Content and Effectiveness of Community-Based Rehabilitation on Quality of Life in People Post Stroke: a Systematic Review with Meta-Analysis

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ABSTRACT

Purpose: *The study aimed to review the content and evaluate the effects of CBR on quality of life (QoL), balance, and walking capacity for people post stroke, compared to other rehabilitation protocols or no care.*

Methods: *A systematic search and meta-analysis of clinical trials of CBR interventions for stroke survivors was conducted. Five online electronic databases (MEDLINE/PubMed, Web of sciences, Scopus, Hinari, and Pedro) were searched for articles published in English and French languages, from inception up to December 2021. Sixteen studies were included that reported on QoL outcomes from CBR interventions involving 1755 adults post stroke.*

Results: *The different CBR interventions that were selected were grouped into three clusters: a) exercise programmes, b) task-oriented training, and c) educational and taking-charge programmes. CBR interventions were more effective than other rehabilitation protocols (SMD=0.16[0.02, 0.30], P=0.03, I^2 =40%) on QoL for people with chronic stroke. The effects of interventions on walking capacity and balance demonstrated non-significant difference (SMD=0.31[-0.02, 0.64], P=0.06, I^2 =88%, and SMD= 0.20[-0.12, 0.53], P=0.22, I^2 =68%, respectively).*

Conclusion: *Current data indicates that CBR can be used in many forms or in combinations to benefit people with chronic stroke. Also, CBR is as effective as other rehabilitative protocols or no care on walking capacity and balance, while being more while being more effective than institution-based rehabilitation or no care effective than institution-based rehabilitation or no care, in improving quality of life which is a well-recognised goal in the rehabilitation of people with chronic stroke.*

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Key words: *balance, community-based rehabilitation, quality of life, stroke, walking capacity*

INTRODUCTION

Stroke is one of the three most common causes of death, along with malignant tumours and cardiovascular diseases, and is a leading cause of long-term disability in adults(Adoukonou et al., 2021; Feigin et al., 2014). The development of neurovascular units in recent years and thrombolytic treatments have reduced the mortality and sequelae associated with stroke(Navarrro et al., 2021). However, the number of persons with disabilities who experience stroke is gradually increasing (Adoukonou et al., 2020). Loss of balance while walking is common after stroke (Chang et al., 2021; Kossi et al., 2021), with about 70% of people living at home post stroke reporting a fall within a year of their stroke(Beyaert et al., 2015; Kossi et al., 2021). Limited walking capacity restricts the person's independent mobility and can contribute to a sedentary lifestyle, increased disability and risk of recurrence, resulting in a poorer quality of life (Nindorera et al., 2021; Schmid et al., 2013).Previous studies have shown that motor function, balance, walking capacity and independence in activities of daily living are of importance for perceived health-related QoL(Langhammer et al., 2008, 2014; Nindorera et al., 2021).Better quality of life has been reported to be associated with greater independence in daily living and mobility (Heikinheimo & Chimbayo, 2015). Park and Kim (2019) found that gait function is essential for a better QoL in people post stroke. Therefore, to facilitate recovery after stroke, the implementation of rehabilitation is promoted, and a key rehabilitation goal for people post stroke is to improve walking capacity in order to enhance QoL (Corbetta et al., 2015).

Overall, despite being considered important indicators of post-stroke rehabilitation and recovery, global outcomes that represent the individual's functioning in society such as participation and perception of health-related QoL (HRQoL) have been less well reported (Desrosiers et al., 2008; Tyson & Turner, 2000) In most low- and middle-income countries, the weakness of a social security system, the delay in management of stroke cases and the inaccessibility of rehabilitation care reduce the chance of optimal functional recovery of people post stroke (Kossi et al., 2016). In low- and middle-income countries, resources for stroke care and rehabilitation are lacking and, following an acute stroke, many people are often discharged from hospital without an option of receiving adequate rehabilitation

by trained healthcare professionals (Wasserman et al., 2009). In addition to the cost of rehabilitation (Calvo et al., 2019; Ntsiea, 2019), the increased pressure to shorten the length of hospital stay and lack of access to affordable rehabilitative interventions have been reported to result in decreased QoL in people post stroke (Choi-Kwon et al., 2006; Mahesh et al., 2018). These challenges also make the burden of having stroke heavier in low- and middle-income countries than in high-income countries (Abegunde et al., 2007; Navarrro et al., 2021). The prohibitive cost and limited access to conventional stroke rehabilitation has resulted in the development of other approaches, such as bringing the rehabilitation strategies into the home or community of people living with stroke, known as community-based rehabilitation (Iemmi et al., 2015; Ryan et al., 2006).

Since the '80s, community-based rehabilitation (CBR) has been presented as an approach for rehabilitation, resulting in feelings of empowerment and promotion of inclusion and participation of persons with disability (De Groote, 2019).It is a holistic strategy for rehabilitating persons with disabilities within the community, as compared to conventional rehabilitation programmes that are solely institutional or medical. It has been developed over the years, and recently the term CBR has been changed to "Community Based Inclusive Development" (CBID). The latter is a key approach to address the Convention on the Rights of Persons with Disabilities and leave no one behind in achieving the Sustainable Development Goals. CBID particularly promotes the participation and voice of people with disabilities in decision-making processes at the local level (De Groote, 2019). CBR is a term used widely in high-income countries as well, commonly described as rehabilitation by trained rehabilitation professionals, delivered outside of a hospital setting - often in the person's home (Tosoc & Lazaro, 2022). This refers to 'community-delivered rehabilitation' which needs to be distinguished from 'informal or self-directed rehabilitation' (Wade, 2003). Overall, CBR is a strategy for rehabilitation, equalization of opportunities, poverty reduction and social inclusion of people with disabilities. Many studies describe various strategies and techniques being implemented, especially in stroke rehabilitation(Graven et al., 2011; Iemmi et al., 2015; Magwood et al., 2020).

The long-term institutionalisation following a stroke often results in isolation from the mainstream of community, social life and activities(Mitchell, 1999). Several systematic reviews have shown a positive effect of CBR on cognition and functional independence in people post stroke(Mitchell, 1999; Ntsiea, 2019; Wade, 2003). However, as far as the authors of the current study are aware, few have

addressed the effectiveness of CBR on QoL. Indeed, eleven years ago, Graven et al. (Graven et al., 2011) studied the effect of 'CBR' delivered by allied health professionals and/or nursing staff on depression, participation, and QoL in people post stroke. The authors found limited to moderate evidence supporting some rehabilitation interventions delivered by allied health professionals in affecting the outcomes of depression, participation and HRQoL post stroke. In fact, their approach refers to the model of community-delivered rehabilitation rather than self-delivered rehabilitation.

Objective

The present study aimed to evaluate the efficacy of CBR on quality of life in people post stroke, compared to other rehabilitation protocols such as institution-based rehabilitation or no care. Secondary objectives included: (i) reviewing the content of CBR, and (ii) evaluating the effects of CBR on balance and walking capacity in people post stroke. This could result in valuable contributions to evidence of the effectiveness of CBR for people post stroke.

METHOD

Study Design

This systematic review and meta-analysis were performed according to the protocol registered in the international prospective register of systematic reviews, PROSPERO (https://www.crd.york.ac.uk/PROSPERO; no. CRD42020197264). The study complied with the preferred reporting items for systematic reviews and meta-analyses statement(Moher et al., 2009). Methodological issues were resolved with guidance from the Cochrane Handbook for systematic reviews of interventions(Higgins, s. d.).

Data Sources and Searches

Five electronic databases (MEDLINE/PubMed, Web of sciences, Scopus, Hinari, and Pedro) were searched for articles published in English and French languages, from inception to December 2021. The search strategy was adapted to each database, combining keywords and MeSH terms where applicable, using a combination of 'stroke', 'rehabilitation', 'care' 'management', and 'community'. The search was limited to randomised controlled trials and clinical trials. Additionally, published reviews and the reference lists of retrieved publications were searched manually. The full search strategy used for each database is presented in Supplementary material 1.

