Åkerlund et al. (2013)

Study Characteristics	
Methods	**Design:** Randomized Controlled Trial **Duration of trial:** March 2008 – December 2010 **Recruitment and allocation:** participants were randomized by lot into either the IG or the CG **Method of blinding**: not reported **Cognitive domain**: working memory
Participants	**Setting:** outpatient rehabilitation **Country:** Sweden **Sample size:** *n* = 40, 51% men; IG: *n* = 22; CG: *n* = 18 (at follow-up: *n* = 38; IG: *n* = 20; CG: *n* = 18) **Inclusion criteria:** performance of ≤ 5 digits forwards and/or ≤ 4 digits reversed in the WAIS-III Digit span and/or ≤ 5 blocks forwards and/or ≤ blocks reversed in the WAIS-III NI Span board. **Exclusion criteria:** aphasia; non-Swedish communicable; participation in study was contraindicated due to medical reasons according to the physician's health assessment (pronounced fatigue, pain or depression). **Age:** *M* = 47.7 (SD 11.27) years **Time since onset of ABI:** *Median* = 32 (range: 12 – 500) weeks **Types of ABI:** TBI: *n* = 7; stroke: *n* = 32; other: *n* = 6 (based on total participants allocated)
Interventions	<u>Intervention group</u> **Brief name**: Computerized WM training – Cogmed QM **What (materials)**: Cogmed QM **What (procedure)**: program includes a battery of visuospatial and verbal WM tasks and all parts of the battery must be trained at each session, 90 trials a day, in conjunction with care as usual. **Who**: not reported, but they got feedback once a week from a trained coach. **How**: not reported **Where**: not reported **When and how much**: 30-45 minutes sessions, 5 times a week, for 5 weeks (25 sessions)

	Control group **Brief name**: normal routines at the clinic **What (materials)**: not reported **What (procedure)**: not reported **Who**: not reported **How**: not reported **Where**: not reported **When and how much**: not reported
Outcomes	**Primary:** none reported **Secondary:** ***ICF-domain Activities:*** • Self-reporting: Dysexecutive Questionnaire (DEX) (patient rating); Activities of Daily Living Scale (patient rating) ***ICF-domain Participation*:** none reported ***ICF-domain Functionality*:** • Working memory: Digit span (forwards and backwards); Corsi block tapping test (forwards and backwards) ***ICF-domain Personal*:** • Mood: Hospital Anxiety and Depression Scale (HADS) **Methods of data collection:** not reported **Data collection time points:** baseline, post-treatment and at 3 months follow-up
Notes	**Funding**: none stated **Conflict of interest**: none reported **Published trial protocol:** none reported **Trial registration:** none reported **Ethics approval:** no (study was performed within the ordinary clinical work; authors reported that the study has therefore not been considered by an ethical committee)

Risk of Bias

Bias	**Authors' Judgement**	**Support of Judgement**
Random sequence generation (selection bias)	Low risk	Participants were randomized by lot into either the IG or the CG

Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	Unclear risk	Blinding or not was not reported but it was apparent that participants could have known which group they were allocated to. Staff would also have been aware of the treatment allocation.
Blinding of outcome assessment (detection bias)	Unclear risk	Not reported whether outcome assessors were aware of the intervention received by study participants
Incomplete outcome data (attrition bias)	High risk	Nine participants dropped out of the study for various reasons, which is a significant number based on the total sample size.
Selective reporting (reporting bias)	Unclear risk	No published study protocol or trial registration
Other bias	Unclear risk	Intervention which participants received in the control group isn't described in enough detail

Amiri et al. (2021)

Study Characteristics	
Methods	**Design:** Randomized Controlled Trial **Duration of trial:** not reported **Recruitment and allocation:** method of randomization not reported **Method of blinding**: therapists wo performed the measurement tests did not know which group each participant belonged to **Cognitive domain**: Working memory/ processing speed
Participants	**Setting:** rehabilitation **Country:** Iran **Sample size:** *n* = 50, 60% men; IG: *n* = 25; CG: *n* = 25 **Inclusion/ exclusion criteria:** chronic ischemic stroke with hemiplegia (right/left side) with interruption of the anterior and medial cerebral arteries; 4 to 12 months post-injury; maximum aged 65 years; ability to read and write; patient's willingness to be present at medical sessions; no sensory aphasia, hemianopsia, hemineglect and hemispatial neglect; no cognitive, nervous, muscular, and mechanical problems before stroke **Age:** IG: *M* = 53.08 (SD 9.31) years; CG: *M* = 54.4 (SD 12.3) years **Time since onset of ABI:** 4 – 12 months **Types of ABI:** stroke
Interventions	<u>Intervention group</u> **Brief name**: RehaCom rehabilitation software **What (materials)**: RehaCom **What (procedure)**: all eight main sections of RehaCom, with a number of subsections were used by therapist according to the needs of the participant. **Who**: not reported **How**: not reported **Where**: not reported **When and how much**: 45-minutes sessions, 2 times a week, for 5 weeks (10 sessions) <u>Control group</u>

	Brief name: routine physiotherapy rehabilitation **What (materials)**: not reported **What (procedure)**: not reported, in addition to physiotherapy participants were free to contact researchers by phone or internet, to go to a psychologist for counselling, and to speak with us about common barriers and ways to overcome them **Who**: physiotherapist, researchers, and/or psychologist, but it was not reported which (and how often) therapists were involved per participant **How**: not reported **Where**: not reported, but probably at the rehabilitation clinic **When and how much**: not reported
Outcomes	**Primary:** none reported **Secondary:** ***ICF-domain Activities:*** none reported ***ICF-domain Participation*****:** none reported ***ICF-domain Functionality*****:** • Working memory: n-back; PASAT • Speed of processing: Symbol Digits Modalities Test (SDMT) ***ICF-domain Personal*****:** none reported **Methods of data collection:** therapists wo performed the measurement tests did not know which group each participant belonged to. **Data collection time points:** baseline and post-treatment
Notes	**Funding**: no **Conflict of interest**: none reported **Published trial protocol:** none reported **Trial registration:** no **Ethics approval:** yes

