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Effect of Home-based Interventions on Basic Activities of Daily Living for Stroke Patients: A Systematic Review and Meta-analysis

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Keywords: Stroke, home-based rehabilitation, activities of daily living

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ABSTRACT

Objectives: To investigate the effectiveness of home-based interventions on improving the ability of basic activities of daily living in stroke patients.

Methods: Randomised controlled trials were searched through 3 electronic databases (PubMed, EMBASE, CINAHL) from their inception to 31 December 2020. The characteristics of participants, home-based interventions, controlled interventions and outcomes of interest were collected. Risk of bias of individual study was assessed by 2 reviewers independently using the Physiotherapy Evidence Database scale (PEDro). Meta-analyses were performed where studies reported comparable interventions and outcomes.

Results: In total, 47 studies were included in the systematic review and 16 studies had sufficient data for inclusion in the meta-analyses. The effect of home-based intervention showed no significant difference when comparing with institution-based intervention (for short-term effect: SMD=0.24, 95% CI -0.15 to 0.62, I^2=0%; for long-term effect: SMD=0.16, 95%CI -0.23 to 0.55, I^2=0%). No significant difference was found between home-based intervention and usual care for long-term effect (SMD=-0.01; 95% CI -0.11 to 0.09; I^2=0%). Home-based rehabilitation combined with usual care showed a significant short-term effect on the ability of basic daily activities, comparing with usual care alone (SMD=0.55; 95% CI 0.22 to 0.87; p=0.001).

Conclusion: Home-based rehabilitation may be an alternative to institution-based rehabilitation and usual care for stroke patients. Home-based rehabilitation with usual care may have a short-term effect on the ability of basic activities of daily living for stroke patients comparing with usual care alone. However, the evidence strength is weak because of the

limited number of studies included into the meta-analyses and the heterogeneity between trials. Future research is needed to investigate the effectiveness of home-based rehabilitation on groups with stratification by stroke severity, type of home-based intervention and manner of delivery. Moreover, more high-quality studies are required to prove the cost-effectiveness of newly developed strategies like caregiver-mediated rehabilitation and tele-rehabilitation.

Keywords: Stroke, home-based rehabilitation, activities of daily living

Strengths and Limitations of this study:

- Investigated the effectiveness of home-based rehabilitation on improving the ability of basic activities of daily living in stroke patients, comparing with institution-based intervention, usual care, no intervention respectively.
- Update some newly developed home-based treatment strategies such as tele-rehabilitation and caregiver-mediated intervention and investigated the effectiveness of the approaches.
- The number of studies included into the individual meta-analysis was limited, because of the inadequate data in the individual studies.
- Nearly half of studies included into the meta-analyses had sample size smaller than 30.
- The clinical heterogeneity between studies in terms of severity of stroke, onset time of stroke, interventions and manner of delivery compromised the evidence strength of our meta-analyses.

INTRODUCTION

Stroke is one of the major causes of death and is a leading cause of adult disability worldwide.[1] About half of stroke patients are left with varying degrees of physical or cognitive impairments.[2] Previous studies have shown that 25-74% of stroke patients need assistance from caregivers for the activities of daily living,[3] and the quality of life of both patients and caregivers is heavily impacted.[4] Although the need for rehabilitation services for the stroke patients after discharge from acute hospitals is widely recognized, outpatient and inpatient rehabilitation are often compromised for reasons such as lack of accessibility, increased costs and poor compliance.[5, 6] On the other hand, the ability of performing activities of daily living in an institution-based environment may not be generalized to the home environment, which is the final discharge destination for most stroke patients.[7] Moreover, the motor relearning of stroke patients improves by context-specific training, and training in the patient's own environment is preferred.[8] Early supported discharge from hospital with subsequent rehabilitation services at home has shown to be more cost-effective than usual care, with a lower caregiver burden and shorter length of stay in hospital.[9, 10] Therefore, a home-based rehabilitation program could be a viable alternative to institution-based stroke rehabilitation.

A Cochrane review of home-based therapy programs for upper limb functional recovery following stroke found that there was insufficient good quality evidence to determine the relative effect of home-based upper limb programs on performance in basic activities of daily living (BADL), compared with placebo, no intervention or usual care.[11] The limited number of included study and the heterogeneity in terms of the type of home-based therapy programs limited the evidence strength. Apart from upper limb function, the ability to perform BADL in

stroke patients is influenced by much more factors such as mobility, cognition and communication,[12] environmental limitation,[13] and psychological adaptation[14]. Moreover, upper limb function is not linearly related to the actual performance of daily activities, and the improved upper limb motor capacity dose not translate into the increased upper limb performance in daily life.[15] Therefore, the effectiveness of home-based intervention including but not limited to upper extremity function training is needed to be investigated.

Another previous review found a significant short-term effect on functional independence in favour of home-based rehabilitation for community-dwelling people with stroke.[16] However, the evidence strength was weak because the control interventions mentioned in the previous review were mixed with usual care, center-based intervention and no intervention. Moreover, as the development of home-based treatment strategy and also for the purpose of reservation of medical services, novel home-based intervention strategies such as tele-rehabilitation and caregiver-mediated intervention have emerged nowadays. An updated review is needed to investigate the effectiveness of home-based interventions on improving the ability of performing self-care activities in stroke patients.

The objective of this systematic review was to evaluate the effectiveness of home-based interventions on performance of BADL in stroke patients, when comparing with institution-based intervention, usual care and no intervention respectively.

METHODS

Search strategy

The PubMed, EMBASE and CINAHL databases were searched from inception to 31 December

2020. The search strategy is presented in supplementary appendix 1.

Inclusion and exclusion criteria

We only included participants in home-based intervention groups who were living in their own home. Studies that included participants in home-based intervention groups who were living in care homes and other forms of supported or sheltered accommodation were excluded. We defined the home-based interventions as (1) prescribed by professionals; (2) implemented in patient's own home. Studies delivered solely environmental modifications, ergonomic intervention, psychosocial interventions or medication were excluded. The comparison interventions included institution-based intervention, usual care and no intervention. We included studies which measured the ability of BADL as one of the outcomes. Trials that studied solely instrumental activities of daily living were excluded.

Selection of studies

Two reviewers independently extracted studies from the 3 databases. The duplicate articles were deleted, and the obviously irrelevant studies were eliminated by screening the titles and abstracts. If at least one of the reviewers considered one reference as eligible, the full text was screened and two reviewers evaluated the study separately based on the inclusion and exclusion criteria. Only the studies identified by both reviewers were included in the review. Any disagreements between the two reviewers were resolved through discussion with the third reviewer.

Data extraction and management

Data were extracted from the included studies and recorded on a data extraction form. The extracted information included the following items: (1) the sample size of each group; (2) disability level and time of stroke onset of participants; (3) details of home-based intervention and intervention in control group; (4) outcome measures and the timepoints of outcome measures; (5) results of effectiveness.

Assessment of methodological quality

Two reviewers independently assessed the methodological quality of the included studies using the Physiotherapy Evidence Database scale (PEDro scale).[17] Any disagreements between the two reviewers were resolved through discussion with the third reviewer.

Data analysis

The Cochrane Collaboration's Review Manager software (RevMan 5.3) was used to carry out all statistical analyses. The overall estimate of the treatment effect was calculated using the means and standard deviations (SDs) of outcome scores in the home-based intervention groups and control groups. Short-term effect and long-term effect were analyzed by comparing the statistical difference of outcome score between two groups at treatment endpoint and at the last follow up respectively. Those studies with no mean or SD of outcome measure reported were excluded from meta-analysis. For the studies that used the same measurement tool, we calculated a pooled estimate of the mean differences (MDs) with 95% confidence intervals. When different measurement tools were used, we used the standardized mean differences (Std.

MDs) instead of MDs.

We planned to perform several meta-analyses to evaluate (1) the effectiveness of home-based intervention comparing with institution-based intervention at treatment endpoint and the follow-up; (2) the effectiveness of home-based intervention comparing with usual care at treatment endpoint and the follow-up; (3) the effectiveness of home-based intervention combined with usual care comparing with usual care at treatment endpoint and the follow-up; and (4) the effectiveness of home-based intervention comparing with no intervention at treatment endpoint and the follow-up.

Statistical heterogeneity was measured using the I^2 statistic. $I^2 > 50\%$ was considered to indicate substantial heterogeneity, which would result in the use of a random-effect model for the meta-analysis. When I^2 was $\leq 50\%$, a fixed-effects model was used.[11]

We planned to perform subgroup analyses to investigate the sources of heterogeneity, according to (1) the level of disability of the stroke patients; (2) the onset time of stroke; (3) type of home-based intervention; (4) self- and/or caregiver-mediated versus professional-mediated.

We also planned to perform a sensitivity analysis to diminish the influence of studies with poor methodological quality on the effect size estimate. The studies with poor PEDro score (≤ 3) were deleted from the meta-analysis. All of the statistical tests were two-tailed, and $P<0.05$ represented statistical significance.

Patient and public involvement

No patient involved

RESULTS

Study identification

The search of the electronic bibliographic databases identified 460 articles (PUBMED = 196, EMBASE = 241, CINAHL = 23). And 5 additional studies were identified through relevant reviews. In total, 47 studies met the eligibility criteria and were included into this systematic review (Figure 1).

Study characteristics

Twenty randomised controlled trials compared home-based rehabilitation with institution-based rehabilitation on an in- or out-patient basis.[18-37] Fourteen randomised controlled trials compared home-based rehabilitation with usual care which was provided according to routine practice without involvement of research team.[18, 24, 38-49] Five randomised controlled trials evaluated the effect of specific home-based interventions by comparing with blank control or sham control.[50-54] Ten randomised controlled trials compared home-based interventions combined with usual care with usual care alone.[55-64] The main characteristics of the included studies are shown (Table 1).

Table 1 Characteristics of included studies

Study	Participants	Disability level of stroke; Time after stroke	Intervention	Outcome measure of BADL and the measurement times	Results
Kalra et al. (2000)[19]	Home-based intervention group (n=149)	Moderately severe; < 72 hours	Care was provided by a multidisciplinary team (doctor, nurse, physiotherapist, occupational therapist, speech and language therapists) at home for a maximum of 3 months	mRS score and proportion of good outcome (BI score 15-20, mRS score 0-3) in groups at 3, 6, 12 months after stroke onset	No significant change in proportion of good outcome in any groups between 3 and 12 months; The proportion of patients alive without severe disability (modified Rankin 0-3) at 12 months was significantly higher on the stroke unit compared with stroke team or domiciliary care
	Institution-based intervention group (in stroke unit) (n=148)		Care was provided by a multidisciplinary team in stroke units. There were clear guidelines for acute care, prevention of complications, rehabilitation, and secondary prevention. Routine management involved joint assessments and goal setting, coordinated treatment, and planned discharges		
	Institution-based intervention group (in general ward) (n=150)		Care was provided by a multidisciplinary team (doctor, nurse, physiotherapist, occupational therapist) in general wards		
Kalra et al. (2005)[31]	Home-based intervention	Moderately severe;	Domiciliary care provided management at home under the	mRS score and 20-point BI score at 3,	No significant change in proportion of good

	(n=149)	< 72 hours	supervision of a general practitioner and stroke specialist with support from a specialist team and community services. Support was provided for a maximum of 3 months.	6, 12 months after stroke onset	outcome in any groups between 3 and 12 months; The proportion of patients alive without severe disability (modified Rankin 0-3) at 12 months was significantly higher on the stroke unit compared with stroke team or domiciliary care
	Institution-based intervention (in stroke unit) (n=148)		24-hour care provided by a multidisciplinary team in stroke units based on clear guidelines for acute care, prevention of complications, rehabilitation, and secondary prevention.		
	Institution-based intervention (in general ward) (n=150)		Management provided by a multidisciplinary team in general wards. The team undertook stroke assessments and advised ward-based nursing and therapy staff on acute care, secondary prevention and rehabilitation aspects.		
Gladman, Lincoln, & Barer (1993)[32]	Home-based intervention (n=162)	None specified; The median of time varied from 21-103 days	Therapy was provided by physiotherapists and occupational therapists at home for up to 6 months	BI score at 6 months after randomization	No significant difference of BI score between groups
	Institution-based intervention (n=165)		Hospital-based rehabilitation service		

Gladman, & Lincoln (1994)[30]	Home-based intervention (n=12)	None specified; The median of time varied from 21-103 days	Physiotherapy and occupational therapy were provided by physiotherapists and occupational therapists for 6 months	BI score at 6 months and 1 year after randomization	No significant difference of BI score between groups at 12 months follow up; No significant difference of change score in BI score between groups at 6 and 12 months
	Institution-based intervention (n=14)		Follow-up service and physiotherapy and occupational therapy were provided in hospital		
Thorsén, Widén Holmqvist, de Pedro-Cuesta, & von Koch (2005)[33]	Early supported discharge to home with home-based intervention (n=42)	Mild to moderate impairments; 5-7 days	Initial medical care and rehabilitation in the stroke unit; After discharge, the foci of training were speech and communication, activities of daily living, and ambulation at home by outreach team consisting of occupational therapists, physiotherapists and a speech-and-language pathologist for the mean duration of intervention program for 14 weeks	BI score at 5 years after stroke onset	No significant difference of BI score between groups
	Institution-based intervention (n=41)		Initial medical care and rehabilitation in the stroke unit; If required, patients would receive additional rehabilitation in the Geriatrics or Rehabilitation Department		
Widén Holmqvist et al.	Early supported discharge to	Moderate disabled; 5-7 days	Early supported discharge with continuity of rehabilitation at home for 3 to 4 months. The home	BI score at 3 months after stroke	No significant difference of BI score between groups

(1998)[34]	home with home-based intervention (n=41)		rehabilitation team included physical therapists, occupational therapists, a speech therapist. The rehabilitation program at home emphasized a task- and context-oriented approach, which implies that the patient performs guided, supervised, or self-directed activities in a functional and familiar context		
	Institution-based intervention (n=40)		Hospital-based, day care, and/ or outpatient care		
von Koch, Widén Holmqvist, Kostulas, Almazan, & de Pedro-Cuesta (2000)[35]	Early supported discharge to home with home-based intervention (n=41)	Moderate neurological impairments; 1 week	Early supported discharge with continuity of rehabilitation at home for 3 to 4 months. The rehabilitation program was provided by a specialized team	BI score at 6 months after stroke	No significant difference of BI score between groups
	Institution-based intervention (n=40)		Inpatient-based and/or day care.		
Özdemir, Birtane, Tabatabaei, Kokino, &	Home-based intervention (n=30)	None specified; 10-82 days	Home-based conventional exercises provided by family caregivers at home at least 2 hours a day, 7 days a week, for a maximum of 150 days;	FIM score (mean follow-up after 60 days)	Control group showed statistically significant greater improvement at follow-up compared with

Ekuklu (2001)[21]			Splint, orthoses and devices were also provided; Regular 2-hour home visits were provided by a team consisting of a rehabilitation physician and a physiotherapist once a week to instructed family caregivers		intervention group
	Institution-based intervention (n=30)		Inpatient-based therapeutic exercises (range of motion, passive stretching, muscle strengthening, mobilization exercises) and neuromuscular facilitation exercises and regular occupational therapy were provided by a multidisciplinary rehabilitation team for 2 hours a day, 5 days a week. Physical agent therapy and splints or orthoses was provided if necessary		
Hesse, Welz, Werner, Quentin, & Wissel (2011)[22]	Home-based intervention (n=25)	Could walk independently within their home with BI score 55-80; The mean of time was 18.5-29.3 weeks	An intermittent high-intensity physiotherapy program of neurodevelopmental treatment and training of activities of daily living was provided by physiotherapists at home for 12 months (three 2-month blocks of therapy, consisting of 4 therapy sessions every week, one session lasted 30 to 45 minutes, totaling 96 sessions). The physiotherapy program involved the Bobath approach to lessen the	Rivermead Activities of Daily Living scale score (self-care section) at every study onset and every second month, and at 3 months follow-up after treatment	Both groups improved significantly over time over time; No significant difference of the Rivermead Activities of Daily Living scores between groups over 12 months

			elevated muscle tone and motor relearning program to train the ability of daily living, e.g. climbing up- and downstairs, walking in- and outside the house, bath and toilet use, passing traffic lights, shopping etc. Between the treatment blocks, a self-therapy program consisting of various stretching, strengthening and motor tasks, was instructed to the patients and their relatives.		
	Institution-based intervention (n=25)		A regular continuous low-intensity physiotherapy program was provided by physiotherapists in the private unit of a physiotherapist (continuous two 30 to 45 minutes physiotherapy sessions per week, totaling 104 sessions). The treatment approach was similar to the intervention group.		
Redzuan, Engkasan, Mazlan, & Freddy Abdullah (2012)[26]	Home-based intervention (n=53)	Mild to severe disability (NIHSS <6, 6-14, >14); The means of time were 12.9 days (intervention group) and 10.9 days (control group)	Home-based rehabilitation was provided by patients and their caregivers at home for 3 months. The intervention was guided by a self-instructional audiovisual videodisk, including (1) patient positioning and handling; (2) bed mobility; (3) passive range of motion exercises, stretching, and strengthening of the upper limbs;	MBI score at 3 months after discharge	Both groups had significant increases in the MBI scores at 3 months; No significant difference in the number of patients with improved MBI score between groups (the MBI score was not similar at baseline)

			(4) passive range of motion exercise, stretching, and strengthening of the lower limbs; (5) transfer techniques from bed to wheelchair and vice versa, and wheelchair into the car and vice versa; and (6) activities of daily living (grooming, desk activities, and upper and lower garment dressing)		
	Institution-based intervention (n=53)		Weekly outpatient therapy sessions were provided for 1 hour each for physical and occupational therapy, with instructions for home rehabilitation without videodisk		
Baskett, Broad, Reekie, Hocking, & Green (1999)[36]	Home-based intervention (n=50)	None specified; The means of time were 38.6 days (intervention group) and 37.5 days (control group)	Self-directed therapy of exercises and activities at home, with home visits by therapists once a week for as long as judged necessary, or for a maximum of 13 weeks	MBI score at 6 weeks and 3 months after discharge	No significant difference of BI score between groups
	Institution-based intervention (n=50)		Outpatient or day hospital therapy of physiotherapy practice (based on neurodevelopment treatments) and occupational therapy (based on neurodevelopment and motor relearning treatments)		
Pandian et al. (2015)[29]	Early supported discharge to home with	None specified; < 1 month	Training of caregivers started in hospital. After discharge, the caregiver-mediated home-based intervention was provided, including positioning,	Number of participants with good outcome (mRS score 0-2)	No statistical analysis

	home-based intervention (n=50)		transfer, and mobility, task-orientated training (particularly walking, upper-limb, and self-care tasks), and provision of information, with an intervention manual provided for the patients and caregivers The therapist was able to be contacted though telephone for support and guidance over the next 3-months	and poor outcome (mRS score 3-6) at 3 months and 6 months	
	Institution-based intervention (n=54)		After discharge, in- or out-patient therapy was provided but caregivers were not provided with trial-specific training		
Roderick et al. (2001)[37]	Home-based intervention (n=66)	None specified; The median of time was 50 days (intervention group) and 48 days (control group)	Home-based intervention was provided by a domiciliary stroke team consisting of a physiotherapist, an occupational therapist with outpatient speech and language therapy provided; Therapy was provided until maximum potential for recovery was reached.	BI score at 6-month follow up	No significant difference of BI score between groups
	Institution-based intervention (n=74)		Care was coordinated by multidisciplinary teams, provided in day hospitals. Therapy was provided until maximum potential for recovery was reached.		
Young, & Forster (1992)[20]	Home-based intervention (n=63)	None specified; Varied from <4 weeks to >12	Home-based therapy was provided by a physiotherapist at home	BI score at 8 weeks from the start of treatment, and at 6	Both groups had significant increases in the BI score at 6 months;

	Institution-based intervention (n=61)	weeks	Therapy was provided in geriatric day hospitals twice a week	months from discharge	The improvement was significantly greater for intervention group, compared to control group
Chen et al. (2017)[28]	Home-based intervention (n=27)	NIHSS score 2-20, mRS score 1-5; 14-90 days	Home-based rehabilitation was provided by caregivers and was tele-supervised by therapists at home for 3 months; The intervention included physical exercises (1 hour for one session, twice a working day, a total of 60 sessions), training of ability of daily activities and electromyography-triggered neuromuscular stimulation (20 minutes for one session, twice a working day a total of 60 sessions)	MBI scores at treatment endpoint, and at 24 weeks follow up (12 weeks after treatment)	Both groups had significant improvements over time; No significant difference of MBI score between groups
	Institution-based intervention (n=27)		The same therapeutic strategy as home-based intervention group was provided by therapists in the outpatient rehabilitation department		
Chen et al. (2020)[27]	Home-based intervention (n=26)	NIHSS score 2-20; 1-3 weeks	Home-based rehabilitation was provided by caregivers and was tele-supervised by therapists at home 10 sessions a week for 12 weeks; The intervention included physical exercises, training of ability of daily activities and electromyography-triggered neuromuscular stimulation	MBI scores at treatment endpoint	Home-based intervention group showed significantly larger improvement in MBI score than control group

	Institution-based intervention (n=26)		The same therapeutic strategy as home-based intervention group was provided by therapists in the outpatient rehabilitation department		
Han et al. (2020)[25]	Home-based intervention (n=12)	mRS scroe 2-4; The means of time were 22.8 months (intervention group) and 53.5 months (control group)	Home programme consisted of ADL tasks was provided by an occupational therapist at home for 50min each time, once a week for 6 weeks	BI-SS (Barthel Index-based Supplementary Scales) score at treatment endpoint	The change score of BI-SS differed significantly between groups; Home-based intervention group had significant improvement of BI-SS score; No significant difference in BI-SS score in control group
	Institution-based intervention (n=14)		Conventional rehabilitation programme included 30min of occupational therapy and 30min of physical therapy for training motor and cognitive function were provided in the hospital twice a week		
Björkdahl, Nilsson, Grimby, & Sunnerhagen (2006)[23]	Home-based intervention (n=29)	None specified; The means of time were 93 days (intervention group) and 91 days (control group)	Individually tailored training for ADL was provided at home by an occupational therapist and a physiotherapist for 9 hours per week for 3 weeks	FIM score at treatment endpoint, at 3 months and 1 year follow up	No significant improvement in either intervention group or control group at the treatment endpoint; Institution-based group had significant improvement of FIM score at 1 year follow up; No significant difference of FIM score between groups over time
	Institution-based intervention (n=29)		Training of deficits or components of function was provided at the day clinic		
Hofstad, Gjelsvik,	Early supported	NIHSS score of 2–26;	Care was provided by a multidisciplinary ambulatory team	mRS and BI score at 3 months and at 6	mRS scores and BI scores and the change scores did