Supplementary material 1. Full search strategy in the five electronic databases

Databases	Search equations	Filters	Results	Dates
Pubmed	((stroke) OR (Cerebrovascular accident)) AND ((Community-based rehabilitation) OR (Community-based inclusive development)) AND (Quality of life)	Full text, Clinical Trial, Randomized Controlled trial, Humans, English, French	42	29/09/2021
Web of science	((stroke) OR (Cerebrovascular accident)) AND ((Community-based rehabilitation) OR (Community-based inclusive development)) AND (Quality of life)	Rehabilitation or Clinical, Neurology or Health Care Sciences Services or Neurosciences or Primary Health Care or Social Work or Social Sciences Biomedical or Social Sciences, Articles	75	29/09/2021
Scopus	((stroke) OR (Cerebrovascular accident)) AND ((Community-based rehabilitation) OR (Community-based inclusive development)) AND (Quality of life)	LIMIT-TO (OA , "all")) AND (LIMIT TO (DOCTYPE , "ar")) AND (LIMIT-TO (SUBJAREA , "MEDI") OR LIMIT-TO (SUBJAREA , "HEAL") OR LIMIT-TO (SUBJAREA , "NURS") OR LIMIT-TO (SUBJAREA , "SOCI")) AND (LIMIT-TO (LANGUAGE , "English"))	36	29/09/2021
Hinari	((Abstract:(stroke)) OR (Cerebrovascular accident)) AND ((Community-based rehabilitation) OR (Community-based inclusive development)) AND (Abstract:(Quality of life))	Full text online; journal articles; Discipline: (occupational therapy & rehabilitation, physical therapy, social welfare & social work); Subject Terms: rehabilitation, humans, stroke, adult, health care sciences & services, health-related quality of life, physical fitness, physical activity, physical medicine and rehabilitation, physical therapy, physiotherapy, quality of life. Language (English, French)	113	29/09/2021
Pedro	Stroke, community-based rehabilitation, quality of life	-	30	29/09/2021

Inclusion criteria:

Studies were included if they were randomised controlled trials or non-controlled clinical trials and reported on outcomes of interventions addressing the effect of community-based rehabilitation on QoL as primary or secondary outcome. To be included, studies had to report on adults (age ≥18 years) with a confirmed diagnosis of a stroke.

Exclusion criteria:

Studies involving post-stroke people aged <18 years, as well as those involving other diagnosis than stroke, were excluded. Studies were excluded if they did not investigate QoL as primary or secondary outcomes and in which the setting was not community-based.

Interventions and Comparators

For this review, interventions were defined as rehabilitation provided by the community, family and/or self-training at home or supervised by a professional(Ru et al., 2017).This refers to 'informal or self-directed rehabilitation'.

Inclusion criteria:

Any CBR programmes as compared with any other rehabilitative strategies intended to improve the QoL of people with stroke or no care, were included.

Exclusion:

Interventions delivered in hospital, including day units and outpatient departments as well as those delivered by healthcare professionals and allied healthcare professionals within an institution, were excluded from this review.

Study Tools

QoL outcome should have been evaluated in people post-stroke using valid tools such as: Stroke Impact Scale (SIS)(Mulder & Nijland, 2016), Stroke Specific Quality of Life Scale (SS-QOL)(Post et al., 2011; Williams et al., 1999),Stroke and Aphasia Quality of Life scale (SAQoL)(Hilari et al., 2003),Short Form 36 (SF-36) (Brazier et al., 1992), EuroQol(Golicki et al., 2015), WHOQoL-Bref(Skevington, 1999), etc. The secondary outcomes should have included balance (measured using Berg Balance Scale –BBS(Blum & Korner-Bitensky, 2008);Timed Up and Go Test -TUG (Podsiadlo & Richardson, 1991) etc.) and walking capacity (evaluated by 6MWT(Cheng et al., 2020; Kervio et al., 2004); 10MWT(Cheng et al., 2020), etc.).

Data Collection and Analysis

Extraction of data and quality assessment

The first and second authors independently screened the titles and abstracts of all unique records for relevance. Full texts of selected papers were reviewed, and data was extracted using an Excel spreadsheet. Differences were discussed until consensus was reached between the two reviewers. If necessary, a third author was consulted. For RCTs, data was extracted at baseline, after the intervention, and when available at follow-up time points. The descriptive outcomes included sociodemographic (sex, age, geographical area, etc.) and clinical characteristics (type of stroke, paretic side, stroke duration, etc.).

The first two review authors assessed the methodological quality of included RCTs using the Physiotherapy Evidence Database (PEDro) scale which is an 11- item scale designed for rating of the methodological quality of randomised trials (Blobaum, 2006). Each item can contribute 1 point to the total PEDro score (1=satisfied, 0=not satisfied; maximum=10 points); exception is item 1 which is related to the external validity or generalisability of the sample(Moseley et al., 2002; Teasell et al., 2003). For clinical trials, the Newcastle Ottawa Scale (NOS) was used, which assesses the quality of non-randomised and non-controlled studies. The NOS evaluates 3 quality parameters (selection, comparability, and outcome) divided across 8 specific items, which slightly differ when scoring case control and longitudinal studies (Wells et al., 2012). Each item on the scale is scored for 1 point, except for comparability which can be adapted to the specific topic of interest to score up to 2 points. Thus, the maximum score for each study is 9, with studies having less than 5 points being identified as representing at high risk of bias (Luchini et al., 2017).In case of disagreement between the review authors, a third author (TA) was consulted.

Data Synthesis and Analysis

To describe the content of CBR, exploratory subgroup analyses were conducted based on intervention type. For the meta-analysis, standardised mean differences (SMD) with 95% confidence intervals (CI) were calculated. The SMD reflects the intervention effect size (ES) in each study relative to the variability observed in that study. An SMD of ‘0’ means that the treatment and control have equivalent effects. Improvement is associated with higher scores on the outcome measure. SMDs >0 or <0 indicate the degree to which the treatment is more or less effective,

respectively, than the control. Effect size (ES) was calculated based on means and standard deviations, and on the size of the intervention and control groups. ES calculated with SMD was interpreted using Cohen's method (Cohen, 1988) and classified as small (0.20), medium (0.50), and large (0.80). The results of the Chi-squared test (significance level: 0.05) were checked to assess the heterogeneity of included studies and the I^2 statistic to quantify consistency. An I^2 value of 50% or higher indicated the presence of substantial heterogeneity. Statistical analyses were performed using a random-effects model with Review Manager Software (Version 5.3).

Ethical Considerations

This systematic review and meta-analysis did not require ethical approval because data was analysed anonymously.

RESULTS

Identification and Selection of Studies

The process by which articles were selected is illustrated in Figure 1. The authors identified 296 records in the electronic database. After duplicate removal, 263 records were screened by title and abstracts, after which 21 articles were deemed to be potentially relevant and 8 studies were excluded after full text scrutiny. The reasons for exclusion included: QoL not reported in the outcomes (n=2), setting was not community-based (n=1), participants without stroke (n=1), no intervention reported (n=4). Ultimately, 16 studies were eligible for analysis and synthesis and met the study's inclusion criteria.