Risk of Bias

Bias	**Authors' Judgement**	**Support of Judgement**
Random sequence generation (selection bias)	Unclear risk	Method of randomization not reported

Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	High risk	The investigators held representative meetings with a general description of the research objectives, the process of the study, and the number of treatment sessions to all participants, indicating that staff and participants were aware of treatment allocation and study objectives
Blinding of outcome assessment (detection bias)	Low risk	Therapists who performed the measurement tests did not know which group each participant belonged to
Incomplete outcome data (attrition bias)	Low risk	Not reported, but it is likely that the assigned participants described in the study were also analysed
Selective reporting (reporting bias)	Unclear risk	No published study protocol or trial registration
Other bias	Unclear risk	Baseline differences in demographic information, e.g. 15 participants in the CG had no academic degree compared to 8 participants in the IG; only neuropsychological tests were used to measure the efficacy, and no measures at the level of activities and participation were included

Björkdahl et al. (2013)

Study Characteristics	
Methods	**Design:** Randomized Controlled Trial **Duration of trial:** March 2008 – December 2010 **Recruitment and allocation:** method of randomization not reported **Method of blinding**: not reported **Cognitive domain**: working memory
Participants	**Setting:** outpatient rehabilitation **Country:** Sweden **Sample size:** *n* = 38, 42% men; IG: *n* = 20; CG: *n* = 18 **Inclusion/exclusion criteria:** a score of ≤ 5 digits/ blocks forwards and/or ≤ 4 digits/blocks reversed on the Digit span and Span board. **Exclusion criteria**: not able to communicate; contraindicated to participate due to medical reasons **Age:** *M* = 51 (SD 11) years **Time since onset of ABI:** *Median* = 27 (range: 12 – 500) weeks **Types of ABI:** stroke: *n* = 28; TBI: *n* = 5; other: *n* = 5
Interventions	<u>Intervention group</u> **Brief name**: Computerized WM training – Cogmed QM **What (materials)**: Cogmed QM **What (procedure)**: program includes a battery of visuospatial and verbal WM tasks and all parts of the battery must be trained at each session, 90 trials a day, in conjunction with care as usual. **Who**: trained coach and psychologist/ occupational therapist. **How**: not reported but appeared to be face-to-face and individually **Where**: at the outpatient rehabilitation clinic **When and how much**: 30-45 minutes sessions, 5 times a week, for 5 weeks (25 sessions) <u>Control group</u> **Brief name**: conventional occupational therapy **What (materials)**: not reported

	What (procedure): therapists decided which treatment activity was provided based on the functional level of participants to achieve the set goals. **Who**: not reported **How**: not reported, but appeared to be face-to-face and individually **Where**: not reported **When and how much**: for 5 weeks, more details not reported
Outcomes	**Primary:** none reported **Secondary:** ***ICF-domain Activities:*** • Proxy rating: Assessment of Motor and Process Skill (AMPS) - process score ***ICF-domain Participation*:** none reported ***ICF-domain Functionality*:** • Memory: Rivermead Behavioural Memory Test (RBMT) ***ICF-domain Personal*:** none reported **Methods of data collection:** not reported **Data collection time points:** baseline, post-treatment and at 3 months follow-up
Notes	**Funding**: none stated **Conflict of interest**: none reported **Published trial protocol:** none reported **Trial registration:** no **Ethics approval:** no

Risk of Bias

Bias	**Authors' Judgement**	**Support of Judgement**
Random sequence generation (selection bias)	Unclear risk	Method of randomization not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	Unclear risk	Not reported, however, participants would have been provided with an information sheet that explained about the nature of the

		study. Staff would also have been aware of treatment allocation
Blinding of outcome assessment (detection bias)	Unclear risk	Not reported
Incomplete outcome data (attrition bias)	Unclear risk	Five participants in the IG and two in the CG dropped out due to unspecified reasons
Selective reporting (reporting bias)	Unclear risk	No published study protocol or trial registration
Other bias	Low risk	No other concerns

Cho et al. (2016)

Study Characteristics	
Methods	**Design:** Randomized Controlled Trial **Duration of trial:** not reported **Recruitment and allocation:** method of randomization not reported **Method of blinding**: not reported **Cognitive domain**: Global cognitive functioning
Participants	**Setting:** inpatient rehabilitation **Country:** Korea **Sample size:** *n* = 30, 54% men; IG: *n* = 14; CG: *n* = 16 (for the sake of this review, CACR is included as IG and traditional rehabilitation as CG) **Inclusion criteria:** hemiplegic stroke; onset 3 months to 1 year before the study; ability to follow verbal instructions and to communicate. **Exclusion criteria**: never attended school or had undergone Neurofeedback or CACR within the past year. **Age:** IG: *M* = 63 (SD 5.4) years; CG: *M* = 64 (SD 8.8) years **Time since onset of ABI:** IG: *M* = 5.1 (SD 2.2) months; CG: *M* = 6.5 (1.5) months **Types of ABI:** stroke
Interventions	Intervention group **Brief name**: Computer-Assisted Cognitive Rehabilitation (CACR) **What (materials)**: RehaCom, incl. attention, concentration and memory **What (procedure)**: attention, concentration and memory tasks from RehaCom were running for 30 minutes per session according to the level of the participant **Who**: two expert therapists, not reported in more detail **How**: not reported **Where**: not reported, but appeared to be in the hospital **When and how much**: 30-minutes sessions, 5 times a week, for 6 weeks (30 sessions) Control group