Næss, Eide, & Skouen (2014)[24]	discharge to home with home-based intervention (n=104)	7 days	consisting of a nurse, a physiotherapist and an occupational therapist in the stroke unit, and discharged home as early as possible, with following home-based rehabilitative treatment provided at home by a multidisciplinary community health team consisting of a nurse, a physiotherapist and an occupational therapist for up to 5 weeks (maximally four hours per day, five days a week); During the treatment period, one or more persons from the community health team were present three days a week, and the last two the days of the week the patients trained by themselves after instructions from the team	months	not differ significantly at any time points between groups; Two early supported discharge groups had significant improvement in mRS score from baseline to 3 months, but not in the controls; No significant difference of mRS score between two early supported discharge groups at 3 months or at 6 months follow up
	Early supported discharge to day unit with day unit- based intervention (n=103)		Care was provided by a multidisciplinary ambulatory team consisting of a nurse, a physiotherapist and an occupational therapist in the stroke unit, and discharged home as early as possible, with the following treatment by in a community day unit for 5 weeks; During the treatment period, one or more persons from the community		

			health team were present three days a week, and the last two the days of the week the patients trained by themselves after instructions from the team		
	Usual care (n=99)		Mainly comprised institutional stay if necessary and/or physiotherapy as needed in the municipality (0–2 hours per week)		
Taule, Strand, Assmus, & Skouen (2015)[18]	Early supported discharge to home with home-based intervention (n=53)	NIHSS score of 2–26; 1-7 days	Care was provided by a multidisciplinary hospital outreach team during hospitalization and to the end of follow-up; Patients were discharged from hospital to their home as early as possible; Treatment was provided by municipal healthcare team at home, which was mainly directed towards ADLs, and function-specific treatment was also offered for 4 weeks	The Assessment of Motor and Process Skills (AMPS) score and mRS score at 3 months	No significant group differences in pre–post changed ADL ability measured by the AMPS at 3 months follow up
	Early supported discharge to home with day unit- based intervention (n=50)		Care was provided by a multidisciplinary hospital outreach team during hospitalization and to the end of follow-up; Patients were discharged from hospital to home as early as possible; Individualized treatment and focused on specific functions like training of memory or of hand function, but also		

			on specific instrumental ADL activities was provided by a municipal healthcare team in a day unit for 4 weeks		
	Usual care (n=51)		No support from the hospital outreach team or the municipal health-care team was provided; Follow up rehabilitation is not provided to all patients. Ordinary treatment might involve treatment at home by a nurse, physical therapist, or occupational therapist from the home municipality and/or treatment by a private physiotherapist		
Rasmussen et al. (2016)[48]	Early supported discharge to home with home-based intervention (n=38)	None specified; >3 days	During hospitalization, home-based intervention of physical exercise and training of ability of daily activities was provided at home by a multidisciplinary team consisting of a nurse, physiotherapists, occupational therapists, and physicians; After discharge, the home training for activities of daily living and continued rehabilitation training at home was provided by the multidisciplinary team for up to 1 month	mRS score and MBI score 90 days after stroke onset	Intervention group achieved significantly better mRS score than control group; No significant difference of MBI score between groups
	Usual care (n=33)		After discharge, standard procedures were provided by municipality health care professionals		

Duncan et al. (1998)[47]	Home-based intervention (n=10)	Minimal to moderate neurological deficits (Fugl-Meyer Motor Score 40 to 90); 30-90 days	Home-based intervention was provided by a physical therapist at home for 12 weeks (8-week therapist-supervised program with 3 visits per week, and 4-week self-instructed program); The exercise program was designed to improve strength, balance, and endurance, using Neuromuscular Facilitation Patterns or Theraband exercise	BI score at treatment endpoint	No significant difference in change scores of BI between groups
	Usual care (n=10)		Usual care prescribed by physicians and treatment might be provided		
Santana et al. (2017)[38]	Early supported discharge to home with home-based intervention (n=95)	FIM score < 100; None specified	Rehabilitation began in stroke unit with the following home-based training by the early home-supported discharge team at home for approximately 8 training session for a maximum of 1 month; The rehabilitation was focus on daily activities valued by the patient in their usual context	FIM score at 6 months after stroke onset	No significant difference in FIM score between groups at 6 months
	Usual care (n=95)		Usual care rehabilitation was frequently focus on components of training of impairments, which might be provided in convalescence unit or home or long-term care unit		
Chaiyawat, &	Home-based intervention	None specified; The means of time	Home-based exercise was provided by a physical therapist once a month with	BI score at 2 years	BI score was significantly improved in the

Kulkantrakorn. (2012a)[40]	(n=30)	were 10 days (intervention groups) and 10.9 days (control group)	audiovisual materials provided for 6 months; The intervention strategy was based on principles of exercise physiology, motor learning and mirror neuron concept; The audiovisual CD of rehabilitation procedures included passive exercise, active exercise, resistance exercise, and activities of daily living (ADL), including preparing a drink, lock and key, putting on and taking off shoes, how to use a cane or wheelchair, etc		intervention group more than the control group
	Usual care (n=30)		Might include outpatient rehabilitation and instruction for home rehabilitation without home visits		
Chaiyawat, & Kulkantrakorn. (2012b)[46]	Home-based intervention (n=30)	None specified; The means of time were 10 days (intervention groups) and 10.9 days (control group)	Home-based exercise was provided by a physical therapist once a month with audiovisual materials provided for 6 months; The intervention strategy was based on principles of exercise physiology, motor learning and mirror neuron concept; The audiovisual CD of rehabilitation procedures included passive exercise, active exercise, resistance exercise, and activities of daily living (ADL),	BI score at 2 years	BI score was significantly improved in the intervention group more than the control group

			including preparing a drink, lock and key, putting on and taking off shoes, how to use a cane or wheelchair, etc		
	Usual care (n=30)		Might include outpatient rehabilitation and instruction for home rehabilitation without home visits		
Lindley et al. (2017)[43]	Early supported discharge to home with home-based intervention (n=623)	Mild to severe disability (NIHSS 0-15, ≥15); The range of time was 0-29 days	The family rehabilitation training was delivered by a rehabilitation professional started in hospital continued at home (up to 6 home visits) for up to 2 months; After discharge, the home-based intervention was provided by caregivers at home; The home-based intervention included limb positioning, task specific activities, training of ability of daily activities and communication, and provision of information, with an intervention manual provided for the patients and caregivers	mRS and BI scores at 3 months and 6 months after randomization	No significant difference in BI scores between groups at 3 months and 6 months
	Usual care (n=627)		Some therapy by a physiotherapist during hospital stay, with post-discharge care vary from no therapy to some outpatient therapy		
Barzel et al. (2015)[44]	Home-based intervention (n=85)	Mild to moderate disability, with subsequent mild	Home-based constraint-induced movement therapy was provided in home environment for 2 hours each	BI scores at treatment endpoint and at 6 months	No significant difference in BI scores between groups at treatment endpoint and at 6

		to moderate impairment of arm function and minimal residual hand function (minimum 10° active wrist extension, 10° active thumb abduction or extension, and 10° extension of two additional fingers); The mean of time were 56.57 (intervention group) months and 45.65 months (control group)	weekday for 4 weeks, accompanied by a caregiver. Additionally, patients were asked to wear a resting glove during exercises and activities of daily living to immobilize their non-affected hand	follow up	months follow up
	Usual care (n=71)		Conventional physical or occupational therapy was provided either in a patient's home or in a therapeutic practice, but additional home training was not obligatory; Therapy might include neurodevelopmental treatment, Perfetti, proprioceptive neuromuscular facilitation, Affolter, apparatus therapy, functional training, massage therapy, and soft tissue manipulation, shoulder and hand mobilization, isometric training, strengthening of muscles, muscle tonus reduction, training of skills and activities of daily living, perceptual and sensory training, assisted movement, fine motor skills training, trunk mobilization and stabilization		
Walker, Gladman, Lincoln, Siemonsma,	Home-based intervention (n=94)	None specified; 1 month	Training of personal and instrumental daily activities was provided by an occupational therapist at home for up to 5 months	BI score at 6 months	Intervention group showed significantly higher BI score than control group

& Whiteley (1999)[45]	Usual care (n=91)		No additional input from the research therapist was provided, but participants might have received input from existing services, as would occur in routine practice		
Mayo et al. (2000)[49]	Early supported discharge to home with home-based intervention (n=58)	None specified; < 28 days	Home intervention was provided by a multidisciplinary team at home, offering nursing, physical therapy, occupational therapy, speech therapy, and dietary consultation for 4 weeks	BI scores at 1 month and 3 months after stroke onset	Both groups improved significantly in BI score over time No significant difference in BI score between groups at either 1 or 3 months after stroke
	Usual care (n=56)		A range of services were provided after discharge, including physical therapy, occupational therapy, speech therapy, as requested by the patient's care provider and offered through extended acute-care hospital stay; inpatient or outpatient rehabilitation; or home care via local community health clinics. Patients could also arrange for private care for which they themselves paid (rehabilitation services are covered by the government only if offered through a designated hospital or community center).		
Wolfe, Tilling, &	Home-based intervention	None specified; None specified	Treatments were provided by a community rehabilitation team	BI score at 1 year post randomization	No significant difference in BI score between group at 1

Rudd. (2000)[39]	(n=23)		consisting of a physiotherapist, an occupational therapist, a speech and language therapist and a therapy aide at home for a maximum of 3 months		year post randomization
	Usual care (n=20)		All other services apart from therapy mentioned in intervention group: outpatient resources available in the district included a hospital-based stroke clinic, geriatric day hospital, generic domiciliary physiotherapy and speech and language therapy, hospital outpatient physiotherapy, and the usual community resources. The maximum level of home care available in the study area to all patients was three 1-hour visits daily by a home help for personal care, meals on wheels, and community nurse visits for specific tasks		
Deng, Yang, & Xiong. (2020)[41]	Home-based intervention (n=49)	NIHSS score of 4-15, mRS score of 2-4; The mean of time was 17 days	Stroke rehabilitation was performed by therapists at home 1-3 times a week for 8 weeks; Medication reconciliation and self-management education was performed by general practitioners and nurses	MBI score at 8 weeks after discharged from stroke unit	The intervention group showed significantly better results than the control group at treatment endpoint; Significant difference between groups at treatment endpoint
	Usual care (n=49)		Medication therapy, strategies of detection and control of potential risk factors were provided		

Lincoln, N. B., Walker, M. F., Dixon, A., & Knights, P. (2004)[42]	Home-based intervention (n=90)	None specified; < 2 years	Rehabilitation service including physiotherapy, occupational therapy, speech and language therapy were provided at patients' own home by a multidisciplinary team for as long as it was considered they were benefiting	BI score at 6 months follow up after randomization	No significant difference in BI score between groups
	Usual care (n=103)		Routine rehabilitation services were provided including service at day hospital, service at outpatient departments and social services of occupational therapy		
Koç. (2015)[54]	Home-based intervention (n=35)	Baseline BI score 60–80, and patients were able to walk with supervision and/or an assistive device; 30-90 days	Home-based exercise program was provided by a nurse at home twice a week for 3 months. And patients were instructed to continue the exercise program; The exercise program included strengthening, range of motion exercise proprioceptive neuromuscular facilitation	BI score at 12 weeks after baseline assessment	The intervention group showed significant more improvement in BI score than control groups, and BI score was significantly higher than control groups at treatment endpoint
	No intervention (n=37)		No intervention was administered by the researcher, instead of home visits by the research staff every 4 weeks for health education and to check their vital signs		
Wang et al. (2015)[50]	Home-based intervention (n=25)	Mild to moderate disability (Brunnstrom	Caregiver-mediated, home-based intervention was provided at home for 3 months;	BI score at 12 weeks	Intervention group showed significantly greater improvement in BI score at

		recovery stages III-V); >6 month	The intervention aimed at improving body functions and structural components, ability of daily activities and participation in outdoor leisure activities; Home visits were provided by a physical therapist once a week for approximately 90 minutes to teach both patients and their caregivers, and written training guideline and simple illustrations were provided to the caregivers		treatment endpoint
	No intervention (n=26)		Home visits or telephone calls by therapists without intervention		
Walker, Drummon, & Lincoln. (1996)[51]	Home-based intervention (n=15)	None specified; 6 months	Dressing practice was provided by an occupational therapist at home for 3 months; Treatment involved teaching patients and carers appropriate techniques such as dressing the affected limb first, energy conservation, the use of red thread to overcome perceptual difficulties and to mark alignment of buttons, and advice on choice of clothing; Cares were encouraged to continue the dressing practice between sessions	the Rivermead ADL score at post-treatment	Both groups showed statistically significant improvement during the treatment phase; Neither group showed any change during the non-treatment phase

	No intervention (n=15)		No intervention (as a crossover study)		
Lin, Hsieh, Lo, Chai, & Liao. (2004)[53]	Home-based intervention (n=9)	Moderate to severe residual disability with BI score (0-20) 5-14; >1 year	Home-based physical therapy was provided by a physical therapist at home once a week for 10 consecutive weeks, with each session lasting for 50 to 60 minutes; The intervention mainly included motor facilitation, postural control training, functional ambulation training with gait correction, and training of daily activities	BI score at post-treatment	No significant difference in changes in BI score at treatment endpoints between groups
	No intervention (n=10)		No intervention (as a crossover study)		
Wade, Collen, Robb, & Warlow (1992)[52]	Home-based intervention (n=49)	Patients used a walking or mobility aid, other than just a stick; had had a fall in the previous three months; were unable to manage stairs, slopes, or uneven surfaces independently; or had a slow gait	Home-based intervention was provided by a physiotherapist at home for 3 months Intervention included re-education of abnormal components; Practice walking inside and outside; Exercises to stimulate reactions; Obstacle courses; Practice on uneven surfaces; Re-education; Practice of correct sequence (feet back, lean forward); Removal of inappropriate aids; Maintenance, adjustment; Provision of	BI score at post-treatment	No significant change in BI score over time in both groups; No significant difference in BI score at treatment endpoint between groups

		speed >10 s over 10 m if under 60, > 12.5 s if 60-69, >16-5s if over 70; 2-7 years	appropriate aids; Advice on and practice of best way of performing daily activities; Referral to community occupational therapy; Demonstrate patient's ability to patient and carer; graduated exercise program		
	No intervention (n=45)		No intervention (as a crossover study)		
Chumbler et al. (2012)[57]	Home-based telerehabilitation intervention + usual care (n=25)	FIM score 18-88; < 24 months	1. Three 1-hour home tele-visits by a trained assistant to assess physical performance and help communicate the instruction of exercises and use of assistive technology and/ or adaptive techniques; 2. In-home messaging device was daily used by participants which was monitored weekly by the teletherapist; 3. Five telephone intervention calls between teletherapists and the participant to review the current exercise regimen and assistive technology, and to overcome barriers; The duration of telerehabilitation was 3 months and all participants also	The motor subscale of the Telephone Version of FIM score at 3 months and 6 months	No significant difference in the motor subscale of the Telephone Version of FIM score at treatment endpoint and 3 months after treatment

			received routine Veterans Affairs care		
	Usual care (n=23)		Any services provided as part of their usual Veterans Affairs or non-Veterans Affairs care, such as home health care.		
Corr, & Bayer (1995)[58]	Home-based intervention + usual care (n=55)	None specified; The range of time were 7-317 days (intervention group) and 8-221 days (control group)	Rehabilitation was provided by an occupational therapist at home; The home-based intervention included teaching new skills, facilitating more independence in activities of daily living, facilitating return of function, enabling patients to use equipment supplied by other agencies, giving information to the patient and carer, and referring to or liaising with other agencies; In addition to any other follow-up services arranged, such as day-hospital attendance and community physiotherapy.	BI scores at 1-year poststroke	No significant difference in BI score between groups at 1-year poststroke
	Usual care (n=55)		No special intervention or follow-up was provided, and the participants could receive any available services as required		
Wong, & Yeung (2015)[64]	Transitional care program with home-based	(1) slight to moderate neurological deficits with	Routine hospital-based physical training program was provided within the first 3 weeks after discharge; Transitional care program was	MBI score post-treatment and at 8 weeks after discharge	The intervention group showed significantly higher MBI scores at post-treatment and at 4 weeks

	intervention + routine hospital-based training (n=54)	NIHSS>=4 or <16 (2) slight to moderate level of disability, with mRS>=2 to <=4; None specified	commenced before discharge and lasted for 4 weeks after discharge at home by a nurse; The transitional care program included home-based intervention consisting training of self-care abilities and exercise, emotion management etc.		after treatment than control groups
	Usual care (n=54)		Routine hospital-based physical training program was provided within the first 3 weeks after discharge		
Gilbertson, Langhorn, Walker, Allen, & Murray (2000)[59]	Home-based intervention + usual care (n=67)	None specified; The median of time were 31 days (intervention group) and 23 days (control group)	Domiciliary program was provided by a therapist for 6 weeks; The intervention aimed at recovery goals identified by the patients such as regaining self-care or domestic or leisure activities, and the therapist also liaised with other agencies for advice, services, and equipment; Routine services as the same in the control group	BI score at 8 weeks and at 6 months follow up	No significant differences in BI scores either at 8 weeks follow up or at 6 months follow up
	Usual care (n=71)		Routine services included inpatient multidisciplinary rehabilitation, a predischarge home visit for selected patients, the provision of support services and equipment, regular multidisciplinary review at a stroke clinic, and selected patients referred to		

			a medical day hospital		
Batchelor, Hill, Mackintosh, Said, & Whitehead. (2012)[56]	Home-based intervention + usual care (n=71)	Were at high risk of falls (either had fallen during hospital admission or had a Step Test worse leg score of less than 7, or a Berg Balance Scale score of less than 49); The mean of time were 3 months (intervention group) and 3.1 months (control group)	Individually tailored falls prevention program was provided by a physiotherapist at home; Home exercise program (strength and balance exercise and walking), falls risk minimization strategies, education, injury risk minimization strategies, with falls prevention booklet provided; Usual care might include referral for ongoing therapy (physiotherapy and occupational therapy)	FIM score at 12 months after baseline assessment	No significant difference in FIM score between groups at 12 months follow up
	Usual care (n=85)		Usual care might include referral for ongoing therapy (physiotherapy and occupational therapy); Falls prevention booklet was also provided		
Sritipsukho, Riewpaiboon, Chaiyawat, & Kulkantrakorn (2010)[63]	Home-based intervention + usual care (n=30)	None specified; The mean of time were 13 days (intervention group) and 10.9 days (control group)	Home-based rehabilitation program based on exercise physiology and motor learning was provided by a physical therapist at home once per month for 3 months, with audiovisual materials provided to patients and caregivers for daily activity practice; Conventional hospital services which included outpatient rehabilitation	The number of participants in both groups who achieve goals	No statistical analysis to compare the effectiveness of the intervention
	Usual care		Conventional hospital services which		

	(n=30)		included outpatient rehabilitation		
Ricauda et al. (2004)[61]	Home-based intervention + usual care (n=60)	None specified; >24 hours	The home rehabilitation program was provided by a physician, a nurse and a physical therapist daily at home; The intervention emphasized a task- and context-oriented approach, which recommended that the patient perform guided, supervised, and self-directed activities in a functional and familiar context; Hospital rehabilitation service was provided by physical therapists	FIM score at 6 months follow up	FIM scores significantly improved in both groups over time; No significant difference in FIM score between groups
	Usual care (n=60)		Hospital rehabilitation service was provided by physical therapists		
Rudd, Wolfe, Tilling, & Beech. (1997)[62]	Home-based intervention + usual care (n=167)	None specified; None specified	Domiciliary treatment was provided by a multidisciplinary team consisting of a physiotherapist, an occupational therapist and a speech and language therapist and a therapy aid for a maximum of 3 months; Treatment included physiotherapy, occupational therapy and speech therapy; Conventional services were provided when appropriate	BI score at 1 year after stroke onset	No significant difference in BI score between groups at 1-year poststroke
	Usual care (n=164)		Conventional services included hospital-based stroke clinic, geriatric day hospital, generic domiciliary physiotherapy and speech and language		

			therapy, hospital outpatient physiotherapy, and the usual community resources; The maximum level of home care available in the study area to all patients was three one-hour visits daily by a home help for personal care, meals on wheels		
Azab, Al-Jarrah, Nazzal, Maayah, Sammour, & Jamous. (2009)[55]	Home-based intervention + usual care (n=20)	Mild to moderate hemiparesis of the affected upper limb, with Brunnstrom recovery stages III-VI, or BI scores 30-90, and the participants were able to voluntarily extend their fingers and wrist slightly; The mean of time were 81 days (male participation) and 87 days (female participation)	Home-based Constraint-Induced Movement Therapy (CIMT) supervised by caregivers for 6 to 7 hours a day for 4 consecutive weeks; Traditional physical and occupational therapy sessions for 40 minutes each, three time per week for 4 weeks	BI score at 6 months post-discharge	Intervention group showed statistically significant improvement in BI score compared to the control group
	Usual care (n=17)		Traditional physical and occupational therapy sessions for 40 minutes each, three time per week for 4 weeks		
Goldberg,	Home-based	None specified;	Home-based treatment was provided	Multiple regression	No comparison of FIM

Segal, Berk, Schall, & Gershkoff. (1997)[60]	intervention + usual care (n=27)	2 weeks to 3 months	by treatment team consisting of physiatrist, psychologist and recreational therapist with weekly phone contact and monthly home visits; Treatment included those needed from therapeutic recreation, social work, and psychology consultants; and special access to educational resources, including a stroke educational manual with associated printed materials and a stroke "hot-line" telephone number; Standard outpatient follow-up services were also provided (were as described below)	models were used to look at the prediction of FIM and FAI scores at 6 months and 1 year follow up assessments	score was made between two groups
	Usual care (n=28)		Standard outpatient follow-up services included routine medical follow-up visits and, when indicated, outpatient rehabilitation services		

There were various home-based interventions performed in the included studies. Thirteen studies did not describe the details of treatment strategy.[19, 20, 24, 30-32, 35, 37, 39, 41, 42, 49, 62] Among 34 studies which reported the details of treatment strategy, 20 studies provided physical exercise practice,[21, 22, 26-29, 36, 40, 43, 46-48, 50, 52-54, 56, 57, 63, 64] 21 studies provided training of daily activities,[18, 22, 25-28, 33, 38, 40, 43, 45, 46, 48, 50-53, 58, 59, 63, 64] 7 studies provided task-/ functional-specific training,[18, 23, 29, 34, 36, 43, 61] 2 studies provided constraint-induced movement treatment.[44, 55] Other treatments like speech and communication therapy,[33] psychosocial intervention,[60] emotion management,[64] electromyography-triggered neuromuscular stimulation,[27, 28] application of leisure activities,[59, 60, 64] providing adaptive aids and equipment,[52, 59] providing fall prevention strategies[56] and providing splint or orthoses[21] were also used as part of home-based intervention for stroke patients.

The delivery strategy of home-based intervention has transformed in recent years. Before 2009, all included trials provided home-based interventions by professionals during home visits. While, among 24 studies published from 2009, 13 studies involved self-/caregiver-mediated intervention,[21, 26-29, 40, 43, 44, 46, 50, 55, 57, 63] in which 4 studies provided tele-rehabilitation supervised by professionals.[27-29, 57]

Risk of bias in included studies

Methodological quality of the included studies is presented (Table 2). Thirty-two out of the included 47 studies were of good methodological quality (PEDro score = 6-8). Eleven studies were of fair quality (PEDro score = 4-5), and four[26, 29, 55, 60] were of poor quality (PEDro score = 1-3).

