Review Article :

Role of Social Support and Technology Interventions in Exercise Adherence among Older Adults with Stroke A Narrative Review.

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Received on Feb 07, 20224, accepted for publication on May 06, 2024, dx.doi.org/10.5455/mjhs.2024.03.014

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Abstract

Stroke is a major cause of disability among older adults, and exercise is a critical component of post-stroke rehabilitation. However, exercise adherence among stroke survivors is often low, leading to reduced quality of life and functional outcomes. This narrative review aims to explore the types and effectiveness of social support and technology interventions in promoting exercise adherence and improving health outcomes among older adults with stroke. The studies included in this review were relevant (original articles, systematic reviews, and meta-analyses) and reported on exercise adherence, social support, and technology within the context of older adults with stroke. The studies extracted for this narrative review were research articles published from 2010 till date. Electronic databases were searched to identify relevant studies. Our findings report that group-based exercise programs are more effective social support interventions for long-term exercise adherence than home-based individual programs for older adults. Technology, particularly remote monitoring devices and platforms, is also been effective in improving engagement and adherence to exercise programs, leading to better functional outcomes and enhanced quality of life for older adults with stroke. In conclusion, social support and technology are effective strategies for promoting exercise adherence in post-stroke older adults. However, further research is needed to identify how best to complement social support approaches with technology tools in clinical practice for optimal outcomes. Through these strategies, healthcare professionals can improve functional outcomes and enhance the quality of life for stroke survivors.

Keywords:
Stroke, Older adults, Social Support, Technology, Exercise.

Introduction

Stroke is one of the leading causes of disability among older adults, making them one of the largest populations treated in physical rehabilitation clinics. [1] An important component of physical rehabilitation for stroke management is exercise. Exercise adherence (EA) is an important factor in promoting recovery and improving the outcomes of older adults post-stroke. [2, 3] It is key in achieving functional recovery and community reintegration. Contrarily, the majority of stroke survivors are physically inactive. The American Heart Association/American Stroke Association reports a high prevalence of physical inactivity among stroke survivors. This consequently contributes to cardiovascular deconditioning, social isolation, and reduced health-related quality of life (HRQOL). [4]

Adherence is defined as the level to which a person's behaviour corresponds with agreed prescriptions from a clinician [5]. According to Miller et al. [6] exercise adherence is defined as 'performing any part of the exercises as instructed to do with or without modifications'. Previous studies have reported a positive dose-response between exercise adherence and functional outcomes from hospital rehabilitation to rehabilitation in the community. Adherence to recommended exercise interventions in the management of stroke in older adults is important for improving functional independence and quality of life.[7] In the United States, 65% of stroke survivors adhered to an administered home exercise program for 6 months after hospital discharge.[6] Also, in a study conducted by Jurkiewicz et al.[8] adherence of stroke survivors dropped from 100% doing a supervised exercise program to 76% and 55% after they were instructed to continue exercises independently. These findings suggest that there is a need to understand the factors that influence exercise adherence to develop appropriate and effective interventions.

Exercise adherence is influenced by various factors, including individual factors such as motivation, self-resilience, and support from close social networks like the family. [9] At the healthcare system and community level, factors such as instructions from the supervisor, regular monitoring, and cultural practices influence exercise adherence.[10] It is recommended that supervised rehabilitation programs have 100% adherence rates among stroke survivors.[6] Supervised rehabilitation programs are programs that are directed or led by a supervisor, for example, a physiotherapist or caregiver. However, these supervised programs are not readily available and accessible to all stroke survivors who can benefit from them. Hence, there is a need

to explore predictors such as social support and innovative approaches using technology to improve exercise adherence among stroke survivors. There are existing studies that support that leveraging technology and including social support systems in the rehabilitation process contributes positively to exercise adherence. [11, 12]

Social support is one of the key factors influencing exercise adherence in stroke management. [13] Evidence shows that older adults with stroke often lack the means, specific direction, and motivation to exercise in their daily lives. [14] Also, their immediate environments like the home setting can present barriers to exercise adherence, such as increased risk of falls and limited supervision. To address these challenges, group-based exercise programs are more effective for long-term exercise adherence than home-based individual programs for older adults. [15] Also, Strom and Egede investigated the relationship between social support and exercise adherence among special populations, such as older adults and diabetes patients. [16] The findings suggest that individuals who have positive social support from their family, friends, or other patients for exercise are more likely to adhere to an exercise program to maintain their exercise behavior in the long term.