	Brief name: traditional rehabilitation therapy **What (materials)**: not reported **What (procedure)**: not reported **Who**: two expert therapists, not reported in more detail **How**: not reported **Where**: not reported, but appeared to be in the hospital **When and how much**: 30-minutes sessions, 5 times a week, for 6 weeks (30 sessions)	
Outcomes	**Primary:** none reported **Secondary:** ***ICF-domain Activities:*** • Proxy rating: Functional Independence Measure (FIM) – cognition subscale score ***ICF-domain Participation*:** none reported ***ICF-domain Functionality*:** none reported ***ICF-domain Personal*:** none reported **Methods of data collection:** not reported **Data collection time points:** baseline and post-treatment	
Notes	**Funding**: none stated **Conflict of interest**: not reported **Published trial protocol:** none reported **Trial registration:** no **Ethics approval:** no	
Risk of Bias		
Bias	**Authors' Judgement**	**Support of Judgement**
Random sequence generation (selection bias)	Unclear risk	Method of randomization not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	Unclear risk	Not reported, however, participants would have been provided with an information sheet that explained about the nature of the study. Staff would also have been aware of treatment allocation

Blinding of outcome assessment (detection bias)	Unclear risk	Not reported
Incomplete outcome data (attrition bias)	Low risk	Not reported, but it is likely that the assigned participants described in the study were also analysed
Selective reporting (reporting bias)	Unclear risk	No study protocol or trail registration
Other bias	Unclear risk	Intervention which participants received in the control group isn't described in enough detail

De Luca et al. (2014)

Study Characteristics	
Methods	**Design:** Randomized Controlled Trial **Duration of trial:** January 2010 – December 2012 **Recruitment and allocation:** potential participants were assigned to one of two groups based on the order of recruiting, which is a predictable allocation sequence **Method of blinding**: not reported **Cognitive domain**: Global cognitive functioning
Participants	**Setting:** rehabilitation **Country:** Italy **Sample size:** *n* = 34, 55% men; IG: *n* = 15; CG: *n* = 19 **Inclusion/exclusion criteria:** 3-6 months post-injury; diagnosis of acquired brain injury (vascular or traumatic); presence of moderate to severe cognitive impairment, i.e. an MMSE score ranging from 10 to 26; absence of severe spasticity with an Ashworth Scale ≤ 3; absence of disabling sensory alterations, severe psychiatric and medical illness. **Age:** *M* = 35.97 (SD 14.26) years **Time since onset of ABI:** 3 – 6 months **Types of ABI:** TBI: 48.57%; stroke: 51.43%
Interventions	<u>Intervention group</u> **Brief name**: pc-cognitive training in addition to conventional treatment **What (materials)**: web-sourced rehabilitation software and commercially available computer programs were used **What (procedure)**: a series of pc-activities were divided in three sessions: memory, executive functions and abilities of thinking (i.e. the exercises of identification, categorization, association, problem solving etc.). **Who**: cognitive therapist **How**: not reported **Where**: at the hospital **When and how much**: 3 times a week, for 8 weeks (24 sessions) <u>Control group</u>

	Brief name: standard treatment **What (materials)**: not reported **What (procedure)**: not reported **Who**: not reported **How**: not reported **Where**: at the hospital **When and how much**: not reported
Outcomes	**Primary:** none reported **Secondary:** ***ICF-domain Activities:*** • Self-reporting: Activities of Daily Living Scale (ADL) (patient rating); Instrumental Activities of Daily Living (IADL) scale (patient rating); Barthel Index (BI) (patient rating) ***ICF-domain Participation*:** none reported ***ICF-domain Functionality*:** • Memory: Rey Auditory Verbal Learning (RAVL – immediate and delayed recall) • Executive functioning: verbal fluency (letter and category) • Attention: Attentive Matrices (AM) ***ICF-domain Personal*:** • Mood: Hamilton Rating Scale for Anxiety (HRS-A); Hamilton Rating Scale for Depression (HRS-D) **Methods of data collection:** evaluations were done by a neuropsychologist **Data collection time points:** baseline, post-treatment and 2-months follow-up
Notes	**Funding**: none stated **Conflict of interest**: not reported **Published trial protocol:** none reported **Trial registration:** no **Ethics approval:** yes
Risk of Bias	
Bias	**Authors' Judgement** **Support of Judgement**

Random sequence generation (selection bias)	High risk	Potential participants were assigned to one of two groups based on the order of recruiting, which is a predictable allocation sequence
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	Unclear risk	Not reported, however, participants would have been provided with an information sheet that explained about the nature of the study. Staff would also have been aware of treatment allocation
Blinding of outcome assessment (detection bias)	Unclear risk	Not reported
Incomplete outcome data (attrition bias)	Low risk	One subject in the CG dropped out for medical reasons
Selective reporting (reporting bias)	Unclear risk	No published study protocol or trial registration
Other bias	Unclear risk	Little information was given about the demographics of either group, e.g. related to type of stroke; intervention which participants received in the control group isn't described in enough detail

De Luca et al. (2018)