Table 2. Physiotherapy evidence database (PEDro) scores of included studies

Study, Year of publication	PEDro scale items											PEDro score (0-10)
	1	2	3	4	5	6	7	8	9	10	11	
Kalra, 2000	√	√	√	√			√	√	√	√	√	8
Kalra, 2005	√	√	√				√	√	√	√	√	7
Gladman, 1993	√	√	√				√	√		√	√	6
Thorsén, 2005	√	√	√				√			√	√	5
Widén Holmqvist, 1998	√	√	√				√	√		√	√	6
von Koch, 2000	√	√	√				√	√		√	√	6
Özdemir, 2001	√	√		√				√	√		√	5
Hesse, 2011	√	√		√			√	√	√	√	√	7
Redzuan, 2012	√	√								√	√	3
Baskett, 1999	√	√	√	√			√	√		√	√	7
Pandian 2015	√	√					√					2
Roderick, 2001	√	√	√	√						√	√	5
Young, 1992	√	√		√			√	√		√	√	6
Chen, 2017	√	√	√	√			√	√	√	√	√	8
Chen, 2020	√	√	√	√			√	√	√	√	√	8
Han, 2020	√	√		√			√	√	√	√	√	7
Gladman, 1994	√	√		√			√			√	√	5
Björkdahl, 2006	√	√	√	√			√	√	√		√	7
Hosfstad, 2014	√	√	√	√	√		√		√	√	√	8
Taule, 2015	√	√	√				√			√	√	5
Rasmussen, 2016	√	√	√	√						√	√	5
Duncan, 1998	√	√	√	√				√	√	√		6
Santana, 2017	√	√	√	√			√			√	√	6
Chaiyawat, 2012a	√	√	√	√				√	√	√	√	7
Chaiyawat,	√	√	√	√				√	√	√	√	7

2012b												
Lindley, 2017	√	√		√			√	√	√	√	√	7
Barzel, 2015	√	√	√	√			√	√	√	√	√	8
Walker, 1999	√	√	√	√			√	√		√	√	7
Mayo, 2000	√	√	√	√				√		√	√	6
Wolfe, 2000	√	√	√						√	√	√	5
Deng, 2020	√	√	√	√			√	√	√	√	√	8
Lincoln, 2004	√	√					√			√	√	4
Koç, 2015	√	√	√	√						√	√	5
Wang, 2015	√	√					√	√	√	√	√	6
Walker, 1996	√	√		√			√	√		√	√	6
Lin, 2004	√	√		√		√	√	√	√	√	√	8
Wade, 1992	√	√		√			√	√		√	√	6
Chumbler, 2012	√	√	√	√			√		√	√	√	7
Corr, 1995	√	√	√	√						√	√	5
Wong, 2015	√	√	√	√			√	√	√	√	√	8
Gilbertson, 2000	√	√	√				√	√	√	√	√	7
Batchelor, 2012	√	√	√	√			√		√	√	√	7
Sritipsukho, 2010	√	√		√			√	√		√	√	6
Ricauda, 2004	√	√		√			√		√	√	√	6
Rudd, 1997	√	√	√	√						√	√	5
Azab, 2009	√						√					1
Goldberg, 1997	√	√		√								2

1: eligibility criteria and source of participants; 2: random allocation; 3: concealed allocation; 4: baseline comparability; 5: blinded participants; 6: blinded therapists;7: blind assessors; 8: adequate follow-up; 9: intention-to-treat analysis; 10: between-group comparisons; 11: point estimates and variability.

*Item 1 does not contribute to the total score.

Good quality, PEDro score 6–10; fair quality, PEDro score 4–5; poor quality, PEDro score ≤ 3.

Effectiveness of home-based intervention compared with institution-based intervention

Twenty studies investigated the effectiveness of home-based intervention comparing with institution-based intervention. One study did not specify the between-group or within-group

statistical comparison.[29] One study did not specify the between-group statistical comparison.[26] Fourteen studies found no significant difference between two groups in the ability of daily living no matter at treatment endpoints or at follow ups.[18, 19, 22-24, 28, 30-37] Five studies reported improvement in ability of daily living in both groups.[20-22, 26, 28] While three studies[20, 25, 27] demonstrated the superiority of home-based intervention comparing with institution-based intervention, one study[21] showed an opposite result.

Three studies with adequate data were included in the meta-analysis to evaluate the effect of home-based intervention comparing with institution-based intervention.[22, 26, 65] All measured the performance of BADL at treatment endpoint, and two studies[22, 65] measured at the follow-up. For the endpoint analysis, a random-effects analysis produced an insignificant result with high heterogeneity between studies (SMD=-0.01; 95%CI= -0.49-0.47; n=194; I^2=64%) (result not shown). A sensitivity analysis was performed after excluding one study with low methodological quality (PEDro scale = 3),[26] and statistical heterogeneity decreased but the result was also insignificant (SMD=0.24; 95% CI= -0.15-0.62; n=104; I^2=0%) (Figure 2). For the follow-up analysis, a fix-effect analysis produced an insignificant result (SMD=0.16; 95% CI= -0.23-0.55; n=104; I^2=0%) (Figure 3).

Effectiveness of home-based intervention compared with usual care

Fourteen studies investigated the effectiveness of home-based intervention comparing with usual care. Nine studies found no significant difference between two groups in the ability of daily living no matter at treatment endpoints or at follow ups.[18, 24, 38, 39, 42-44, 47, 49] Five studies showed significantly better improvement in the home-based intervention than in the usual care group.[40, 41, 45, 46, 48]

Five studies were pooled in the meta-analysis to evaluate the effect of home-based intervention comparing with usual care.[38, 41, 43, 44, 49] Two study measured the performance of BADL at treatment endpoint.[41, 44] For the endpoint analysis, a random-effects analysis produced an insignificant result with high heterogeneity between studies (SMD=0.65; 95%CI= -0.73-2.04; n=254; I^2=96%) (result not shown). Four studies measured outcome at the follow-up. [38, 43, 44, 49] For the follow-up analysis, a fix-effect analysis produced an insignificant result (SMD=-0.01.; 95% CI= -0.11-0.09; n=1444; I^2=0%) (Figure 4).

Effectiveness of home-based intervention compared with no intervention

Five studies investigated the effectiveness of home-based intervention comparing with no intervention. Three studies demonstrated significant effects on the ADL in home-based intervention but not in control group.[50, 51, 54] The other two studies found no significant benefit from home-based intervention.[52, 53]

Four studies were pooled in the meta-analysis to evaluate the effect of home-based intervention comparing with no intervention.[50, 52-54] All of them measured the performance of BADL at treatment endpoint, and a random-effects analysis produced an insignificant result with high heterogeneity between studies (SMD=0.84; 95% CI= -0.38-2.05; n=231; I^2=94%) (result not shown).

Effectiveness of home-based intervention addition to usual care compared with usual care

Ten investigated the effectiveness of home-based intervention comparing with no intervention. Two studies did not specify the between-group statistical comparison.[60, 63] Six studies found no significant difference between two groups in the ability of daily living no matter at treatment endpoints or at follow ups.[56-59, 61, 62] Two studies demonstrated significantly greater

improvement in home-based intervention group than control group.[55, 64] Wong *et al*[64] and Ricauda *et al*[61] found significant improvement in both group while Batchelor *et al*[56] showed there was no significant improvement either in home-based intervention group or in the control group.

Four studies were pooled in the meta-analysis to evaluate the effect of home-based intervention addition to usual care comparing with usual care.[56, 57, 62, 64] Two studies measured the performance of BADL at treatment endpoint, and a fix-effect analysis produced a significant result (SMD=0.55; 95% CI=0.22-0.87; n=152; I^2=3%) (Figure 5). All of them measured at the follow-up and a random-effects analysis produced an insignificant result with high heterogeneity between studies (SMD=0.23; 95% CI= -0.16-0.62; n=545; I^2=71%) (result not shown).

Subgroup analysis

We were unable to conduct subgroup analyses according to the level of disability of the stroke patients, the onset time of stroke, type of intervention or manner of delivery of the treatment because of the clinical diversity between studies, the insufficient information in the individual study and the limited number of included study.

DISCUSSION

Our review found that home-based intervention combined with usual care might have short-term benefits for stroke patients compared with usual care alone. The long-term effect of home-based intervention might be no more or less than usual care and institution-based intervention, and the short-term effect of home-based intervention might be equivalent to the institution-

based intervention. However, the evidence strength was weak because of the limited number of studies.

There was insufficient evidence to prove the short-term effect of home-based intervention on ability of activities of daily living in stroke patients, when comparing with no intervention. There was no enough evidence to suggest the short-term effect of home-based intervention comparing with usual care, or to suggest the long-term effect of home-based intervention addition to usual care comparing with usual care. The heterogeneity between the studies limited the conclusions that could be drawn.

Many current rehabilitation interventions are developed in clinical setting, and some are translated to home. Home-based intervention strategies vary in type, duration, intensity, frequency and delivery way. This systematic review revealed that exercise physiology practice and training of activity of daily living were commonly performed as home-based interventions which are supported by current evidence. AHA/ASA Guideline suggested that lower extremity strengthening exercise and cardiovascular exercise are beneficial to improve gait capacity of stroke patients and also can improve their ability to perform gait-related mobility tasks.[66] And training of activities of daily living is strongly recommended for community-dwelling stroke patients.[67] Some newly developed home-based interventions like caregiver-mediated rehabilitation and tele-rehabilitation have emerged for the past two decades to replace the traditional home visits by professionals. A Cochrane systematic review found that the caregiver-mediated rehabilitation did not increase the caregiver burden but the effectiveness on the ability of performing BADL in stroke patients was uncertain.[68] One large study found that the lower dose of caregiver-guided rehabilitation training and non-multidisciplinary

coordination might decrease the efficacy of caregiver-mediated home-based interventions.[43] Tele-rehabilitation seemed to be a good alternative to traditional rehabilitation. Chen *et al* delivered the same treatment strategy to home-based telerehabilitation group and institution-based rehabilitation group.[65] At the end of intervention and at follow up, both groups showed significant improvement in ability of daily living, and there was no significant difference between two groups throughout the time. Similarly, when comparing with the traditional face-to-face way of home-based intervention performed by professionals, home-based tele-rehabilitation showed equal positive effect on enhancing the ability of daily living of stroke patients.[69] More high-quality studies and practice are required to prove the effectiveness of those new strategies.

Limitations

There is no sufficient study to determine the effectiveness of home-based intervention comparing with other approaches. Although 47 studies were included in the review, many of them did not report adequate data so that they were not included in the meta-analyses. Nearly half of studies included into the meta-analyses had sample size smaller than 30. The clinical heterogeneity between studies in terms of severity of stroke, onset time of stroke, interventions and manner of delivery also compromised the evidence strength of our meta-analyses.

CONCLUSION

Our finding reveals that home-based rehabilitation may be an alternative to institution-based rehabilitation and usual care for stroke patients. And the home-based intervention combined

with usual care may be more effective than usual care alone for the short-term effect. However, the evidence strength is weak and future research is needed to investigate the effectiveness of home-based rehabilitation on groups with stratification by stroke severity, stage of stroke, type of home-based intervention and manner of delivery. Moreover, more high-quality studies are required to prove the cost-effectiveness of newly developed strategies like caregiver-mediated rehabilitation and tele-rehabilitation.

Contributors Wei Xijun and Qin ping designed the review. Qin Ping and Chen Xuan screened and selected the study. Qin Ping and Cai Canxin rated the study quality and extracted the data. Qin ping analysed the data and wrote the paper. Wei Xijun revised the paper.

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Competing interests None

Ethics approval None. No human or animal was involved in this study, but the authors implemented systematic review and meta-analysis based on published articles.

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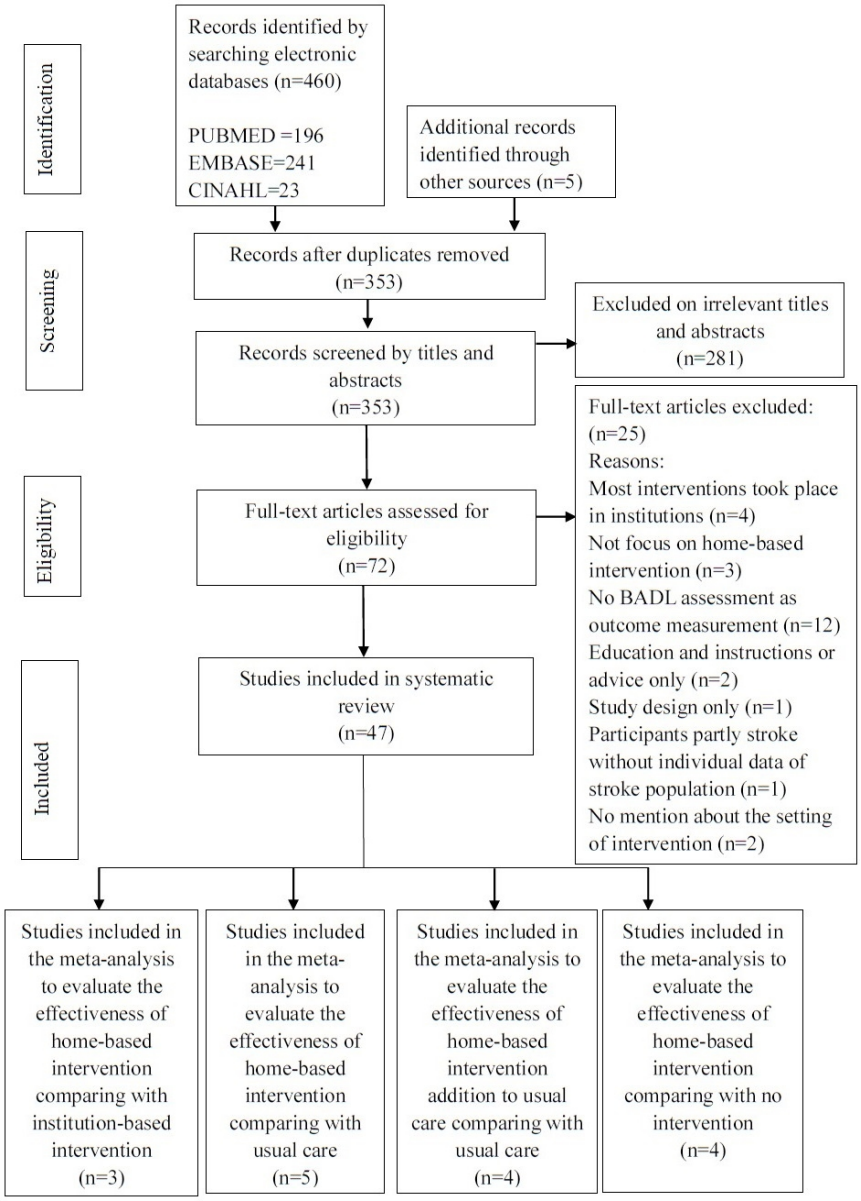

Figure 1. Flowchart of study selection

248x346mm (96 x 96 DPI)

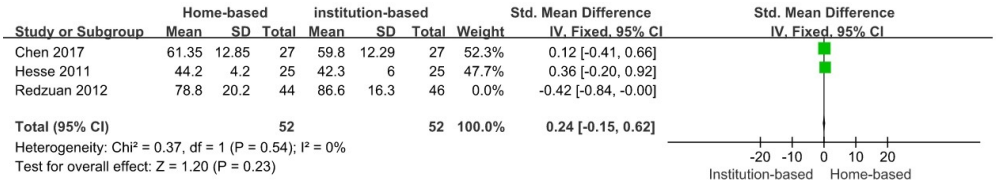

Figure 2. Forest plot comparing the effectiveness of home-based intervention with institution-based intervention at treatment endpoint (sensitivity analysis)

222x41mm (144 x 144 DPI)

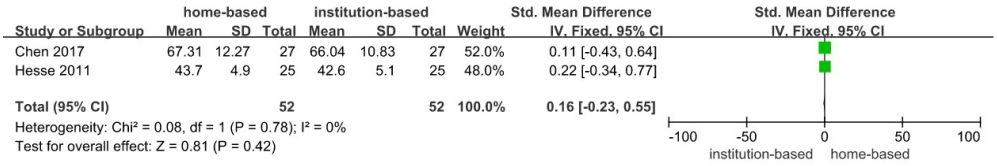

Figure 3. Forest plot comparing the effectiveness of home-based intervention with institution-based intervention at the follow up

222x38mm (144 x 144 DPI)

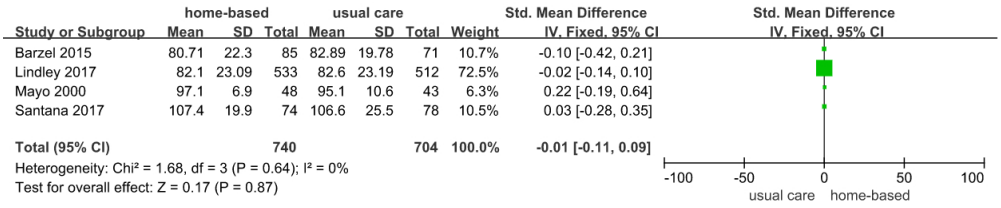

Figure 4. Forest plot comparing the effectiveness of home-based intervention with usual care at the follow up

557x120mm (57 x 57 DPI)

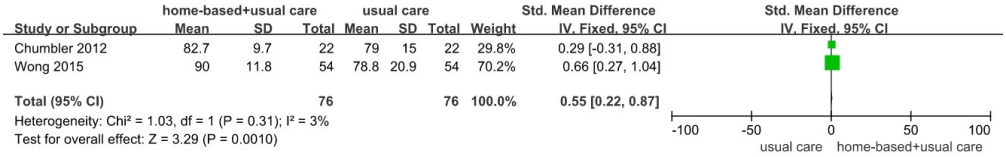

Figure 5. Forest plot comparing the effectiveness of home-based intervention addition to usual care with usual care at the endpoint

234x38mm (144 x 144 DPI)

Appendix 1.

Search strategy of Pubmed

Pubmed	
#1	stroke [Mesh]
#2	hemiplegia [Mesh]
#3	"cerebrovascular disorders" [Mesh]
#4	"cerebral vascular accident"
#5	"cerebrovascular accident"
#6	"cerebral vascular disease"
#7	"cerebrovascular disease"
#8	"cerebral vascular disorder"
#9	"cerebrovascular disorder"
#10	"stroke"
#11	"hemiplegia"
#12	"hemiplegic"
#13	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12
#14	"home care services" [Mesh]
#15	"home care service"
#16	"home care"
#17	"home based"
#18	home

#19	"residential care service"
#20	"residential care"
#21	"residence based"
#22	"residence"
#23	"resident"
#24	#14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23
#25	activities of daily living [Mesh]
#26	"activities of daily living"
#27	"ADL"
#28	"barthel index"
#29	"BI"
#30	"FIM"
#31	"functional independence measure"
#32	"daily life activity"
#33	#25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32
#34	#13 AND #24 AND #33
Filters:	Article types: randomized controlled trial
	Text availability: full text
	Publication date: to 2020.12.31
	Language: English

Search strategy of Embase

EMBASE	
#1	'cerebrovascular accident' / exp OR 'cerebrovascular accident'
#2	'cerebral vascular accident' / exp OR 'cerebral vascular accident'
#3	'cerebrovascular disease' / exp OR 'cerebrovascular disease'
#4	'cerebral vascular disease' / exp OR 'cerebral vascular disease'
#5	'cerebral vascular disorder' / exp OR 'cerebral vascular disorder'
#6	'cerebrovascular disorder' / exp OR 'cerebrovascular disorder'
#7	'stroke'/ exp OR 'stroke'
#8	'hemiplegia' / exp OR 'hemiplegia'
#9	'hemiplegic' / exp OR 'hemiplegic'
#10	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9
#11	'home care service' / exp OR 'home care service'
#12	'home care' / exp OR 'home care'
#13	'home based'
#14	'home' / exp OR 'home'
#15	'residential care service'
#16	'residential care' / exp OR 'residential care'
#17	'residence based'
#18	'residence' / exp OR 'residence'
#19	'resident' / exp OR 'resident'
#20	#11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19

#21	'activities of daily living' / exp OR 'activities of daily living'
#22	'daily life activity' / exp OR 'daily life activity'
#23	'adl'
#24	'barthel index' / exp OR 'barthel index'
#25	'bi'
#26	'functional independence measure' / exp OR 'Functional independence measure'
#27	'fim'
#28	#21 OR #22 OR #23 #24 OR #25 OR #26 OR #27
#29	#10 AND #20 AND #28
Filters:	Study type: randomized controlled trial
	Publication type: article
	Publication date: to 2020.12.31
	Language: English

Search strategy of CINAHL

CINAHL	
S1	"cerebral vascular accident" (Find all my search terms)
S2	"cerebrovascular accident" (Find all my search terms)
S3	"cerebral vascular disease" (Find all my search terms)
S4	"cerebrovascular disease" (Find all my search terms)
S5	"cerebral vascular disorder" (Find all my search terms)
S6	"cerebrovascular disorder" (Find all my search terms)
S7	stroke (Find all my search terms)
S8	hemiplegia (Find all my search terms)
S9	"hemiplegic" (Find all my search terms)
S10	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9
S11	"home care service" (Find all my search terms)
S12	"home care" (Find all my search terms)
S13	"home based"
S14	home
S15	"residential care service" (Find all my search terms)
S16	"residential care" (Find all my search terms)
S17	"residence based" (Find all my search terms)
S18	residence
S19	resident
S20	S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19

S21	"activities of daily living" (Find all my search terms)
S22	"ADL" (Find all my search terms)
S23	"barthel index" (Find all my search terms)
S24	"BI" (Find all my search terms)
S25	"functional independence measure" (Find all my search terms)
S26	"FIM" (Find all my search terms)
S27	"daily life activity" (Find all my search terms)
S28	S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27
S29	S10 AND S20 AND S28
Filters:	Randomized controlled trial
	Full text
	Publication date: to 2020.12.31
	English language

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2-3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4-5
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	5
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	No review protocol
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	6
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5-6
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	5-6, Supplementary appendix 1
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	6
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	6-7
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	7
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	7
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	7-8
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	7-8

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	7
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	8
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	9
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	9-38
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	39-41
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	41-45
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	41-45
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	41-45
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	42, 45
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	44-46
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	46
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	46-47
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	47

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

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Effect of Home-based Interventions on Basic Activities of Daily Living for Patients with Stroke: A Systematic Review with Meta-analysis

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Effect of Home-based Interventions on Basic Activities of Daily Living for Patients with Stroke: A Systematic Review with Meta-analysis

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Keywords: Stroke, home-based rehabilitation, activities of daily living,

Word count: 4533

ABSTRACT

Objectives: To investigate the effectiveness of home-based interventions on improving the ability of basic activities of daily living in patients with stroke.

Methods: Randomised controlled trials were searched through MEDLINE, Embase and CINAHL from their inception to 31 December 2021. We included studies involving home-based intervention prescribed by professionals and implemented at patients' home. The characteristics of these studies were collected. Risk of bias of individual study was assessed by Physiotherapy Evidence Database scale. Meta-analyses were performed where studies reported comparable interventions and outcomes.

Results: In total, 49 studies were included in the systematic review and 16 studies had sufficient data for meta-analyses. The short-term effect of home-based intervention showed no significant difference when comparing with institution-based intervention (SMD=0.24, 95% CI -0.15 to 0.62, I^2=0%). No significant difference was found between home-based intervention and usual care for long-term effect (SMD=0.02; 95% CI -0.17 to 0.22; I^2=0%). Home-based rehabilitation combined with usual care showed a significant short-term effect on the ability of basic daily activities, comparing with usual care alone (SMD=0.55; 95% CI 0.22 to 0.87; p=0.001; I^2=3%).

