Effectiveness of Telerehabilitation in Improving Activities of Daily Living Among Poststroke Patients: A Systematic Review

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ABSTRACT

Purpose: Telerehabilitation (TR) refers to the delivery of rehabilitation services using information and communication technology between healthcare professionals and post-stroke patients that has a potential to deliver quality, accessible, cost-effective, and efficient rehabilitation services in a remote location. The purpose of this systematic review is to determine the clinical effectiveness of TR in regaining functional skills among post-stroke patients in terms of Activities of Daily Living (ADLs).

Methods: The study conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist for systematic reviews of intervention. The databases utilized were PubMed, Google scholar, Cochrane Library, PEDro, ProQuest, EBSCOHost, and Lilacs. Articles were screened by title, abstract, and full text, and data were then extracted.

Results: The search yielded 11159 total articles. After screening, 8 articles remained for review and data extraction. Based on this review's data, the effectiveness of TR towards poststroke patients' improvement shows a significant improvement on activity on daily living as incorporated with motor function, balance and gait that is supported by various outcome measures.

Conclusion: Among post-stroke patients, TR showed to be beneficial in improving motor function, quality of life and motor performance of the activities of daily living. However, the clinical effectiveness of TR remains unclear. Further studies are needed to prioritize improvements concerning clinical effectiveness of TR.

Key words: Telerehabilitation, post-stroke, activities of daily living

Telerehabilitation (TR) utilizes technology to provide rehabilitation services to patients, allowing them to have more options, offer treatments more effectively, and overcome geographic barriers to healthcare access. In the face of the COVID-19 outbreak, healthcare had to adjust and prioritize safe healthcare delivery by reducing direct contact with patients. Currently, 2.4 billion individuals worldwide may require rehabilitation. Existing rehabilitation services have been affected in 60 to 70 percent of countries due to the COVID-19 pandemic. Even after lockdowns and vaccines, physical distance will likely become the new normal. This gave an opportunity for TR to come to light in physical therapy services. Experts describe TR as using information and communication technology to provide rehabilitation services that aim to produce a credible alternative or supplement to center-based rehabilitation treatments from a distance. It can provide a wide range of services, including patient and family education, counseling, assessment, intervention, continuous monitoring, and offline self-management programs. Rehabilitation practice generally depends significantly on objective measurement and standardized testing procedures to guide the diagnostic process and evaluate the outcomes of therapeutic interventions. Like face-to-face assessments, pain, swelling, range of motion, muscular strength, balance, gait, and functional tests may all be done virtually with a family member/caregiver's assistance. TR delivers high-quality musculoskeletal treatment on a one-on-one basis. Remote muscle-strengthening activities increase physical functioning and quality of life while reducing discomfort. Earlier technology did not allow clinicians to get these measurements, necessitating skilled assistance on the other end. Perhaps the most major roadblock is physicians' inability to envision transforming what is typically "hands-on" therapy into a virtual medium. Telerehabilitation, according to Winters and Winters (2004), can help with self-efficacy and compliance with home programs by optimizing the timing, intensity, and duration of the rehabilitation program.[1] In line with rehabilitative research results and global social and demographic trends, bringing services into the home via technology has become the preferred form of care. The research says the most effective rehabilitation for patients is when done at home. If skills are taught in the environment in which they will be used, it is more likely to be learned and transferred to everyday activities. Thus, the effectiveness and feasibility of TR services need further exploration and clarification from various data of a collection of studies.