Study Characteristics	
Methods	**Design:** Randomized Controlled Trial **Duration of trial:** January 2013 – May 2015 **Recruitment and allocation:** potential participants were assigned to one of two groups based on the order of recruiting, which is a predictable allocation sequence **Method of blinding**: not reported **Cognitive domain**: Global cognitive functioning
Participants	**Setting:** rehabilitation **Country:** Italy **Sample size:** n = 35, 51.4% men; IG: n = 20; CG: n = 15 **Inclusion/exclusion criteria:** 3-6 months post-injury; diagnosis of vascular brain injury); cognitive rehabilitation based on medical and neuropsychological team's diagnosis; presence of moderate to severe cognitive impairment, i.e. an MMSE score ranging from 12 to 20; absence of severe spasticity with an Ashworth Scale ≤ 3; absence of disabling sensory alterations, severe psychiatric and medical illness. **Age:** IG: M = 43.9 (SD 16.6) years; CG: M = 42.1 (SD 17.7) **Time since onset of ABI:** 3 – 6 months **Types of ABI:** stroke
Interventions	Intervention group **Brief name**: pc-based Erica training in addition to conventional treatment **What (materials)**: Italian computerized cognitive tool, called Erica (www.erica.giunti.it), including 5 specific cognitive domains: attention process, memory abilities, spatial cognition, verbal and nonverbal executive functions. **What (procedure)**: the cognitive therapist provided exercises with a growing hierarchy of complexity through the Erica rehabilitative platform: the exercises difficulty was flexible to the progressive changes of the patients performance **Who**: trained cognitive therapist **How**: face-to-face and individually **Where**: not reported, but appeared to be at the rehabilitation centre

	When and how much: 45-minute sessions, 3 times a week, for 8 weeks (24 sessions) (incl. conventional treatment: 45-minute sessions, 9 times a week, for 8 weeks (72 sessions) Control group **Brief name**: conventional treatment **What (materials)**: paper-and-pencil modality, and these were specifically built to stimulate specific cognitive skills **What (procedure)**: not reported **Who**: not reported **How**: face-to-face and individually **Where**: not reported, but appeared to be at the rehabilitation centre **When and how much**: 45-minute sessions, 6 times a week, for 8 weeks (48 sessions)
Outcomes	**Primary:** none reported **Secondary:** ***ICF-domain Activities:*** none reported ***ICF-domain Participation*****:** none reported ***ICF-domain Functionality*****:** • Working memory: Digit span • Memory: Rey Auditory Verbal Learning (RAVL – immediate and delayed recall) • Executive functioning: verbal fluency (letter and category) • Attention: Attentive Matrices (AM) ***ICF-domain Personal*****:** • Mood: Hamilton Rating Scale for Anxiety (HRS-A); Hamilton Rating Scale for Depression (HRS-D) **Methods of data collection:** evaluations were done by a neuropsychologist **Data collection time points:** baseline and post-treatment
Notes	**Funding**: none stated **Conflict of interest**: none reported **Published trial protocol:** none reported **Trial registration:** no **Ethics approval:** yes
Risk of Bias	

Bias	Authors' Judgement	Support of Judgement
Random sequence generation (selection bias)	High risk	Potential participants were assigned to one of two groups based on the order of recruiting, which is a predictable allocation sequence
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	Unclear risk	Not reported, however, participants would have been provided with an information sheet that explained about the nature of the study. Staff would also have been aware of treatment allocation
Blinding of outcome assessment (detection bias)	Unclear risk	Not reported
Incomplete outcome data (attrition bias)	Low risk	The assigned participants described in the study were also analysed
Selective reporting (reporting bias)	Unclear risk	No published study protocol or trial registration
Other bias	Unclear risk	Intervention which participants received in the control group isn't described in enough detail

Fernandez et al. (2017)

Study Characteristics	
Methods	**Design:** Non-Randomized Controlled Trial **Duration of trial:** 2010 – 2014 **Recruitment and allocation:** participants were included based on the availability sampling method. Participants who met the inclusion criteria were allocated to the different groups according to availability of space at the computer room. **Method of blinding**: not reported **Cognitive domain**: Memory and attention
Participants	**Setting:** rehabilitation **Country:** Cuba **Sample size:** *n* = 80, 66% men; IG: *n* = 50; CG: *n* = 30 **Inclusion criteria:** not reported **Exclusion criteria**: severe cognitive dysfunction, aphasia, illiteracy, degenerative diseases or mental retardation before ABI **Age:** IG: *M* = 33.7 (SEM 1.77) years; CG: *M* = 34.2 (SEM 2.27) years **Time since onset of ABI:** IG: *M* = 5.6 (SEM 0.96) years; CG: *M* = 5 (SEM 0.87) years **Types of ABI:** TBI: *n* = 47; stroke: *n* = 33
Interventions	Intervention group **Brief name**: RehaCom **What (materials)**: RehaCom software (www.schuhfried.at) **What (procedure)**: participants performed subprograms that were selected by the therapist at the pre-established degree of difficulty **Who**: two specialists administered the training in conjunction with a conventional neuro-restoration program **How**: four participants worked simultaneously under supervision by two specialists **Where**: in a laboratory designed for this purpose **When and how much**: 50-minute sessions, 5 times a week, for 8 weeks (40 sessions) (incl. conventional program: 2-hour sessions neuro-restoration and 50-minutes RehaCom, 12 times a week, for 8 weeks (96 sessions)

