REVIEW

Home Care Practices that Improve Performance of Activities of Daily Living of Patients Post-stroke : A Systematic Review

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Abstract : Evidence is inconsistent on the effectiveness of home rehabilitation for patients post-stroke. This review aims to explore home care practices that improve the performance of activities of daily living of patients post-stroke. Adhering to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA), clinical trials and mixed-methods studies published from 2012 to 2022 were gathered from PubMed, ScienceDirect, EBSCO, and ProQuest in December 2022. The Mixed Method Appraisal Tool (MMAT) was used for quality appraisal. Narrative synthesis approach was utilized to present the findings. A total of 758 articles were screened, and 10 were included in the final analysis. Five out of ten programs were found superior compared with usual care. Factors that influence the effectiveness of the programs include the age of the participants, severity of disabilities, family participation, and presence of a multidisciplinary team. A multidisciplinary healthcare team approach toward the enhancement of knowledge, skills, and behaviors of patients and their families is common in effective home care. The role of nurses is emphasized not only as providers of direct patient care but also as coordinators of the healthcare team and patients and their families. This study provides insights for policymakers in developing healthcare system for post-stroke care. J. Med. Invest. 71 : 197-204, August, 2024

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INTRODUCTION

Stroke is the leading cause of disability and the second leading cause of death worldwide (1). It occurs when blood flow to the brain is interrupted due to a blockage or rupture in the brain's blood vessels. Without oxygen and nutrients, brain cells may die within minutes. This often leads to long-term functional health deterioration or death (2). Treatment requires emergency care in a specialized acute stroke unit in the hospital. A team of healthcare professionals with training in stroke care is ideally assigned to these special units.

The effect of stroke depends on the type, severity, and location of the affected part of the brain. Common affectations include muscle movement, cognition, speech, sensation, and emotion (3). Additionally, depression and dementia can deeply affect the physical recovery of patients with stroke (4). Transitional care for complex chronic conditions, such as stroke, stroke necessitates comprehensive interventions across various domains (e.g., medication adherence, blood pressure control, social determinants, physical function, and risk factor management) (5). Rehabilitation should be provided promptly and suitably across acute, convalescent, and chronic stages. Ensuring a smooth transition between treatments for each phase is crucial for enhancing and preserving functionality in stroke patients. (6).

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To monitor recovery, it is necessary to use tools to measure response to treatment. The Barthel Index measures the functional abilities of patients with neuromuscular or musculoskeletal disorders (7). It is widely used because of its simplicity (8). It has 10 assessment items and easy-to-understand scoring divisions of 2 to 4 levels. The results are out of 100 points, making it easy to compare scores. The Barthel Index was strongly associated with healthcare outcomes (i.e. mortality, discharge destination, and length of stay) and quality care, thus proving its value as an evaluation tool (8).

It is striking to note that 86% of deaths due to stroke occur in people residing in lower-income and lower-middle-income countries (LMICs) (9). Given the complexity and costly nature of stroke recovery, it is not surprising that the death rate is high in lower-income and LMICs. The shift from hospital-based to home-based rehabilitation is promising due to the sense of comfort it provides to patients (10). Considering that LMICs have approximately 3% of the purchasing power available for healthcare compared with high-income nations, a new home care model for stroke rehabilitation should be both effective and sustainable (11). However, there is a lack of consensus on the effectiveness of home-based rehabilitation. Current literature shows contrasting results about the effects of home-based stroke rehabilitation targeted toward persons with physical disabilities. The review by Gelaw *et al*. (10) concluded that home-based rehabilitation is not superior to in-hospital rehabilitation, while the review by Chi *et al*. (12) shows that home-based rehabilitation can have positive outcomes on functional abilities of patients with stroke. There is a need to clarify what factors should be considered in designing and implementing home-based rehabilitation. With the lack and maldistribution of healthcare workers, especially in LMICs, it is

important to explore the crucial role of nurses, who comprise the largest proportion of the healthcare workforce, in home-based rehabilitation.

This systematic review aims to determine which home care and rehabilitation interventions are effective in improving Activities of Daily Living (ADL) in patients after stroke. The results of this study will be significant in creating a post-stroke home care model that is holistic and sustainable.

MATERIALS AND METHODS

Design

This study employed a systematic review design and followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA) (13).