According to the study by Seron, et al., numerous researchers have investigated the effects of TR on several conditions in various patients.[2] In terms of increasing functional outcomes in patients with stroke, many researchers frequently conclude that TR is economical, and its effectiveness is equal to clinic-based rehabilitation in improving functional outcomes. However, current studies lack specific skills such as gross motor skills, functional fine motor skills, activities of daily living (ADLs), and quality of life in patients with stroke. Different musculoskeletal conditions also focus more on improving pain and joint mobility, motor recovery, or strength. According to Russell, et al., on which researchers compared the effectiveness of TR and in-person rehabilitation on ADLs in stroke, reported that there is only low or moderate-level evidence testing whether TR is a more effective or similarly effective way to provide rehabilitation. TR could significantly enhance the improvement of life, especially in surgery patients, yet the effects on physical outcomes are questionable. TR is effective in improving physical function, usual care is superior to usual care alone, and even treatment delivered exclusively through TR is more effective than face-to-face intervention in reducing pain and promoting improved physical function in a variety of musculoskeletal diseases. Besides these, TR programs make it more accessible over larger areas and lessen the economic limits by removing travel time and event expenditures. In contrast, services for rehabilitation are not considered important in Philippine rehabilitation settings. This may be understood given that facilities and resources should be directed toward more urgent medical concerns given the limited staff and inadequate healthcare resources. As stated in the study of Leochico, et al., the adoption of TR in the Philippines continues to be complicated by issues with stakeholders or the surrounding environment.[3] The lack of understanding, acceptability, and technical preparedness among stakeholders, as well as skepticism and resistance to change, are some of the internal challenges. The absence of standardized TR standards, a lack of local evidence, possible expenses, a lack of technological resources, data privacy concerns, dangers to patient safety, and ambiguous responsibility of rehabilitation providers are a few examples of external difficulties. Despite this pandemic, the TR program has the capacity to complete its rehabilitative aims; as stated in the study by Leochico, et al., human factors difficulties identified were a lack of stakeholder adoption, the availability of the knowledge and skills needed in e-health, and even concerns about data privacy.[3] Likewise, the lack of national e-health policies or laws, as well as a framework for health information systems, governance, and data privacy protections, is a widely known concern in developing countries. However, among all of these individual factors across sectors, the Internet was the most challenging in adapting to the telehealth approach in the Philippines. A more high-quality study is needed to verify the effectiveness of TR in regaining functional skills among post-stroke patients and the satisfaction of patients with TR while considering the current healthcare setting in the Philippines. In summary, the purpose of this study is to determine if TR has a significant effect on improving the activities of daily living (ADLs) of post-stroke patients. This systematic review seeks to achieve the following objectives: To determine the clinical effectiveness of TR in regaining functional skills among post-stroke patients in terms of ADLs and the viability and adaptation of TR in the Philippine healthcare setting. Secondary to this objective is to identify the patient satisfaction and cost-effectiveness of TR.

MATERIALS AND METHODS

Ethics Statement

The FEU-NRMF IERC ruled the study is exempted from ethical review since there was no participation of human subjects.

Study Design

This study conducted the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist for systematic reviews of intervention. The PRISMA 2020 statement is a 27-item checklist addressing the introduction, methods, results, and discussion sections of a systematic review report; however, items that fall under meta-analysis were removed.[4] This study followed a guideline preferred for systematic review and meta-analysis steps adapted from Tawfik, et al. (2019).

Eligibility Criteria

The study was considered pertinent if it met the following criteria: Published in the English language or with English translation, studies that included post-stroke participants at all levels of severity and all types of strokes, undergoing TR delivered by physical therapists and functional skills were assessed using an outcome measure such as but not limited to Barthel Index, Stroke Impact scale and Fugl-Meyer assessment. Only randomized controlled trials and cohort studies were included in this review.

