMSE ($\geq$24/30):26.6(1.8)

							(none meet criteria for depression, spatial neglect or dementia)
Cho 2015 [6]	1. Neurofeedback training	13	8/5	62.9(7.2)	Type: not stated Hemisphere (r/l): 9/4 Severity: not stated Time post-onset:10.6(3.2) months	Vision: visual perceptual deficit Diagnosis: MMSE Severity:19.8(2.5)	none stated
	2. No intervention	14	11/3	63.6(9.3)	Type: not stated Hemisphere (r/l):8/5 Severity: not stated Time post-onset: 12.5(2.7) months	Vision: visual perceptual deficit Diagnosis: MMSE Severity:20.5(3.7)	none stated
Choi 2018 [7]	1. WiiFit virtual reality training	14	9/5	49.50(23.00)	Infarction/haemorrhage: 10/4 Hemisphere (r/l): 8/6 Severity: not stated Time post onset: not stated	Vision: visual perceptual deficit Diagnosis: MVPT score <45 Severity: not stated	MAS (G0/G1/G1+/G2/G3): 1/7/6/0/0 MMSE-K (score):28.50(3.25)
	2. Control - general balance training	14	8/6	51.00(13.75)	Infarction/haemorrhage: 8/6 Hemisphere (r/l): 9/8 Severity: not stated Time post onset: not stated	Vision: visual perceptual deficit Diagnosis: MVPT score <45: Severity: not stated	MAS (G0/G1/G1+/G2/G3): 2/4/8/0/0 MMSE-K (score):28.50(3.50)
De Bruyn 2020 [8]	1. Sensorimotor	22	12/10	75.5 median [60.8–80.3]	Ischaemia/haemorrhage:19/3 Hemisphere (r/l): 17/5	Somatosensory: Sensorimotor impairment	Not stated

	therapy			IQR	Severity: not reported Time post onset: 38.5 median (30.8–48.3) days IQR	Diagnosis: action research arm test score<52 out of 57 and a negative composited standardized somatosensory deficit index Severity: ARAT 8/57	
	2. Motor exercises	18	9/9	61.5 median [54–70] IQR	Ischaemia/haemorrhage:14/4 Hemisphere (r/l): 8/10 Severity: not reported Time post onset: 40 median (28.8–53.5) days IQR	Somatosensory: Sensorimotor impairment Diagnosis: action research arm test score<52 out of 57 and a negative composited standardized somatosensory deficit index Severity: ARAT 12/57	Not stated
Edmans 2000 [9]	1. Transfer of training perceptual treatment	40	18/22	69.75(9.10)	Type: not stated Hemisphere (r/l): unclear Severity: not stated Time post onset: 37.68(16.60) days	Vision: visual perceptual deficit Diagnosis: RBAB, score > 2 SD below mean on four+ subtests Severity: median 100.50 (IQR 52.95-124.73)	Dysphasia (present/absent): 12/28 Dysarthria (present/absent):9/31 Articulatory dyspraxia (present/absent):6/34 Reasoning problems (present/absent):25/7 Memory problems

							(present/absent):32/4 Depression (present/absent): 8/24 Anxiety (present/absent): 14/18 Limb dyspraxia (present/absent): 3/33 Sensory problems (present/absent):28/9
	2. Functional perceptual treatment	40	22/18	67.85(11.38)	Type: not stated Hemisphere (r/l): unclear Severity: not stated Time post onset: 31.15(10.13) days	Vision: visual perceptual deficit Diagnosis: RBAB, score > 2 SD below mean on four+ subtests Severity: median 99.90(IQR 76.35-124.68)	Dysphasia (present/absent):14/36 Dysarthria (present/absent):6/34 Articulatory dyspraxia (present/absent):5/35 Reasoning problems (present/absent):23/11 Memory problems (present/absent):31/6 Depression (present/absent):13/21 Anxiety (present/absent):9/25 Limb dyspraxia (present/absent):6/31