	Control group **Brief name**: conventional neuro-restoration program (non-computerized) **What (materials)**: a program of activities (non-computerized) to stimulate attention, memory, and executive function using cards, paper-and-pencil tasks in combination with tasks to train fine motor functions. **What (procedure)**: not reported, only described that they followed the same principles mentioned in the IG **Who**: not reported **How**: not reported **Where**: not reported **When and how much**: 2-hour sessions, 7 times a week, for 8 weeks (56 sessions)
Outcomes	**Primary:** none reported **Secondary:** ***ICF-domain Activities:*** none reported ***ICF-domain Participation*****:** none reported ***ICF-domain Functionality*****:** • Working memory: Digit span • Memory: Wechsler Memory Scale (WMS – logical memory, visual memory and associative learning) • Executive functioning: TMT-B • Speed of processing: TMT-A ***ICF-domain Personal*****:** none reported **Methods of data collection:** not reported **Data collection time points:** baseline and post-treatment
Notes	**Funding**: none stated **Conflict of interest**: none reported **Published trial protocol:** none reported **Trial registration:** no **Ethics approval:** no
Risk of Bias	
Bias	**Authors' Judgement** **Support of Judgement**

Random sequence generation (selection bias)	High risk	A non-randomized controlled trial; participants were allocated to either the IG or CG based on availability in the computer room
Allocation concealment (selection bias)	High risk	The enrolling researcher or participant was aware of the upcoming allocation, as participants were allocated based on computer room availability
Blinding of participants and personnel (performance bias)	Unclear risk	Not reported, however, participants would have been provided with an information sheet that explained about the nature of the study. Staff would also have been aware of treatment allocation
Blinding of outcome assessment (detection bias)	Unclear risk	Not reported
Incomplete outcome data (attrition bias)	Low risk	The assigned participants described in the study were also analysed
Selective reporting (reporting bias)	Unclear risk	No published study protocol or trial registration
Other bias	Unclear risk	Only neuropsychological tests were used to measure the efficacy, and no measures at the level of activities and participation were included

Ho et al. (2022)

Study Characteristics	
General information	**Design:** Randomized Controlled Trial **Duration of trial:** not reported **Recruitment and allocation:** Sealed opaque envelopes were used to allocate participants to the intervention or control group. **Method of blinding**: not reported **Cognitive domain**: Global cognitive function
Participants	**Setting:** Hospital **Country:** Taiwan **Sample size:** *n* = 39, 67% men; IG: *n* = 19; CG: *n* = 20 **Inclusion criteria:** Being aged between 45 and 85 years, being a stroke survivor, having mild to moderate cognitive impairment, as determined on the MMSE scores of 20 – 26, being able to follow the therapists' instructions. **Exclusion criteria:** Having receptive or expressive aphasia, being unable to perform cognitive training tasks due to a visual perception problem (line bisection test score < 7). **Age:** IG: *M* = 63.6 (SD 11.3) years; CG: *M* = 65.5 (SD 8.3) years **Time since onset of ABI:** IG: *M* = 19.9 (SD 18.9) months; CG: *M* = 31.8 (SD 24) months **Types of ABI:** Stroke
Interventions	Intervention group **Brief name**: Lumosity **Why**: n*ot reported* **What (materials)**: Lumosity software (www.lumosity.com), 10 games to perform various cognitive activities for information processing speed (speed match, spatial speed match, and speed pack), attention (lost in migration, space junk, start search, and train of thought), and memory (memory matrix, rotation matrix, and money comb). **What (procedure)**: each training session consisted of 3 to 4 games covering all the three domains. Lumosity changes the

	difficulty level of the games according to the participants' performance. **Who**: occupational therapist. **How**: individually and face-to-face **Where**: not reported, but probably at the hospital. **When and how much**: 20 minutes sessions, 2 times a week, for 12 weeks (24 sessions) (8 hours in total). Control group **Brief name**: conventional cognitive training **Why**: n*ot reported* **What (materials):** paper-and-pencil tasks, and table-top tasks such as board games, puzzles, card games, and memory games, aimed at improving attention, memory, information processing speed and executive function. **What (procedure)**: therapist selects the appropriate game according to the participants' difficulty level and adjusted the difficulty according to their performance. **Who**: occupational therapist **How**: face-to-face and individually **Where**: not reported, but probably at the hospital. **When and how much**: 20 minutes sessions, 2 times a week, for 12 weeks (24 sessions) (8 hours in total).
Outcomes	**Primary:** none reported **Secondary:** ***ICF-domain Activities:*** • Self-reporting: SIS-ADL ***ICF-domain Participation*:** SIS-participation ***ICF-domain Functionality*:** • Working memory: Digit span; Spatial span • Speed of processing: SDMT ***ICF-domain Personal*:** none reported **Methods of data collection:** not reported **Data collection time points:** baseline, post-treatment, one month follow-up

Notes	**Funding**: grant from Kaoh-Siung Municipal Ta-Tung Hospital, Taiwan **Conflict of interest**: none reported **Published trial protocol:** none reported **Trial registration:** none reported **Ethics approval:** The study was approved by the Institutional Review Board	
Risk of Bias		
Bias	**Authors' Judgement**	**Support of Judgement**
Random sequence generation (selection bias)	Low risk	Sealed opaque envelopes were used for randomization
Allocation concealment (selection bias)	Low risk	Sealed envelopes
Blinding of participants and personnel (performance bias)	Unclear risk	Not reported, however, participants would have been provided with an information sheet that explained about the nature of the study. The participants would have been able to determine if they were receiving a computerised intervention or not. Also, the personnel would have been aware of treatment allocation.
Blinding of outcome assessment (detection bias)	Unclear risk	Not reported
Incomplete outcome data (attrition bias)	Low risk	No subjects were excluded
Selective reporting (reporting bias)	Unclear risk	No protocol but all outcomes appear to be reported
Other bias	Low risk	No other concerns

Rozental-Iluz et al. (2016)