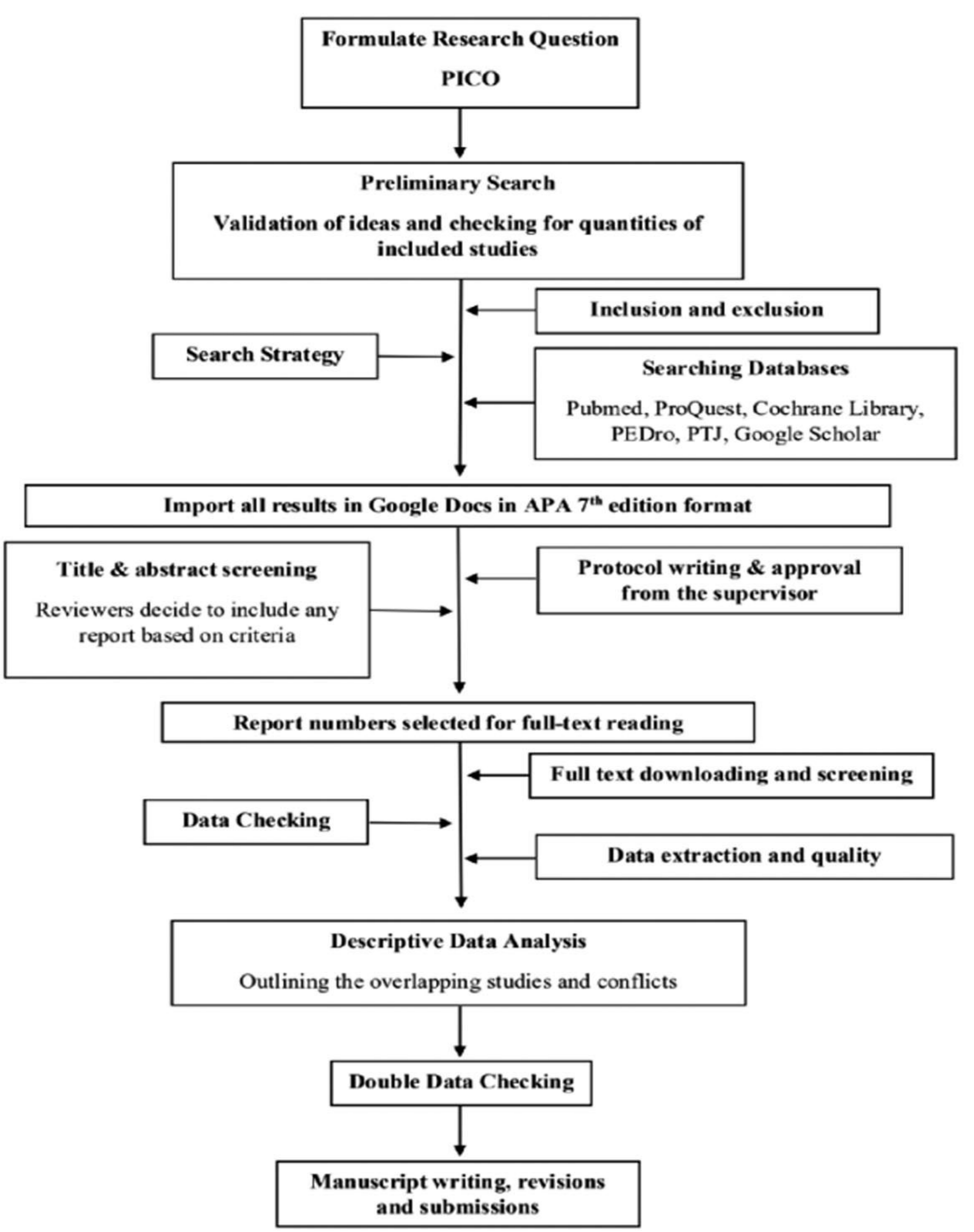

Figure 1. Guideline preferred for systematic review and meta-analysis steps adapted from Tawfik et al. (2019)

The review excluded studies that need paid access that is outside the FEU-NRMF partnered databases, incomplete study, studies produced prior to the year 2012, studies involving a non-stroke participant, mixed method or qualitative type, and studies that included other intervention/s outside physical therapy scope, robotics, and virtual reality. Articles that included pediatric patients as participants were excluded.

Information Sources

The researcher executed a comprehensive search of the following databases: Pubmed, Google Scholar, Cochrane Library, PEDro, ProQuest, EBSCOHost, and Lilacs. The researchers searched "TR and Cerebrovascular Accidents" from the year 2012 onwards on any stated databases. Searching for publications related to the themes was included in the electronic database search. The reference lists of included studies or pertinent reviews found were checked through the search to verify that all the materials were covered.

Search Strategy

A scoping search was done by using Google Scholar as the primary database to estimate the number of studies available on this topic with the following terms used "telerehab* AND stroke*" and a total of 9,960 studies were identified.

For the main search strategy, the following search terms for all databases were used: "telerehab* AND post-stroke patients", "telerehab* AND stroke*", AND "telerehab* AND cerebrovascular accident". A total of 4,880 studies were retrieved using "telerehab* AND post-stroke patients" from all databases; 11,159 studies for "telerehab* AND stroke*"; and 1,298 studies for "telerehab* AND cerebrovascular accident". As relevant studies were identified, researchers checked for additional relevant articles by hand searching and citation chaining.