Search Methods

This systematic review seeks to answer the following clinical question based on the Population, Intervention, Comparison, and Outcome (PICO) framework : In patients post-stroke discharged to home (P), which home care practices (I) are more effective compared with (C) usual care in improving their performance of Activities of Daily Living (O). Home care practices refer to home-based rehabilitation, programs, or interventions provided by a healthcare professional through in-person and/or telehealth delivery. Usual care refers to established post-acute stroke care processes by a medical institution. A systematic literature search was conducted in December 2022 using the following databases : ProQuest, ScienceDirect, PubMed, and EBSCO. Keywords and Boolean operators were : ("self-care" or "physical function" or "activities of daily living") and ("stroke") and ("home care services" or "domiciliary care"). Table 1 shows the keywords and inclusion criteria used in the database search.

Inclusion and exclusion criteria.

This review included studies that met the specified eligibility criteria : 1) studies involving only patients post-stroke discharged to home ; 2) studies focusing on home-based rehabilitation, programs, or interventions aimed at improving the Barthel Index scores of the participants ; 3) type of articles : quantitative and mixed methods. The search was limited to articles published in English between 2012 and 2022. Studies found in grey literature, conference proceedings, books, book chapters, reviews, and dissertations were excluded.

Study screening

The researchers imported and managed all study citations found through the search strategy using Covidence. Covidence "is a web-based collaboration software platform that streamlines the production of systematic and other literature reviews" (14) from screening, full-text review, risk of bias assessment to data extraction and export. Two reviewers (AB, GS) independently evaluated the eligibility of each study based on titles and abstracts. If there were disagreements between the two reviewers, another reviewer was asked to evaluate the studies to break the tie. This was followed by the reviewers independently reading and assessing the entire text of the eligible articles and deciding which of them could provisionally be included. Finally, the five reviewers had a meeting to reach a consensus on the final selection of studies to be included.

Data extraction

Using a data extraction form, two reviewers (AB, GS) independently extracted the data. The following data was extracted : title, country, objectives, design, age of participants, sample size, intervention, outcome measure, statistical tools and results, and key findings.

Quality assessment

The Mixed Method Assessment Tool (MMAT version 2018) (15) was used to evaluate the quality of the articles. MMAT allows the assessment of different types of research designs. It was used to evaluate the scientific merit of randomized controlled trials and non-randomized studies included in this review. The total points scored was divided by the total points possible to calculate a quality score. Classification and range scores are as follows : weak (≤0.50), moderate-weak (0.51 to 0.65), moderate-strong (0.66 to 0.79), or strong (≥0.80) (16).

Data analysis

Meta-analysis was not done due to the heterogeneity of the reporting of Barthel Index outcomes. Data analysis was conducted through narrative synthesis by evaluating the intervention characteristics, statistical analysis and significance, and outcomes of the home care interventions. Narrative synthesis is used when meta-analysis is not possible (17). The intervention characteristics of each study were recorded and categorized into themes. The statistical analysis was examined based on appropriateness. Intervention outcomes are considered more effective if the Barthel Index difference is statistically significant compared with the control. The different authors explained the factors that influenced the outcomes of their study. These factors were recorded, further analyzed, and synthesized into themes.

RESULTS

Search Outcome

The search yielded 758 articles, of which 47 duplicates were removed. The 711 articles were screened for title and abstract. After removing 627 irrelevant studies, a total of 84 articles were subjected to a full-text review. There were 74 studies that did not meet the eligibility criteria, leaving a total of ten studies included for data extraction and analysis. Figure 1 shows the PRISMA flow diagram.

Quality Assessment results

The methodological rating for each study can be seen by responding "Yes," "No," or "Can't tell" to a series of criteria questions. The evaluation was completed by the primary reviewer (AB), and it was validated by the other two reviewers (GS and TT). The methodological quality of the included studies was typically rated as moderate-strong to strong, ranging from 75% to 100%, according to the MMAT classification of evidence quality. Three studies were assessed using the quantitative non-randomized study, while seven papers each were evaluated using quantitative randomized. Three of the ten studies were rated at 75%, while seven were given 100%. The evaluation outcomes from the studies are summarized in Table 1.