Technology has also provided a solution to improve engagement and adherence to exercise programs. These innovative solutions can tackle barriers that limit accessibility to rehabilitation programs. Ultimately, this leads to better functional outcomes and enhanced quality of life for stroke survivors. One of the key ways in which technology has increased exercise adherence is through remote monitoring. [17] Through remote monitoring devices and platforms, stroke survivors can receive personalized feedback, track their progress, and stay connected with professionals or supervisors. This approach provides the necessary support to overcome logistical, psychosocial, and physical barriers.[18]

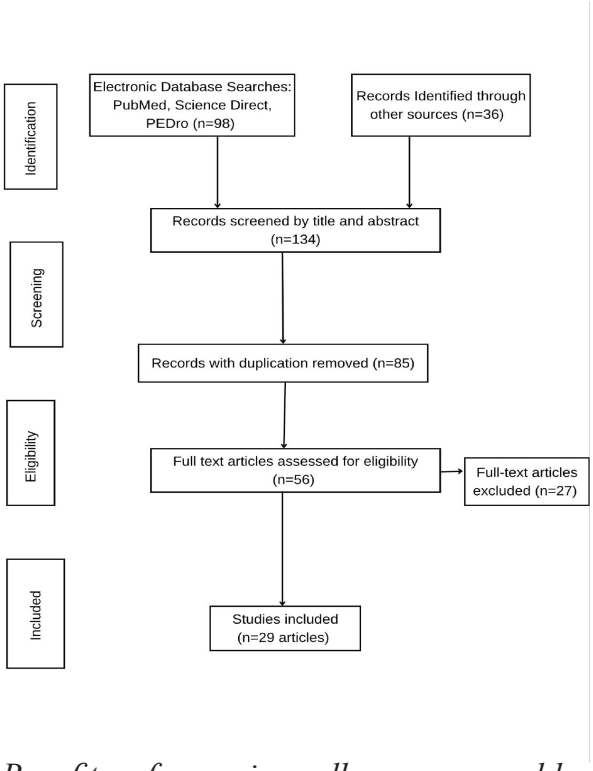
Social support and technology have been identified as the key strategies for promoting exercise adherence among post-stroke older adults. Hence, there is a need to expand on the effectiveness of both social support and technology interventions on exercise adherence and health outcomes among older adults post-stroke. Therefore, this review aims to identify different social support and technology interventions, the impact of both interventions on exercise adherence and health outcomes, and the challenges associated with their use among older adults post-stroke.

Methods

Search Strategy

The studies included in this work were relevant (original articles, systematic reviews, and meta-analyses) and reported on exercise adherence, social support, and technology within the context of post-stroke among older adults The studies extracted for this narrative review were limited to English-published research articles published from 2010 till date. The following electronic databases were searched: PubMed, PEDro, and Science Direct. Google Scholar and Google were the search engines used in the study.

The search strategies including their synonyms used were: Exercise, OR Adherence, OR Exercise Adherence, AND Older Adults, OR Social Support, OR Technology, AND Stroke, OR Impact. The advanced search options were used for PubMed. Studies were included if 1) the population were stroke survivors 2) the population were between ages 60 and above 3) studies published within the last 10 years 4) Studies focusing on interventions involving social support and/or technology. From search results, 134 articles were found in total. The abstracts and titles of all articles were screened independently by two researchers (OM and OO). Duplicate articles (n=85) were excluded after screening. 56 full-text articles were screened for their match with the eligibility criteria and 27 were excluded. After this thorough review, a total of 29 articles were then included (Figure 1).



Benefits of exercise adherence on older adults with stroke

Immediately after a stroke, therapeutic exercises are designed to address impairments and promote functional outcomes on time. The primary objective of these exercises is to prevent complications arising from prolonged inactivity, to restore voluntary movement, and to regain basic daily activities. [19] Studies have shown that early mobilization, within 24 hours after the stroke, can lead to faster ambulation and functional recovery. After being deemed medically stable, the exercises focus on maintaining or improving pre-stroke activity levels, with an emphasis on increasing

task difficulty, repetition, and functional practice. [19, 20]

Exercise rehabilitation is important for older adults post-stroke, and adherence to the exercise program is necessary to achieve the health benefits. [7, 21] Several studies have emphasized the importance of exercise adherence among older adult stroke survivors. [22] A study conducted by Mahmood et al. 9 revealed that adherence to a home exercise program is necessary for improving functional outcomes post-stroke. In another study by Liu et al. [23], the group that received adherence strategies reported better exercise adherence and mobility than the control group. Adherence to exercise not only improves functional outcomes but also helps prevent secondary health conditions associated with physical inactivity, such as low bone density and impaired balance that can result in frequent falls. [24] Frequent falls are a secondary consequence of stroke and can contribute to a 2 to 7-fold increase. [25]