Study Characteristics	
Methods	**Design:** Randomized Controlled Trial **Duration of trial:** not reported **Recruitment and allocation: p**articipants were allocated based on 1:1 randomization, so no random element was used in generating the allocation order/ the order was predictable; allocation was concealed, however, procedure not reported **Method of blinding**: assessors were blind of the treatment allocation **Cognitive domain**: executive functioning
Participants	**Setting:** rehabilitation **Country:** Israel **Sample size:** *n* = 36, 56.8% men; IG: *n* = 18; CG: *n* = 18 (follow-up: *n* = 33; IG: *n* = 17; CG: *n* = 16) **Inclusion/exclusion criteria:** > 19 years old; > 6 months post-stroke; walking 10 meters with or without assistance; executive deficits determined by a profile score of 3 or below out of 4 on the Zoo Map test **Age:** IG: *M* = 56.6 (SD 9.6) years; CG: *M* = 59.2 (SD 10.1) years **Time since onset of ABI:** IG: *M* = 3.7 (SD 1.6) years; CG: *M* = 3.1 (SD 1.8) years **Types of ABI:** stroke
Interventions	Intervention group **Brief name**: Video-game intervention **What (materials)**: four video-game consoles (i.e. Xbox Kinect, Nintendo Wii Fit, Sony PlayStation 2 and 3 MOVE, EyeToy, and one VR-system SeeMe System) **What (procedure)**: video-games were performed standing up to encourage body movement. Occupational therapists chose the video-games, provided verbal or physical guidance and supervised to maintain safety. Social interaction was encouraged **Who**: occupational therapists instructed and supervised participants **How**: face-to-face and in pairs of two during group sessions of 6-8 participants

	Where: rehabilitation centre **When and how much**: 1-hour sessions, two times a week, for 3 weeks (24 sessions) <u>Control group</u> **Brief name**: traditional motor intervention **What (materials)**: exercises in sitting and standing, walking and performing functional tasks in pairs or triads that encouraged movement of the whole body (transferring objects, folding laundry, throwing-catching balls) **What (procedure)**: occupational therapists chose the tasks, provided verbal or physical guidance and supervised to maintain safety of participants. Social interaction was encouraged **Who**: occupational therapists instructed and supervised participants **How**: face-to-face and in pairs of two during group sessions of 6-8 participants **Where**: rehabilitation centre **When and how much**: 1-hour sessions, two times a week, for 3 weeks (24 sessions)
Outcomes	**Primary:** none reported **Secondary:** ***ICF-domain Activities:*** • <u>Proxy rating</u>: Executive Function Route Finding task (EFRT); Executive Function Performance Test (EFPT) ***ICF-domain Participation*:** none reported ***ICF-domain Functionality*:** • <u>Executive functioning</u>: TMT-B ***ICF-domain Personal*:** none reported **Methods of data collection:** administered at rehabilitation centre and assessors were blind to the treatment allocation **Data collection time points:** baseline, post-treatment and at 3 months follow-up
Notes	**Funding**: none stated **Conflict of interest**: none reported **Published trial protocol:** none reported

	Trial registration: yes **Ethics approval:** yes	
Risk of Bias		
Bias	**Authors' Judgement**	**Support of Judgement**
Random sequence generation (selection bias)	High risk	Participants were allocated based on 1:1 randomization. Thus, no random element was used in generating the allocation order/ the order was predictable
Allocation concealment (selection bias)	Unclear risk	Allocation was concealed, however, procedure was not reported
Blinding of participants and personnel (performance bias)	Unclear risk	Not reported, however, participants would have been provided with an information sheet that explained about the nature of the study. Staff would also have been aware of the treatment allocation
Blinding of outcome assessment (detection bias)	Low risk	Assessors were blind of treatment allocation
Incomplete outcome data (attrition bias)	Low risk	Three participants dropped out in the IG and another three in the CG because they were unable to come two times a week, could not be reached or were on a holiday, but given the sample size of the study, this is negligible
Selective reporting (reporting bias)	Low risk	Study is registered in the trial register
Other bias	Unclear risk	Baseline differences in demographic information, e.g. differences between groups in independence in IADL (participants in the IG were more independent compared to the CG)

Välimäki et al. (2018)

Study Characteristics	
Methods	**Design:** Randomized Controlled Trial **Duration of trial:** September 2015 – April 2016 **Recruitment and allocation:** participants were randomly assigned by block randomization; the randomization list was given to the trail manager outside the study group. The trial manager informed the researchers about participants' group after the baseline assessment had taken place **Method of blinding**: cognitive outcome assessors were kept blind, however, in some occasions study participants told them about their possible game playing **Cognitive domain**: Global cognitive functioning
Participants	**Setting:** outpatient rehabilitation **Country:** Finland **Sample size:** n = 48, 48.5% men; IG: n = 23; CG: n = 25 **Inclusion/exclusion criteria:** Finnish-speaking; 18 - 65 years old; diagnosed with TBI; discharged from the hospital at least 12 months before recruitment; own a TV and computer; have internet access **Age:** IG: M = 42.14 (SD 12.15) years; CG: M = 40.9 (SD 12.01) years **Time since onset of ABI:** > 12 months post-injury **Types of ABI:** TBI
Interventions	Intervention group **Brief name**: Rehabilitation gaming **What (materials)**: CogniFit, web-based cognitive training platform with 33 games **What (procedure)**: participants were instructed to play at least one exercise from each of the three categories (memory, spatial perception and mental planning) during each training session daily, otherwise, they were free to choose which exercises they wished to play. **Who**: once a week a researcher called to keep track on adherence and motivation **How**: individually