Characteristics of reviewed studies

The ten included studies were published between 2012 and 2020, three of which used quantitative non-randomized while seven employed a quantitative randomized study. The studies under review were carried out in different countries, including Taiwan, Portugal, Thailand, India, China, and Denmark. Table 2 offers more information about the characteristics of the reviewed studies.

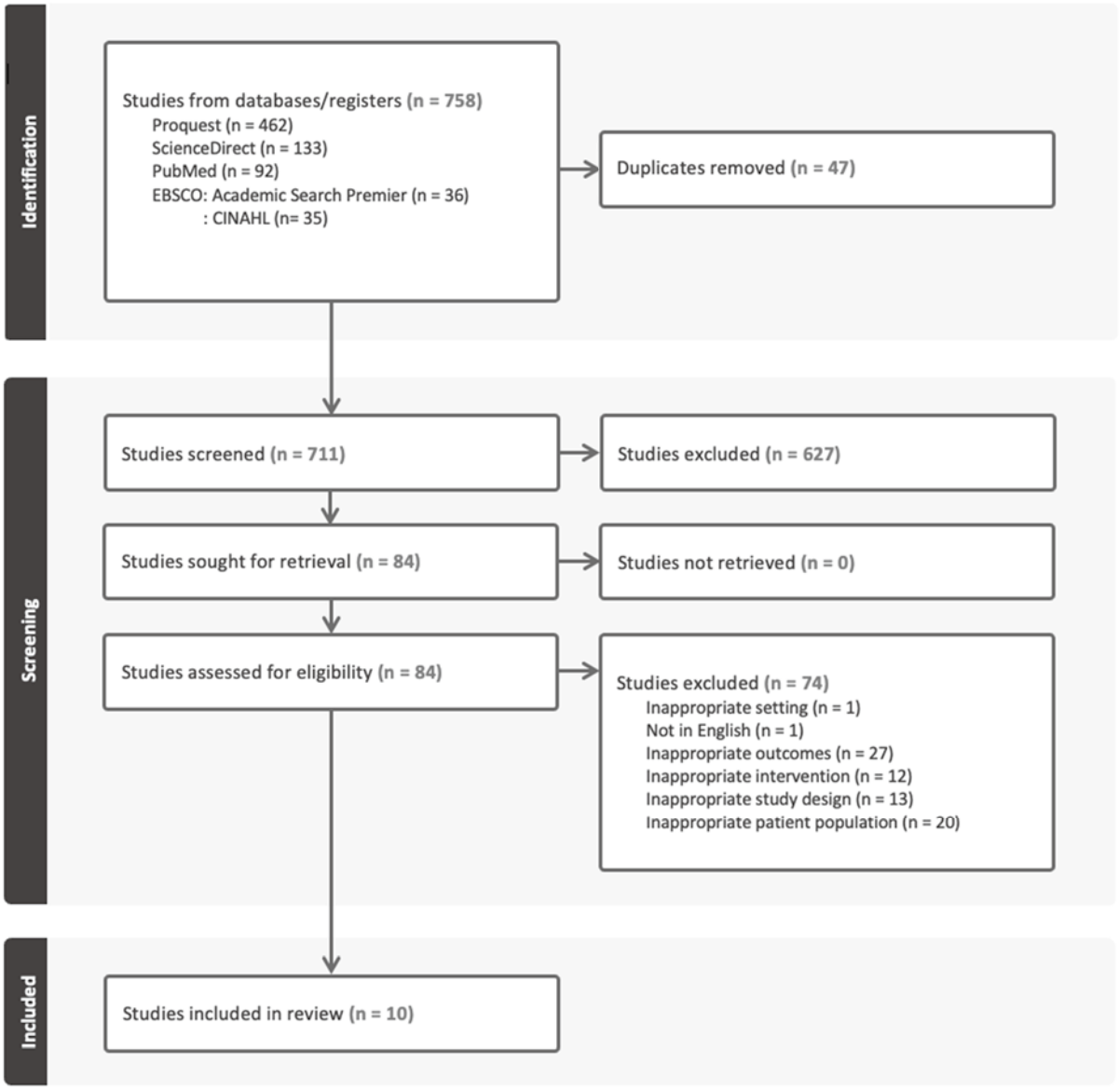

Figure 1. PRISMA flow diagram

Included studies' interventions and usual care

Five out of the ten included studies have home care practices that showed statistically significant differences in Barthel index scores compared to usual care or pre-intervention. Home care practices are home-based rehabilitation, programs, or interventions provided by a healthcare professional through in-person and/or telehealth delivery.