Conclusion: Home-based rehabilitation with usual care which varied from no therapy to in- or out-patient therapy may have a short-term effect on the ability of basic activities of daily living for patients with stroke comparing with usual care alone. However, the evidence quality is low because of the limited number of studies and participants included into the meta-analysis and the possible publication bias. Future research is needed to investigate the effectiveness of

home-based rehabilitation on groups with stratification by stroke severity and time since stroke onset, with elaboration of details of the home-based and the control intervention. Moreover, more high-quality studies are required to prove the cost-effectiveness of newly developed strategies like caregiver-mediated rehabilitation and tele-rehabilitation.

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Keywords: Stroke, home-based rehabilitation, activities of daily living

Strengths and limitation of this study:

- Investigated the effectiveness of home-based rehabilitation on improving the ability of basic activities of daily living in patients with stroke, comparing with institution-based intervention, usual care, no intervention respectively.
- Updated some newly developed home-based treatment strategies such as tele-rehabilitation and caregiver-mediated intervention and investigated the effectiveness of them.
- The number of studies included into the individual meta-analysis was limited, because of the inadequate data in the individual studies.
- The clinical heterogeneity between studies in terms of severity of stroke, onset time of stroke, interventions and manners of delivery also compromised the evidence strength of our meta-analyses.

INTRODUCTION

Stroke is one of the major causes of death and is a leading cause of adult disability worldwide.[1] About half of patients with stroke are left with varying degrees of physical or cognitive impairments.[2] Previous studies have shown that 25-74% of patients with stroke need assistance from caregivers for the activities of daily living,[3] and the quality of life of both patients and caregivers is heavily impacted.[4] Although the need for rehabilitation services for the patients with stroke after discharge from acute hospitals is widely recognized, outpatient and inpatient rehabilitation are often compromised for reasons such as lack of accessibility, increased costs and poor compliance.[5, 6] On the other hand, the ability of performing activities of daily living in an institution-based environment may not be generalized to the home environment, which is the final discharge destination for most patients with stroke.[7] Moreover, the motor relearning of patients with stroke improves by context-specific training, and training in the patient's own environment is preferred.[8] Early supported discharge from hospital with subsequent rehabilitation services at home has shown to be more cost-effective than usual care, with a lower caregiver burden and shorter length of stay in hospital.[9, 10] Therefore, a home-based rehabilitation program could be a viable alternative to institution-based stroke rehabilitation.

A Cochrane review of home-based therapy programs for upper limb functional recovery following stroke found that there was insufficient good quality evidence to determine the relative effect of home-based upper limb programs on performance in basic activities of daily living (BADL), compared with placebo, no intervention or usual care.[11] The limited number of included studies and the heterogeneity in terms of the type of home-based therapy programs

limited the evidence strength. Apart from upper limb function, the ability to perform BADL in patients with stroke is influenced by much more factors such as mobility, cognition and communication,[12] environmental limitation,[13] and psychological adaptation[14]. Moreover, upper limb function is not linearly related to the actual performance of daily activities, and the improved upper limb motor capacity dose not translate into the increased upper limb performance in daily life.[15] Therefore, the effectiveness of home-based intervention including but not limited to upper extremity function training is needed to be investigated.

Another previous review found a significant short-term effect on functional independence in favour of home-based rehabilitation for community-dwelling people with stroke.[16] However, the evidence strength was weak because the control interventions mentioned in the previous review were mixed with usual care, center-based intervention and no intervention. Moreover, as the development of home-based treatment strategy and also for the purpose of reservation of medical services, novel home-based intervention strategies such as tele-rehabilitation and caregiver-mediated intervention have emerged nowadays. An updated review is needed to investigate the effectiveness of home-based interventions on improving the ability of performing self-care activities in patients with stroke.

The objective of this systematic review was to evaluate the effectiveness of home-based interventions on performance of BADL, when comparing with institution-based intervention, usual care and no intervention respectively in patients with stroke.

METHODS

The following items were reported according to the Preferred Reporting Items for Systematic

reviews and Meta-Analyses (PRISMA).[17]

Patient and Public Involvement

No patient involved.

Search strategy

The MEDLINE, Embase and CINAHL databases were searched through PubMed, EMBASE and EBSCOhost platforms respectively, from inception to 31 December 2021. The search strategy is presented in supplementary appendix 1.

Inclusion and exclusion criteria

We only included participants in home-based intervention groups who were living in their own home. Studies that included participants in home-based intervention groups who were living in care homes and other forms of supported or sheltered accommodation were excluded. We defined the home-based interventions as (1) prescribed by professionals; (2) implemented in patient's own home. Studies delivered solely environmental modifications, ergonomic intervention, psychosocial interventions or medication were excluded. The comparison interventions included institution-based intervention, usual care and no intervention. We included studies which measured the ability of BADL as one of the outcomes. Trials that studied solely instrumental activities of daily living were excluded. We only included peer reviewed studies in English language. Grey literature like unpublished studies or conference abstracts were excluded.

Selection of studies

Two reviewers independently extracted randomised controlled studies from the 3 databases. The duplicate articles were deleted, and the obviously irrelevant studies were eliminated by

screening the titles and abstracts. If any one of the reviewers considered one reference as eligible, the full text was assessed and two reviewers evaluated the study separately based on the inclusion and exclusion criteria. The two reviewers also searched for relevant reviews reported on the similar topic from the 3 databases. Reference lists of those reviews were examined, and citation searching and full text assessment were conducted to identify the additional eligible studies. Only the studies identified by both reviewers were included in the review. Any disagreements between the two reviewers were resolved through discussion with the third reviewer.

Data extraction and management

Data were extracted from the included studies and recorded on a data extraction form by one reviewer and checked by another reviewer. The extracted information included the following items: (1) the total number of participants of each group; (2) characteristics of participants such as age, gender, disability level, time elapsed since stroke onset; (3) characteristics of home-based interventions and interventions in control group, and details of home-based interventions; (4) outcome measures of performance of BADL and the timepoints of outcome measures; (5) results of effectiveness.

Assessment of methodological quality

Two reviewers independently assessed the methodological quality of the included studies using the Physiotherapy Evidence Database scale (PEDro scale).[18] The PEDro scale is an 11-item scale assessing the following items of individual study: (1) specified eligibility criteria and source of participants; (2) random allocation; (3) concealed allocation; (4) similarity at baseline; (5) blindness of participants; (6) blindness of therapists; (7) blindness of assessors; (8) less than

15% dropouts; (9) intention-to-treat analysis; (10) between-group statistical comparisons; (11) point and variability measures. Each satisfied item contributes one point to the total PEDro score, except for item 1 which pertains to external validity. Researchers have suggested that scores of < 4 are considered poor quality, 4 to 5 are considered fair quality, 6 to 8 are considered good quality and 9 to 10 are considered excellent quality.[19, 20] Any disagreements between the two reviewers were resolved through discussion with the third reviewer.

Data analysis

The Cochrane Collaboration's Review Manager software (RevMan 5.3) was used to carry out all statistical analyses. The overall estimate of the treatment effect was calculated using the means and standard deviations (SDs) of outcome scores with continuous data in the home-based intervention groups and control groups. Short-term effect and long-term effect were analyzed by comparing the statistical difference of outcome score between two groups at treatment endpoint and at the last follow up respectively. Those studies with no mean or SD of outcome measure reported were excluded from meta-analysis. For the studies that used the same measurement tool, we calculated a pooled estimate of the mean differences (MDs) with 95% confidence intervals. When different measurement tools were used, we used the standardized mean differences (Std. MDs) instead of MDs.

Statistical heterogeneity was measured using the I^2 statistic. $I^2 > 50\%$ was considered to indicate substantial heterogeneity, which would result in the use of a random-effect model for the meta-analysis. When I^2 was ≤50%, a fixed-effects model was used.[11] Inverse-variance method was used to estimate the treatment effect.

We planned to perform several meta-analyses to evaluate (1) the effectiveness of home-

based intervention comparing with institution-based intervention at treatment endpoint and the follow-up; (2) the effectiveness of home-based intervention comparing with usual care at treatment endpoint and the follow-up; (3) the effectiveness of home-based intervention combined with usual care comparing with usual care at treatment endpoint and the follow-up; and (4) the effectiveness of home-based intervention comparing with no intervention at treatment endpoint and the follow-up.

We planned to perform subgroup analyses to investigate the sources of heterogeneity, according to (1) the level of disability of the patients with stroke with stratification of mild, moderate and severe stroke; (2) the onset time of stroke; (3) type of home-based intervention; (4) self- and/or caregiver-mediated versus professional-mediated.

We also planned to perform a sensitivity analysis to diminish the influence of studies with poor methodological quality on the effect size estimate. The studies with poor PEDro score (≤3) were deleted from the meta-analysis. All of the statistical tests were two-tailed, and $P<0.05$ represented statistical significance.

We planned to test for funnel plot asymmetry to assess the publication bias if there were more than ten studies included in these meta-analysis.[21]

Assessment of certainty of the evidence

Two reviewers independently assessed the quality of the evidence using the GRADE approach.[22] Five factors result in rating down the quality of evidence including study limitations, inconsistency of results, indirectness of evidence, imprecision and publication bias. We rated the overall quality of evidence as high, moderate, low, or very low for each outcome. We justified all decisions to downgrade the quality of evidence.

RESULTS

Study identification

The search of the electronic bibliographic databases identified 460 articles (MEDLINE = 221, Embase = 231, CINAHL = 14). And 5 additional studies were identified through the references lists of relevant articles and reviews. In total, 49 studies met the eligibility criteria and were included into this systematic review (Figure 1).

Study characteristics

Twenty-one randomised controlled trials compared home-based rehabilitation with institution-based rehabilitation on an in- or out-patient basis.[23-43] Fifteen randomised controlled trials compared home-based rehabilitation with usual care which was provided according to routine practice without involvement of research team and might include no therapy, home care, instructions for home rehabilitation, in-patient therapy and out-patient therapy.[32, 38, 44-56] Five randomised controlled trials evaluated the effect of specific home-based interventions by comparing with blank control or sham control.[57-61] Ten randomised controlled trials compared home-based interventions combined with usual care with usual care alone.[62-71] The main characteristics of the included studies are shown (Supplementary table 1). Summary of details of the home-based intervention in each included study according to the Template for Intervention Description and Replication (TIDierR)[72] are shown in an additional supplementary table (Supplementary table 2).

There were various home-based interventions performed in the included studies. Twelve studies did not describe the details of treatment strategy.[28, 29, 32, 33, 37, 43, 48, 50, 52, 56, 68, 70] Among

37 studies which reported the details of treatment strategy, 19 studies provided physical exercise practice,[23, 26, 27, 31, 34-36, 45-47, 49, 53, 57-59, 61, 63, 64, 71] 20 studies provided training of daily activities,[23-27, 30, 36, 38, 45, 46, 53-55, 58-61, 65, 66, 71] 8 studies provided task-/ functional-specific training,[35, 39-42, 51, 61, 69] 2 studies provided constraint-induced movement treatment.[44, 62] Other treatments like speech and communication therapy,[42] psychosocial intervention,[67] emotion management,[71] electromyography-triggered neuromuscular stimulation,[26, 27] environmental modification,[47, 64] application of leisure activities,[66, 67, 71] providing adaptive aids and equipment,[59, 66] providing fall prevention strategies[63] and providing splint or orthoses[34] were also used as part of home-based intervention for patients with stroke.

The delivery strategy of home-based intervention has transformed in recent years. Before 2009, 24 out of 25 included studies provided home-based interventions by professionals during home visits. Among 24 studies published from 2009, 11 studies involved self-/caregiver-mediated intervention,[23, 26, 27, 31, 35, 36, 44, 51, 61, 62, 64] in which 4 studies provided tele-rehabilitation supervised by professionals.[26, 27, 35, 64]

Risk of bias in included studies

Methodological quality of the included studies is presented (Table 1). Thirty-three out of the included 49 studies were of good methodological quality (PEDro score = 6-8). Twelve studies were of fair quality (PEDro score = 4-5), and four were of poor quality (PEDro score = 1-3).

Table 1. Physiotherapy Evidence Database (PEDro) scores of included studies

Studies	Items											Score
	1	2	3	4	5	6	7	8	9	10	11	(0-10)
Asano, 2021	√	√					√		√	√	√	5
Baskett, 1999	√	√	√	√			√	√		√	√	7
Björkdahl, 2006	√	√	√	√			√	√	√		√	7

Chen, 2017	√	√	√	√			√	√	√	√	√	8
Chen, 2020	√	√	√	√			√	√	√	√	√	8
Gladman, 1994	√	√		√			√			√	√	5
Gladman, 1993	√	√	√				√	√		√	√	6
Han, 2020	√	√		√			√	√	√	√	√	7
Hesse, 2011	√	√		√			√	√	√	√	√	7
Hosfstad, 2014	√	√	√	√	√		√		√	√	√	8
Kalra, 2000	√	√	√	√			√	√	√	√	√	8
Özdemir, 2001	√	√		√				√	√		√	5
Pandian 2015	√	√					√					2
Redzuan, 2012	√	√								√	√	3
Roderick, 2001	√	√	√	√						√	√	5
Taule, 2015	√	√	√				√			√	√	5
Thorsén, 2005	√	√	√				√			√	√	5
von Koch, 2001	√	√	√				√	√		√	√	6
von Koch, 2000	√	√	√				√	√		√	√	6
Widén Holmqvist, 1998	√	√	√				√	√		√	√	6
Young, 1992	√	√		√			√	√		√	√	6
Barzel, 2015	√	√	√	√			√	√	√	√	√	8
Chaiyawat, 2012	√	√	√	√				√	√	√	√	7
Chaiyawat, 2009	√	√	√	√				√	√	√	√	7
Chen, 2021	√	√		√	√			√	√	√	√	7
Deng, 2020	√	√	√	√			√	√	√	√	√	8
Duncan, 1998	√	√	√	√				√	√	√		6
Lincoln, 2004	√	√					√			√	√	4
Lindley, 2017	√	√		√			√	√	√	√	√	7
Mayo, 2000	√	√	√	√				√		√	√	6
Rasmussen, 2016	√	√	√	√						√	√	5
Santana, 2017	√	√	√	√			√			√	√	6
Walker, 1999	√	√	√	√			√	√		√	√	7
Wolfe, 2000	√	√	√						√	√	√	5

Azab, 2009	√					√					1
Batchelor, 2012	√	√	√	√		√		√	√	√	7
Chumbler, 2012	√	√	√	√		√		√	√	√	7
Corr, 1995	√	√	√	√					√	√	5
Goldberg, 1997	√	√		√							2
Gilbertson, 2000	√	√	√			√	√	√	√	√	7
Mandigout, 2021	√	√		√		√		√	√	√	6
Ricauda, 2004	√	√		√		√		√	√	√	6
Rudd, 1997	√	√	√	√					√	√	5
Wong, 2015	√	√	√	√		√	√	√	√	√	8
Koç, 2015	√	√	√	√					√	√	5
Lin, 2004	√	√		√	√	√	√	√	√	√	8
Wade, 1992	√	√		√		√	√		√	√	6
Walker, 1996	√	√		√		√	√		√	√	6
Wang, 2015	√	√				√	√	√	√	√	6

Rating items:
1-eligibility criteria and source of participants; 2-random allocation; 3-concealed allocation; 4-baseline comparability; 5-blinded participants; 6-blinded therapists;7-blind assessors; 8-adequate follow-up; 9-intention-to-treat analysis; 10-between-group comparisons; 11-point estimates and variability.
Item 1 evaluates external validity, does not contribute to the total score.

Effectiveness of home-based intervention compared with institution-based intervention

Twenty-one studies investigated the effectiveness of home-based intervention comparing with institution-based intervention. Three study did not specify the between-group statistical comparison.[33, 35, 38] Fifteen studies found no significant difference between two groups in the ability of daily living no matter at treatment endpoints or at follow ups.[23-32, 37, 39-42] While one study[43] demonstrated the superiority of home-based intervention comparing with institution-based intervention, one study[34] showed an opposite result. Seven studies reported improvement in ability of daily living in both groups.[23, 26, 31, 32, 36, 37, 43]

Three studies with adequate data were included in the meta-analysis to evaluate the effect of home-based intervention comparing with institution-based intervention.[31, 36, 73] Two studies measured the performance of BADL at treatment endpoint,[26, 31] and one study[26] measured at the follow-up after intervention_ENREF_75. One study did the follow-up assessment during the treatment period.[36] For the endpoint analysis, a fix-effect analysis produced an insignificant result (SMD=0.24; 95%CI=-0.15 to 0.62; n=104; I^2=0%) (Figure 2).

At treatment endpoint, very low-quality evidence indicates the uncertainty of the effect of home-based intervention comparing with institution-based intervention. The evidence was downgraded one level for publication bias and two levels for imprecision as the sample size is small and the 95% CI estimated includes both null effect and appreciable benefit or harm.

Effectiveness of home-based intervention compared with usual care

Fifteen studies investigated the effectiveness of home-based intervention comparing with usual care. Ten studies found no significant difference between two groups in the ability of daily living no matter at treatment endpoints or at follow ups.[32, 38, 44, 49-54, 56] Five studies showed significantly better improvement in the home-based intervention than in the usual care group.[45-48, 55]

Six studies were pooled in the meta-analysis to evaluate the effect of home-based intervention comparing with usual care.[44, 47, 48, 51, 52, 54] Four studies measured the performance of BADL at treatment endpoint.[44, 47, 48, 52] For the endpoint analysis, a random-effects analysis produced an insignificant result with high heterogeneity between studies (SMD=0.62; 95%CI=-0.07 to 1.31; n=475; I^2=92%) (figure was eliminated). Three studies measured outcome at the follow-up after intervention.[44, 52, 54] For the follow-up analysis (after

intervention), a fix-effect analysis produced an insignificant result (SMD= 0.02.; 95% CI= -0.17 to 0.22; n=399; I^2=0%) (Figure 3). Three studies measured outcome during the period of treatment.[47, 48, 51] For the follow-up analysis (during the treatment period), a random-effects analysis produced an insignificant result with high heterogeneity between studies (SMD=1.03; 95%CI=-0.21 to 2.27; n=1264; I^2=98%) (figure was eliminated).

At treatment endpoint, very low-quality evidence indicates the uncertainty of the effect of home-based intervention comparing with usual care. The evidence was downgraded one level for publication bias, one level for inconsistency because of the heterogeneity between results, and one level for imprecision as the 95% CI estimated includes both null effect and appreciable benefit or harm.

At follow-up after intervention, very low-quality evidence indicates the uncertainty of the effect of home-based intervention comparing with usual care. The evidence was downgraded one level for publication bias and two levels for imprecision as the sample size is small and the 95% CI estimated includes both null effect and appreciable benefit or harm.

At follow-up during the intervention period, very low-quality evidence indicates the uncertainty of the effect of home-based intervention comparing with usual care. The evidence was downgraded one level for publication bias, one level for inconsistency because of the heterogeneity between results, and one level for imprecision as the 95% CI estimated includes both null effect and appreciable benefit or harm.

Effectiveness of home-based intervention compared with no intervention

Five studies investigated the effectiveness of home-based intervention comparing with no intervention. Four out of five included studies showed significantly greater improvements of

BADL in home-based intervention group than in the control group.[57, 58, 60, 61] Three studies demonstrated significant improvements on the BADL in home-based intervention but not in control group.[57, 60, 61]

Four studies were pooled in the meta-analysis to evaluate the effect of home-based intervention comparing with no intervention.[57-59, 61] All of them measured the performance of BADL at treatment endpoint, and a random-effects analysis produced an insignificant result with high heterogeneity between studies (SMD=0.84; 95% CI= -0.38 to 2.05; n=231; I^2=94%) (figure was eliminated).

At treatment endpoint, very low-quality evidence indicates the uncertainty of the effect of home-based intervention comparing with no intervention. The evidence was downgraded one level for publication bias, one level for inconsistency because of the heterogeneity between results, and two levels for imprecision as the sample size is small and the 95% CI estimated includes both null effect and appreciable benefit or harm.

Effectiveness of home-based intervention addition to usual care compared with usual care

Ten studies investigated the effectiveness of home-based intervention comparing with no intervention. One study did not specify the between-group statistical comparison.[67] Seven studies found no significant difference between two groups in the ability of daily living no matter at treatment endpoints or at follow ups.[63-66, 68-70] Two studies demonstrated significantly greater improvement in home-based intervention group than control group.[62, 71] Wong *et al*[71] and Ricauda *et al*[69] found significant improvement in both group while Batchelor *et al*[63] showed there was no significant improvement either in home-based intervention group or in the control group.

Four studies were pooled in the meta-analysis to evaluate the effect of home-based intervention addition to usual care comparing with usual care.[63, 64, 70, 71] Two studies[64, 71] measured the performance of BADL at treatment endpoint, and a fix-effect analysis produced a significant result (SMD=0.55; 95% CI=0.22 to 0.87; n=152; I^2=3%) (Figure 4). All of them measured at the follow-up and a random-effects analysis produced an insignificant result with high heterogeneity between studies (SMD=0.23; 95% CI= -0.16 to 0.62; n=545; I^2=77%) (figure was eliminated).

At treatment endpoint, low-quality evidence indicates the home-based intervention addition to usual care may have little or no effect on BADL comparing with usual care alone. The evidence was downgraded one level for publication bias, one level for imprecision as the sample size is small.

At follow-up after intervention, very low-quality evidence indicates the uncertainty of the effect of home-based intervention addition to usual care comparing with usual care alone. The evidence was downgraded one level for publication bias, one level for inconsistency because of the heterogeneity between results, and one level for imprecision as the 95% CI estimated includes both null effect and appreciable benefit or harm.

Subgroup analysis

We were unable to conduct subgroup analyses according to the level of disability of the patients with stroke, the onset time of stroke, type of intervention or manner of delivery of the treatment because of the clinical diversity between studies, the insufficient information in the individual study and the limited number of included studies.

Sensitivity analysis

We were unable to conduct sensitivity analyses because there was no low-quality study included in the meta-analyses.

Assessment of reporting bias

We were unable to conduct the funnel plot to assess the reporting biases because the limited number of included studies in each meta-analysis.

DISCUSSION

Our review found that home-based intervention combined with usual care may have short-term benefits for patients with stroke compared with usual care alone. However, the evidence strength was weak because of the limited number of studies and participants included into the meta-analysis and the possible publication bias. We speculated the intensive dosage of intervention attributes to the effect of home-based intervention combined with usual care. Most included studies conducted the professional-mediated home-based intervention to participants and the usual care was also provided, which ensured the high intensity of therapy to improve the recovery of stroke.

There was insufficient evidence to determine the short-term effect of home-based intervention comparing with the institution-based intervention, or to determine the long-term effect of home-based intervention comparing with the usual care, because of the limited number of studies and participants included into the meta-analyses. There was insufficient evidence to prove the short-term effect of home-based intervention on ability of activities of daily living in patients with stroke, when comparing with no intervention. There was insufficient evidence to suggest the short-term effect of home-based intervention comparing

with usual care, or to suggest the long-term effect of home-based intervention addition to usual care comparing with usual care. The heterogeneity between the studies limited the conclusions that could be drawn.