						Sensory problems (present/absent):27/7
Kang 2009 [10]	1. Computerized visual perception rehabilitation with motion tracking	8	not reported	59.5(10.7)	Ischaemia/haemorrhage: 8/8 (whole group data) Hemisphere (r/l):8/0 Severity: not stated Time post onset: 64.3(37.4) days	Vision: visual perceptual deficit NB: all particpants had hemiplegia (inclusion crietrion) Diagnosis: Motor Free Visual Perception Test standard score 5<109. Severity: 65.8(19.5) MVPT score	none stated
	2. Computer-based cognitive rehabilitation program	8	not reported	62.5(9.6)	Ischaemia/haemorrhage: 8/8 (whole group data) Hemisphere (r/l):8/0 Severity: not stated Time post onset: 58.1(29.9) days	Vision: visual perceptual deficit NB: all particpants had hemiplegia (inclusion crietrion) Diagnosis: Motor Free Visual Perception Test standard score 5<109. Severity: 68.3(11.4) MVPT score	none stated
Kim 2015 [11]	1. Pressure sense perception training on	10	4/6	54.70(3.09)	Infarct/haemorrhage: 4/6 Hemisphere (r/l): 3/7 Severity: not reported Time post onset:	Tactile: pressure perception dysfunction Diagnosis: Semmes-Weinstein monofilaments	not stated

	stable surface				42.20(21.61) months	Severity: not stated	
	2. Pressure sense perception training on unstable surface	10	8/2	59.40(8.63)	Infarct/haemorrhage:4/6 Hemisphere (r/l):4/6 Severity: not reported Time post onset:37.80 (22.40) months	Tactile: pressure perception dysfunction Diagnosis: Semmes-Weinstein monofilaments Severity: not stated	not stated
	3. No treatment	10	8/2	56.40(11.87)	Infarct/haemorrhage:3/7 Hemisphere (r/l):5/5 Severity: not reported Time post onset:50.70(13.83) months	Tactile: pressure perception dysfunction Diagnosis: Semmes-Weinstein monofilaments Severity: not stated	not stated
Koo 2018 [12]	1. Transcranial Direct Current Stimulation	12	6/6	52.42 (3.23)	Ischaemia/haemorrhage: 4/8 Hemisphere (r/l): 6/6 Severity: not reported Time post onset: 18.67(8.10) days	Somatosensory: Somatosensation Diagnosis: patients with impairment in at least one of the pin prick, light touch, or proprioception parameters during a bedside screening evaluation. Severity: Not stated	Hypertension, Diabetes & moderate (2) or severe impairment (10) score on Modified Barthel Index
	2. Sham Transcranial Direct Current Stimulation	12	5/7	58.67 (3.40)	Ischaemia/haemorrhage: 7/5 Hemisphere (r/l): 4/8 Severity: not reported Time post onset: 19.67 (7.76)	Somatosensory: Somatosensation Diagnosis: patients with impairment in at least one	Hypertension, Diabetes & moderate (3) or severe impairment (9) score

					days	of the pin prick, light touch, or proprioception parameters during a bedside screening evaluation. Severity: Not stated	on Modified Barthel Index
Lee 2021 [13]	1. Robot-assisted therapy	14	9/5	59.56 (8.29)	Ischaemia/haemorrhage: 9/5 Hemisphere (r/l): 5/9 Severity: not reported Time post onset: 882.00 (957.67) days	Tactile: Tactile Dysfunction Diagnosis: revised Nottingham Sensory Assessment Tactile Score <2 and Kinesthetic score <3. Modified Ashworth Scale score <3. Brunnstrom Stages II-V Severity: Not stated	not stated
	2. Conventional therapy	10	7/3	53.50 (12.33)	Ischaemia/haemorrhage:4/6 Hemisphere (r/l): 2/8 Severity: not reported Time post onset: 883.30 (1,020.49) days	Tactile: Tactile Dysfunction Diagnosis: revised Nottingham Sensory Assessment Tactile Score <2 and Kinesthetic score <3. Modified Ashworth Scale score <3. Brunnstrom Stages II-V Severity: Not stated	not stated