The study by Chaiyawat *et al*. (4) showed that an early home-based rehabilitation program in the first 6 months after ischemic stroke resulted in improved functions, reduced disability, and improved quality of life compared with usual care. The intervention they implemented involved a personalized exercise regimen conducted by a physical therapist in the patient's home once per month for a duration of six months. Moreover, caregivers were provided with counseling focused on education, application of learned information in practical situations, and problem-solving in the home. The authors (4) described usual care outpatient rehabilitation and home rehabilitation instructions prescribed by the patient's physician. There were also no follow-up home visits in the control group.

Chen *et al*.'s (18) study modified two home care models for their intervention, which reduced dependency and improved the quality of life for patients after stroke in China. This model consisted of a pre-discharge phase and a post-discharge phase. A medical-nursing team involving a chief physician, clinical pharmacist, community nurse, specialist nurse, psychologist, rehabilitation therapist, and specialist dietitian developed individualized plans for each patient. The team collaborated closely with both the patient and their family members throughout the process, and provided guidance in ADL. Follow-up and monitoring through telephone calls and home visits were provided by the community nurse. In the control group, the physician instructed the patients and caregivers on home care after stroke. The nurse

Table 1. Quality assessment scores of studies using MMAT (15)

Criteria \ Included Studies	Chaiyawat & Kulkantrakorn (2012)	Wong & Yeung (2014)	Chen *et al.* (2016)	Hiengkaew & Vongsirinavarat (2016)	Rasmussen *et al.* (2015)	Chen *et al.* (2017)	Lindley *et al.* (2017)	Pitthayapong *et al.* (2017)	Araújo *et al.* (2020)	Han *et al.* (2020)
Quantitative randomized										
1. Is randomization appropriately performed?	Y	Y	Y		Y	Y	Y			Y
2. Are the groups comparable at baseline?	Y	Y	Y		Y	Y	Y			Y
3. Are there complete outcome data?	Y	Y	Y		Y	Y	Y			Y
4. Are outcome assessors blinded to the intervention provided?	Y	Y	Y		Y	Y	Y			Y
5. Did the participants adhere to the assigned intervention?	Y	Y	Y		Y	Y	C			C
Quantitative non-randomized										
1. Are the participants representative of the target population?				Y				Y	Y	
2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?				Y				Y	Y	
3. Are there complete outcome data?				Y				Y	Y	
4. Are the confounders accounted for in the design and analysis?				Y				Y	Y	
5. During the study period, is the intervention administered (or exposure occurred) as intended?				C				Y	Y	
Quality score (%)	100 Strong	100 Strong	100 Strong	75 Moderate-strong	75 Moderate-strong	100 Strong	100 Strong	100 Strong	100 Strong	75 Moderate-strong

Y : Yes, C : Can't tell

Table 2. Summary of Included Studies

Author /Year/Study Title/Country	Objectives	IG	CG	Intervention	Key findings
Chaiyawat & Kulkantrakorn /2012/ Randomized controlled trial of home rehabilitation for patients with ischemic stroke : impact upon disability and elderly depression / Thailand	To create and assess the impact of a personalized six-month home-based rehabilitation program on the disability level and quality of life of ischemic stroke patients over a two-year period.	30	30	A physical therapist administered a personalized exercise regimen at the patient's home once a month for six months. Caregivers were offered individual counseling sessions, focusing on education, practical application of information, and problem-solving specific to home environments, if necessary.	An initial home-based rehabilitation program during the first six months following an ischemic stroke results in swifter enhancement of function, decreased disability, and enhanced quality of life compared to standard care.
Wong & Yeung /2014/ Effects of a 4-week transitional care programme for discharged stroke survivors in Hong Kong : a randomised controlled trial /China	To assess the efficacy of a transitional care program (TCP), a nurse-led four-week initiative was implemented, structured according to the assessment-intervention-evaluation framework of the Omaha System.	54	54	The TCP comprised a comprehensive pre-discharge assessment and care planning, succeeded by weekly family meetings, home visits, and telephone check-ins throughout the four-week period following discharge.	This study has presented evidence indicating that a four-week transitional program is sufficient to elicit effects on patient and clinical outcomes.