Figure 1: Flowchart of Study Selection and Inclusion

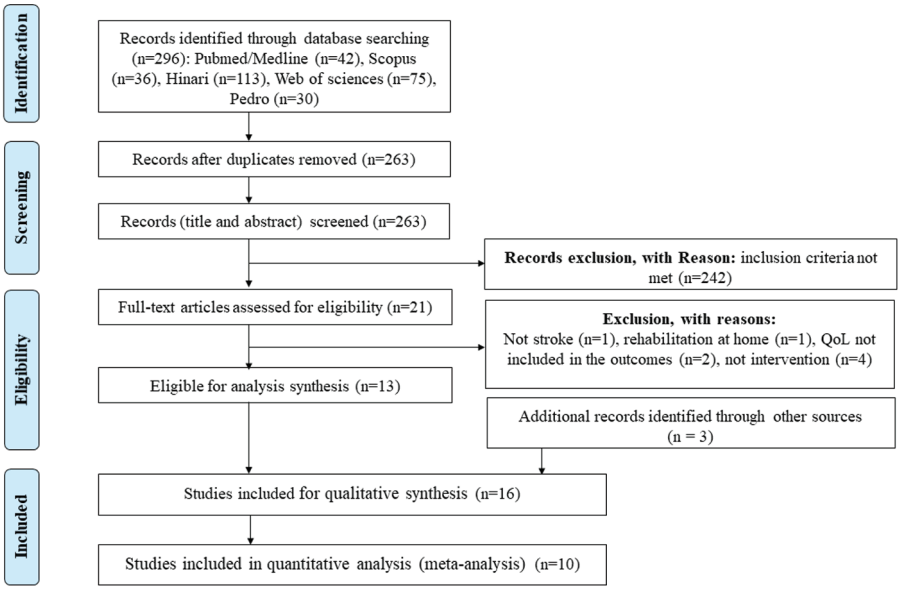

Table 1. Patient characteristics in the included studies

Study ID	Country	Experimental group							Control group						
		Size (n)	Mean age (mo) ± SD	Time since stroke (mo)	Sex (%)	Type of stroke (%)		Side of injury (%)	Size (n)	Mean age (mo) ± SD	Time since stroke (mo)	Sex (%)	Type of stroke (%)		Side of injury (%)
					M	Is	He	RH				M	Is	He	RH
Calugi et al (2016)	Italy	126	71.8±10.5	9.58±4.23	67.5	NR	NR	63.3	103	70.1±10.7	6.47±4.27	60.2	NR	NR	47.5
Dean et al. (2018)	England	23	70±12	16.67	70	65	13	NR	22	71±10	16,2	67	68	1	NR
Dunn et al. (2017)	Australia	20	60.1±19	5.3±3.5	40	NR	NR	NR	NA	NA	NA	NA	NA	NA	NA
Ellis-Hill et al. (2019)	England	29	72.0±11.2	7(1–32)	41	75	20	38	27	67.4±12.8	7(2–19)	74	74	22	50
Fu et al. (2020)	New Zealand	E1 132	71.4±12	1.5±0.81	56.1	NR	NR	NR	130	73±12.2	1.5	57.7	NR	NR	NR
		E2 138	71.7±12	1.5	61.6	NR	NR	NR							
Gordon et al (2013)	India	64	63.4±9.4	12.8±3.6	45.3	87.3	12.7	56.3	64	64.9±11.1	11.8±3.6	45.3	84.3	7.2	65.6
Harrington et al. (2010)	England	119	71±10.5	10.3	55	NR	NR	41	124	70±10.2	10.3	54	NR	NR	45
Hartman-Maeir et al. (2007)	Israel	27	61.6±7	35.20	56	NR	NR	56	56	57.7±11	11.6±72	75	NR	NR	57
Jagroop et al. (2018)	Canada	10	72.7±9	NR	90	10	20	40	NA	NA	NA	NA	NA	NA	NA
Lai et al. (2004)	China	21	69.5±6	36±24	57	76	24	NR	NA	NA	NA	NA	NA	NA	NA
Malagoni et al. (2016)	Italy	6	62.5±13.8	6.2±3.5	67	67	33	33	6	70.7±9.0	6.8±4.1	83	67	33	50

Mayo et al (2015)	Canada	E1 93 E2 93	61±12 65±11	30±26.4 37.2±37.2	61 60	NR NR	NR NR	NR NR	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
Mohd Nordin et al. (2019)	Malaysia	42	60	16	81	61.9	28.6	50	46	59.5	NR	78.3	47.8	32.6	43.5
Stuart et al. (2009)	Italy	40	66.8±1	50.4±9.6	62.5	NR	NR	35	38	70±1.7	42±6	76.3	NR	NR	50
Sullivan et al. (2014)	United States	11	60.4±12	146.4±92.4	54.6	NR	NR	36.4	NA	NA	NA	NA	NA	NA	NA
Taylor-Piliae (2014)	United States	97	70.5±9.81	36±49.5	54.8	67.5	20.4	30.2	48	68.2±10.3	38.7±46.7	47.9	62.5	29.2	29.2

M = Male; Is = Ischemic; He = Hemorrhagic; RH = Right Hemisphere; E1 = Experimental 1; E2 = Experimental 2; NA = non-applicable ; NR = non reported

Studies and Participants' Characteristics

The 16 included studies involved a total of 1755 participants, with sample sizes ranging from 6 to 400. The reported mean/median ages of participants ranged from 60 years to 72.7 years for those receiving the intervention, and from 55.8 years to 73 years for controls. The proportion of male participants ranged from 40% to 90%, while time since stroke ranged from 1.5 to 146 months. The studies included in this review spanned a period of 17 years from 2004 – 2020. Articles were all published in peer-reviewed journals. All of the studies were implemented in the community or home-based setting. Eight randomised controlled trials and eight clinical trials were found. A summary of the included studies is compiled in Table 1 and additional details of included studies' characteristics are given in Table 2.

Table 2: Additional details on the studies characteristics

Study ID	Design	Interventions		Outcomes measures	Results reported
		Experimental group	Control group		
Calugi et al (2016)	CT	Content: APA-TPE (adaptive physical activity combined with therapeutic patient education) - APA including mobility, balance and stretching exercises - TPE including an overview of stroke risk factors, the potential for recovery, how to cope with disabilities and the benefits of a healthy lifestyle Modality: individual & group training Setting: community	TAU = treatment as usual (usual care)	Ability to perform ADLs (Modified BI); Caregiver burden (CSI); Depression (GDS) and Health-related quality of life (SF-12).	The physical component of SF-12 showed a faster increase in the experimental group compared with the TAU group (t=-1,91; p=0,058) but the difference between groups did not reach statistical significance
Dean et al. (2018)	RCT	Content: ReTrain (Rehabilitation Training) followed by three drop-in sessions over the subsequent 3 months Modality: individual & group training Setting: home & community	Usual care & advice booklet about exercise after stroke	QoL (SQoL, SF 12, EQ-5D-5L) Functional mobility (RMI, TUG, modified PSFS) and physical activity (accelerometer); SSEQ, FAS, EBESE.	ReTrain is feasible, acceptable and safe.