Lincoln 1985 [14]	1. Perceptual training	17 (3 head injury)	9/8	48.76(14.58)	Stroke/sub arachnoid haemorrhage): 9/5 Hemisphere (r/l/both/neither): 8/7/1/1 Severity: not stated Time post onset: 2.35(0.95) months	Vision: visual perceptual deficit Diagnosis: RPAB Severity: not stated	not stated
	2. Conventional Therapy	16 (3 head injury)	8/8	51.44(16.04)	Stroke/sub arachnoid haemorrhage): 12/1 Hemisphere (r/l/both/neither): 7//81/0 Severity: not stated Time post onset: 3.06(2.43) months	Vision: visual perceptual deficit Diagnosis: RPAB Severity: not stated	not stated
Park 2015 [15]	1. Computer-based cognitive rehabilitation training	15	6/9	64.7(8.9)	Type: not stated Hemisphere (r/l): not stated Severity: not stated Time post onset: 1.5(0.5) months	Vision: visual perceptual deficit Diagnosis: MMSE Severity: 20.6(2.3) MMSE scor	not stated
	2. Conventional cognitive rehabilitation	15	8/7	65.2(8.0)	Type: not stated Hemisphere (r/l): not stated Severity: not stated Time post onset: 1.8(0.6) months	Vision: visual perceptual deficit Diagnosis: MMSE Severity: 20.5(2.0) MMSE score	not stated
Seim 2021 [16]	1. VTS Glove	8	5/3	54.1	Ischaemia/haemorrhage: not reported	Tactile: Tactile Discrimination Disorder	Not stated

					Hemisphere (r/l): 3/5 Severity: not reported Time post onset: 4.3 yrs mean	Diagnosis: Impaired touch sensation in the hand (Semmes-Weinstein monofilament exam score of $\geq$ 0.2 grams on 3 of 20 measured locations on the hand) Severity: Not stated	
	2. Sham	8	6/2	54.5	Ischaemia/haemorrhage: not reported Hemisphere (r/l): 5/3 Severity: not reported Time post onset: 3 yrs	Tactile: Tactile Discrimination Disorder Diagnosis: Impaired touch sensation in the hand (Semmes-Weinstein monofilament exam score of $\geq$ 0.2 grams on 3 of 20 measured locations on the hand) Severity: Not stated	Not stated
Yang 2015 [17]	1. Computer generated visual feedback training	7	4/3	62.4 (12.9)	Ischaemia/haemorrhage: 7/0 Hemisphere (r/l): 0/7 Severity: not reported Time post onset: 6.0 (4.0) months	Somatosensory: Pusher Syndrome Diagnosis: greater than zero point scores in each section of the scale for contraversive pushing (sitting plus standing) Severity: Not stated	Not stated

	2. Mirror visual feedback training	5	5/0	57.6 (17.3)	Ischaemia/haemorrhage): 3/2 Hemisphere (r/l): 2/3 Severity: not reported Time post onset: 5.8 (3.3) months	Somatosensory: Pusher Syndrome Diagnosis: greater than zero point scores in each section of the scale for contraversive pushing (sitting plus standing) Severity: Not stated	Not stated
Yun 2018 [18]	1. Robot-assisted gait training	19	10/8	63.6 (8.3)	Ischaemia/haemorrhage:12/6 Hemisphere (r/l): 3/15 Severity: 12.7 (1.5) NIHSS Time post onset: 31.3 (7.5) days	Somatosensory: Pusher Syndrome Diagnosis: Burke lateropulsion scale score over 2 points Severity: Not stated	10 participants had neglect; 2 aphasia
	2. Conventional physical therapy	19	9/9	64.3 (8.4)	Ischaemia/haemorrhage):13/5 Hemisphere (r/l): 4/14 Severity: 12.9 (1.6) NIHSS Time post onset: 28.8(6.8) days	Somatosensory: Pusher Syndrome Diagnosis: Burke lateropulsion scale score over 2 points Severity: Not stated	10 participants had neglect; 3 aphasia

SCP: Scale for contraversive pushing; GDS:Geriatric Depression Scale; BIT: Behavioral Inattention Test; MMSE: Mini-Mental State

Examination; K-MMSE: Korean Mini-Mental State Examination;; IR:immediate recall; MTCF:Modified Taylor Complex Figure; MVPT: motor

Free visual perception test; MAS: Modified Ashworth Scale; G, grade; NIHSS National Institutes of Health Stroke Scale; RPAB: Rivermead

Perceptual Assessment Battery; SD: standard deviation; IQR: inter-quartile range

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