Author /Year/Study Title/Country	Objectives	IG	CG	Intervention	Key findings
Chen *et al*. /2016/ Quasi-experimental evaluation of a home care model for patients with stroke in China /China	To evaluate the effectiveness of a modified home care model in China	168	173	A modified home care model included guidance for the patient and family members in turning over, feeding, cleaning, mobility assistance, fall prevention, sputum excretion, getting in and out of bed, wheel chair use, medication compliance, joint movement, diet, food preparation, pressure ulcer prevention and treatment, wound care, tracheotomy care, oxygen use, urinary catheter care and nasal tube care.	Home care may be associated with higher quality of life and reduced dependency among stroke patients in China.
Hiengkaew & Vongsirinavarat /2016/ Home-Based Physical Therapy for Individuals With Stroke in Thailand / Thailand	To ascertain the improvement in voluntary movement, postural balance, and ADL capability following the administration of home-based physical therapy (HBPT) among stroke survivors in Thailand.	One group 2412		Thirteen physical therapists attended to their respective patients, with a maximum of 15 visits over a span of 7 months. The visit schedule included weekly visits for the first two months (totaling eight visits), visits every other week for the subsequent two months (totaling four visits), and monthly visits for the final three months (totaling three visits).	The intervention improved performance of ADL voluntary movement and postural balance for patients in Thailand.
Rasmussen *et al*. /2015/ Stroke rehabilitation at home before and after discharge reduced disability and improved quality of life : a randomised controlled trial /Denmark	To asses if inpatients subjected to home-based rehabilitation result in improved outcomes compared with standard care.	31	30	In-patients were brought home and performed physical exercises and ADL. Home rehabilitation was continued for up to four weeks after discharge.	The total amount of home-based training in minutes highly correlated with mRS, Barthel, Motor Assessment Scale and EuroQol-5DTM scores (P-values ranging from P<0.00001 to P=0.01).
Chen *et al*. /2017/ Effects of Home-based Telesupervising Rehabilitation on Physical Function for Stroke Survivors with Hemiplegia : A Randomized Controlled Trial / China	To assess the efficacy of home-based telesupervised rehabilitation in enhancing physical function among stroke survivors with hemiplegia, and explore the potential of this intervention to alleviate caregiver burden.	27	27	Therapists guided the participants in doing physical exercises and electromyography-triggered neuromuscular stimulation (ETNS) through video conferencing.	Home-based telesupervising rehabilitation is as effective as usual care in improving functional outcomes, and has the potential to reduce caregiver burden.
Lindley *et al*. /2017/ Family-led rehabilitation after stroke in India (ATTEND) : a randomised controlled trial /India	To evaluate the effectivness of Family-led Rehabilitation after Stroke in India (ATTEND) to deliver family-led rehabilitation after stroke.	623	627	The coordinators assessed the patients' conditions and conducted joint goal-setting. The family were trained in limb positioning, task-specific procedures and post-discharge care.	The family-led rehabilitation training did not influence any physical, affective, or quality-of-life outcomes.
Pitthayapong *et al*. /2017/ A Community Based Program for Family Caregivers for Post Stroke Survivors in Thailand / Thailand	To evaluate the effectiveness of the post-stroke care program within the community setting in Thailand.	31	31	The four-week program involved disseminating relevant information, conducting skill-building exercises during post-stroke care sessions, and employing strategies to boost the motivation and behavioral skills of family caregivers, all guided by the information-motivation-behavioral skills model.	The post-stroke care program enhanced the caregiving abilities of family caregivers, leading to improvements in the functional status of post-stroke patients and a reduction in complications.
Araújo *et al*. /2020/ A quasi-experimental study of the effect of an intervention on older stroke survivors' functionality /Portugal	To evaluate the efficacy of the InCARE (Intervention in CARE givers for the elderly following a stroke) program.	89	85	1. Training informal caregivers to put , "hands on" caring 2. Training handling techniques 3. Using telephone support	This study indicated that the InCARE program significantly influenced and proved effective in enhancing practical skills among a group of informal caregivers of stroke survivors. However, it did not show effectiveness in improving functionality in older individuals post-stroke.
Han *et al*. /2020/ Effect of home-based reablement program on improving activities of daily living for patients with stroke : A pilot study /Taiwan	To explore the impacts of home-based reablement on three aspects of ADL - namely, actual performance, ability, and self-perceived difficulty - in stroke patients.	12	14	Participants in the home-based reablement cohort were provided with a six-week home program, conducted by a single occupational therapist, which included engaging in ADL tasks for 50 minutes once a week.	The six-week home-based reablement program did not yield statistically significant effects on patients' perceived performance, satisfaction, and difficulty levels in ADL. However, stroke patients demonstrated potential for enhancing their ADL capability, particularly in tasks of personal concern.