Many current rehabilitation interventions are developed in clinical setting, and some are translated to home. Home-based intervention strategies vary in type, duration, intensity, frequency and delivery way. This systematic review revealed that exercise physiology practice and training of activity of daily living were commonly performed as home-based interventions which are supported by current evidence. AHA/ASA Guideline suggested that lower extremity strengthening exercise and cardiovascular exercise are beneficial to improve gait capacity of patients with stroke and also can improve their ability to perform gait-related mobility tasks.[74] And training of activities of daily living is strongly recommended for community-dwelling patients with stroke.[75] Some newly developed home-based interventions like caregiver-mediated rehabilitation and tele-rehabilitation have emerged for the past two decades to replace the traditional home visits by professionals. A Cochrane systematic review found that the caregiver-mediated rehabilitation did not increase the caregiver burden but the effectiveness on the ability of performing BADL in patients with stroke was uncertain.[76] One large study found that the lower dose of caregiver-guided rehabilitation training and non-multidisciplinary coordination might decrease the efficacy of caregiver-mediated home-based interventions.[51] Tele-rehabilitation seemed to be a good alternative to traditional rehabilitation. Chen *et al* delivered the same treatment strategy to home-based telerehabilitation group and institution-based rehabilitation group.[73] At the end of intervention and at follow up, both groups showed significant improvement in ability of daily living, and there was no significant difference

between two groups throughout the time. Similarly, when comparing with the traditional face-to-face way of home-based intervention performed by professionals, home-based tele-rehabilitation showed equal positive effect on enhancing the ability of daily living of patients with stroke.[77] More high-quality studies and practice are required to prove the effectiveness of those new strategies.

Limitations

There is no sufficient study to determine the effectiveness of home-based intervention comparing with other approaches. Although 49 studies were included in the review, many of them did not report adequate data so that they were not included in the meta-analyses, therefore, only 2-4 studies were included into each meta-analysis. Moreover, among the 49 included studies, several studies of the original study and their follow-up study shared the same study population, including two studies conducted by Chaiyawat et al,[45, 46] four studies conducted by von Koch et al,[39-42] two studies conducted by Gladman et al[28, 29]. Therefore, only 44 trials were included. Nearly half of studies included into the meta-analyses had sample size smaller than 30. The clinical heterogeneity between studies in terms of severity of stroke, onset time of stroke, interventions and manner of delivery also compromised the evidence strength of our meta-analyses. Estimation of publication bias using funnel plots was failed because of the insufficient number of included studies in each meta-analysis. Publication bias was possibly increased as we have not searched for the grey literature.

CONCLUSION

Our finding reveals that the home-based intervention combined with usual care may be more effective than usual care alone for the short-term effect. However, the evidence strength is weak. Future research with larger sample size is needed to investigate the effectiveness of home-based rehabilitation, including (1) on groups with stratification of stroke severity defined by Brunnstrom stage; (2) on groups with stratification of acute, subacute and chronic stroke; (3) with elaboration of the details of the home-based interventions and the control interventions. Moreover, more high-quality studies are required to prove the cost-effectiveness of newly developed strategies like caregiver-mediated rehabilitation and tele-rehabilitation.

Contributors Wei xijun and Qin ping designed the review. Qin Ping and Chen xuan screened and selected the study. Qin Ping and Cai canxin rated the study quality and extracted the data. Qin ping analysed the data and wrote the paper. Wei xijun revised the paper.

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Competing interests None.

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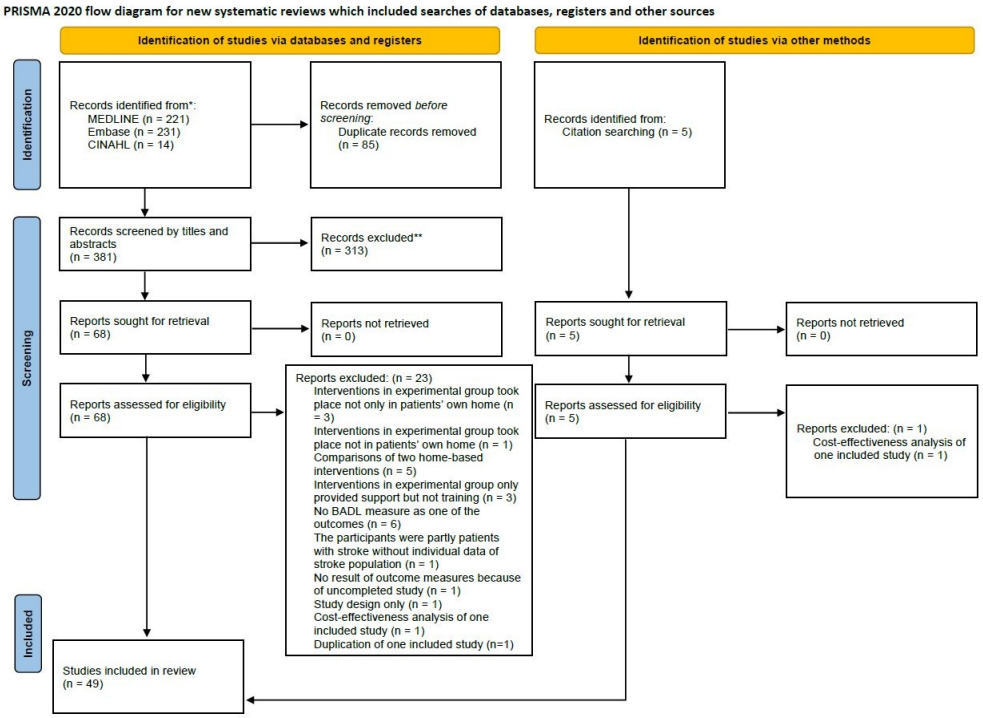

Figure 1

330x240mm (96 x 96 DPI)

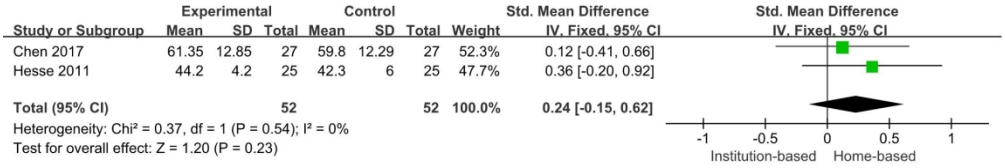

Figure 2

219x37mm (240 x 240 DPI)

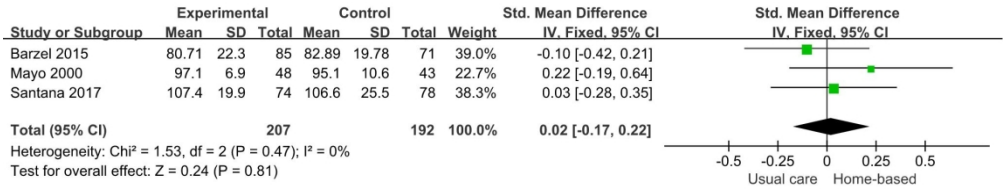

Figure 3

217x40mm (240 x 240 DPI)

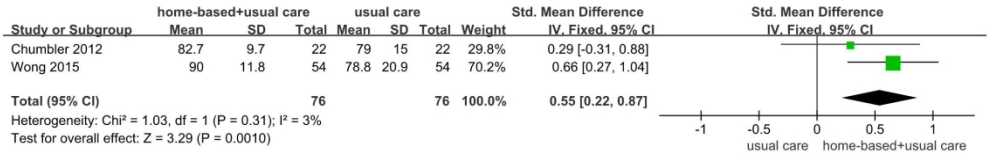

Figure 4

237x37mm (240 x 240 DPI)

Appendix 1.

Search strategy of MEDLINE through PubMed

MEDLINE	
#1	stroke [Mesh]
#2	hemiplegia [Mesh]
#3	"cerebrovascular disorders" [Mesh]
#4	"cerebral vascular accident"
#5	"cerebrovascular accident"
#6	"cerebral vascular disease"
#7	"cerebrovascular disease"
#8	"cerebral vascular disorder"
#9	"cerebrovascular disorder"
#10	"stroke"
#11	"hemiplegia"
#12	"hemiplegic"
#13	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12
#14	"home care services" [Mesh]
#15	"home care service"
#16	"home care"
#17	"home based"
#18	home

#19	"residential care service"
#20	"residential care"
#21	"residence based"
#22	"residence"
#23	"resident"
#24	#14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23
#25	activities of daily living [Mesh]
#26	"activities of daily living"
#27	"ADL"
#28	"barthel index"
#29	"BI"
#30	"FIM"
#31	"functional independence measure"
#32	"daily life activity"
#33	#25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32
#34	#13 AND #24 AND #33
Filters:	Article types: randomized controlled trial
	Text availability: full text
	Publication date: from 1000.1.1 to 2021.12.31
	Language: English

	Journal: MEDLINE

Search strategy of Embase through EMBASE.com

EMBASE	
#1	'cerebrovascular accident' / exp OR 'cerebrovascular accident'
#2	'cerebral vascular accident' / exp OR 'cerebral vascular accident'
#3	'cerebrovascular disease' / exp OR 'cerebrovascular disease'
#4	'cerebral vascular disease' / exp OR 'cerebral vascular disease'
#5	'cerebral vascular disorder' / exp OR 'cerebral vascular disorder'
#6	'cerebrovascular disorder' / exp OR 'cerebrovascular disorder'
#7	'stroke'/ exp OR 'stroke'
#8	'hemiplegia' / exp OR 'hemiplegia'
#9	'hemiplegic' / exp OR 'hemiplegic'
#10	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9
#11	'home care service' / exp OR 'home care service'
#12	'home care' / exp OR 'home care'
#13	'home based'
#14	'home' / exp OR 'home'
#15	'residential care service'
#16	'residential care' / exp OR 'residential care'
#17	'residence based'
#18	'residence' / exp OR 'residence'
#19	'resident' / exp OR 'resident'

#20	#11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19
#21	'activities of daily living' / exp OR 'activities of daily living'
#22	'daily life activity' / exp OR 'daily life activity'
#23	'adl'
#24	'barthel index' / exp OR 'barthel index'
#25	'bi'
#26	'functional independence measure' / exp OR 'Functional independence measure'
#27	'fim'
#28	#21 OR #22 OR #23 #24 OR #25 OR #26 OR #27
#29	#10 AND #20 AND #28
	Sources: Embase
Filters:	Study type: randomized controlled trial
	Publication type: article
	Publication year: <1966 to 2021
	Language: English

Search strategy of CINAHL through EBSCOhost

CINAHL	
S1	"cerebral vascular accident" (Find all my search terms)
S2	"cerebrovascular accident" (Find all my search terms)
S3	"cerebral vascular disease" (Find all my search terms)
S4	"cerebrovascular disease" (Find all my search terms)
S5	"cerebral vascular disorder" (Find all my search terms)
S6	"cerebrovascular disorder" (Find all my search terms)
S7	"stroke" (Find all my search terms)
S8	"hemiplegia" (Find all my search terms)
S9	"hemiplegic" (Find all my search terms)
S10	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9
S11	"home care service" (Find all my search terms)
S12	"home care" (Find all my search terms)
S13	"home based" (Find all my search terms)
S14	"home" (Find all my search terms)
S15	"residential care service" (Find all my search terms)
S16	"residential care" (Find all my search terms)
S17	"residence based" (Find all my search terms)
S18	"residence" (Find all my search terms)
S19	"resident" (Find all my search terms)
S20	S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19

S21	"activities of daily living" (Find all my search terms)
S22	"ADL" (Find all my search terms)
S23	"barthel index" (Find all my search terms)
S24	"BI" (Find all my search terms)
S25	"functional independence measure" (Find all my search terms)
S26	"FIM" (Find all my search terms)
S27	"daily life activity" (Find all my search terms)
S28	S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27
S29	S10 AND S20 AND S28
Filters:	Publication type: Randomized controlled trial
	Linked full text
	Publication date: to 2021.12.31
	Language: English

Supplementary table 1 Characteristics of included studies

Author Year	Grouping (Number of participants)	Characteristics of participants				Brief description of intervention (Treatment strategy, mode of delivery, treatment provider)	Outcome measurement of BADL		Results
		Age (year):	Gender: Male/Female	Time after stroke onset	Disability level of stroke		Measurement tools	Measurement timepoints	
Asano 2021	Home-based tele-rehabilitation (n=61)	mean (range): 63.8 (40.8-89.6)	32/29	Within 4 weeks	Not specified	Progressive rehabilitation exercises including exercise training and training of functional activities were prescribed by a tele-therapist and performed by patients themselves	Modified Barthel Index (MBI)	At 3 months after post rehabilitation (at treatment endpoints)	(1) Both the home-based intervention group and control group showed improvements in MBI score at treatment endpoint (2) There was no between-group difference at treatment endpoint
	Institution-based intervention (n=63)	mean (range): 64.4 (40.7-86.6)	33/30			Centre-based outpatient rehabilitation was provided approximately once or twice a week			
Baskett 1999	Home-based self-directed exercises (n=50)	mean (SD): 67.8 (11.6)	27/23	mean (SD): 38.6 (28.1) days staying in hospital	Not specified	Home-based self-directed exercises aiming at improve the	Modified Barthel Index (MBI)	(1) At 6 weeks after discharge from hospital (2) At 3 months after discharge from hospital (at	(1) There was no between-group difference either at 6 weeks after discharge

						ability of ADL were prescribed by professionals for patients and their caregivers		treatment endpoints)	or at treatment endpoint
	Institution-based intervention (n=50)	mean (SD): 71.7 (9.1)	30/20	mean (SD): 37.5 (36.4) days staying in hospital		Outpatient or day hospital therapy was provided			
Björkdahl 2006	Home-based intervention (n=30)	median (range): 52 (28-61)	22/8	mean (range): 27 (9-58) days staying in acute hospital; mean (range): 66 (24-155) days staying in rehabilitation unit	Not specified	Home-based intervention which was focus on activities in patients' natural context was provided by professionals during home visits	Functional Independence Measure (FIM)	(1) At 3 weeks after discharge (at treatment endpoint) (2) At 3 months (3) At 1 year follow-up	(1) The home-based intervention group showed no improvement in FIM motor sum score from discharge to the 1 year follow-up (2) The control group (day clinic group) showed improvements in FIM motor sum score from discharge to the 1 year follow-up and from 3 months follow-up to 1 year follow-up (3) There was no between-group difference either at treatment endpoint or at follow-up
	Institution-based intervention (n=29)	median (range): 55 (27-64)	22/7	mean (range): 30 (7-70) days staying in acute hospital; mean (range): 61 (20-134) days staying in rehabilitation unit		Outpatient therapy which was focus on the training of deficits or components of function was provided in a day clinic			
Chen 2017	Home-based telesupervising rehabilitation (n=27)	mean (SD): 66.52 (12.08)	18/9	14 to 90 days	National Institute of Health Stroke Scale (NIHSS) scores from 2 to 20 and modified Rankin Scale	Home-based intervention including physical exercises with ADL training and	Modified Barthel Index (MBI)	(1) At 12 weeks after randomisation (at treatment endpoint) (2) At 24 weeks after randomisation	(1) Both the home-based intervention group and control group showed improvements in MBI score at treatment endpoint

					(mRS) scores from 1 to 5	the ETNS therapy was performed by patients themselves with or without caregivers' help under the tele-supervision by professionals			(2) There was no between-group difference either at treatment endpoint or at follow-up
	Institution-based intervention (n=27)	mean (SD): 66.15 (12.33)	15/12			Outpatient rehabilitation with the same treatment strategy of home-based intervention was provided by professionals			
Chen 2020	Home-based motor training telerehabilitation (n=26)	mean (SD): 64.19 (9.42)	14/12	Within 1-3 weeks	National Institute of Health Stroke Scale (NIHSS) scores from 2 to 20	Home-based intervention including physical exercises with ADL training and the ETNS therapy was performed by patients themselves with or without caregivers' help under the tele-supervision by	Modified Barthel Index (MBI)	(1) At 12 weeks after randomisation (at treatment endpoint) (2) At 24 weeks after randomisation	There was no between-group difference in the mean change score of MBI either at treatment endpoint or at follow-up

						professionals			
	Institution-based intervention (n=26)	mean (SD): 59.42 (10.00)	12/14			Outpatient rehabilitation with the same treatment strategy of home-based intervention was provided by professionals			
Gladman 1993	Domiciliary-based rehabilitation (n=162)	mean: 70	85/77	Not specified but with description of acute stroke	Not specified	Home-based intervention was performed by professionals during home visits	Barthel Index (BI)	At 6 months after discharge (at treatment endpoint)	There was no between-group difference in the BI score at treatment endpoint
	Institution-based intervention (n=165)	mean: 70	88/77			Outpatient rehabilitation according to the usual practices in Nottingham, where there had hitherto been no domiciliary rehabilitation service was provided			
Gladman 1994	Domiciliary-based rehabilitation (n=162)	mean: 70	85/77	Not specified but with description of acute stroke	Not specified	Home-based intervention was performed by professionals during home visits	Barthel Index (BI)	At 12 months after discharge	There was no between-group difference in the BI score at 12 months follow up
	Institution-	mean:	88/77			Outpatient			

	based intervention (n=165)	70				rehabilitation according to the usual practices in Nottingham, where there had hitherto been no domiciliary rehabilitation service was provided			
Han 2020	Home-based reablement programme (n=12)	mean (SD): 70.8 (6.5)	8/4	mean (SD): 22.8 (17.7) months	modified Rankin Scale (mRS) scores from 2 to 4	Home-based intervention of ADL training was provided by professionals during home visits	Barthel Index (BI))	At 6 weeks (at treatment endpoint)	(1) There was no between-group difference in the change score of BI at treatment endpoint (2) There was no between-group difference in the BI score at treatment endpoint
	Institution-based intervention (n=14)	mean (SD): 65.4 (16.7)	9/5	mean (SD): 53.5 (43.7) months		Conventional rehabilitation including 30 minutes of occupational therapy and 30 minutes of physical therapy for training motor and cognitive functions was provided in the hospital for twice a week			
Hesse 2011	Intermittent high-intensity	mean (SD): 62.4 (11.3)	13/12	mean (SD): 12.9 (2.3) weeks	Patients could walk	(1) An intermittent	Rivermead Activities of Daily Living scales	(1) At every second month from the discharge from	(1) Both the home-based intervention group

	home-based physiotherapy programme (n=25)				independently within their home – technical aids were allowed – but they still needed help with personal hygiene, dressing, feeding and stair climbing, resulting in a Barthel Index (BI, 0–100) ranging from 55 to 80	high-intensity home-based physiotherapy programme was provided by professional during home visits (2) Self-therapy programme consisting of various stretching, strengthening and motor tasks was performed by patients and their caregivers		inpatient rehabilitation to home during the 12-months study period (at 2 months after discharge; at 4 months after discharge; at 6 months after discharge; at 8 months after discharge; at 10 months after discharge; at 12 months after discharge which was at treatment endpoint) (2) At 15 months after discharge (at 3 months after treatment)	and control group showed improvements in Rivermead Activities of Daily Living scales (self-care) score overt time (2) There were no between-group differences in Rivermead Activities of Daily Living scales (self-care) score at any time
	Institution-based intervention (n=25)	mean (SD): 61.9 (9.4)	14/11	mean (SD): 14.8 (3.9) weeks		Regular physiotherapy programme which treatment strategy was similar to the home-based intervention, consisting of two weekly 30 to 45 minutes physiotherapy			

						sessions was provided by a physiotherapist in the private unit			
Hofstad 2014	Early supported discharge to home with home-based intervention (n=104)	mean (range): 72.00 (27-92)	61/43	Within 7 days	NIHSS score of 2-26, and NIHSS <2 with modified Rankin Scale (mRS) score ≥2	Home-based intervention was provided by a multi-disciplinary community health team during home visits	Barthel Index (BI)	(1) At 3 months follow-up (2) At 6 months follow-up	(1) The home-based intervention group showed improvement in BI score at 3 months follow-up, and a trend for improvement at 6 months follow-up (2) The institution-based intervention group showed improvement in BI score at 3 months and 6 months follow-up (3) There was no between-group difference either at 3 months or 6 months follow-up
	Institution-based intervention (n=103)	mean (range): 70.61 (29-91)	56/47			Rehabilitation treatment was provided by professionals in a community day unit			
Kalra 2000	Domiciliary stroke care (n=149)	median (IQR): 77.7 (67-83)	81/68	Within 72 hours	Moderately severe stroke (patients with persistent neurological deficit affecting continence, mobility, and ability to look after themselves, requiring	Home-based intervention was provided by a specialist stroke team during home visits	Barthel Index (BI)	(1) At 3 months after stroke onset (2) At 12 months after stroke onset	(1) A favourable outcome of BI score 15–20 at 3 months was seen in 82% of patients in the stroke-unit group compared with 70% of patients in the stroke team and 74% of patients in the domiciliary-care group
	Institution-based intervention (in stroke unit) (n=148)	median (IQR): 75 (72-84)	79/69			Coordinated treatment was provided by a multidisciplinary team in the stroke			

					multidisciplinary treatment)	unit			(2) There was no significant change in BI score in any groups between 3 and 12 months follow ups
	Institution-based intervention (in general ward) (n=150)	median (IQR): 77.3 (71-83)	74/76			Day-to-day treatment was prescribed by a specialist team and was provided by staff in the general ward			
Özdemir 2001	Home-based rehabilitation (n=30)	48-80	19/11	mean (range): 36 (15-75) days	Not specified	Home-based interventions including exercises and provision of splints, orthoses and devices were prescribed by professionals and was performed by patients and family members	Functional Independence Measure (FIM)	At treatment endpoint	(1) The institution-based intervention group showed improvement in FIM score at treatment endpoint (2) The institution-based intervention group showed greater improvement in FIM score than the home-based intervention group at treatment endpoint
	Institution-based intervention (n=30)		21/9	mean (range): 41 (10-82) days		Intense multidisciplinary rehabilitation services including therapeutical and neuromuscular exercises with occupational therapy were provided in the rehabilitation clinic			
Pandian	Family-led,	mean (SD):	61/43	Within 1 month	Patients with	Home-based	modified Rankin Scale	(1) At 3 months follow up	(1) 26 (29%) patients had