Dunn et al. (2017)	CT	Content: The HowFITSS intervention including a manual provided to each participant Modality: individual training Setting: home & community	Waiting list	QoL (SAQoL); Walking speed (10MWT), Balance (Step test), fatigue (FAS), depression (PHQ).	Small significant improvements on the SAQoL (p<0.001).
Ellis-Hill et al. (2019)	RCT	Content: Artist-facilitated arts and health group intervention (HoS) plus usual care (UC) Modality: group training Setting: Community	usual care (UC)	HRQoL (SF-36); well-being (WEMWBS); mood (HADS); capability (ICECAP-A); self-esteem and self-concept (RSES, HISDS-III);	Preliminary effect sizes for candidate primary outcomes were in the direction of benefit for the HoS arm.
Fu et al. (2020)	RCT	Content: Take Charge (community-based self-directed rehabilitation intervention) Modality: individually training Setting: home	Written educational material about stroke	QoL as assessed SF-36 PCS; ADLs and independence by SF-12 PCS, BI, FAI, EQ VAS, CSI;	Take Charge improves QoL (p=0.004), which is sustained at 12 months (p<0.001)
Gordon et al. (2013)	RCT	Content: walk briskly along a prescribed course for 15 minutes, 3 times per week, for 12 weeks, initially, progressing by 5 minutes per week up to 30 minutes in their home or community. Modality: group training Setting: Community	light massage to the affected limbs for 25 minutes, 3 times per week, for 12 weeks, at home	Health-related quality of life (SF-36); Functional status (BI and Older Americans Resource and Services scale); Endurance (6MWT); Lower extremity strength.(Motricity Index).	There was a trend toward greater improvement over time for the Physical Health Component of the SF-36 (P=0.077) and significantly greater improvement over time for distance walked in 6 minutes in favor of the walking group (P<0.001).
Harrington et al. (2010)	RCT	Content: Exercise and education schemes facilitated by volunteers and qualified exercise instructors (supported by a physiotherapist) Modality: individual & group training Setting: home & community	Standard care & information sheet	QoL (WHOQoL-Bref); ADLs (FAI); Functional mobility (RMI); balance (TUG); depression (HAD); strain related to care provision (CSI); social care and personal costs (NHS and PSS); social and physical integration in stroke survivors (SIPSO)	A significant improvement was demonstrated on the psychological component of WHOQol-bref at six months (p=0.011).
Hartman-Maeir et al. (2007)	CT	Content: Community-based rehabilitation program Modality: group training Setting: community	No care	Health status or QoL (SIS); ADLs, functional assessment and levels of disability (FIM, IADLq); Leisure participation (ACS) and satisfaction from life areas (LiSat-9);	Not advantage in terms of disability levels (p = 0.004). The activity level increased due to the program (P < 0.001) and the satisfaction scores were higher than non-participants (p < 0.05).
Jagroop et al. (2018)	CT	Content: Community-based exercise program: a warm-up, aerobic, resistance, balance, and flexibility exercises. Modality: group training Setting: community	No control group	QoL (SSQoL); ADLs (Sit to stand, 6MWT, TUG, BBS); Program effectiveness (ESES).	A trend for significant improvements for QoL (p=0.085) and for ADLs (p=0.01).
Lai et al. (2004)	CT	Content: Educational talks, exercise (strength and balance) and psychosocial support, conducted by a physiotherapist via a videoconference link Modality: individual training Setting: community	No control group	QoL (SF-36); Balance (BBS); Self-esteem (SSES); Depression (GDS-15); Locomotion, balance and key position changes (EMS); ADL (Lawton IADL).	Feasibility, efficacy (p < 0.001) and high level of acceptance of telerehabilitation for community-dwelling stroke clients.

Malagoni et al. (2016)	RCT	Content: Ti-To rehabilitation program consisted of a structured home based phase performed alternately. Modality: individual training Setting: home-based	Supervised standard rehabilitation program	QoL (SF-36); 6MWT, TUG Feasibility and satisfaction (CSQ-8)	Improvements in functional capacity and quality of life (p=0.03)
Mayo et al. (2015)	CT	Content: Evidence-based program delivered in three 12-week sessions including exercise (aerobic exercise, strength of peripheral and core musculature, balance, flexibility, and rapidity of movements) and project-based activities, done as individuals and in groups Modality: individual & group training Setting: community	No control group	Hours spent per week in meaningful activities outside of the home; Reintegration to Normal Living Index; Stroke-Specific Geriatric Depression Scale; gait speed; EQ-5D and Preference-Based Stroke Index.	Over 45% of people met or exceeded the pre-specified target of a three hour per week increase in meaningful activity and this most often took a full year of intervention to achieve. Greatest gains were in satisfaction with community integration (mean 4.78; 95% CI: 2.01 to 7.55) and stroke-specific health related quality of life (mean 4.14; 95% CI: 2.31 to 5.97).
Mohd Nordin et al. (2019)	RCT	Content: Career-assisted therapy conducted at home: task-oriented activities consisting of a set of physical activities and a set of domestic tasks, cognitive or brain stimulating activities and leisure activities. Modality: group training Setting: home	Usual therapy implemented in out-patient hospital setting	Health-related QoL (EQ-5D-5L and EQ VAS); Mobility level (RMI); Balance (BBS); lower limb strength (FTSS); Gait speed (10MWT);	Both therapy groups improved significantly in all the functional measures; mobility ($p < 0.01$), balance ($p < 0.01$), lower limb strength ($p < 0.01$), gait speed ($p < 0.05$), and in the quality of life score ($p < 0.05$)
Stuart et al. (2009)	nRCT	Content: Community-based progressive group exercise regime that included walking, strength, and balance training for 1 hour, thrice a week, in local gyms, supervised by gym instructors Modality: group training Setting: community	Usual care	QoL (SIS); Gait velocity (6MWT); Depression (HRS); Stroke impairments (Motricity Index); Mobility (SPPB, 6MWT, BBS); Basic ADL (BI)	APA-stroke appears to be safe, feasible, and efficacious in a community setting ($P < 0.00015$).
Sullivan et al. (2014)	CT	Content: Pedometer monitored, community-based intervention: to wear pedometers on the nonparetic hip during all waking hours, 7 days a week for 6 weeks. Modality: individual training Setting: community	No control group	QoL (SIS-16); Walking endurance and walking speed (6MWT and 10MWT); Balance self-efficacy (ABC); Captures satisfaction (Pedometer Satisfaction Survey).	There were moderate effect sizes for changes in SIS-16 (0.312) and 6MWT (0.293). Increasing steps correlated with increased perception of physical function.
Taylor-Piliae et al. (2014)	RCT	Content: Yang style 24-posture short-form TC (n=53), strength and range of movement exercises (SS) (n=44) while 1-hour class 3 times a week for 12 weeks. Modality: group training Setting: community	Written materials and resources for participating in community-based physical activity. In addition, they weekly phone call to inquire of their health status to provide individual attention.	Physical function (SPPB, fall rates, and 2-minute step test; Quality of life (SF-36, Center for Epidemiologic Studies Depression Scale, and Pittsburgh Sleep Quality Index)	All groups reported better perceived physical (SF-36 physical composite score: $F1,142=4.15$, $P=0.04$) and mental health (SF-36 mental composite score: $F1,142=15.60$, $P<.01$). Post hoc tests indicated that there was no significant change in perceived physical health for any of the groups ($P>.05$); however, all groups had significant improvements in perceived mental health after the 12-week intervention ($P<.05$)

SF-36 PCS: Physical Component Summary score of the Short Form 36 ; **BI**: Barthel Index; **FAI**: Frenchay Activities Index ; **MRS**: Modified Rankin Scale; **CSI**: Caregiver Strain Index ; **EQ-5D-5L**: Euroqol ; **SSQoL**: Stroke-Specific Quality of Life; **ADLs**: Activities of daily living; **BBS**: Berg Balance Scale ; **6MWT**: 6-minute walk test; **SQoL**: Stroke Quality of Life; **RMI**: Rivermead Mobility Index; **TUG**: Timed Up and Go Test; modified **PSFS**: modified Patient-Specific Functional Scale; **SSEQ**: Stroke Self-Efficacy Questionnaire; **FAS**: Fatigue Assessment Scale; **EBESE**: Exercise Beliefs and Exercise Self-Efficacy questionnaires; **SAQoL**: Stroke and Aphasia Quality of Life; **CRF** : Cardiorespiratory fitness; **HRQoL** : ambulation and health-related quality of life ; **SWT**: Shuttle Walk Test ; **cGXT**: cycle graded exercise test; **10MWT**: 10-meter walk test; **PHQ**: Patient Health Questionnaire ; **WHOQoL-Bref**: World Health Organization Quality of Life; **HAD**: Hospital Anxiety and Depression; **NHS**: National Health Service ; **PSS**:Personal Social Services; **SIPSO:** Subjective Index of Physical and Social Outcome; **FIM**: Functional Independence Measure; **IADLq**: Instrumental Activities of Daily Living Questionnaire ; **ACS**: Activity Card Sort; **Li-Sat**: Life-Satisfaction questionnaire ; **SIS**: Stroke Impact Scale; **GDS-15**: Geriatric Depression Scale 15-item Short Form; **EMS**: Elderly Mobility Scale ; **FTSS**: Five Times Sit to Stand; **EQ VAS**: EQ-Visual analogue Scale ; **CIRS**: Cumulative Illness Rating Scale ; **MMSE**: Mini-Mental State Examination; **HRS**: Hamilton Rating Scale ; **SPPB**: Short Physical Performance Battery. **WEMWBS**: Warwick-Edinburgh Mental Well-being Scale; **HADS:** Hospital Anxiety and Depression Scale; **ICECAP-A**: ICEpop CAPability measure for adults; **RSES** : Rosenberg Self-Esteem Scale; **HISDS-III:** Head Injury Semantic Differential Scale.