IG : Intervention group ; CG : Control group

provided additional guidance one week after discharge via phone calls. However, there were no home visits or therapy delivered professionally at home or in hospitals.

Hiengkaew and Vongsirinavarat's (19) retrospective pre-test and post-test study of 2,412 patients with stroke, showed that home-based physical therapy improved ADL in patients who had suffered a stroke for up to 20 years. In the therapy service, 13 physical therapists provided patients with therapeutic exercises for up to 15 visits over 7 months. With the goal of improving ADL, the exercises were "designed to reduce spasticity, increase muscle strength, and/or train normal movement patterns and postural balance, depending on the body impairments" (19).

Pitthayapong *et al*. (20) showed in their study that their 4-week intervention was effective in improving the skills of family caregivers, resulting in improved functional status of patients after stroke. The program was based on the information-motivation-behavioral model and consisted of home visits to impart knowledge and skills to the caregivers. Information was provided on basic stroke pathology, complications, nutrition, and medication. They were also taught about nutrition, patient mobility, fall prevention, stress management, and social support. On the other hand, usual care was described as the nurse conducting home visits at least once within the first month post hospital discharge. The nurse evaluated the patient's condition and provided solutions to identified problems. Additional home visits may be provided by healthcare workers of Community Health Centers. However, in their study, more than 50% received only one home visit and the rest never received any home visits.

Wong and Yeung's (21) Transitional Care Program (TCP) was effective in improving quality of life, satisfaction, and modified Barthel Index scores. TCP was based on the Omaha Framework, which included environmental, psychosocial, physiological, and health-related behavioral interventions. Wong and Yeung enhanced these interventions by adding six domains : "(i) management and prevention of stroke recurrence ; (ii) symptom assessment and management ; (iii) enhancing physical function : self-care abilities and exercise ; (iv) healthy behavior : medication adherence and diet ; (v) building resilience : connections with the self, family, social life, and a Higher Being ; and (vi) emotion management." The authors also emphasized the critical role of the nurse not only as a care provider but also as a coordinator of the multidisciplinary team to ensure collaboration with patients. Both the intervention and control groups received usual care. The usual care was hospital-based physical training performed within the first three weeks post-hospital discharge. The therapist assesses the patient during the first session and suggests additional sessions when necessary.

Five (11, 22-25) studies did not report significant differences in the Barthel Index scores between intervention and control groups.

In Lindley *et al*.'s (11) Family-led rehabilitation after stroke in India (ATTEND), the coordinators assessed the patients' impairment and disability, provided information and joint goal setting in ADL and communication. The families were also trained in limb positioning, encouraged to practice task-specific procedures, and reminded of post-discharge care. Both intervention and control groups received usual care, which involved assessment and treatment by a physiotherapist during hospitalization. After discharge, patients received no or some outpatient therapy.

The InCARE program of Araújo *et al*. (22) provided skills training on ADL and telephone counseling for informal caregivers. The usual care, which the intervention group also received, included unstructured verbal education on home visits, availability of community resources and information on stroke consequences.

Rasmussen *et al*. (23) tested the effectiveness of stroke rehabilitation at home pre- and post-discharge. During hospitalization, their team drove the patient home and performed physical exercises and ADL. After that, the patient was returned to the hospital. After discharge, home training was provided based on patients' needs on ADL. The control group received standard care in-hospital and after discharge. The authors (23) described standard care as intensive training based on patient's ability. However, they could not assess the amount of training the control group received.