2015	trained caregiver-delivered, home-based rehabilitation intervention (n=50)	60 (13)			residual disability (defined as requiring help from another person for everyday activities)	interventions including positioning, transfers, mobility, task-orientated training (particularly walking, upper-limb, and self-care tasks) prescribed by professionals were performed by patients' caregivers	(mRS)	(2) At 6 months follow up	a good outcome (mRS 0–2) and 64 (71%) a poor outcome (mRS 3–6) at 3 months follow up (2) 35 (39%) had a good outcome and 54 (61%) had a poor outcome at 6 months follow up
	Institution-based intervention (n=54)					Routine care was provided on an in- or out-patient basis			
Redzuan 2012	Video-based therapy programme at home (n=44)	mean (SD): 63.7 (12)	21/23	mean (SD): 12.9 (8) days staying in hospital	10 patients with mild stroke (NIHSS score < 6); 26 patients with moderate stroke (NIHSS score = 6-14); 8 patients with severe stroke (NIHSS score > 14)	Home-based interventions including exercises and training of activities of daily living were prescribed by professionals and were performed by patients and/or their caregivers	Modified Barthel Index (MBI)	At 3 months after discharge	(1) More patients in the home-based intervention group (60%) had improved MBI scores compared with patients in the control group (45.7%) (2) Both the home-based intervention group and control group showed improvements in MBI score at 3
	Institution-	mean (SD):	31/15	mean (SD):	17 patients with	Outpatient			

	based intervention (n=46)	59.4 (11)		10.9 (7) days staying in hospital	mild stroke (NIHSS score < 6); 24 patients with moderate stroke (NIHSS score = 6-14); 5 patients with severe stroke (NIHSS score > 14)	therapy for 1 hour each for physical and occupational therapy was provided weekly			months follow up
Roderick 2001	Domiciliary rehabilitation service (n=66)	mean (range): 78.3 (62-91)	33/33	median (IQR): 50 (36.8, 85.3) days staying in hospital	Not specified	Home-based intervention was provided by a physiotherapist and an occupational therapist	Barthel Index (BI)	At 6 months follow up	(1) Both the home-based intervention group and control group showed improvements in BI score at 6 months follow up (2) There was no between-group difference at 6 months follow up
	Institution-based intervention (n=74)	mean (range): 79.6 (60-95)	32/42	median (IQR): 48 (30, 80) days staying in hospital		Therapy was provided by multi-disciplinary teams in day hospitals			
Taule 2015	Early supported discharge at home (n=53)	median (range): 74 (42-92)	29/24	Within 1-7 days	2-26 in the NIHSS score	Home-based intervention was mainly directed towards ADLs, and function-specific treatment was also provided by a professional during home	(1) Assessment of Motor and Process Skills-motor scale (AMPS-motor scale) (2) modified Rankin Scale (mRS)	At 3 months follow-up	No within-group or between-group statistical analysis

						visits			
	Institution-based intervention (n=50)	mean (range): 72 (29-90)	29/21			Therapy which focused on specific functions and on specific instrumental ADL activities was provided by the municipal health-care team in a day unit			
Thorsén 2005	Early supported discharge (ESD) with continued rehabilitation at home (n=30)	mean: 71	15/15	5-7 days	Patients with mild to moderate impairments (independence in feeding and continence according to Katz index of ADL with impaired motor capacity according to the Lindmark scale)	The home-based intervention emphasizing a task- and context-oriented approach, which implies that the patient performs guided, supervised, or self-directed activities in a functional and familiar context, was provided by professionals during home visits	Barthel Index (BI)	At 5 years after stroke	There was no between-group difference at 5 years follow up
	Institution-based intervention (n=24)		14/10			Routine rehabilitation service was provided in the hospital, day			

						care, and/or outpatient care			
von Koch 2001	Early supported discharge (ESD) with continued rehabilitation at home (n=39)	Not specified	Not specified	5-7 days	Patients with moderate impairments (independence in feeding and continence according to Katz index of ADL with impaired motor capacity according to the Lindmark scale)	The home-based intervention emphasizing a task- and context-oriented approach, which implies that the patient performs guided, supervised, or self-directed activities in a functional and familiar context, was provided by professionals during home visits	Barthel Index (BI)	At 12 months after stroke	There was no between-group difference at 12 months follow up
	Institution-based intervention (n=38)					Routine rehabilitation service was provided in the hospital, day care, and/or outpatient care			
von Koch 2000	Early supported discharge (ESD) with continued rehabilitation at home	median (range): 72 (49-84)	22/18	5-7 days	Patients with moderate impairments (independence in feeding and continence according to Katz	The home-based intervention emphasizing a task- and context-oriented approach, which implies that the	Barthel Index (BI)	At 6 months after stroke	There was no between-group difference at 6 months follow up

	(n=40)				index of ADL with impaired motor capacity according to the Lindmark scale)	patient performs guided, supervised, or self-directed activities in a functional and familiar context, was provided by professionals during home visits			
	Institution-based intervention (n=38)	median (range): 73 (49-89)	21/17			Routine rehabilitation service was provided in the hospital, day care, and/or outpatient care			
Widén Holmqvist 1998	Early supported discharge (ESD) with continued rehabilitation at home (n=41)	mean (SD): 70.8 (7.6)	22/19	5-7 days	Patients with moderate impairments (independence in feeding and continence according to Katz index of ADL with impaired motor capacity according to the Lindmark scale)	The home-based intervention emphasizing a task- and context-oriented approach, which implies that the patient performs guided, supervised, or self-directed activities in a functional and familiar context, was provided by professionals	Barthel Index (BI)	At 3 months after stroke	There was no between-group difference at 3 months follow up

						during home visits			
	Institution-based intervention (n=40)	mean (SD): 72.6 (8.9)	22/18			Routine rehabilitation service was provided in the hospital, day care, and/or outpatient care			
Young 1992	Home physiotherapy (n=63)	median (range): 70 (60-89)	38/25	Not specified but with description of patients with a new stroke episode	Not specified	Home-based intervention was provided by one of five experienced community physiotherapists during home visits	Barthel Index (BI)	At 6 months after discharge	(1) Both the home-based intervention group and control group showed improvements in BI score at 6 months follow up (2) The home-based intervention showed greater improvement in BI score than the institution-based intervention group at 6 months follow up
	Institution-based intervention (n=61)	median (range): 72 (60-88)	31/30			Rehabilitation was provided in one of four geriatric day hospitals twice a week			
Barzel 2015	Home-based constraint-induced movement therapy (CIMT) (n=85)	mean (SD): 62.55 (13.73)	51/34	mean (SD): 56.57 (47.36) months	Minor: n=68 Moderate: n=16 Major: n=1	Home CIMT which was relevant to everyday life was performed with the coaching by non-professional (eg, family member)	Barthel Index (BI)	(1) At 4 weeks after intervention (at treatment endpoint) (2) At 6 months follow-up	(1) The home-based intervention group showed improvement in BI score at treatment endpoint relative to baseline, but showed no improvement at 6 months follow-up
	Usual care	mean (SD):	43/28	mean (SD):	Minor: n=54	Traditional			(2) The usual care group

	(n=71)	65.30 (12.63)		45.65 (57.69) months	Moderate: n=16 Major: n=1	physiotherapy and occupational therapy were performed by professionals either in a patient's home or in a therapeutic practice			showed no improvement in BI score either at treatment endpoint or at 6 months follow-up (3) There was no between-group difference at 6 months follow-up
Chaiyawat 2012	Home-based individual's exercise programme (n=30)	mean (SD): 67 (10)	14/16	Patients were screened for eligibility around 3 days after stroke onset	mean (SD): 16.4 (4.1) in the National Institute of Health Stroke Scale (NIHSS) score	Home-based individual's exercise programme included exercises and ADL practice was performed by a professional during home visits, with provision of standard materials on an audiovisual CD of rehabilitation procedures	Barthel Index (BI)	At 2 years after discharge from the hospital	(1) Both the home-based intervention group and the usual care group showed improvement in BI score at 2 years follow-up (2) The home-based intervention group showed significantly greater improvement than usual care group at 2 years follow-up
	Usual care (n=30)	mean (SD): 66 (11)	13/17		mean (SD): 17.8 (3.9) in the NIHSS score	Might include outpatient rehabilitation and instruction for home rehabilitation at the discretion of			

						their physicians			
Chaiyawat 2009	Home-based individual's exercise programme (n=30)	mean (SD): 67 (10)	14/16	Not specified	mean (SD): 16.4 (4.1) in the National Institute of Health Stroke Scale (NIHSS) score	Home-based individual's exercise programme included exercises and ADL practice was performed by a professional during home visits, with provision of standard materials on an audiovisual CD of rehabilitation procedures	Barthel Index (BI)	At 3 months after discharge from the hospital	(1) The home-based intervention group showed improvement in BI score at 3 months (2) The home-based intervention group showed significantly greater improvement than usual care group at 3 months
	Usual care (n=30)	mean (SD): 66 (11)	13/17		mean (SD): 17.8 (3.9) in the NIHSS score	Might include outpatient rehabilitation and instruction for home rehabilitation at the discretion of their physicians			
Chen 2021	Nurse-guided home-based rehabilitation exercise programme (n=59)	mean (SD): 55.41 (6.78)	41/18	mean (SD): 3.41 (0.79) months	Not specified	Environmental modification of home and exercise programme mainly including strengthening training of the	Barthel Index (BI)	(1) At 3 months after initiation of rehabilitation (2) At 6 months after initiation of rehabilitation (3) At 12 months after initiation of	(1) The home-based intervention group showed significantly higher BI score than usual care group at 3 months, 6 months and 12 months after initiation of

						lower muscle groups were provided by a nurse during home visits		rehabilitation (at treatment endpoint)	rehabilitation (2) The home-based intervention group showed significantly greater improvement than usual care group at 3 months, 6 months and 12 months after initiation of rehabilitation
	Usual care (n=62)	mean (SD): 56.41 (6.13)	44/18	mean (SD): 3.23 (0.82) months		Conventional rehabilitation included issuing a rehabilitation manual for stroke, performing telephonic follow-up and completing follow-up medical appointments for assessment of recovery at 3, 6 and 12 months			
Deng 2020	Integrated transitional care programme (n=49)	mean (SD): 60.7 (17.8)	32/17	mean (SD): 15 (6) days' stay in stroke unit	mean (SD): 8.9 (4.9) in the NIHSS score	Stroke rehabilitation was provided by a multidisciplinary poststroke consultation team during home visits	Modified Barthel Index (MBI)	(1) At 4 weeks after discharge from stroke unit (2) At 8 weeks after discharge from stroke unit (at treatment endpoint)	(1) The home-based intervention group showed significantly higher MBI score than usual care group at 4 weeks and 8 weeks after discharge from stroke unit (2) The home-based intervention group showed significantly greater improvement than usual care group
	Usual care (n=49)	mean (SD): 62.9 (20.5)	30/19	mean (SD): 17 (9) days' stay in stroke unit	mean (SD): 9.1 (4.5) in the NIHSS score	Usual post-discharge care consisted of detection and			

						control of potential risk factors and medication therapy based on secondary stroke prevention strategy			at 4 weeks and 8 weeks after discharge from stroke unit
Duncan 1998	Therapist-supervised home-based exercise programme (n=10)	mean (SD): 67.3 (9.6)	Not described	30 to 90 days	Minimal or moderately impaired sensorimotor function (Fugl-Meyer Motor Score 40 to 90	Home-based exercises were provided by a physical therapist during home visits	Barthel Index (BI)	At 12 weeks after the baseline assessment (at treatment endpoint)	There was no between-group difference at 12 weeks follow-up
	Usual care (n=10)	mean (SD): 67.8 (7.2)				Usual care included home health visits and outpatient therapy			
Hofstad 2014	Early supported discharge (ESD) to home with home-based intervention (n=104)	mean (range): 72.00 (27-92)	61/43	Within 7 days	NIHSS score of 2-26, and NIHSS <2 with modified Rankin Scale (mRS) score ≥2	Home-based intervention was provided by a multi-disciplinary community health team during home visits	Barthel Index (BI)	(1) At 3 months follow-up (2) At 6 months follow-up	(1) The home-based intervention group showed improvement in BI score at 3 months follow-up, and a trend for improvement at 6 months follow-up (2) The usual care group showed no improvement in BI score either at 3 months or 6 months follow-up (3) There was no
	Usual care (n=99)	mean (range): 74.19 (32-98)	52/47			Usual care without any intervention from the study			

									between-group difference either at 3 months or 6 months follow-up
Lincoln 2004	Home-based intervention (n=189)	mean (SD): 72.8 (11.4)	94/95	Within 2 years	Not described	Home-based intervention including physiotherapy, occupational therapy, speech and language therapy were provided by a multidisciplinary team during home visits	Barthel Index (BI)	At 6 months after randomization	There was no between-group difference in BI score at 6 months after randomization
	Usual care (n=232)	mean (SD): 71.2 (11.5)	128/104			Routine rehabilitation services included day hospitals, outpatients departments and social services occupational therapy			
Lindley 2017	Family-led home-based rehabilitation (n=623)	mean (SD): 57.5 (12.92)	421/202	Within 1 month	mean (SD): 10.1 (4.9) in the NIHSS score	(1) Family rehabilitation training including information provision, joint goal setting, carer training, and	Barthel Index (BI)	(1) At 3 months after randomization (2) At 6 months after randomization	There was no between-group difference in BI score either at 3 months or at 6 months follow-up

						task-specific training was performed by a professional during home visits (2) Home-based intervention for patients was mediated by caregivers			
	Usual care (n=627)	mean (SD): 58.0 (14.21)	416/211		mean (SD): 9.6 (4.8) in the NIHSS score	Usual care consisted of some therapy, in the form of assessment and treatment by a physiotherapist, during hospital stay, with post-discharge care varying from no therapy to some outpatient therapy sessions			
Mayo 2000	Tailor-made home programme with prompt discharge from hospital (n=58)	mean (SD): 70.3 (12.7)	37/21	28 days	mean (SD): 8.9 (2.2) in the Canadian Neurological Scale (CNS) score	Home-based intervention including physical therapy, occupational therapy, speech therapy, and	Barthel Index (BI)	(1) At 1 month (at treatment endpoint) (2) At 3 months follow-up	(1) The home-based intervention group showed improvement in BI score at 1 month and at 3 months follow-up (2) The usual care group

						dietary consultation was provided by a multidisciplinary team during home visits			showed improvement in BI score at 1 month and at 3 months follow-up (3) There was no between-group difference either at 1 month or at 3 months follow-up
	Usual care (n=56)	mean (SD): 69.6 (12.7)	40/16		mean (SD): 8.9 (2.1) in the Canadian Neurological Scale (CNS) score	Usual care comprised a range of services, including PT, OT and ST as requested by the patient's care provider and offered through extended acute-care hospital stay; inpatient or outpatient rehabilitation; or home care via local community health clinics.			
Rasmussen 2016	Early home-based rehabilitation (n=38)	median (IQR): 78 (72-84)	16/22	Not specified but with description of acute stroke	median (IQR): 44 (37-46) in the Scandinavian Stroke Scale Score	Home-based interventions including physical exercises and training of activities of daily living were provided by a multidisciplinary team during	Modified Barthel Index (MBI)	At 90 days follow-up	There was no between-group difference in MBI score at 90 days follow-up

						home visits			
	Usual care (n=33)	median (IQR): 79 (71-85)	14/19		median (IQR): 42 (31-46) in the Scandinavian Stroke Scale Score	Usual care was provided by professionals in the stroke unit and after hospital discharge			
Santana 2017	Early home-supported discharge (EHSD) service (n=95)	mean (range): 67.5 (40-84)	47/48	Not specified	Had some residual disability in the form of an initial Functional Independence Measure (FIM) of up to 100	Home-based interventions including physiotherapy, occupational therapy and psychology which was focused on training of daily activities were provided by professionals during home visits	Functional Independence Measure (FIM)	(1) At 2 months after randomisation (2) At 6 months after randomisation	There was no between-group difference in FIM score either at 2 months or at 6 months
	Usual care (n=95)	mean (range): 66.5 (35-84)	54/41			Usual care included standard care in the stroke unit and standard rehabilitation available in the region following discharge including no further rehabilitation, further			

						ambulatory rehabilitation, inpatient rehabilitation			
Taule 2015	Early supported discharge (ESD) at home (n=53)	median (range): 74 (42-92)	29/24	Within 1-7 days	2-26 in the NIHSS score	Home-based intervention was mainly directed towards ADLs, and function-specific treatment was also provided by a professional during home visits	(1) Assessment of Motor and Process Skills-motor scale (AMPS-motor scale) (2) modified Rankin Scale (mRS)	At 3 months follow-up	There were no between-group differences in the change of AMPS score and mRS score at 3 months from baseline
	Usual care (n=51)	median (range): 74 (32-98)	30/21			Usual care might involve no follow-up rehabilitation, treatment at home by a nurse, physical therapist, or occupational therapist from the home municipality and/or treatment by a private practising physiotherapist			
Walker 1999	Home-based occupational therapy	mean (SD): 73.6 (8.1)	52/42	Within 1 month	Not specified	Home-based occupational therapy was	Barthel Index (BI)	At 6 months after randomisation	There was significant between-group difference in BI score in favour of

	(n=94)					provided to improve the independence in personal and instrumental ADL by a professional during home visits			the home-based intervention group at 6 months follow-up
	Usual care (n=91)	mean (SD): 75.1 (8.6)	42/49			Usual care involved existing services of routine rehabilitation			
Wolfe 2000	Home-based rehabilitation (n=23)	mean (SD): 72 (12)	10/13	Not specified	Not specified	Home-based intervention was provided by professionals during home visits	Modified Barthel Index (MBI)	At 1 year after randomisation	There was no between-group difference in MBI score at 1 year follow up
	Usual care (n=20)	mean (SD): 76 (7.04)	8/12			Usual care was defined as all other services apart from therapy in home-based intervention group			
Azab 2009	Home-based constraint-induced movement therapy (CIMT)	Not specified	Not specified	Not specified	Patients with mild (Brunnstrom recovery scale score of 5 to 6, or BI score of 65 to	(1) Home-based CIMT was supervised and encouraged by a trained	Barthel Index (BI)	(1) At 4 weeks following CIMT (at treatment endpoints) (2) At 6 months follow up	(1) The home-based intervention group showed greater improvement in BI score than the control group at treatment

	combined with usual care (n=20) Usual care (n=17)				90) to moderate (Brunnstrom recovery scale score of 3 to 4, or BI score of 30 to 64) hemiparesis of the affected upper limb	family member (2) Usual care included physical and occupational therapy Usual care included physical and occupational therapy			endpoint (2) The home-based intervention group showed improvement in BI score at 6 months follow up
Batchelor 2012	Home-based multifactorial Falls prevention programme combined with usual care (n=71)	mean (SD): 70.8 (11.4)	45/26	mean (SD): 3.0 (1.6) months	Patients with high falls risk who either had fallen during hospital admission or had a Step Test worse leg score of less than 7, or a Berg Balance Scale score of less than 49	(1) Home-based exercise programme addressing balance and mobility problems and falls risk minimization strategies and injury risk minimization strategies were performed by a professional (2) Usual care including physical and occupational therapy was	Functional Independence Measure (FIM)	At 12 months after baseline assessment	(1) There was no within-group difference of FIM score either in the home-based intervention group or in the control group at 12 months follow up (2) There was no between-group difference in FIM score at 12 months follow up

						provided by professionals			
	Usual care (n=85)	mean (SD): 72.2 (9.9)	54/31	mean (SD): 3.1 (1.9) months		Usual care including physical and occupational therapy was provided by professionals			
Chumbler 2012	Multifaceted stroke telerehabilitation (STeleR) intervention combined with usual care (n=25)	mean (SD): 67.1 (9.5)	24/1	Within 24 months	mean (SD): 6.7 (1.3) of the Goldstein and Chilukuri algorithm of the Canadian Neurological Scale score	(1) The STeleR intervention included home televisits and telephone intervention calls performed by a teletherapist (2) Routine Veterans Affairs (VA) care was provided	The motor subscale of the Telephone Version of the Functional Independence Measure (FONEFIM)	(1) At 3 months (at treatment endpoint) (2) At 6 months follow up	There was no between-group difference in FONEFIM score either at treatment endpoint or at 6 months follow up
	Usual care (n=23)	mean (SD): 67.7 (10.0)	23/0		mean (SD): 6.8 (1.4) of the Goldstein and Chilukuri algorithm of the Canadian Neurological Scale score	Usual VA or non-VA care was provided			
Corr 1995	Home-based occupational therapy combined with usual care	mean (range): 75.1 (41-96)	15/40	median (range): 11 (2-88) days from stroke onset to stroke unit admission;	Not specified	(1) The home-based intervention including teaching new	Barthel Index (BI)	At 1 year after stroke	There was no between-group difference in BI score at 1 year follow up

	(n=55)			median (range): 50 (5-229) days staying in stroke unit		skills; facilitating more independence in activities of daily living; facilitating return of function; enabling patients to use equipment supplied by other agencies, was provided by an occupational therapist during home visits (2) Any other follow up services such as day-hospital attendance and community physiotherapy were provided			
	Usual care (n=55)	mean (range): 75.8 (54-94)	26/29	median (range): 10 (1-52) days from stroke onset to stroke unit admission; median (range): 50 (7-169) days staying in stroke unit		Any available services as required were provided			
Gilbertson 2000	Domiciliary occupational	median (IQR): 71 (28-89)	29/38	median (IQR): 31 (17-57) days	Not specified	(1) Home-based intervention	Barthel Index (BI)	(1) At 8 weeks (at treatment endpoint)	There was no between-group difference in BI

	therapy combined with usual care (n=67)					which was tailored to recovery ability of self-care or domestic or leisure activities was provided by an occupational therapist during home visits (2) Routine services included inpatient multidisciplinary rehabilitation, a predischarge home visit for selected patients, the provision of support services and equipment, regular multidisciplinary review at a stroke clinic, and selected patients referred to a medical day hospital		(2) At 6 months follow up	score either at treatment endpoint or at 6 months follow up
	Usual care (n=71)	median (IQR): 71 (31-89)	31/40	median (IQR): 23 (13-66) days		Routine services included inpatient multidisciplinary rehabilitation, a			

						predischarge home visit for selected patients, the provision of support services and equipment, regular multidisciplinary review at a stroke clinic, and selected patients referred to a medical day hospital			
Goldberg 1997	Home-based, case-managed care combined with usual care (n=21)	median (range): 72 (65-84)	10/11	Within 2-3 months	Patients without severe pre-morbid or comorbid conditions sufficient to impact significantly on their capacity to recover from the qualifying stroke	(1) Home-based intervention including therapeutic recreation, social work, and psychology consultation was provided by a treatment team during home visits (2) Standard outpatient follow-up services included routine medical follow-up visits and, when indicated,	Functional Independence Measure (FIM)	(1) At 6 months (2) At 1 year	No within-group or between-group statistical analysis

						outpatient rehabilitation service			
	Usual care (n=20)	median (range): 72 (65-81)	11/9			Standard outpatient follow-up services included routine medical follow-up visits and, when indicated, outpatient rehabilitation service			
Mandigout 2021	Individualized home-based coaching programme combine with usual care (n=41)	median (IQR): 63 (12)	30/11	Within 6 months	Not specified	(1) The treatment strategy of home-based intervention was not specified (2) Usual care which might include outpatient therapy, medical appointment	Barthel Index (BI)	(1) At 6 months (at treatment endpoint) (2) At 12 months follow up	There was no between-group difference in BI score either at treatment endpoint or at 12 months follow up
	Usual care (n=42)	median (IQR): 58 (24)	32/10			Usual care which might include outpatient therapy, medical appointments at 1, 6 and 12			

						months was provided for 12 months			
Ricauda 2004	Home hospitalization service combined with usual care (n=60)	median (IQR): 83 (78-89)	24/37	Within 24 hours	median (IQR): 24 (22-26.5) of NIHSS score	(1) The home-based intervention emphasizing a task- and context-oriented approach, which recommended that the patient perform guided, supervised, and self-directed activities in a functional and familiar context was provided by professionals during home visits (2) Routine hospital rehabilitation service was provided by physical	Functional Independence Measure (FIM)	At 6 months	(1) Both the home-based intervention group and the control group showed improvement in FIM score at 6 months follow up (2) There was no between-group difference in FIM score at 6 months follow up

						therapists			
	Usual care (n=60)	median (IQR): 80 (74-87)	30/29		median (IQR): 24 (22-26.5) of NIHSS score	Routine hospital rehabilitation service was provided by physical therapists			
Rudd 1997	Early discharge with home rehabilitation combined with usual care (n=167)	mean (SD): 70 (11)	92/75	mean (SD): 22 (25) days staying in hospital before randomisation	Not specified	(1) Home-based intervention including physiotherapy, occupational therapy and speech therapy was provided by professionals during home visits (2) Conventional care included in-patient treatment, discharge planning, and outpatient care	Modified Barthel Index (MBI)	At 12 months after stroke	There was no between-group difference in MBI score at 12 months follow up
	Usual care (n=164)	mean (SD): 72 (12)	93/71	mean (SD): 25 (30) days staying in hospital before		Conventional care included in-patient treatment, discharge			

				randomisation		planning, and outpatient care			
Wong 2015	4-week transitional care programme (TCP) with home-based intervention combined with usual care (n=54)	mean (SD): 67.5 (11.6)	20/34	Not specified	Patients with slight to moderate neurological deficits (NIHSS score ≥4 or < 16) and with slight to moderate level of disability (mRS score ≥2 to ≤4)	(1) TCP included home-based intervention consisting of management and prevention of stroke recurrence; symptoms assessment and management; enhancing physical function: self-care abilities and exercise; healthy behaviour: adherence to medication and diet; building resilience: connections with the self, family, social life and a Higher	Modified Barthel Index (MBI)	(1) At 4 weeks after discharge (at treatment endpoint) (2) At 8 weeks after discharge	(1) Both the home-based intervention group and the control group showed improvement in MBI score at treatment endpoint and at 8 weeks follow up (2) The home-based intervention group showed higher MBI scores than the control group at treatment endpoint and at 8 weeks follow up