CBR, Community based rehabilitation; **RCT,** Randomized controlled trial; **TC,** Take Charge ; **CT**, Clinical trial ; **NA**, non-applicable

Methodological Quality Assessment

Eight RCTs of the included trials were of high quality (PEDro score ≥ 8; Supplementary material 2)(Calugi et al., 2016; Fu et al., 2020; Gordon et al., 2013; Harrington et al., 2010; Nordin et al., 2019; Taylor-Piliae et al., 2014).The assessment by the NOS also showed that the seven other included studies have an average methodological quality (4 < NOS score ≤ 8)(Calugi et al., 2016; Dunn et al., 2017; Jagroop et al., 2018; Lai et al., 2004; Sullivan et al., 2014) and no studies were of low methodological quality (Supplementary material 3).

Supplementary material 2. Methodological quality assessment of included studies with PEDro scale

Study	A	B	C	D	E	F	G	H	I	J	Score/10	Level
Calugi et al. (2016)	N	N	Y	N	N	N	Y	Y	Y	Y	5	3
Dean et al. (2018)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10	1
Ellis-Hill et al. (2019)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10	1
Fu et al. (2020)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10	1
Gordon et al. (2013)	Y	NC	Y	Y	Y	NC	Y	Y	Y	Y	8	1
Harrington et al. (2010)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10	1
Malagoni et al. (2016	Y	Y	Y	Y	Y	NC	Y	Y	Y	NC	8	1
Mohd Nordin et al. (2019)	Y	Y	Y	Y	Y	Y	Y	Y	Y	NC	9	1
Stuart et al. (2009)	N	N	Y	N	N	N	Y	Y	Y	Y	5	3
Taylor-Piliae et al. (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	NC	9	1

Y = yes; N = no; NC = not clear.

A = random allocation; B = concealed allocation; C = groups similar at baseline; D = participant blinding; E = therapist blinding; F = assessor blinding; G = <15% dropout; H = intention-to-treat analysis; I = between group difference reported; J = point estimate and variability reported.

Levels: 1 = score 8–10 (excellent quality); 2 = score 6–7 (good quality); 3 = score 4–5 (fair); 4 = score < 4 (poor quality)

Supplementary material 3. Methodological quality assessment of included studies with New Castle Ottawa scale

Authors(years)	Study design	A	B	C	D	E	F	G	H	I	Score/9	Level
Calugi et al. (2016)	Non randomized controlled trial	0	1	0	0	0	1	1	1	1	5	Average
Dean et al. (2018)	Randomized controlled trial	1	1	1	1	1	1	1	1	1	9	High
Dunn et al. (2017)	Clinical trial	1	0	1	1	0	0	1	1	1	6	Average
Ellis-Hill et al. (2019)	Randomized controlled trial	1	1	1	1	1	1	1	1	1	9	High
Fu et al. (2020)	Randomized controlled trial	1	1	1	1	1	1	1	1	1	9	High
Gordon et al. (2013)	Randomized controlled trial	1	1	1	1	0	1	1	1	1	8	High
Hartman-Maeir et al. (2007)	Non randomized controlled trial	1	0	1	1	1	1	1	1	1	8	High
Harrington et al. (2010)	Randomized controlled trial	1	1	1	1	1	1	1	1	1	9	High
Jagroop et al. (2018)	Clinical trial	1	0	1	1	0	0	1	0	1	5	Average
Lai et al. (2004)	Clinical trial	1	0	1	1	0	0	1	0	1	5	Average
Malagoni et al. (2016	Randomized controlled trial	1	1	1	1	1	1	1	0	0	7	High
Mayo et al. (2015)	Clinical trial	1	1	0	0	0	1	1	1	0	5	Average
Mohd Nordin et al. (2019)	Randomized controlled trial	1	1	1	1	1	1	1	0	0	7	High
Stuart et al. (2009)	Non randomized controlled trial	1	1	1	0	1	0	1	0	0	5	Average
Sullivan et al. (2014)	Clinical trial	1	0	1	1	0	0	1	0	0	4	Average
Taylor-Piliae et al. (2014)	Randomized controlled trial	1	1	1	1	1	1	1	1	0	9	High

Risk of Bias Assessment

The overview of the risk of bias ratings was as follows (Supplementary material 4):10 studies out of 16 reported appropriate generation of a random allocation sequence(Dean et al., 2018; Dunn et al., 2017; Fu et al., 2020; Gordon et al., 2013; Harrington et al., 2010; Mayo et al., 2015; Nordin et al., 2019; Taylor-Piliae et al., 2014); 8 studies out of 16 presented concealment of the allocation sequence(Dean et al., 2018; Dunn et al., 2017; Gordon et al., 2013; Harrington et al., 2010; Nordin et al., 2019; Taylor-Piliae et al., 2014); 6 studies described blinding of participants and personnel(Dean et al., 2018; Ellis-Hill et al., 2015; Gordon et al., 2013; Malagoni et al., 2016; Nordin et al., 2019; Taylor-Piliae et al., 2014); all studies described blinding of the outcome assessment and exhibited non-selective reporting; and 5 studies had uncertain complete outcome data(Calugi et al., 2016; Hartman-Maeir et al., 2007; Jagroop et al., 2018; Malagoni et al., 2016; Stuart et al., 2009).

Supplementary material 4. Evaluation of the risk of bias in the included studies by the Cochrane risk of bias assessment tool

Studies	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other bias	Total /7
Calugi et al. (2016)	-	-	-	+	?	+	?	2
Dean et al. (2018)	+	+	+	+	+	+	+	7
Dunn et al. (2017)	+	+	-	+	+	+	+	6
Ellis-Hill et al. (2019)	+	+	+	+	+	+	+	7
Fu et al. (2020)	+	+	?	+	+	+	+	6
Gordon et al. (2013)	+	+	+	+	+	+	+	7
Harrington et al. (2010)	+	+	-	+	+	+	+	6
Hartman-Maeir et al. (2007)	-	-	-	+	?	+	+	3
Jagroop et al. (2018)	-	-	-	+	?	+	+	3
Lai et al. (2004)	-	-	-	+	+	+	+	4
Malagoni et al. (2016)	+	-	+	+	?	+	+	6
Mayo et al. (2015)	+	-	-	+	+	+	+	5
Mohd Nordin et al. (2019)	+	+	+	+	+	+	+	7
Stuart et al. (2009)	?	-	-	+	?	+	?	2
Sullivan et al. (2014)	-	-	-	+	+	+	+	4
Taylor-Piliae et al. (2014)	+	+	+	+	+	+	+	7

+, Low risk; –, High risk;?, Unclear

Content of CBR Interventions

The CBR interventions were clustered into three groups: a) exercise programme, b) task-oriented training, and c) educational and taking-charge programmes, as shown in Figure 2.