Role of social support in exercise adherence among older adults stroke survivors Theoretical Models

Social support is defined as the provision of assistance, information, or relationships that enable an individual to effectively manage their day-to-day life, whether in times of crisis or not. [26] This multifaceted construct has been found to have a positive impact on both the physical and psychological outcomes of stroke survivors. [27] However, the exact pathway of how it influences these outcomes is still unclear. Several models have been theorized and one of such models explains that social support and physical health are linked by different pathways. One of the models theorized to explain the link between social support and physical health. The first pathway entails behavioral processes such as health-seeking behaviors and adherence to medical interventions. The second pathway is linked to emotions, and appraisals, which are more psychological processes. [28] Two other theoretical models, the Main Effect Model and the Stress Buffering Model, can also explain the impact of social support. The Main Effect Model suggests that high levels of support promote general health regardless of stress, thus reducing the risk of developing illnesses or improving the recovery rate after illnesses. On the other hand, the Stress Buffering Model compensates for the negative effect of stress, reducing the risk of developing illnesses indirectly. [29]

Benefits of Social Support among Older Adults with Stroke

Social support can effectively alleviate patients' negative emotions, and also im-

prove their physiological and psychological health, increase adherence, and the effectiveness of functional exercise programs.[30, 31] According to a study by Scorraro et al. [32] on home exercise programs for older adult stroke survivors, good social support is essential for patient motivation. Based on the perspectives of the older adult population, the support received and the perceived availability of support is necessary to meet physical and emotional needs and improve their support-seeking behavior, which can significantly affect overall well-being. [33] Perceived social support is positively related to motivation to participate in exercise programs, which help in recovery, and higher perceived social support of stroke patients increases their motivation to recover. [34] These findings align with the results of Lee et al. [35] and Singh et al. [36] studies, which showed that older patients who received adequate medical coverage through family, friends, healthcare providers, and society built confidence in overcoming the disease and recovering. [35-37] Furthermore, a mixed-methods systematic review of community-based group exercise interventions for older adults found that higher exercise adherence rates were associated with increased social connectedness, well-being gains, and an empowering sense of belonging. [38]

Lack of social support can be a significant barrier preventing stroke survivors from participating in community-based exercise programs and adhering to prescribed exercise regimens. [39] Poor motivation levels can affect adherence, which, in turn, can have an impact on the recovery of all functions and increase the burden on both family and society. [40] Therefore, elderly stroke patients with a stronger motivation for rehabilitation, coupled with a higher level of social support, tend to exhibit better exercise compliance and lower levels of agoraphobia, which can create a more conducive environment for subsequent rehabilitation.[41]

Studies have demonstrated that the quality, quantity, and timing of social support are positively correlated with exercise participation among older stroke survivors. [42, 43] It is important to emphasize that for social support to have a significant effect on participation, it must have been established before the onset of the disease. Furthermore, it has been found that generous amounts of social support would be more beneficial for optimal results. [42] Additionally, it is crucial to note that for social support to be effective in promoting exercise adherence post-stroke, it must be tailored to the individual's needs. The individual's perception of emotional and instrumental support received at that particular time is what ultimately determines the effective-

ness of social support. [42] There are various types and approaches to social support.

Types of Social Support Intervention among Older Adults with Stroke

Studies have shown that social support interventions can greatly improve exercise adherence among patients who have suffered a stroke. There are 4 types of social support and according to Kruithof et al. [28], they include 1) emotional support such as empathy, love and trust, 2) instrumental support displayed through the provision of goods and services, 3) informational support, 4) appraisal support like providing feedback or affirmations. Social support can be measured from a subject as well as an objective perspective. It can be measured quantitatively through the amount of social support or network size, for example, and qualitatively through perceived satisfaction with the social support. 28 Social support can be displayed in many forms, including reminder techniques such as calling patients regularly, weekly or fortnight visits, using sticky notes in homes, tally sheets, pamphlets, or text messages. These techniques have been shown to enhance adherence and effectiveness of exercise prescriptions. [9]

The Role of Family and Friends in Exercise Adherence among Older Adults with Stroke

Evidence demonstrates that social support from spouses, family, and friends can enhance exercise prescription adherence, particularly among the elderly. [45] According to a study by Socrrano et al. [32] caregivers report that the involvement of family and friends can motivate stroke survivors encouraging them to adjust to their disability and adhere to their exercise programs. In addition, another study shows that stroke patients who receive emotional support and encouragement from their families are more likely to adhere to their home exercise programs. [46]

The patient's family can provide support by serving as their exercise partner, setting reminders, or monitoring their progress. To avoid burnout and keep the exercise routine fresh, it is suggested to have multiple family members take turns supervising the patient's activities. [9] Community involvement can also be beneficial when friends, family, and acquaintances engage in conversations with the patient on topics of mutual interest, such as work, politics, current affairs, or sports, rather than solely focusing on their illness.