						Being; and emotion management (2) Routine hospital-based physical training programme was provided within the first 3 weeks after hospital discharge			
	Usual care (n=54)	mean (SD): 71.5 (11.6)	20/34			Routine hospital-based physical training programme was provided within the first 3 weeks after hospital discharge			
Koç 2015	Home-based exercise (n=35)	Not specified	Not specified	30-90 days	Patients with baseline Barthel index (BI) scores of 60–80 who were ambulatory with supervision and/or an assistive device	Home-based intervention including stretching and flexibility exercises, assistive and resistive exercises, active-assisted range of motion exercises, and progressive	Barthel Index (BI)	(1) At 4 weeks (2) At 8 weeks (3) At 12 weeks (at treatment endpoint)	(1) The home-based intervention group showed improvement in BI score over time (2) The control group showed no improvement in BI score over time (3) The home-based intervention group showed higher BI score than the control

						walking programme and relaxation			group over time
	No intervention (n=37)					N/A			
Lin 2004	Home-based physical therapy programme (n=9)	mean (SD): 61.4 (11.2)	7/2	More than 1 year	Severe to moderate residual disability with BI score 5–14	Home-based intervention mainly consisted of motor facilitation, postural control training, functional ambulation training with gait correction, and ADL training	Barthel Index (BI)	At 11 weeks (at treatment endpoint)	The intervention group showed greater improvement in BI score than the control group
	No intervention (n=10)	mean (SD): 62.8 (9.4)	6/4			N/A			
Wade 1992	Home-based physiotherapy intervention (n=49)	mean (SD): 72.3 (9.7)	27/22	More than 1 year	Patients had mobility problems more than one year after stroke: they used a walking or mobility aid, other than just a stick; had had a fall in the previous three months; were unable to manage	The home-based intervention including exercises to improve the walking and balance and ADL practice was provided by a physiotherapist during home visits	Barthel Index (BI)	At 3 months (at treatment endpoint)	There was no between-group difference in BI score at treatment endpoint
	No	mean (SD):	20/25			N/A			

	intervention (n=45)	72.0 (10.6)			stairs, slopes, or uneven surfaces independently; or had a slow gait speed >10 s over 10m if under 60, > 12.5 s if 60-69, >16.5 s if over 70				
Walker 1996	Home-based dressing practice (n=15)	mean (SD): 65.9 (8.16)	9/6	6 months	Patients with dressing problems	Home-based intervention involving teaching patients and carers appropriate techniques such as dressing the affected limb first, energy conservation, the use of red thread to overcome perceptual difficulties and to mark alignment of buttons, and advice on choice of clothing, was provided by an occupational therapist during home visits	Rivermead Activities of Daily Living scales (self-care)	At 3 months (at treatment endpoint)	(1) The home-based intervention group showed improvement in Rivermead Activities of Daily Living scales (self-care) score at treatment endpoint (2) The control group showed no improvement in Rivermead Activities of Daily Living scales (self-care) score at treatment endpoint (3) The home-based intervention group showed greater improvement in Rivermead Activities of Daily Living scales (self-care) score than the control group at treatment
	No intervention	mean (SD): 70.2 (10.35)	7/8			N/A			

	(n=15)								endpoint
Wang 2015	Caregiver-mediated, home-based intervention (CHI) (n=25)	mean (SD): 62.0 (9.5)	13/12	More than 6 months	Patients with mild to moderate disability (Brunnstrom recovery stages III-V)	Home intervention was designed to improve patients' body functions and structural components; to improve patients' ability to undertake everyday activities within their living environments using task-specific restorative and compensatory training methods; and to help the patients reintegrate into the society by participating in restorative outdoor leisure activities	Barthel Index (BI)	At 12 weeks (at treatment endpoint)	(1) The home-based intervention group showed improvement in BI score at treatment endpoint (2) The control group showed no improvement in BI score at treatment endpoint (3) The home-based intervention group showed greater improvement in BI score than the control group at treatment endpoint
	No intervention (n=26)	mean (SD): 65.4 (10.6)	17/9			N/A			

N/A: Not applicable

Table 2 Summary of intervention details in individual studies

Author Year	Brief name	Why	What (materials)	What (procedures)	Who provided	How	Where	When and how much	Tailoring	Modifications of intervention throughout trial	Strategies to improve or maintain intervention fidelity	Extent of intervention on fidelity

Asano 2021	Progressive rehabilitation exercises through tele-rehabilitation	Tele-rehabilitation can enable therapists to work with and evaluate their patients remotely and the patients to perform rehabilitation in the comfort of their own home and at their own convenience	Not specified	(1) Participants and their caregivers were trained to use the hardware and software (2) Participants received progressive rehabilitation exercises including upper limb strengthening, lower limb strengthening, seated balance exercise, standing balance exercise and training of functional activities	(1) A research assistant trained the use of hardware and software: (2) A tele-therapist prescribed the progressive rehabilitation exercises and provided tele-consultations	Online exercises and video calls during a tele-consultation	(1) Training of the use of hardware and software: in acute hospital before discharge or in homes after discharge (2) The progressive rehabilitation exercises took place in participants' home	(1) Training of the use of hardware and software before discharge or after discharge from acute hospital: 1-3 sessions with each session being an hour long (2) The progressive rehabilitation exercises were provided in participants' home after discharge for three months, with tele-consultations once a week	The difficulty level and minimum range of motion desired for each exercise prescribed is determined by the tele-therapist who will assess and inform the patient of the change before increasing the difficulty level	Not described	Adherence of therapy was recorded by the subject in a diary to record the number of minutes subject spent each day. And the tele-therapist checked the entering data during tele-consultations	50/61 completed the 3-month assessment

Baskett 1999	Home-based self-directed exercises	Outpatient therapy might disempower the patient and caregiver from believing that they can be actively involved in their own rehabilitation programme. Furthermore, in the hospital setting, it is often difficult to plan ongoing therapy without a detailed understanding of and continuing supervision within the home environment. Therefore, this study investigated	Not specified	(1) Advice on the self-directed therapy programme (2) Self-directed exercises aiming at improve the ability of ADL were prescribed for patients and their caregivers	(1) A physiotherapist and an occupational therapist provided the advice (2) Home-based intervention for patients was mediated by themselves or caregivers	(1) Advice was provided during home visits (2) Home-based interventions for patients were provided by themselves with or without the help of caregivers at home	At patients' home	(1) Advice was provided by professionals once a week for as long as judged necessary, or for a maximum of 13 weeks (2) Patients was encouraged to attempt the prescribed home-based self-directed exercises programme several times a day	Not described	Not described	The subject or caregiver was asked to record the type and duration of activities they achieved each day	46/50 completed the 3-month assessment

		the feasibility of the home-based self-directed exercises programme										
Björkdahl 2006	Home-based intervention	Aiming to evaluate if three weeks of rehabilitation in the home setting of younger patients with stroke would improve activity to a larger extent than ordinary outpatient rehabilitation at the clinic and facilitate the rehabilitation process	Not specified	Home-based intervention which was focus on activities in patients' natural context, varing from personal care to shopping and leisure activities was provided	A physiotherapist and an occupational therapist provided the home-based intervention	Home-based interventions for patients were provided by professionals during home visits	At patients' home	9 hours of home-based training per week for three weeks was provided after discharge from the rehabilitation ward	Individually tailored training, based on the patient's needs and desires was provided	Not described	Not described	30/30 completed the 3-week assessment
Chen 2017	Home-based telesupervising rehabilitation	Aiming to evaluate the efficacy of a telerehabilitation system, which integrated	Not specified	(1) Home-based intervention including physical exercises with ADL	Therapists provided instructions and demonstrations of the home-based intervention and tele-supervision	(1) Instructions and demonstrations of the home-based intervention were provided	At patients' home	(1) Instructions and demonstrations of the home-based interventio	Individualized physical exercise plan was provided	Not described	The caregivers were asked to keep training logs in the record plate of the system	26/27 completed the 12-week assessment

		electromyography-triggered neuromuscular stimulation (ETNS) rehabilitation, detection of physiological parameters, medical history records, data storage, and high-quality video-audio system on physical function for stroke survivors		training and the ETNS therapy was prescribed and taught by professionals (2) The home-based intervention was performed by participants and the caregivers with the tele-supervision by professionals		by professionals face to face during home visits (2) Home-based interventions were performed by patients themselves with or without the help of caregivers at home		n were provided until the participants or the caregivers could manage it without the help of the therapists (2) The physical exercises with ADL training were conducted for 1 hour, twice in a working day for 12 weeks, a total of 60 sessions (3) The ETNS was conducted for 20 minutes, twice in a working day for 12 weeks, a			that faithfully recorded the survivors' daily training	

								total of 60 sessions				
Chen 2020	Home-based motor training telerehabilitation	Home-based telerehabilitation (TR) has been indicated that TR approaches can be as efficacious as conventional rehabilitation (CR) in improving activities of daily living (ADL), and enhanced the compliance of rehabilitation training. The study aimed to determine the effects of a 12-week home-based motor training TR procedure in subcortical stroke patients with	Not specified	(1) Home-based intervention including physical exercises with ADL training and the ETNS therapy was prescribed and taught by professionals (2) The home-based intervention was performed by participants and the caregivers with the tele-supervision by professionals	Therapists provided instructions and demonstrations of the home-based intervention and tele-supervision	(1) Instructions and demonstrations of the home-based intervention were provided by professionals face to face during home visits (2) Home-based interventions were performed by patients themselves with or without the help of caregivers at home	At patients' home	(1) Instructions and demonstrations of the home-based intervention were provided until the participants or the caregivers could manage it without the help of the therapists (2) The physical exercises with ADL training were conducted for 1 hour, twice in a working day for 12 weeks, a total of 60 sessions	Individualized physical exercise plan was provided	Not described	The caregivers were asked to keep training logs in the record plate of the system that faithfully recorded the survivors' daily training	26/26 completed the 12-week assessment

		motor dysfunction						(3) The ETNS was conducted for 20 minutes, twice in a working day for 12 weeks, a total of 60 sessions				
Gladman 1993; Gladman 1994	Domiciliary-based rehabilitation	Aiming to determine whether stroke patients would make greater improvements in ADL after discharge from hospital	Not specified	Home-based intervention including physiotherapy and occupational therapy	Two physiotherapists and one occupational therapist provided the domiciliary service	Home-based intervention was performed professionals during home visits	At patients' home	The domiciliary rehabilitation service was provided for up to six months	Not described	Not described	Not described	157/165 completed the domiciliary rehabilitation
Han 2020	Home-based reablement programme	There is evidence supporting that the reablement intervention leads to significant improvements in ADL for older adults.	Not specified	Home-based intervention of ADL training	One occupational therapist provided the home-based intervention	Home-based intervention was performed professionals during home visits	At patients' home	The home-based intervention was provided 50 minutes each time, once a week for 6 weeks	Not described	Not described	Not described	12/12 completed the 6-weeks assessment

		However, evidence on the effectiveness of reablement for patients with stroke is limited. The study aimed to investigate the effects of reablement in patients with stroke from the 3 concepts of ADL										
Hesse 2011	Intermittent high-intensity home-based physiotherapy programme	Aiming to evaluate whether patients undergoing the pulsed high-intensity treatment design would have better motor functions in one year compared to those	Not specified	(1) Intermittent high-intensity home-based intervention of physiotherapy based on the Bobath approach and the motor relearning programme was provided to	(1) Two physiotherapists provided the home-based intervention (2) Self-therapy was performed by patients themselves and their caregivers	(1) Home-based intervention was performed professionals during home visits (2) Self-therapy programme was performed by patients themselves and their caregivers at home	At patients' home	(1) The home-based intervention was provided in three two-month blocks (months 1 + 2, months 5 + 6, months 9 + 10), consisting of four therapy	Individualized self-therapy programme was prescribed	Not described	The patients and their caregivers kept a diary, in addition the therapists phoned the patients every 14 days during self-therapy period	25/25 completed the 12-months home-based intervention

		receiving continuous low-intensity training		improve motor function relevant for patients' everyday life (2) Self-therapy programme consisting of various stretching, strengthening and motor tasks was prescribed				sessions every week, one session lasted 30 to 45 minutes net. The three two-month blocks totalled 96 30 to 45 minute sessions (2) Self-therapy programme was performed between the treatment blocks (months 3 + 4, months 7 + 8, months 11 + 12) for at least 30 minutes in every workday				
Hofstad 2014	Early supported	Aimed to compare the	Not specified	Not specified	A multi-disciplinary	(3) Home-based interventions	At patients' home	(1) The scheduled	Not described	Not described	Not described	(1) Many patients

	discharge (ESD) to home with home-based intervention	rehabilitation results after ESD to rehabilitation as usual, and to investigate the effect of community treatment given in two different settings; either in a day unit or in the patients' homes			community health team, consisting of a nurse, a physiotherapist and an occupational therapist provided the home-based intervention	were provided during home visits		treatment period was five weeks and maximally four hours per day, five days a week (2) During the treatment period, team members were present three days a week, and the last two the days of the week the patients trained by themselves after instructions from the team				did not comply with the scheduled treatment (2) 85/104 completed the home-based intervention
Kalra 2000	Domiciliary stroke care	Aimed to compare the efficacy of stroke unit, stroke team,	Not specified	Not specified	A specialist stroke team provided the home-based intervention	Home-based interventions were provided during home visits	At patients' home	The home-based intervention was provided for a maximum	Individualised care plan outlining activities	Not described	Not described	144/153 (including 149 confirmed stroke and 10

		and domiciliary stroke care in reducing mortality, dependence, and institutionalisation in patients with moderately severe strokes						of 3 months	and the objectives of treatment were provided			confirmed no-stroke) completed the 12-months assessment
Özdemir 2001	Home-based rehabilitation	Aimed to test the hypothesis that medical rehabilitation gains can be obtained through home-based rehabilitation services with professional staff supervision of family members	Not specified	(1) Instructions from professional were provided (2) Home-based intervention including conventional exercises and provision of splints, orthoses and devices were provided	(1) A rehabilitation physician and a physiotherapist provided the instructions for family caregivers (2) Family caregivers performed the home-based intervention to patients	(1) Instructions were provided during home visits (2) Home-based interventions were provided by patients and their family caregivers at home	At patients' home	(1) The home-based intervention was provided for at least 2 hours a day, 7 days a week (2) The mean rehabilitation period at home was 64 days (range, 29–150 days)	Not described	Not described	Not described	Not specified
Pandian 2015	Family-led, trained caregiver-	The aim of this pilot study was to	A culturally appropriate, simple,	Home-based intervention including	(1) A physiotherapist prescribed	Home-based interventions were provided by	At patients' home	Caregivers performed the home-based	Not described	Not described	Not described	44/50 completed the 6-months

	delivered, home-based rehabilitation intervention	determine the feasibility of a multicenter, randomized, controlled trial in India of a family-led, trained caregiver-delivered, home-based rehabilitation intervention vs. routine care	pictorial 'manual' covering key exercises relevant to activities of daily living was provided for patients' caregivers	positioning, transfers, mobility, task-orientated training (particularly walking, upper-limb, and self-care tasks) was provided	the home-based intervention (2) Patients' caregivers delivered the home-based intervention to patients	patients' caregivers at home		intervention when the patients were discharged home				assessment
Redzuan 2012	Video-based therapy programme at home	Aiming to evaluate the effectiveness of an intervention using video to deliver therapy at home for patients with stroke	A self-instructional audiovisual DVD of standardized rehabilitation procedures and patient handling techniques was provided	Home-based self-instructional intervention including patient positioning and handling; bed mobility; passive range of motion exercises, stretching, and strengthening of the upper limbs and the lower limbs; transfer techniques from bed to	(1) Home-based self-instructional intervention was prescribed and taught to patients and/or their caregivers by therapists (2) Home-based self-instructional intervention was performed by patients and/or their	(1) Home-based self-instructional intervention was prescribed and taught to patients and/or their caregivers by therapists face to face (2) Home-based self-instructional intervention was performed by patients and/or their caregivers with the guidance of	At patients' home	Upon discharge, caregivers and/or patients were encouraged to do the exercises along with the video as often as possible	An investigator and the therapist would go through the video content with each patient and determine the appropriate sections and/or exercises and	Not described	Caregivers and/or patients were encouraged to do the exercises along with the video as often as possible and were asked to record their exercises in a diary	44/53 completed the 3-months assessment

				wheelchair and vice versa, and wheelchair into the car and vice versa; and activities of daily living	caregivers	a video at home			emphasize the important parts of the video according to the patient's stroke severity and resulting impairment			
Roderick 2001	Domiciliary rehabilitation service	Aiming to compare the effectiveness and costs of a new domiciliary rehabilitation service for elderly stroke patients with geriatric day-hospital care	Not specified	Not specified	Home-based intervention was provided by a physiotherapist and an occupational herapists	Home-based intervention was performed by professionals during home visits	At patients' home	The home-based intervention was provided until maximum potential for recovery was reached	Not described	Not described	Not described	54/66 completed the 6-months assessment
Taule 2015	Early supported discharge (ESD) at home	Current evidence supports ESD from hospital to home after acute hospital	Not specified	Home-based intervention was mainly directed towards ADLs, and function-specific treatment was also offered	An occupational therapist and/or a physiotherapist provided the home-based intervention	Home-based intervention was provided during home visits	At patients' home	(1) ESD intervention was provided during hospitalization and at home	Not described	Not described	Not described	39/53 completed the 3 months assessment

		treatment as patients have demonstrated benefits in independence. However, the influence of different rehabilitation models on the patients' ADL ability is still scarcely explored. This study aimed to compare three models of rehabilitation: ESD in a day unit, ESD at home and traditional treatment in the municipality						(2) A home visit was provided after discharge within three days, and lasted for a maximum of five weeks after the home visit				
Thorsén 2005; von Koch 2001;	Early supported discharge (ESD) and continued	Aiming to determine whether the home rehabilitation	Not specified	Home-based intervention emphasizing a task- and context-oriented	Two physical therapists, two occupational therapists, and one speech therapist	Home-based intervention was provided during home visits	At patients' home	The home-based intervention programme approximately	The home-based interventi on was	Not described	The duration and type of therapy were recorded in a protocol by	(1) 41/41 complete d the 3 months assessme

von Koch 2000; Widén Holmqvist 1998	rehabilitation at home	model as developed at the Department of Neurology was more effective and/or resource efficient than current, organizationally diverse rehabilitation in a hospital or day care or through outpatient care		approach, which implies that the patient performs guided, supervised, or self-directed activities in a functional and familiar context, was provided	provided the home-based intervention			3 to 4 months in duration. The frequency of therapy contacts for the patients receiving rehabilitation at home was decided by the providing therapist in consultation with the patient and his or her family. The frequency of home visits was gradually reduced until the therapist discharged the patient	tailored for each patient		the therapists. Patients were asked to keep diaries between therapy sessions on time and type of training	nt (2) 40/41 completed the 6 months assessment (3) 39/41 completed the 12 months assessment (4) 30/41 completed the 5 years assessment
Young 1992	Home physiotherapy	Aiming to compare the effectiveness of day hospital attendance with home physiotherapy for stroke patients to determine	Not specified	Not specified	One of five experienced community physiotherapists provided the home-based intervention	Home-based intervention was provided during home visits	At patients' home	Not specified	Not described	Not described	Not described	56/63 completed the 6 months assessment

		which service produces greater functional and social improvement for the patient, reduces emotional stress for the caregiver, and lessens the need for community support										
Barzel 2015	Home-based constraint-induced movement therapy (CIMT)	Home CIMT is a modified form of CIMT that reduces the need for professional assistance in ambulatory care, training the increased use of the stroke-affected arm in daily life within the patient's	Not specified	(1) Patients received information and instruction of home CIMT (2) Patients were supervised by a professional who solved problems and adjusted	(1) A physical or occupational therapist provided information and instruction of home CIMT and provided supervision and adjustment through problem solving (2) Home CIMT was coached	(1) 2 home visits to provide information and instruction (2) 3 home visits to supervise and adjust exercises and practice (3) Face-to-face coaching of home CIMT by non-professional	At patients' home	(1) 2 home visits of 50-60 min in the first week (2) 3 home visits of 50-60 min in the next 3 weeks (3) Home CIMT was recommended for 2 h each weekday, giving 40 h	Exercises were adapted to the patient's abilities	Not described	The non-professional coach| maintained a training diary to document the time per exercise (using a stopwatch), the number of repetitions, and the time of practising	82/85 completed the home CIMT

		home environment		exercises and practice which were relevant to everyday life with special focus on activities of daily living (ADL) (3) Patients were instructed to do home CIMT	by a non-professional (eg, family member)			of practice in 20 days				
Chaiyawat 2012	Home-based individual's exercise programme	The programme would be able to improve the ADL and function, decrease disability and increase quality of life	Standard materials on an audiovisual CD of rehabilitation procedures: passive exercise, active exercise, resistance exercise, and ADL	(1) Individual counseling, which focused on education, applying information learned in practical situations, and solving problems was offered to the caregiver if needed (2) The intervention	A physical therapist provided the individual counseling and home-based rehabilitation	Intervention was provided during home visits	At patients' home	(1) Individual counseling was provided before home-based rehabilitation (2) Home-based rehabilitation was provided once a month for 6 months; Each	Individual counseling, which focused on education, applying information learned in practical situations, and solving problems occurring at home	Not described	(1) The duration and type of therapy were recorded on a case report form by the therapist (2) Patients or caregivers were asked to keep	(1) 30/30 completed the home-based rehabilitation programme (2) Compliance with the intervention, as indicated by daily records was high

				strategy included exercises and ADL practice				home-based rehabilitation lasted approximately 1 h			diaries between therapy sessions on the time and type of training	
Chaiyawat 2009	Individual's home-based exercise programme	Because inpatient rehabilitation programmes in Thailand are not widely available, the demand for home rehabilitation is increasing. Therefore, a model for effective home rehabilitation for stroke patients will help improve stroke care	Standard materials on an audiovisual CD of rehabilitation procedures: passive exercise, active exercise, resistance exercise, and ADL	(1) Individual counseling, which focused on education, applying information learned in practical situations, and solving problems was offered to the caregiver if needed (2) The intervention strategy included exercises and ADL practice	A physical therapist provided the individual counseling and home-based rehabilitation	Intervention was provided during home visits	At patients' home	(1) Individual counseling was provided before home-based rehabilitation (2) Home-based rehabilitation was provided once a month for 3 months; Each home-based rehabilitation lasted approximately 1 h	Individual counseling, which focused on education, applying information learned in practical situations, and solving problems occurring at home	Not described	(1) The duration and type of therapy were recorded on a case report form by the therapist (2) Patients or caregivers were asked to keep diaries between therapy sessions on the time and type of training	(1) 30/30 completed the home-based rehabilitation programme (2) Compliance with the intervention (as indicated by daily records) at one, two, and three months was 94%, 95%, and 95%