Figure 2: CBR Interventions clustered into three groups

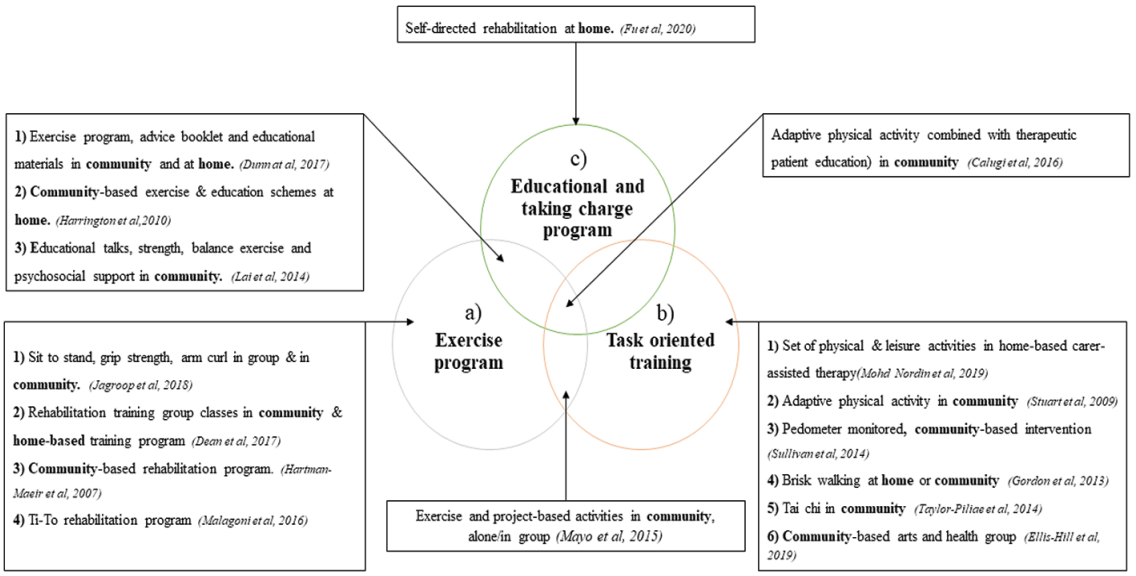

Figure legend: a) Exercise programme, b) Task-oriented training, and c) Educational and taking-charge programme

a) Exercise programme - Within this group, 9 studies (Calugi et al., 2016; Dean et al., 2018; Dunn et al., 2017; Harrington et al., 2010; Hartman-Maeir et al., 2007; Jagroop et al., 2018; Lai et al., 2004; Malagoni et al., 2016; Mayo et al., 2015) used this type of intervention in the form of an exercise programme (aerobic, resistance, balance, flexibility exercises, strength of peripheral and core musculature); rehabilitation training, progressive group exercise including walking, strength, and balance. All interventions were 'community-delivered rehabilitation' supervised by a professional (such as a physiotherapist, qualified exercise instructors, training volunteers).

b) Task-oriented training - Eight studies (Calugi et al., 2016; Ellis-Hill et al., 2015; Gordon et al., 2013; Mayo et al., 2015; Nordin et al., 2019; Stuart et al., 2009; Sullivan et al., 2014; Taylor-Piliae et al., 2014)utilised this type of CBR, namely a set of physical activities, set of domestic tasks, cognitive or brain stimulating activities and leisure activities, project-based activities, pedometer monitored, community-based intervention, adaptive physical activity, tai chi, etc.

c) Educational and taking-charge programme -This intervention concerns 5 studies(Calugi et al., 2016; Dunn et al., 2017; Fu et al., 2020; Harrington et al.,

2010; Lai et al., 2004) and aimed to provide participants with an overview of stroke risk factors, the potential for recovery, how to cope with disabilities and the benefits of a healthy lifestyle, educational schemes and talks. All this reinforces the verbal information and self-directed rehabilitation intervention.Regardless of the type or form of the different procedures, they were performed individually at home and/or in groups, but the most important was the combination of the different intervention types of CBR. One study(Mayo et al., 2015) combined the (a) and (b) intervention types; 3 studies(Dunn et al., 2017; Harrington et al., 2010; Lai et al., 2004) combined intervention types (a) and (c); and 1 study(Calugi et al., 2016) combined all three CBR intervention formats. Also, the majority of the interventions were hybrid (a community-delivered rehabilitation and self-delivered rehabilitation).

Type of Experimental and Control Interventions

Figure 3 depicts the interventions executed in the ten trials included in this meta-analysis. CBR interventions were compared to usual care with physical training component(Calugi et al., 2016; Nordin et al., 2019; Stuart et al., 2009), or usual care without a physical training component (massage, information sheet, advice booklet, or no care) (Gordon et al, 2013; Fu et al, 2020), or a combination of both control interventions(Harrington et al, 2010; Taylor-Piliae et al, 2014; Dean et al, 2018).

Volume of the Interventions

Interventions were conducted at a frequency of 1 to 5 times per week, with duration of generally ≥ 30 minutes per session. The duration of the experimental intervention varied from 6 to 48 weeks, while little data was reported for the control group. The details for the volume of interventions administered to the participants are presented in Table 3.

Figure 3: Classification of interventions executed in the ten trials included in this meta-analysis

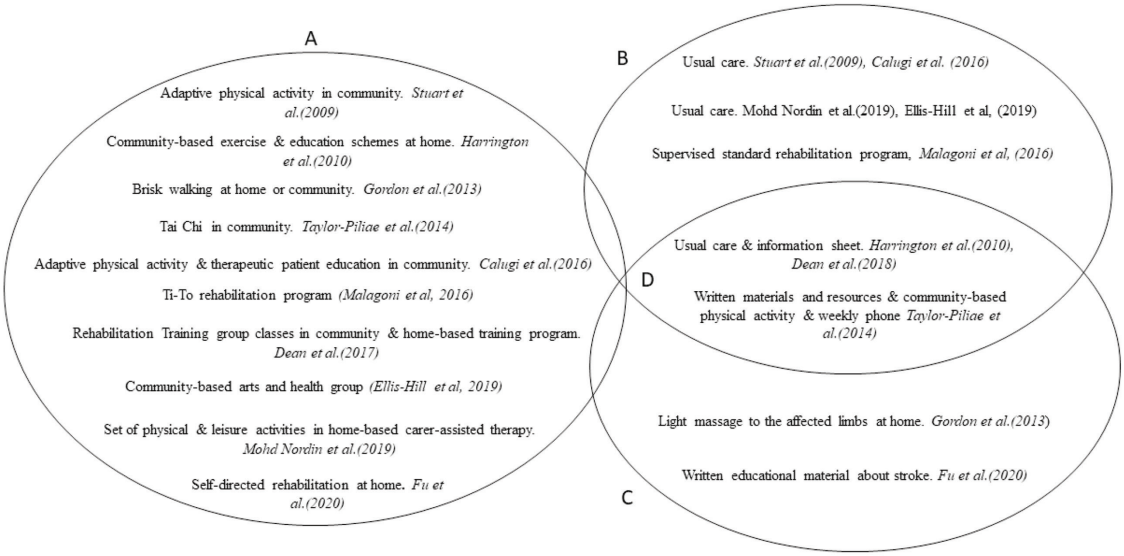

Figure legend : A, Experimental intervention; B, Control intervention with physical training component; C, Control intervention without physical training component; D, combination of both control interventions