Study Selection

This study used a PRISMA flow diagram as the "records identified through database searching" section displays the number of records retrieved by the database. Two groups of reviewers (consisting of three reviewers per group) independently screened the title and abstracts using standardized forms and determined the studies that fall under inclusion and exclusion. The same set of reviewers examined the rest of the data based on the complete text to confirm that they fit all the eligibility criteria. Team discussion, and a single third reviewer handled the inconsistencies to establish an agreement in the selection process. The reason for the exclusion of data was documented. (Figure 2)

Data Collection Process & Data Items

The following characteristics were collected from the studies included in the review: author, study design, participants, outcome measure/s, intervention, and result. To further appraise, a quality assessment for systematic review was conducted through a checklist. The third reviewer was the one that resolved any disagreements. To clear up any ambiguities, study authors were contacted. The Table 1 shows the list and definition of all outcomes for which data were sought, as well as the prioritization of primary and secondary outcomes, along with justifications.

Primary Outcome

The primary outcome was based on the following objectives: ADLs and adaptation of TR in the Philippine setting. This aimed to acquire a broad understanding of the effect of TR if studies are not included or eliminated based on the outcome measures, they utilized.

Secondary Outcome

The secondary outcomes were the following: Cost-effectiveness of TR was based on the efficacy, lesser costs of the interventions used, and availability of resources to the patients. Patient satisfaction with TR was based on their feedback, PT-patient interaction, challenges experienced during the consultation and rehabilitation, and other measures mentioned in the studies.

Quality Assessment

There were 2 quality assessment tools used in this study. Risk of bias for randomized controlled trials was assessed using the Cochrane Collaboration tool, while the quality assessment tool developed by National Heart, Lung, and Blood Institute (NHLBI)