Chen 2021	Nurse-guided home-based rehabilitation exercise programme	Exercise training is strongly recommended for patients post-stroke, and the time spent in hospital may not be sufficient to prepare patients for further rehabilitation. Also, home-based rehabilitation was proved to decrease the level of disability and correspondingly improve functional recovery among patients with motor impairments	Not specified	(1) Environmental modification was provided to diminish any environmental hazards (2) Exercise programme was provided which mainly included strengthening the lower limb muscle groups with exercises, such as joint training, sit-ups, balance training while standing, standing, bending to pick things up, straight leg-lifting, and	An advanced practice registered nurse (APRN) who had received professional physiotherapy training provided environmental modification and guidance of patients during the exercise programme	Environmental modification and exercise programme were provided during home visits	At participants' home	(1) During the first home visit, the nurse modified the environmental hazards (2) During the first 3 months, patients underwent three exercise sessions per week, with each session lasting 30 min (3) During the next 3 months, patients underwent one session per week (4) Thereafter, the frequency of the supervised	The home-based rehabilitation exercise programme was an individually tailored rehabilitation intervention programme	Not described	Not described	59/70 completed the home-based rehabilitation exercise programme

				climbing stairs				exercise dropped to once a month, and once every other month, up to 12 months				
Deng 2020	Integrated transitional care programme	Transitional care (TC) interventions have emerged as a potential solution to ensure the continuity and coordination of healthcare when patients transfer across care settings and between providers	Not specified	As soon as the patient was discharged to home, the home-based intervention was performed, including (1) ongoing stroke rehabilitation, (2) medication reconciliation and (3) self-management education regarding risk factors control and stroke warning signs	A multidisciplinary poststroke consultation team consisting of a community-based general practitioner, a nurse and a rehabilitation therapist. The extended team members included a neurologist, a rehabilitation specialist and social workers. To ensure the continuity of care delivery, a nurse in the community setting was designated as a coordinator	Home-based interventions were provided during home visits	At patients' home	(1) The scheduled treatment was 8 weeks and maximally 2 hours per day (2) During the first 4 weeks, team members were present three days a week (3) Periodic phone calls were used to understand patient changes. At a	Not described	Not described	Not described	49/49 completed the Integrated transitional care programme

								minimum, patients were contacted twice a week for the first four weeks postdischarge (4) During the next 4 weeks, team members were present once a week				
Duncan 1998	Therapist-supervised home-based exercise programme	Emerging evidence suggested that intensive remedial therapy like aerobic training may be beneficial for stroke survivors, as a result, researchers combined all 3	Not specified	(1) 10-minute warm-up session of stretching and flexibility exercise (2) The first block included assistive and resistive exercises using	A physical therapist provided the home-based exercise programme	Home-based interventions were provided during home visits	At patients' home	(1) The experimental exercise intervention was initiated within 5 days of baseline testing (2) The programme included 3 visits a week for 8	(1) Resistance progression was based on a protocol in which when subjects could	Not described	Not described	10/10 completed the home-based exercise programme

		components (strength, balance, and endurance) into 1 intervention		Proprioceptive Neuromuscular Facilitation Patterns (PNF) or Theraband exercise to the major muscle groups of the upper and lower extremities (3) The second block included 15 minutes of balance exercises, (4) In the third block, participants were encouraged to use the affected upper extremity in functional activities (5) The final block				weeks, and the patients were instructed to continue the exercise programme on their own for 4 additional weeks (3) Each exercise session lasted approximately 1.5 h	complete 2 sets of 10 repetitions through the available range of motion, resistance was increased by progression of Theraband elasticity (levels of resistance) or by incre			

				included a progressive walking programme or progressive exercise on a bicycle ergometer					ased manual resistance in PNF exercises (2) Individuals were instructed to walk at their usual pace or bicycle at low revolutions per minute			
Hofstad 2014	Early supported discharge (ESD) to	Aimed to compare the rehabilitation results after	Not specified	Not specified	A multi-disciplinary community health team, consisting of	Home-based interventions were provided during home visits	At patients' home	(1) The scheduled treatment period was	Not described	Not described	Not described	(3) Many patients did not comply

	home with home-based intervention	ESD to rehabilitation as usual, and to investigate the effect of community treatment given in two different settings; either in a day unit or in the patients' homes			a nurse, a physiotherapist and an occupational therapist provided the home-based intervention			five weeks and maximally four hours per day, five days a week (2) During the treatment period, team members were present three days a week, and the last two the days of the week the patients trained by themselves after instructions from the team				with the scheduled treatment (4) 85/104 completed the home-based intervention
Lincoln 2004	Home-based intervention performed by a community stroke team	Aimed to assess whether rehabilitation by a specialist multiprofessi	Not specified	Rehabilitation service including physiotherapy, occupational therapy, speech and language	A multidisciplinary team provided the home-based intervention	Home-based interventions were provided during home visits	At patients' home	Home-based rehabilitation was provided for as long as it was considered patients were benefiting	Not described	Not described	Not described	Not described

		onal team improved the outcome, in terms of functional abilities, mood, quality of life and satisfaction with care, as compared with conventional outpatient rehabilitation services		therapy								
Lindley 2017	Family-led rehabilitation after stroke in India	Given that low-income and middle-income countries have only about 3% equivalent purchasing power to spend on health care compared with high-income countries, any new	An intervention manual was provided for the patient and caregiver	(1) Family rehabilitation training involved training family members to provide a simplified version of evidence-based rehabilitation, and included comprehensive	(1) A rehabilitation professional provided the family rehabilitation training (2) Home-based intervention for patients was mediated by caregivers	(1) Family rehabilitation training was provided during home visits (2) Home-based interventions for patients were provided by caregivers at home	(1) The family rehabilitation training was started in hospital, and continued at home (2) The home-based intervention was performe	(1) The family rehabilitation training was designed to take place for about 1 h a day in hospital for about 3 days. After hospital discharge, up to six home visits were provided to	Not described	Not described	(1) For family rehabilitation training, a log of trial interventions was kept by the professional for each participant for hospital	(1) The family rehabilitation training programme was delivered as planned with a mean time of 3·0 h in hospital. And an additiona

		model of stroke rehabilitation should be both sustainable and effective. Researchers hypothesised that family caregiver delivered rehabilitation would increase independence and survival after stroke unit admission		impairment and disability assessment by the coordinators; information provision; joint goal setting with the patient and caregiver for basic activities of daily living (ADL), extended ADL (EADL), and communication; caregiver training for limb positioning; encouragement of the practice of task-specific activities;			d at home	assess progress, continue caregiver training activities, and reset goals (2) Patients and their caregivers were encouraged to performed the home-based intervention after discharge to home			and home visit activities (2) Patients and their caregivers were encouraged to perform family-led rehabilitation and they were encouraged to keep log of rehabilitation activities for 30 days after discharge	l 3·1 h of training were delivered during home visits (2) Patients and caregivers reported 17·8 h of family-led rehabilitation given in the first 30 days after hospital discharge

				and reminders to prepare the patient and carer for hospital discharge (2) Home-based intervention mediated by caregivers was prescribed for patients and their caregivers								
Mayo 2000	Tailor-made home programme of rehabilitation and nursing services with prompt discharge from hospital	Aimed to evaluate the effectiveness of prompt discharge combined with home rehabilitation on health-related quality of life (HRQL), community reintegration, and function	Not specified	Home-based intervention included physical therapy, occupational therapy, speech therapy, and dietary consultation	A multidisciplinary team provided the home-based intervention	Home-based interventions were provided during home visits and supplemented with telephone monitoring	At patients' home	(1) The duration of the intervention was 4 weeks (2) Subsequent home visits were arranged as needed	Intervention was individualized to a patient's needs	Not described	Not described	Not described
Rasmussen	Early home-based	Aimed to evaluate the	After being discharged to	(1) Home-based	A multidisciplinary,	Home-based interventions were	At patients' home	(1) As soon as an	Home-based	Not described	Not described	36/38 completed the

2016	rehabilitation	efficacy of early home-based rehabilitation compared with standard care three months after stroke onset.	homes, written plans for training sessions were given to patients	interventions before discharge included physical exercises and training of activities of daily living (2) After being discharged to homes, patients received written plans for training sessions, and received help to perform activities of daily living and continued rehabilitation training, which focused on the patient's occupational problems	intersectoral and interventional team including a nurse, physiotherapists, occupational therapists and physicians, provided the home-based intervention	provided during home visits		inpatient was able to train at home, home-based interventions were performed one to three times per week (2) After discharged to home, the home-based interventions were provided one to five days per week for up to four weeks according to the ability and needs of the patients	training was based upon the patient's needs and rehabilitation goals			home-based intervention

Santana 2017	Early home-supported discharge (EHSD) service	While EHSD services for stroke patients have been researched in Scandinavia and the United Kingdom, no trials have taken place in the health systems environment of Southern Europe. The present study was developed as part of a European project on integrated care	Not specified	(1) Patients and carers received education on healthy behaviours and information about stroke (2) The mix of physiotherapy, occupational therapy and psychology sessions was also adapted to the specific condition of each patient. Rehabilitation was focused on daily activities valued by the patient in their usual context (3) Caregivers	Two physiotherapists, two occupational therapists and a psychologist	Home-based interventions were provided during home visits	The EHSD intervention was started in hospital, and continued at home	(1) EHSD intervention started during patients' stay at the stroke unit (2) Approximately eight home-based training sessions for a maximum of one month were provided	(1) Information and training was tailored to the patient's needs (2) Rehabilitation was focused on daily activities valued by the patient in their usual context	Not described	Not described	Not described

				were trained and made aware of the competencies and ability of the patient and were encouraged to follow their progress								
Taule 2015	Early supported discharge (ESD) at home	Current evidence supports ESD from hospital to home after acute hospital treatment as patients have demonstrated benefits in independence. However, the influence of different rehabilitation models on the patients' ADL ability is still	Not specified	Home-based intervention was mainly directed towards ADLs, and function-specific treatment was also offered	An occupational therapist and/or a physiotherapist provided the home-based intervention	Home-based intervention was provided during home visits	At patients' home	(1) ESD intervention was provided during hospitalization and at home (2) A home visit was provided after discharge within three days, and lasted for a maximum of five weeks after the home	Not described	Not described	Not described	39/53 completed the 3 months assessment

		scarcely explored. This study aimed to compare three models of rehabilitation : ESD in a day unit, ESD at home and traditional treatment in the municipality						visit				
Walker 1999	Home-based occupational therapy	Aimed to evaluate the effect of occupational therapy on stroke patients who were not admitted to hospital	Not specified	Occupational therapy was provided to improve the independence in personal and instrumental ADL	A research occupational therapist provided the home-based intervention	Home-based intervention was provided during home visits	At patients' home	The home-based intervention was provided for patients with stroke 1 month after onset for up to 5 months	The frequency of interventi on was agreed between the therapist, patients and if relevant, the carers	Not described	Not described	Not described
Wolfe 2000	Home-based rehabilitation	Stroke patients requiring rehabilitation , those not	Not specified	Not specified	A rehabilitation team including a physiotherapist, occupational therapist, a speech	Home-based intervention was provided during home visits	At patients' home	The home-based intervention was provided for a maximum	Not described	Not described	Not described	Not described

		admitted to hospital were significantly less likely to receive rehabilitation than those admitted. In an attempt to redress this situation, researchers aimed to assess the effectiveness of providing rehabilitation to non-admitted stroke patients in a pilot trial			and language therapist and a therapy aid, provided the home-based intervention			of 3 months				
Azab 2009	Home-based constraint-induced movement therapy (CIMT) combined with usual care	Aiming to investigated the effect of home-based CIMT on the Barthel Index (BI)	Not specified	(1) Home-based CIMT consisted of the participant wearing a "mitt" on the uninvolved hand while practicing a	A family member supervised and encouraged the patients to perform the home-based intervention	A family member supervised and encouraged the patients to perform the home-based intervention	The home-based intervention was performed at patients' home	(1) The home-based intervention was performed for 6 to 7 hours per day for a period of 4 consecutive weeks (2) The usual	Participants were encouraged to progress the task goal according to their motor capabilities or the	Not described	Compliance was reported by the trained family member in the home diary activities sheet	Not described

				full functional task (2) Usual care included physical and occupational therapy which included active range of motion of bilateral upper extremities, stretching exercises in the upper extremity, hand-eye coordination activities, ambulation, and strengthening exercises for bilateral upper extremities				care was performed for 80 minutes, three times per week for 4 weeks	speed of performance			
Batchelor 2012	Home-based multifactorial Falls prevention	Aiming to determine whether a multifactoria	Not specified	(1) Home-based multifactorial Falls	A physiotherapist provided the home-based intervention	The home-based intervention was provided during home visits	The home-based intervention was	Not specified	Individualised home exercise	Not described	Adherence was assessed through exercise	(1) 75/85 completed the 12 months

	programme combined with usual care	l falls prevention programme reduces falls in people with stroke at risk of recurrent falls and whether this programme leads to improvements in gait, balance, strength, and fall-related efficacy		prevention programme included home-based exercise programme which addressed balance and mobility problems, falls risk minimization strategies and injury risk minimization strategies (2) Usual care including physical and occupational therapy was provided by professionals			performed at patients' home		programme was prescribed		diaries completed by participants and discussion with the physiotherapist at each review and following completion of the study	follow up (2) Of the 64 intervention participants for whom falls data were available, 16 (25.0%) fully adhered, 36 (56.3%) partially adhered, and 12 (18.7%) did not adhere to the exercise programme
Chumbler 2012	Multifaceted stroke telerehabilitation (STeleR) intervention combined	Aiming to determine whether a multifactorial falls prevention	Not specified	(1) Home televisits were provided to demonstrate exercise	A physiotherapist or an occupational therapist provided tele-rehabilitation intervention	The home-based intervention was provided through telerehabiltiation	At patients' home	The STeleR intervention lasted 3 months which included 3 1-hour home tele-visits and 5	The prescribed exercise was selected by the	Not described	An in-home messaging device (IHMD) was used to enhance	(1) 22/25 completed the 3 months follow up (2) 24/25

	with usual care	programme reduces falls in people with stroke at risk of recurrent falls and whether this programme leads to improvements in gait, balance, strength, and fall-related efficacy		which focused on strength and balance, to developed a treatment plan which might include modification of home environment and application of new adaptive equipment or techniques, to solve interval problems (2) Telephone intervention was provided to review current exercise regimen and assistive technology and to				telephone intervention calls	therapist based on patients' physical performance measures		exercise adherence	completed the 6 months follow up

				reassess and advance the exercise program (3) Routine Veterans Affairs (VA) care was provided								
Corr 1995	Home-based occupational therapy combined with usual care	Aiming to evaluate the influence of continued rehabilitative intervention by an occupational therapist on stroke patients after their discharge from a stroke unit	Not specified	(1) The home-based intervention including teaching new skills; facilitating more independence in activities of daily living; facilitating return of function; enabling patients to use equipment supplied by other agencie, was provided by an occupational therapist during home visits (2) Any other follow up	An occupational therapist provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	Not specified	Appropriate therapeutic interventions were carried out as needed, based on the model of human occupation	Not described	Not described	46/55 completed the 1 year assessment

				services such as day-hospital attendance and community physiotherapy were provided								
Gilbertson 2000	Domiciliary occupational therapy combined with usual care	Aiming to establish if a brief programme of domiciliary occupational therapy could improve the recovery of patients with stroke discharged from hospital	Not specified	(1) Home-based intervention which was tailored to recovery ability of self-care or domestic or leisure activities (2) Routine services included inpatient multidisciplinary rehabilitation, a predischarge home visit for selected patients, the provision of support services and equipment, regular multidisciplinary review at a stroke clinic, and selected patients referred to a medical day	An occupational therapist provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	The home-based intervention was provided for 6 weeks for around 10 visits lasting 30-45 minutes	The home-based intervention was developed tailored to recovery goals identified by the patients	Not described	Not described	(1) 64/67 completed the 8 weeks assessment (2) 60/67 completed the 6 months assessment

				hospital								
Goldberg 1997	Home-based, case-managed care combined with usual care	Aiming to develop a systematic follow-up program for stroke survivors and their caregivers during the first year after discharge from inpatient rehabilitation, and to test a new model of delivery of health services to this population	A stroke educational manual with associated printed materials was provided	(1) Home-based intervention included therapeutic recreation, social work, and psychology consultation (2) Standard outpatient follow-up services included routine medical follow-up visits and, when indicated, outpatient rehabilitation service	A physiatrist, psychologist, and recreational therapist provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	The home-based intervention was provided bimonthly for hour-long	Not described	Not described	Not described	21/27 completed the 1 year assessment
Mandigout 2021	Individualized home-based coaching program combine with usual care	Aiming to investigate whether an individualised home coaching program improved walking capacity (at 6	Not specified	(1) The treatment strategy of home-based intervention was not specified (2) Usual care which might	A therapist provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	The home-based intervention was provided through home visits once every 3 weeks for 6 months	Individualized coaching program was provided	Not described	An activity tracker was used to monitor physical activities at home	39/42 completed the home-based intervention

		months) and promoted long-term benefits (at 12 months) in subacute post-stroke patients		include outpatient therapy, medical appointment								
Ricauda 2004	Home hospitalization service combined with usual care	Aiming to evaluate whether home-treated patients have different mortality rates from those of patients admitted to and treated on a general medical ward (GMW), and to evalute residual functional impairment, neurological deficit, depression, morbidity, and admission to long-term	Not specified	(1) The home-based intervention emphasized a task- and context-oriented approach, which recommended that the patient perform guided, supervised, and self-directed activities in a functional and familiar context (2) Routine hospital rehabilitation service	Physiotherapists, speech therapists, occupational therapists and psychologists, provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	Not specified	Not described	Not described	Not described	39/60 completed the 6 months assessment

		facilities in the two groups of patients										
Rudd 1997	Early discharge with home rehabilitation combined with usual care	Aiming to assess the clinical effectiveness of an early discharge policy for patients with stroke by using a community-based rehabilitation team	Not specified	(1) Home-based intervention included physiotherapy, occupational therapy and speech therapy (2) Conventional care included in-patient treatment, discharge planning, and outpatient care	Therapists provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	The home-based intervention was provided for maximum once a day, for up to 3 months	Individual care plan was provided for each patient	Not described	Not described	136/167 completed the 12 months assessment
Wong 2015	4-week transitional care programme (TCP) with home-based intervention combined with usual care	Aiming to test the effects of a transitional care model with a specified dose of intervention	Not specified	(1) TCP included home-based intervention consisting of management and prevention of stroke	A trained nurse provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	(1) Home-based intervention was provided three days per week for 4 weeks (2) The routine	Not described	Not described	Not described	(1) 47/54 completed the 4 weeks assessment (2) 45/54 completed the 8 weeks

				recurrence; symptoms assessment and management; enhancing physical function: self-care abilities and exercise; healthy behaviour: adherence to medication and diet; building resilience: connections with the self, family, social life and a Higher Being; and emotion management (2) routine hospital-based physical training				hospital-based physical training programme was offered within the first 3 weeks after hospital discharge				assessment

				programme was provided								
Koç 2015	Home-based exercise	Aiming to assess the efficiency of structured home-based exercises for patients with subacute ischemic stroke in terms of their activities of daily living	Not specified	Home-based intervention including stretching and flexibility exercises, assistive and resistive exercises, active-assisted range of motion exercises, and progressive walking programme and relaxation	A nurse provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	Home-based intervention was provided twice a week for 12 weeks, with each treatment session lasting 1 hour	Not described	Not described	Not described	Not described
Lin 2004	Home-based physical therapy programme	Aiming to examine the effects of low-intensity home-based physical therapy on the performance of ADL and motor	Not specified	Home-based intervention mainly consisted of motor facilitation, postural control training, functional ambulation training with	One of four physical therapists provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	Home-based intervention was provided once a week for 10 consecutive weeks, with each treatment session lasting about 50 to 60 minutes	Daily exercise programmes were tailor-made to the patients' individual needs	Not described	Not described	9/10 completed the home-based intervention

		function in patients more than 1 year after stroke		gait correction, and ADL training								
Wade 1992	Home-based physiotherapy intervention	Aiming to determine whether the home-based intervention of a physiotherapist improved mobility in patients seen more than one year after stroke	Not specified	Home-based intervention included exercises to improve the walking and balance and ADL practice	A physiotherapist provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	Home-based intervention was provided for 3 months	Not described	Not described	Not described	48/49 completed the 3 months assessment
Walker 1996	Home-based dressing practice	Aiming to investigate the intensive treatment for patients with persistent dressing problems at six months after discharge from hospital	Not specified	Home-based intervention involved teaching patients and carers appropriate techniques such as dressing the affected limb first, energy conservation, the use of red thread to overcome perceptual difficulties and	An occupational therapist provided the home-based intervention	The home-based intervention was provided during home visits	At patients' home	Home-based intervention was provided for 3 months	Not described	Not described	Not described	Not described

				to mark alignment of buttons, and advice on choice of clothing								
Wang 2015	Caregiver-mediated, home-based intervention (CHI)	Aiming to examine whether CHI based on the ICF conceptual framework was effective in improving the physical functioning of patients with chronic stroke	Individualized training guidelines and simple illustrations were provided by a physical therapist for the caregivers	Home intervention was designed to improve patients' body functions and structural components; to improve patients' ability to undertake everyday activities within their living environments using task-specific restorative and compensatory training methods; and to help the patients reintegrate into the society by participating in restorative outdoor leisure activities	(1) A physical therapist prescribed the home-based intervention and taught home-based intervention to patients and their caregivers (2) Patients and their caregivers performed the home-based intervention	(1) The teaching of the home-based intervention was provided during home (2) The home-based intervention was provided by caregivers at home	At patients' home	(1) The teaching of the home-based intervention was provided once a week for 12 weeks with each session lasting approximately 90 minutes (2) The home-based intervention was encouraged to be performed at least twice a week and, if possible, every day	A personalized training schedule was provided for each patient	Not described	Caregivers was requested to record the frequency of training and tasks completed each week, and during the home visits, the physical therapist examined the activities practiced, the frequency of practice, and the overall progress of the patient during the past week.	25/25 completed the home-based intervention

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	2-3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	4-5
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	5
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	6
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	6
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	supplementary appendix 1 (search strategy)
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	7
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	7
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	7
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	7
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	8
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	8-9
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	8-9
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	8-9
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	8-9
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	8-9
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	9
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	9
Reporting bias	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	9-10

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
assessment			
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	10
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	10, Figure 1 (process of study selection)
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Figure 1 (process of study selection)
Study characteristics	17	Cite each included study and present its characteristics.	12-93
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	94-96
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	96-100
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	96-100
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	96-100
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	101
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	101
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	101
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	96-100
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	101-102
	23b	Discuss any limitations of the evidence included in the review.	101-104
	23c	Discuss any limitations of the review processes used.	103-104
	23d	Discuss implications of the results for practice, policy, and future research.	104
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	The review was not registered
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	A protocol was not prepared

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Not applicable
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	103
Competing interests	26	Declare any competing interests of review authors.	103
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	No mention

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

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