Table 3. Summary of the volume of the experimental and control interventions

Studies	Experimental				Control			
	Duration (weeks)	Frequency (times/week)	Volume/session (min)	Total training time (min)	Duration (weeks)	Frequency (times/week)	Volume/ session (min)	Total training time(min)
Calugi et al. (2016)	8	2	NR	NR	NR	NR	NR	NR
Dean et al. (2018)	12	2	120	1440	12	NR	120	1440
Dunn et al. (2017)	12	NR	30	360	NA	NA	NA	NA
Ellis-Hill et al. (2019)	14	NR	120	1200	NR	NR	NR	NR
Fu et al. (2020)	48	NR	NR	NR	NR	NR	NR	NR
Gordon et al. (2013)	12	3	30	NA	12	3	25	NA
Hartman-Maeir et al. (2007)	NR	NR	NR	NR	NR	NR	60	NR
Harrington et al. (2010)	8	2	120	960	8	NR	NR	NR
Jagroop et al. (2018)	9	1	60	540	NA	NA	NA	NA
Lai et al. (2004)	8	1	90	720	NA	NA	NA	NA

Malagoni et al. (2016	10	6	2 X 10	1200	10	3	60	1800
Mayo et al. (2015)	12	2	180	4320	NA	NA	NA	NA
Mohd Nordin et al. (2019)	12	3	180	2160	12	NR	120	1440
Stuart et al. (2009)	24	3	180	4320	24	NR	NR	NR
Sullivan et al. (2014)	6	5	NR	NR	NA	NA	NA	NA
Taylor-Piliae et al. (2014)	12	3	60	2160	12	NR	NR	NR

NA, not applicable; NR, not reported

Outcome Descriptions

All included studies reported on the primary outcome measure (Supplementary material 5). A variety of standardised assessment tools and self-reported measures were used to evaluate the effectiveness of CBR on:

- **Quality of life**: reported by the 16 studies using the short form SF-36 (n=7), the Stroke-Specific Quality of Life (SSQoL) (n=2), Stroke Impact Scale (SIS) (n=3), World Health Organisation Quality of Life-BREF (WHOQoL-Bref) (n=1), Euroqol (EQ-5D-5L) (n=2) and Stroke and Aphasia Quality of Life (SAQoL) (n=1).
- **Walking capacity** (n=8): 6-minute walk test (6MWT) (n=6) and 10-metre walk test (10MWT) (n=3).
- **Balance** (n=8): Berg Balance Scale (BBS) (n=4) and Timed Up and Go Test (TUG) (n=4).

Supplementary material 5. Outcome measures used in the included studies

OUTCOME MEASURE	STUDY ID															
	Calugi et al (2016)	Dean et al. (2018)	Dunn et al. (2017)	Ellis-Hill et al. (2019)	Fu et al. (2020)	Gordon et al (2013)	Hartman-Maeir et al. (2007)	Harrington et al. (2010)	Jagroop et al. (2018)	Lai et al. (2004)	Malagoni et al. (2016)	Mayo et al (2015)	Mohd Nordin et al. (2019)	Stuart et al. (2009)	Sullivan et al. (2014)	Taylor-Piliae (2014)
Quality of life																
short form (SF-36)	X			X	X	X				X	X					X
Stroke-Specific Quality of Life (SSQol)		X							X							
Stroke Impact Scale (SIS)							X							X	X	

World Health Organization Quality of Life Stroke Quality of Life (WHOQoL-Bref)								X								
Euroqol (EQ-5D-5L)		X										X	X			
Stroke and Aphasia Quality of Life (SAQol)			X													
Walking ability																
6-minute walk test (6MWT)						X					X			X	X	
10-meter walk test (10MWT)			X										X		X	
Balance																
Berg Balance Scale (BBS)									X	X			X	X		
Timed Up and Go Test (TUG)		X						X	X		X					
Activities-Specific Balance Confidence Scale (ABC)															X	
Activities of daily living and independence																
Barthel Index (BI)	X				X	X								X		
Frenchay Activities Index (FAI)					X			X								
EQ-Visual analogue Scale (EQ VAS)					X											
Functional Independence Measure (FIM)							X									
Instrumental Activities of Daily Living Questionnaire (IADLq)							X			X						
Impairments																
Rivermead Mobility Index (RMI)		X						X					X			
Elderly Mobility Scale (EMS)										X						

modified Patient-Specific Functional Scale (modified PSFS)		X														
Motricity Index						X								X		
Mini-Mental State Examination														X		
Fatigue Assessment Scale (FAS)		X	X													
Short Physical Performance Battery (SPPB)														X		X
Social participation																
Hospital Anxiety and Depression (HAD)				X				X								
Patient Health Questio-nnaire (PHQ)			X													
Hamilton Rating Scale (HRS)														X		
Geriatric Depression Scale (GDS)	X						X					X				
Subjective Index of Physical and Social Outcome (SIPSO)								X								
Activity Card Sort (ACS)							X									
Life-Satisfaction questio-nnaire (Li-Sat)							X									
Exercise Beliefs and Exercise Self-Efficacy questio-nnaires (EBESE)		X														
Carer strain : Caregiver Strain Index (CSI)	X				X			X						X		

Quantitative Analysis

Figure 4 shows the overall effect of the experimental interventions on the three outcomes (quality of life, walking capacity, and balance) compared to other rehabilitative strategies (institution-based rehabilitation). Figure 4 also displays the subgroup analyses regarding the three outcomes.

The overall analysis showed a significant difference effect in favour of CBR interventions compared to other rehabilitative strategies (SMD=0.22[0.07, 0.37], P=0.004, I^2=77%).

Figure 4: Overall and subgroup analyses of the effect of CBR interventions on quality of life, walking capacity, and balance.