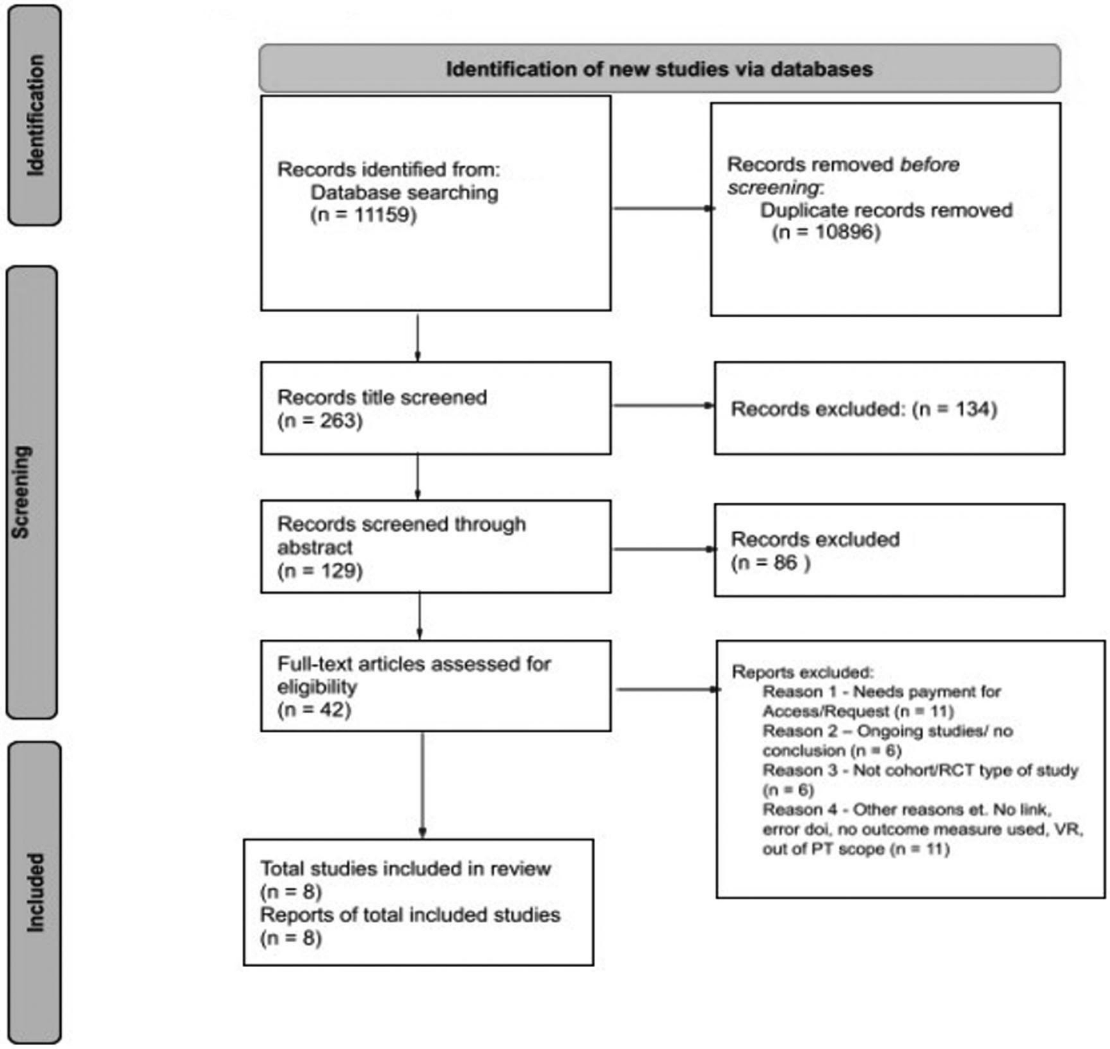

Figure 2. Study selection process using PRISMA 2020 flow diagram.

for Observational Cohort and Cross-Sectional Studies was used to assess the quality of the articles included in the review. This is a 14-question tool designed to systematically assess the internal validity of a study. Each question can be answered with yes, no, or not reported, and the number of affirmative responses was totaled. Two authors independently assessed the risk of bias in each study.

RESULTS

Study Selection

A search for articles produced a total of 11,159. However, after removing duplicates, only 263 articles remained whose titles were screened. Out of these, 134 were excluded, leaving 129 articles for abstract screening. After reviewing the individual abstracts, 42 articles were selected for full-text screening. Finally, after the complete screening process, only 8 articles were deemed suitable for inclusion in the review.

Study Characteristics

The 8 studies consisted of participants with post-stroke in regaining functional skills (ADLs with motor function, balance, and gait) that participated in daily home exercise programs, including strengthening exercises, balance training, range of motion exercises, patient education about stroke, practice tasks, games, and monitoring through video and telephone calls. (Table 1).

Table 1. Study characteristics.

Author/s	Study Design	Participants (n)	Outcome Measures (Primary; Secondary)	Intervention	Results of the Study
Chumbler et al. (2012)[5]	Randomized Controlled Trial	Ischemic or hemorrhagic stroke aged 45 to 90 years within the previous 24 months (n=52)	**Primary:** The motor subscale of the Telephone Version of the Functional Independence Measure (FONEFIM); The Overall Function Component of the Late-Life Function and Disability Instrument (LLFDI) **Secondary:** LLFDI Subscale Component Function: a) Upper Extremity Function; b) Basic lower extremity function; c) Advanced lower extremity function; and d) LLFDI Disability Component	Three 1-hour televisits, daily in-home messaging device monitored weekly, and five telephone intervention calls within 3-months period + Veteran Affair care, such as home health	Physical function of post-stroke patients was significantly improved with the Stroke TR (STeleR) intervention, with improvements persisting for up to 3 months after the intervention including 3 1-hour home visits and 5 telephone intervention calls were completed. Considering that there are limited resources available for stroke survivors, STeleR could be a useful adjunct to traditional post stroke rehabilitation.
Bellomo et al. (2020)[6]	Cohort study	Chronic stroke outpatients (n=25)	Fugl-Meyer Scale (FM)	At least 3 sessions with the WeReha for a minimum of 15 minutes each, (recommended 30 minutes for each session). Video-guided exercises with visual and voiced or ringing biofeedback for balance rehabilitation, strengthening the muscles of the legs and arms, and range of motion .	The FM scale scores ($p = .003$) and mRS scores ($p = .047$) were significant after treatment. In addition to conventional home exercise program, it could be used as a telerehabilitative resources.
Cramer et al. (2019)[7]	Randomized Controlled Trial	Stroke patients who had arm motor deficits (n=124)	**Primary:** Fugl-Meyer Arm motor Scale (FM) **Secondary:** Box and Blocks test and Stroke Impact Scale-hand motor domain	36 treatment sessions (70 minutes supported by videoconferencing which consisted of exercises, functional games and stroke education plus a 10-minute break; 18 supervised and 18 unsupervised) during a 6- to 8-week period	Compared with TR therapy, in-clinic therapy was comparable in effectiveness for improving function after 6 weeks since both groups improved their function. The TR group performed 1,031 arm movements per day, suggesting that TR may be useful for maximizing