	Where: at participants' own homes **When and how much**: 30-minute sessions, 7 times a week, for 8 weeks (56 sessions) <u>Control group</u> **Brief name**: entertainment gaming **What (materials)**: commercial digital games designed for Sony Playstation 3 **What (procedure)**: participants were instructed to choose an entertainment game that they found enjoyable. Participants were not forced to play any one type of game, and they were able to change the game during the 8-week training period. **Who**: once a week a researcher called to keep track on adherence and motivation **How**: individually **Where**: at participants' own homes **When and how much**: 30-minute sessions, 7 times a week, for 8 weeks (56 sessions)
Outcomes	**Primary:** ***ICF-domain Functionality*:** • <u>Executive functioning:</u> TMT-B • <u>Speed of processing</u>: TMT-A **Secondary:** ***ICF-domain Activities:*** • <u>Self-reporting</u>: Behavioural Rating Inventory of Executive Functioning (BRIEF-A) ***ICF-domain Participation*:** none reported ***ICF-domain Functionality*:** • <u>Working memory</u>: Digit span; Paced Auditory Serial Addition Test (PASAT - 3s and 2s) ***ICF-domain Personal*:** • <u>Mood</u>: Patient Health Questionnaire (PHQ-9) **Methods of data collection:** cognitive outcome assessors were kept blind, however, in some occasions study participants told them about their possible game playing

	Data collection time points: baseline, post-treatment and at 3 months follow-up	
Notes	**Funding**: none stated **Conflict of interest**: none reported **Published trial protocol:** yes **Trial registration:** yes **Ethics approval:** yes	
Risk of Bias		
Bias	**Authors' Judgement**	**Support of Judgement**
Random sequence generation (selection bias)	Low risk	Participants were randomly assigned by block randomization
Allocation concealment (selection bias)	Low risk	The randomization list was given to the trail manager outside the study group. The trial manager informed the researchers about participants' group after the baseline assessment had taken place
Blinding of participants and personnel (performance bias)	Unclear risk	Researchers who called patients once a week were not blind for treatment allocation, neither the participants
Blinding of outcome assessment (detection bias)	Unclear risk	Cognitive outcome assessors were kept blind, however, in some occasions study participants told them about their possible game playing
Incomplete outcome data (attrition bias)	Unclear risk	Four participants in the IG and four participants in the CG dropped out, but the reason for dropout was not described
Selective reporting (reporting bias)	Low risk	Published study protocol and study is registered in the trial register
Other bias	Low risk	No other concerns

Van de Ven et al. (2017)

Study Characteristics	
Methods	**Design:** Randomized Controlled Trial **Duration of trial:** April 2013 – November 2015 **Recruitment and allocation:** randomization software was used; groups were coded by the research coordinator **Method of blinding**: participants and their proxies were not informed that one of the two training programs was considered to be a mock training but they were told that we compared the effects of two training programs; outcomes were self-reported questionnaires **Cognitive domain**: executive functioning
Participants	**Setting:** outpatient rehabilitation **Country:** The Netherlands **Sample size:** *n* = 73, 64.4% men; IG: *n* = 38; CG: *n* = 35 **Inclusion/exclusion criteria:** cognitive impairments as testified by medical records; cognitive complaints at study entry; able to work with a computer **Exclusion criteria**: any disease other than stroke that results in severe cognitive impairments; a history of substance abuse or addiction; incapable of executing the training or outcome measure tasks **Age:** IG: *M* = 57 (SD 9.1) years; CG: *M* = 60.9 (SD 7.5) years **Time since onset of ABI:** IG: *M* = 28.3 (SD 16.4) months; CG: *M* = 28.3 (SD 14.4) months **Types of ABI:** stroke
Interventions	Intervention group **Brief name**: Cognitive Flexibility Training **What (materials)**: BrainGymmer (www.braingymmer.com) **What (procedure)**: a total of nine tasks in the domains of attention, memory and reasoning were used. Every 3 minutes a new task of a different domain was presented in a predefined order, to trigger cognitive flexibility. Feedback was provided immediately after each task and at the end of each session. Each session consisted of 10 different tasks and the difficulty was adapted to the participant

	Who: participants were contacted by phone by a neuropsychologist every week or every two weeks to ask about their training experience and participants received an e-mail when they did not train for two days **How**: self-administered **Where**: at participants' own homes **When and how much**: 30-minute sessions, 5 times a week, for 12 weeks (58 sessions) Control group **Brief name**: mock training **What (materials)**: www.braingymmer.com **What (procedure)**: the training consisted of four tasks which were considered to train executive functioning only minimally. Participants trained for 10 minutes per task and thus carried out three tasks per session. Task difficulty was not adaptive because participants were instructed to train at a constant level for one to two weeks and could only move to a higher level after this predetermined period. **Who**: participants were contacted by phone by a neuropsychologist every week or every two weeks to ask about their training experience and participants received an e-mail when they did not train for two days **How**: self-administered **Where**: at participants' own homes **When and how much**: 30-minute sessions, 5 times a week, for 12 weeks (58 sessions)
Outcomes	**Primary:** ***ICF-domain Activities:*** • Proxy rating: Dysexecutive Questionnaire (DEX) (proxy rating); Instrumental Activities of Daily Living (IADL) scale (proxy rating); Cognitive Failure Questionnaire (CFQ) (proxy rating); • Self-reporting: DEX (patient rating); IADL scale (patient rating); CFQ (patient rating)