Han *et al*.'s (24) home-based reablement program, carried out by an occupational therapist, was focused on improving performance of ADL perceived as most important by the patients. Usual care involved twice a week 30-minute sessions each of occupational and physical therapy aimed at improving motor and cognitive functions.

Chen *et al*. (25) tested the effect of Home-based Telesupervising Rehabilitation. This involved face-to-face training on physical exercises with complementary occupational therapy and Electromyography-triggered Neuromuscular Stimulation (ETNS). After returning home, the patients and caregivers were guided via live video conferencing on physical exercises and ETNS. In the control group, the physical exercises and ETNS were conducted by therapists in the outpatient rehabilitation department.

DISCUSSION

Five out of ten included studies showed statistically significant differences in Barthel Index scores compared to usual care or pre-intervention. These effective programs focused on enhancing the knowledge, skills, and behaviors of patients and their families through a multidisciplinary approach. Patients and their families were taught problem-solving (4), basic home nursing (18), stroke knowledge, nutrition, and medication (20). Skills training was focused on ADL. Behavior change was initiated through counseling (4), emotional and stress management and social support (20), and family meetings (21).

Upon further examination, the difference in effectiveness is influenced by several factors, such as participants' age, disability and stroke severity, family participation, program timeline, presence of a multidisciplinary team, and frequency of home visits.

Advanced age decreases the potential of patients to improve their physical function compared with healthy adults (22). This is consistent with the review of Roy-O'Reilly and McCullough (26), who found that older patients with stroke experience increased mortality and morbidity rates and typically have poorer functional recovery compared to younger adults. Healthcare workers must discuss the level of expectations on outcomes especially for patients with advanced age. These patients are more vulnerable and, hence, would need more resources and dedicated caregivers.

Some studies (4, 20, 21, 23) have excluded participants with severe physical or cognitive impairment, which resulted in superior programs compared with usual care. It is suggested that future studies be conducted on patients with different levels of disability. Chaiyawat & Kulkantrakorn (4) also revealed that depression showed a significant correlation with dependency and diminished health-related quality of life, underscoring the necessity for mental health assistance. This highlights that mental health should not be neglected as part of holistic care. Even patients with higher Barthel Index scores, who have mental health concerns, may feel unmotivated to continue therapy, which results in a decrease in physical function abilities.

The study of Han *et al*. (24) also excluded patients with severe

disabilities but resulted in non-significant results. This may be due to the short length of the 6-week program.

The program timelines were also investigated in the included articles. Chaiyawat and Kulkantrakorn (4) and Rasmussen *et al*. (23) found that early supported discharge improved functional outcomes, suggesting that the healthcare team should start rehabilitation before discharge. The 2017 review of Coleman *et al*. (27) also warns that intensive rehabilitation within 24 hours of stroke is potentially harmful. Lindley *et al*. (11) attribute their non-significant result to the limited 30-minute daily intervention compared with the conventional Western standard of 1-2 hours of daily therapy. Neuroplasticity is the brain's ability to migrate functions of the damaged areas to the uninjured areas (27). The time course for neuroplasticity in humans remains unclear ; therefore, it is important for programs to last until rehabilitation goals are met. Wong and Yeung (21) highlighted that home visits in conjunction with telephone calls provide greater benefits compared to telephone calls alone for patients post-discharge. The commencement, therapy time, and discharge from professionally delivered therapy must fit the individual patient. The availability of human and financial resources, especially in LMICs, poses a challenge to the continuity of long-term rehabilitation. Policymakers should consider facilitating ease of access to long-term rehabilitation in the community settings.

All of the included studies agree that rehabilitation support at home, usually from family members, is crucial for functional recovery. Pitthayapong *et al*. (20) showed that family caregivers who understand the nature of stroke and have better skills in assisting during ADL resulted in better ADL function and reduced complications. Lindley *et al*. (11) argued that family dynamics influence the level of family support. It might not be sustainable to delegate all tasks from professionals to family members because these family members also have other priorities in life.

Rasmussen *et al*. (23) also revealed that coming home to family is considered by patients to be an important component of recovery. They can regain control over their lives and strive for re-personalization. Preparing the home does not only entail the preparation of the family members' knowledge and skills, but also the home's physical setup. Han *et al*. (24) suggested that home-based professionals should overcome environmental barriers such as the provision of handrails for toileting. The home should be modified in order to assist the patient in recovery safely.