					brain plasticity after having a stroke.
Deng et al. (2012)[8]	Randomized Controlled Trial	Chronic stroke with impaired ankle dorsiflexion (n=19)	**Primary**: Ankle DF	TR at home, between the participant and therapist, using a computerized movement training for the track group consisting of 60 training blocks per day with 3 trials per block amounting to 20 days of 3,600 trials. The group has a command of "track" on their computer screen, with target waveform, tracking response, and knowledge of results in each trial.	Compared to move group, the track group has significantly larger dorsiflexion during gait. Even though fMRI did not show significant differences in volume, percent volume, and intensity of cortical activation, there was a significant difference between 2 groups on the frequency count of the number of participants as the track group decreased their pretest to posttest measurements while the move group increased.
Dodakian et al. (2017)[9]	Cohort study	Poststroke with stable arm motor deficits (n=12)	**Primary:** Fugl-Meyer scale **Secondary:** Box and Blocks, Stroke Impact Scale (Hand motor subsection), NIH Stroke Scale, MMSE, Barthel Index, Geriatric Depression Scale	28 days of TR using a system delivered to their home consisting of 1 structured hour focused on individualized exercises and games, stroke education, and an hour of free play.	Participants had arm repetitions average of 24,607 ± 9934 individually and showed significant increase in arm motor status with 50% of them exceeding the MCID. There is also an increase in stroke prevention knowledge after daily stroke education via TR.
Sarfo et al. (2018)[10]	Cohort study	Stroke survivors (n=20)	Stroke Levity Scale (SLS), Modified Ranking Score (MRS), Montreal Cognitive Assessment (MOCA)	Post-stroke patients received Smartphone with the 9zest Stroke App® to deliver individualized, goal-targeted 5-days-a-week exercise program that was remotely supervised by a tele-therapist for 12 weeks.	Participants improved their motor impairments with high satisfaction from using 9zest Stroke App that has an individualized, goal-targeted exercise program for 5 days a week for 12 weeks.
Saywell et al. (2021)[11]	Randomized Controlled Trial	Hemispheric stroke (n=95)	**Primary:** Physical subcomponent of SIS **Secondary:** Grip strength, SSEQ, overall SIS	ACTIV: Each participants received 4 face-to-face visits, 5 structured phone calls, and personalized text messages for 6 months	ACTIV may not be an effective intervention in improving physical function compared to the usual care as there is nonsignificant difference between the groups measured by SIS.

Wu Msc et al. (2020)[12]	Randomized controlled trial	ischemic or hemorrhagic stroke (n=61)	**Primary:** FMA, BBS, TUG, 6MWT, MBI	ACUTE PHASE: Good limb position (No more than 2 hours in the same position); Breathing training (5-7 minutes, 2 times a week); Joint activity maintenance training(10 groups, 2 groups per day); Bed turning training(10 per group, 2 groups per day); Early balance training (10-15 minutes each time, 1 time per day); Early walking ability training(10 per group, 2 groups per day); RECOVERY PERIOD: Sitting-up training; Balance training(15 minutes each time, 1 time per day); Antispasmodic training(10 per group, 2 groups per day); Intensive Training of Active Activity Ability of Limbs;Walking function training; Activity Training of Daily Life Additional:home remote rehabilitation guidance uses the Internet-based TCMeeting v6.0 video conferencing system.	Both groups were significantly improved in terms of motor function and quality of life, but the intervention group showed greater improvement in Fugl-Meyer Motor Function Assessment, Berg Balance Scale, and Stroke-Specific Quality of Life Scale.

Clinical Effectiveness of Telerehabilitation

The review's data highlight the positive impact of TR on enhancing motor performance in daily activities for individuals recovering from strokes. Notably, among the eight studies considered, three showcased clinical effectiveness, with over half of the subjects surpassing the minimal clinically important difference compared to their baseline performance.