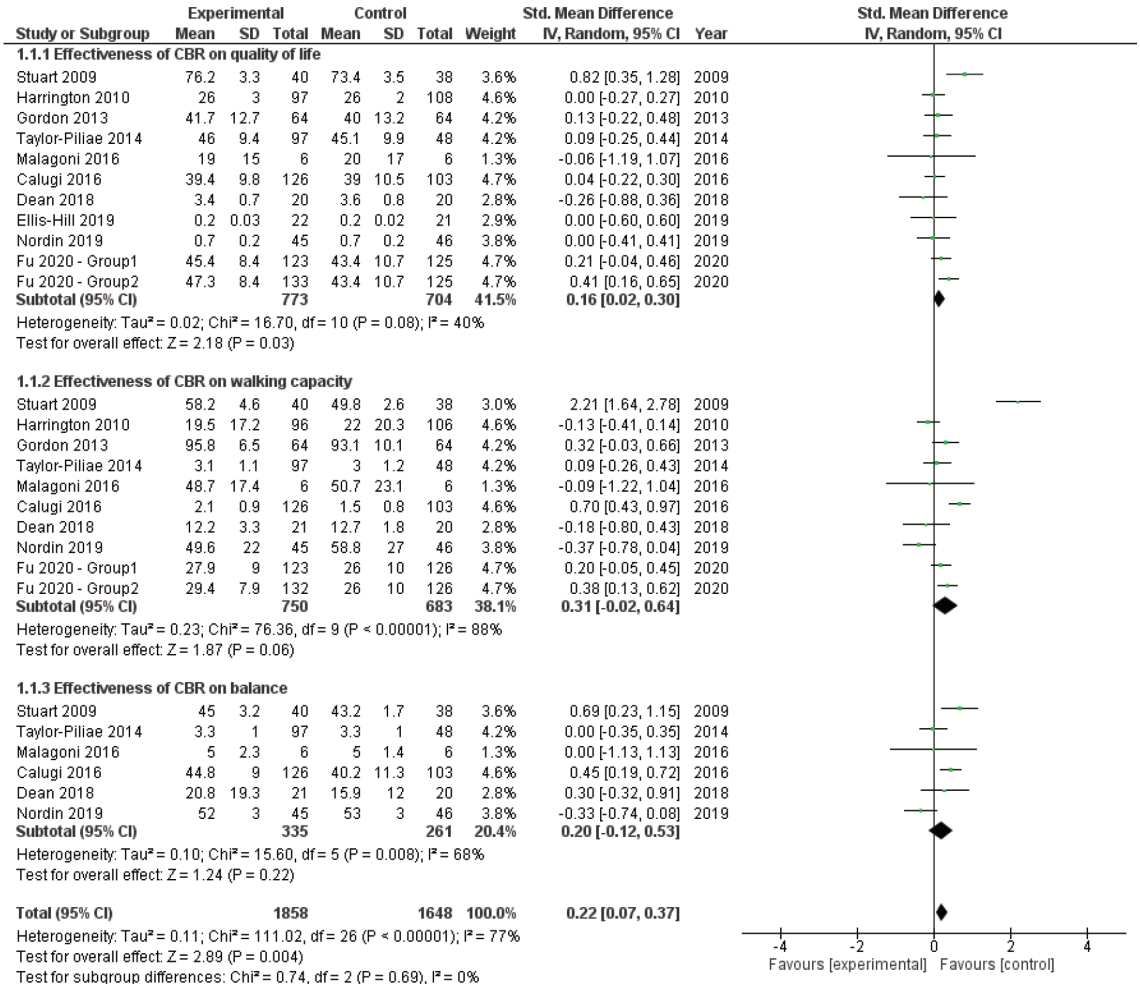

Figure legend: Forest plot showing overall and subgroup analyses of the effect of CBR interventions on quality of life, walking capacity, and balance. The effects are shown by the standard mean difference (SMD); significance set at $p< 0.05$

Subgroup Analysis

- Ten trials with 11 experimental (773 participants) and control (704 participants) groups described the effect of CBR on QoL. Significant effects were found in favour of CBR (SMD=0.16[0.02, 0.30], P=0.03, I^2=77%).
- Nine trials with 10 experimental (750 participants) and control (683 participants) groups described the effect of CBR on walking capacity. Results shows similar effects of CBR compared with other rehabilitative strategies (SMD=0.31[-0.02, 0.64], P=0.06, I^2=88%).
- Six trials with 6 experimental (335 participants) and control (261 participants) groups described the effect of CBR on balance. Results shows similar effects of CBR compared with other rehabilitative strategies (SMD=0.20[-0.12, 0.53], P=0.22, I^2=68%).

DISCUSSION

The purpose of this systematic review and meta-analysis was to evaluate the efficacy of CBR on quality of life in people post stroke compared to institution-based rehabilitation (IBR) or no care. Secondary objectives included reviewing the content of CBR and evaluating its effect on balance and walking capacity in people post stroke. Results showed that CBR interventions were more effective on QoL for people with chronic stroke compared to institution-based rehabilitation or no care. Also, CBR interventions were as effective as institution-based rehabilitation or no care in improvement of walking capacity and balance.

These results suggest that people treated in community settings obtain better QoL outcomes than those who received institution-based rehabilitation or no care. This conclusion applies to chronic people post stroke, as only one(Fu et al, 2020) out of 16 studies report on the subacute phase of stroke (1.5 months after stroke). Evidence from a previous meta-analysis also suggests that CBR is significantly more effective in improving QoL at three months for the physical activity area of the SF-36 instrument(Naidoo, 2010).Even though favourable roles for rehabilitation in people with chronic stroke are now reported(Maguire et al, 2012; Morreale et al, 2016; Korkmaz et al, 2021), evidence suggests that best results usually occur within the first few weeks and months after stroke(Jørgensen et al,

1995; Morreale et al, 2016).

Benefits associated with home and community rehabilitation lie in the fact that the environment is familiar to the person, it provides emotional security, the client is the focus of the treatment programme, and goal setting is more relevant(Eldar, 2000; Kendall et al, 2007).The involvement of the family and the community in the care system would have a favourable impact on the quality of life of clients and therefore on their recovery. Upon closer inspection, this review found 2 studies(Stuart et al, 2009; Fu et al, 2020) with strong significance for the effectiveness of CBR on QoL. The study by Stuart et al (2009) which revealed a strong positive effect compared a CBR intervention with usual care, without the physical training component. For the study of Fu et al (2020) (group 2), a significant effect was found by comparing CBR to written educational material about stroke, covering common issues following stroke and risk factor management. The common factor of the last two mentioned studies was the total number of sessions (duration) of the selected programmes. Fu et al (2020) (group 2) involved the 'Taking Charge' programme for 48 weeks (twice per week) while Stuart et al(2009) performed an intervention that lasted 24 weeks (3 times per week).

The overall effect from the meta-analysis indicates that CBR had an effect (non-significant) on walking capacity and balance. This effect can be understood from the positive relationship reported between balance and functional independence in people post stroke(Langhammer et al, 2008; Kossi et al, 2019; Nindorera et al, 2021). Moreover, previous studies have identified the predictive value of specific types of scales on activities of daily living (walking) after a stroke(Naidoo, 2010; Fu et al., 2020). However, in one review(Naidoo, 2010) it was indicated that CBR had no significant effect on functional independence as measured with the Barthel Index score.

A wide variety of aspects of CBR were noted in the studies included in the present systematic review: adaptive physical activity, walking, tai chi, community-based exercise programme or home-based programme, etc. This variety was expected since CBR is a strategy that is based on the needs of *people living with disabilities* (Khasnabis & Motsch, 2008; Madden et al., 2014).This evidence should be used in the context of international frameworks such as the WHO CBR Matrix or the WHO rehabilitation services framework. It is important to note that the identified CBR components are relevant for the optimal integration, activation and participation of stroke survivors in the community.

Other factors to consider when interpreting the results of this review include variations in the interventions between comparison groups and the relatively small number of studies included in the data analysis. Intervention outcomes emphasised change in the physical component of health-related QoL and in the mental component as well. Consequently, the study results collectively were mixed or hybrid interventions, with several studies reporting statistically significant improvements in groups receiving interventions compared with control groups.

The methodological quality of the included studies was considered good. Common methodological weaknesses in these studies included the lack of blinding of therapists and clients(Siu et al, 2009). While acknowledging that it is not always possible to blind participants in CBR intervention studies, given that all of the studies used blinding of the assessor reduces the potential for evaluation bias(Siu et al, 2009).Therefore, the authors feel that bias on the part of the outcome assessment has been negated. Granted that the lack of blinding has the potential to increase community-based participants' motivation to try to obtain compensatory treatment or put more effort into self-management to compensate their potential loss of the institution-based treatment(Siu et al, 2009).

Strength and Limitations

This review focused on 16 studies with10 RCTs included in the meta-analysis. RCTs and clinical trials are universally considered to be the "gold standard" designs providing strong evidence for guiding practice and to examine causal relationships between rehabilitation interventions and outcomes. The studies included in this review provided sufficient data to understand the components and recommendations regarding the use of CBR to improve quality of life, walking and balance in people with chronic stroke. Nonetheless, the findings need to be interpreted in the context of potential limitations. First, the search was restricted to studies published in English or French, and relevant studies in other languages may have been missed. Secondly, QoL is a complex construct and no distinction was made between general measures of QoL and those that were considered to be related to health.

CONCLUSION

This systematic review and meta-analysis aimed to review the content of community-based rehabilitation (CBR) and to compare its effectiveness with other

rehabilitative strategies. The results showed that CBR interventions can be used in many forms to improve QoL, walking capacity, and balance in people with chronic stroke. In low- and middle-income countries, where human resources for rehabilitation are very limited, it is clear that developing cost-effective models of rehabilitation care is fundamental for stroke survivors. Evidence from this review suggests that self-directed rehabilitations interventions could constitute a promising strategy for people with chronic stroke.

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