	***ICF-domain Participation*:** Utrecht Scale for Evaluation of Rehabilitation- Participation (USER-P) ***ICF-domain Personal*:** • Quality of Life: Short Form Health Survey (SF-36) **Secondary:** ***ICF-domain Functionality*:** none reported ***ICF-domain Personal*:** • Mood: Hospital Anxiety and Depression Scale (HADS-D) **Methods of data collection:** self-administered (and proxy) questionnaires which patients completed at their own homes. **Data collection time points:** baseline, post-treatment and 4 weeks follow-up.
Notes	**Funding**: yes **Conflict of interest**: none reported **Published trial protocol:** yes **Trial registration:** yes **Ethics approval:** yes

Risk of Bias

Bias	**Authors' Judgement**	**Support of Judgement**
Random sequence generation (selection bias)	Low risk	Randomization software was used
Allocation concealment (selection bias)	Low risk	Groups were coded by research coordinator
Blinding of participants and personnel (performance bias)	Low risk	Participants and their proxies were not informed that one of the two training programs was considered to be a mock training but they were told that they compared the effects of two training programs.
Blinding of outcome assessment (detection bias)	Low risk	Self (and proxy)- administered questionnaires
Incomplete outcome data (attrition bias)	Low risk	All participants completed the outcome assessments before and post-treatment

Selective reporting (reporting bias)	Low risk	Study protocol was published and trial was registered
Other bias	Low risk	No other concerns

Wentink et al. (2016)

Study Characteristics	
Methods	**Design:** Randomized Controlled Trial **Duration of trial:** January 2013 – September 2013 **Recruitment and allocation:** participants were randomly allocated by a block randomization scheme made by a random digit generator; the randomisation sequence was concealed (blinded) from research personnel **Method of blinding**: assessors were not aware of whether a participant was randomised to the IG or CG **Cognitive domain**: Global cognitive functioning
Participants	**Setting:** outpatient rehabilitation **Country:** The Netherlands **Sample size:** *n* = 110, 62.5% men; IG: *n* = 53; CG: *n* = 57 **Inclusion criteria:** 45 to 75 years; diagnosed with stroke 12-36 months ago; self-perceived cognitive impairments; access to the internet; able to visit the rehabilitation centre; having time to participate. **Exclusion criteria:** antidepressant use; receiving actual treatment for cognitive impairments; severe aphasia; lack of computer skills; not being proficient in Dutch; psychological disorders in need of treatment (e.g. depression); physical disorders known to impact cognition. **Age:** IG: *Median* = 59 (range: 46 – 74) years; CG: *Median* = 59 (range: 46 – 73) years **Time since onset of ABI:** IG: *M* = 26 (SD 9.1) months; CG: *M* = 25 (SD 7.4) months **Types of ABI:** stroke
Interventions	<u>Intervention group</u> **Brief name**: Computer-Based Cognitive Rehabilitation (CBCR) **What (materials)**: Lumosity Inc.® Sixteen games were used and five cognitive domains were targeted: attention, speed, memory, flexibility, problem solving (duration of each game is approximately five minutes). **What (procedure)**: three games were randomly assigned to the participant per session. After completion, participants received

	feedback that the session for that day was finished. Participants were able to play longer than the training session. Each participant started at the same difficulty, which was raised or lowered depending on performance. **Who**: a research assistant could be contacted by telephone **How**: self-administered **Where**: at participants' own homes **When and how much**: 15-20 minutes sessions, five times a week, for 8 weeks (45 sessions) Control group **Brief name**: Information **What (materials)**: texts or videoclips with information on a website specifically designed for this study. **What (procedure)**: unidirectional explanations about brain differences between men and woman, the influence of stress on brain function and possible difficulties with living with a damaged brain. **Who**: a research assistant could be contacted by telephone **How**: self-administered **Where**: at participants' own homes **When and how much**: for 8 weeks
Outcomes	**Primary:** ***ICF-domain Activities:*** • Proxy rating: Cognitive Failure Questionnaire (CFQ) (proxy rating) • Self-reporting: CFQ (patient rating) ***ICF-domain Functionality*:** • Working memory: Corsi block tapping task (forward and backward); Digit span (forward and backward) • Executive functioning: TMT-A/B • Speed of processing: TMT-A **Secondary:** ***ICF-domain Participation*:** none reported ***ICF-domain Personal*:**

	• Quality of Life: Stroke specific Quality of Life scale (Ss-QoL-12) **Methods of data collection:** questionnaires were filled in by participants at their own homes, and the computerized performance tests were completed in the rehabilitation centre by assessors who were not aware of group allocation **Data collection time points:** baseline, post-treatment and at 2 months follow-up
Notes	**Funding**: none stated **Conflict of interest**: not reported **Published trial protocol:** none reported **Trial registration:** no **Ethics approval:** yes

Risk of Bias

Bias	**Authors' Judgement**	**Support of Judgement**
Random sequence generation (selection bias)	Low risk	Participants were randomly allocated by a block randomization scheme made by a random digit generator
Allocation concealment (selection bias)	LOW risk	The randomisation sequence was concealed (blinded) from research personnel
Blinding of participants and personnel (performance bias)	Unclear risk	Not reported, however, participants would have been provided with an information sheet that explained about the nature of the study. Staff would also have been aware of the treatment allocation
Blinding of outcome assessment (detection bias)	LOW risk	Assessors were not aware of whether a participant was randomised to the IG or CG
Incomplete outcome data (attrition bias)	Low risk	Three participants dropped out in the IG, but based on the sample size, this is negligible
Selective reporting (reporting bias)	Unclear risk	No published study protocol or trial registration

Other bias	Unclear risk	Baseline differences in demographic information, e.g. in the IG significantly more participants had a haemorrhage CVA compared to the CG