Wu, et al. (2020) conducted a study that underscored the efficacy of a secure and efficient TR exercise program.[12] This program was shown to assist stroke patients in recovering motor function and improving their daily living and overall quality of life. Similarly, studies by Sarfo et al. (2018)[10] and Bellomo et al. (2020)[6] reported favorable outcomes in post-stroke patients who engaged in daily exercise routines, encompassing upper and lower limb exercises. These exercises contributed to the enhancement of daily living activities as measured by the Barthel index. It is worth noting, however, that Deng, et al. (2012) reported limited improvements in physical activity following TR among post-stroke patients, suggesting the need for more extensive trials to assess the cost-effectiveness of this approach.[8]

The study by Huiqiong Deng, et al. (2012) provided insights into the improvement of ankle dorsiflexion through complex movement training within the framework of TR.[8] Other notable studies, including Bellomo, et al. (2020)[6], Cramer, et al. (2019)[7], Dodakian, et al. (2018)[9], and Wu, et al. (2020)[12], reported significant enhancements in Fugl Meyer scores, which is a common metric for evaluating patient mobility goals. While there were positive trends observed in the Balance Berg Scale (BBS), this scale did not consistently meet the Minimal Detectable Change for individuals dealing with chronic stroke.

Patient Satisfaction in Telerehabilitation

The research review also delves into the aspect of patient satisfaction within the context of TR. The consensus among various studies is that patient satisfaction is closely intertwined with the success of TR programs.

Bellomo, et al. (2020) underlines that TR, exemplified by the WeReha program, is not intended to replace conventional therapy but rather complement it.[6] This perspective aligns with Cramer, et al. (2019), who asserted that TR is as effective as in-clinic therapy in improving arm motor function and stroke-related knowledge.[7] One notable recommendation from these studies is the importance of maintaining engagement through meaningful interactions with therapists. High levels of patient motivation were identified as key contributors to the effectiveness of TR interventions. Nevertheless, challenges such as internet stability and adherence issues, particularly in unsupervised home programs, posed potential hurdles to achieving optimal outcomes.

Given these findings, the incorporation of readily accessible and cost-effective technologies in TR setups emerged as a strategic approach. This approach, as highlighted by Saywell, et al. (2021), could significantly extend post-stroke rehabilitation to patients discharged to rural areas with limited access to traditional rehabilitation resources.[11] This becomes especially relevant in regions grappling with staffing shortages and resource constraints, offering a potential solution to address the accessibility gap in rehabilitation services.

Cost-effectiveness in Telerehabilitation

Dodaikan, et al. (2018) highlighted key barriers—access, cost, and compliance—that hinder optimal post-stroke physical rehabilitation.[9] The accumulated evidence across various studies demonstrates that TR effectively addresses these barriers. As indicated by Chumbler, et al. (2012), TR holds promise, particularly for individuals in low socioeconomic status and rural regions. Supporting this, Bellomo, et al. (2020) advocate for TR as a viable substitute for traditional post-stroke rehabilitation, especially in remote or underserved areas.

Considering potential internet instability, the WeReha program has strategically mitigated this concern by designing a setup that operates with limited dependence on continuous internet connectivity. Instead, intermittent connectivity is used solely for data uploads from patient activities. While Deng, et al. (2012) envisions TR not as a replacement but as a complementary element in the rehabilitation journey, it offers a positive outlook for managing costs, especially as healthcare expenditures continue to rise.[8]

Saywell, et al. (2021) further emphasize that leveraging readily available, cost-effective technology in TR setups can effectively extend post-stroke rehabilitation to individuals discharged to rural areas.[11] This becomes particularly significant in regions where staffing and resources are scarce, potentially bridging the gap in accessibility to rehabilitation services.

Table 2. Quality assessment for observational cohort and cross-sectional studies.

Quality assessment tool	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
Bellomo et al[6]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	Yes	Yes	Yes	NR	Yes	Yes	12
Dodakian, McKenzie et al[9]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	NR	NR	Yes	NR	Yes	Yes	10
Fred S. Sarfo, et al[10]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	Yes	Yes	Yes	NR	Yes	Yes	12

Risk of Bias Assessment

National Heart, Lung, and Blood Institute (NHLBI) for Observational Cohort and Cross-Sectional Studies were used to assess 3 studies. To qualitatively evaluate the results, those above 12 were rated good, those below 9 were deemed to be poor, and those between 9 and 12 were fair studies. As a result, three out of three studies have a fair rate. (Table 2).

Five studies were evaluated using Cochrane Collaboration's tool; all were rated good in random sequence generation, allocation concealment, selective reporting, blinding and attrition bias. One study was reported unclear on other biases. (Figure 3).