The included articles have also highlighted the need for a multidisciplinary approach. Physicians plan the course of care for the patient. Physical therapists provide physical rehabilitation services and stroke knowledge. Occupational therapists assist patients in executing ADL. The nurses' roles include assessment, direct care, coordination of the multidisciplinary team, and linking the patients and their families to the healthcare team (21). An individual-tailored program from the healthcare team proves beneficial. (4, 25). In LMICs, there are unequal distribution of health professionals in terms of numbers and geographical locations. As nurses constitute the largest number of health professionals in the health system, other professionals may be able to shift other tasks to nurses with appropriate training and endorsement.

Chen *et al*. (25) contended that the aim of rehabilitation is to enhance individuals' capacity for daily activities in a cost-effective manner. This reduces stress on caregivers. Therapies that reduce travel costs may also be beneficial.

The included studies described usual care as a comparator to their respective interventions. Usual care were routine post-discharge interventions implemented in their respective research settings. For each included study, usual care varied in terms of health care provider, type and frequency of rehabilitation, and frequency of home visits. These variations may also account for the outcomes of Barthel Index scores when intervention groups were compared to control groups.

To elucidate these differences, usual care in some studies (4, 11, 21, 22) started with an assessment conducted by the physician or physical therapist, followed by hospital-based or home-based physical therapy. Han *et al*. (24) outlined standard care as comprising two sessions per week, each lasting 30 minutes, of occupational and physical therapy focused on improving motor and cognitive functions. Chen *et al*. (18) explained that one week after discharge, the nurse conducted a follow-up call via telephone and offered further guidance if needed. Pitthayapong *et al*. (20) described that the public health nurse conducted a home visit at least once within the first month post-discharge. Activities during home visit include monitoring the patient's condition, providing suggestions to reduce complications, and encouraging physical rehabilitation. Some institutions also offered some to no follow-up home visits to their patients (4, 11, 18).

Five studies (11, 22-25) did not report significant differences in Barthel Index scores with their respective comparators. However, other outcome measures in each study showed significant improvements or similar benefits. The Family-led rehabilitation (11) did not result in improved outcomes but also did not increase harms (e.g., caregiver burden). The InCARE program (22) improved caregivers' practical skills ; however, it did not improve the functionality of older people with stroke. A reablement program (24) showed non-significant effects on ADL in terms of patients' perceived performance, satisfaction and difficulty, but showed potential to improve ADL that patients perceive as most important. The home-based tele-supervising rehabilitation (25) showed improved functionality within groups but not between groups. Furthermore, both groups showed a significant decrease in caregiver burden. The authors explain that home rehabilitation saved travel time and provided an opportunity for patients to be with their families, contributing to improved mental health. Rasmussen *et al*.'s (23) stroke rehabilitation at home reported a strong correlation in rehabilitation duration and modified Rankin Scale and modified Barthel index scores. Furthermore, quality of life improved and reduced costs. These mentioned programs may serve as comparable alternatives to usual care, particularly those that can reduce costs and caregiver burden (23, 25) and initiate early discharge (23).

Overall, a systemic approach to home rehabilitation, with the nurses as care coordinators, is promising. There is a need to carefully coordinate the various components of rehabilitation, such as patient and family education, human resources, financial resources, and monitoring of patient outcomes.

This study was limited to examining the effects of home care practices on Barthel Index scores. Also, research articles from January 2023 to March 2024 are not included in this study. Future research may explore other measures of functional capacity and health-related quality of life. It is also recommended to consider the factors that influence the effectiveness of home care programs during their program design process. Policymakers may consider the results of this study in developing health system frameworks on post-stroke care.

CONCLUSION

Effective home care practices that improve patients' performance of ADL after stroke include the enhancement of knowledge, skills, and behaviors of patients and their families. A multidisciplinary healthcare team approach is common among the studies reviewed, with the nurses emphasized as providing not only direct patient care but also as coordinators of the

healthcare team and patients and their families. The programs were started before discharge and continued through home visits and telephone calls. Some programs showed the same effect as usual care. It became clear that there is a need for ongoing research with consistent evaluation criteria to measure the effectiveness of home care.

DECLARATION OF CONFLICT OF INTEREST

The authors declare no conflict of interest.

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