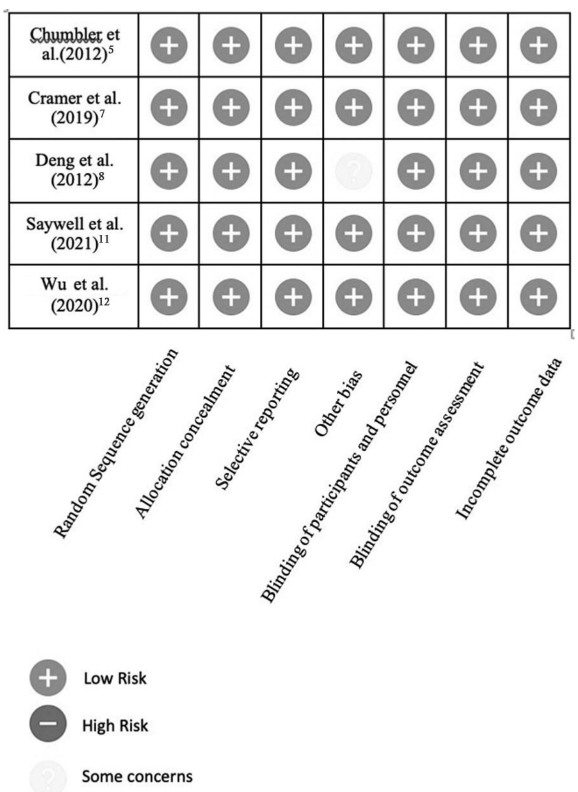

Figure 3. Risk of bias assessments for studies in a Cochrane review.

DISCUSSION

The study primarily aimed to assess the clinical effectiveness of TR in post-stroke patients' functional skill recovery for Activities of Daily Living (ADLs). The review encompassed eight studies, including randomized controlled and observational ones, involving 408 stroke patients within a 24-month period from stroke onset. The findings highlight the potential of TR in enhancing motor performance and ADLs, with several studies demonstrating clinical effectiveness surpassing the minimal clinically important difference. Wu Z, et al. (2020)[12], Sarfo FS, et al. (2018)[10], and Bellomo RG, et al. (2020)[6] underscore TR's efficacy in improving motor function and overall quality of life, albeit mixed results reported by Deng H, et al. (2012) pointing to the need for further research into cost-effectiveness.[8]

Patient satisfaction is identified as vital in successful TR programs. Alignment between Bellomo RG, et al. (2020)[6] and Cramer SC, et al. (2019)[7] emphasizes engagement's role in complementing traditional therapy, and patient motivation correlates with positive outcomes. Yet, internet stability and adherence challenges suggest strategies for sustaining patient commitment.

Recognizing barriers—access, cost, and compliance—Dodaikan S, et al. (2018) highlights TR's potential to overcome these challenges effectively. Aligned with Chumbler NR, et al. (2012)[5] and Bellomo RG, et al. (2020)[6], both supports TR as a great leverage of extending rehabilitation in underserved populations. WeReha's approach to mitigate internet instability showcases adaptability. Deng H, et al. (2012) emphasizes TR's complementary nature, suggesting cost-effective recovery strategies.[8] Saywell NL, et al. (2021) suggests technology adoption for post-stroke rehabilitation in resource-scarce regions.

Despite challenges, implications suggest that TR can enhance clinical effectiveness, patient satisfaction, and cost-effectiveness. Patient-centered approaches and technology integration are vital, yet further research is needed for optimal implementation.

In the Philippines, amid COVID-19 disruptions, TR offers an alternative to limited healthcare resources. Challenges persist, including provider readiness and data privacy concerns. The review encourages exploration of TR despite obstacles.

While not superior to conventional methods, TR complements clinical practice, aiding decision-making. The review's findings emphasize its effectiveness in improving motor function, ADLs, independence, and quality of life.

Limitations for this review were identified, which include time constraints, budget limitations, and reliance on existing data. Onsite data gathering was absent due to the systematic review's focus on existing resources, omitting physical interviews.

CONCLUSION

In summary, the reviewed studies collectively demonstrate that TR holds promise in improving motor function among post-stroke patients. However, variations in outcome measures, individual motivation, and technological considerations are pivotal factors influencing the success of TR interventions.

Contributions to the implementation of patient satisfaction were sought. Further studies should report on the clinical effectiveness of ADLs. In line with this, although the Philippine adaptation regarding the use of TR was deemed feasible, local experimental studies are encouraged to be conducted to support this claim.

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