Although experts suggest that families should be involved in the process, the amount of assistance provided needs to

be balanced to avoid creating dependency. Hence, caregivers must have sufficient knowledge to understand the importance of the prescribed exercises to reinforce patients' adherence. [9]

The Role of Health Professionals in Exercise Adherence among Older Adults with Stroke

Older adults with stroke are more likely to adhere to their home exercise programs if they receive social support from healthcare professionals, compared to those who do not. According to a study conducted by Zhang et al.[21] stroke survivors reported that the interventions of multidisciplinary teams were significant enablers of exercise adherence post-stroke. Specifically, participants reported that before they were discharged from the hospital, rehabilitation therapists assisted them in developing an exercise rehabilitation program. The exercise prescriptions developed were described as simple, safe, and feasible, and were tailored to the patient's preferences, thereby encouraging them to perform the exercises at home. Moreover, the motivation provided by nurses to move more during the hospitalization period played a crucial role in encouraging their adherence to exercises. After discharge, the stroke survivors were regularly seen by a community physician, which provided an opportunity to monitor recovery regularly and track adherence rates.[21]

In another study, positive words and verbal encouragement from healthcare staff motivated older adults with ischemic stroke to believe in the benefits of exercise and increase adherence to prescribed exercise. [46] This may be due to the high level of trust that older people have in healthcare professionals. [47] Providing adequate information about the exercises, safety protocols, and comfort can also strongly impact external motivation, which can facilitate participation in exercise programs. [48] As a result, older adults can follow the advice given by professionals and have high compliance with exercises. [46] Post-stroke rehabilitation is a dynamic process that varies across different stages of recovery. Nonetheless, higher adherence rates are crucial at the initial stages of recovery to achieve improved health outcomes and enable long-term adherence rates. [22] During the early phase, some strategies such as enhancing self-efficacy, activity scheduling, regular feedback, and monitoring can be initiated. As the rehabilitation progresses, additional strategies, such as interim progress tracking, peer group involvement, providing rewards, and reminders, can be gradually introduced to break the monotony of ongoing exercise programs and encourage adherence.[22] Another potential motivating

factor is good interaction between exercise instructors. [48] Therefore, it is important for all healthcare professionals, including exercise instructors, to intentionally build a positive relationship with older adults who have suffered a stroke in order to have a positive impact on their health outcomes.

The Role of Support Groups in Exercise Adherence among Older Adults with Stroke

The importance of bonding and affiliations cannot be overstated as it has a remarkable impact on motivating patients toward recovery. [49] Patient testimonials and their success stories with rehabilitation can be utilized to inspire and encourage other patients. Participating in group exercises with stroke patients in the local community, as well as having a peer support system or exercise partner, has been found to significantly improve adherence to prescribed exercise regimens.[9] Moreover, a research study revealed that group-based exercise interventions were more effective in promoting long-term adherence as compared to individual home-based programs. [50] Among stroke patients, the social aspect of group exercise can enhance motivation and accountability therefore encouraging them to adhere to their exercise prescriptions. This may be because group activities are deemed enjoyable, providing opportunities for social connections and camaraderie. Additionally, it offers encouragement from other members of the group to try new exercises, overcome negative perceptions of ability, and instill accountability.[47]

Role of technology on exercise adherence in stroke survivors

Telerehabilitation is a novel approach that combines digital tools with technology interventions. It is particularly useful for underinsured stroke patients, who have difficulty with transportation, depend on caregivers, or lack stroke rehabilitation services in their geographic areas.[51] Tele-rehabilitation has the potential to shorten the length of an inpatient hospital stay by assisting patients in completing their rehabilitation at home and lowering expenses.[52] The increasing accessibility of smart technology presents a unique opportunity to enhance the delivery of home exercise programs through mobile devices such as video-guided exercise on electronic tablets and video-guided exercise mobile apps. 12 Multiple studies have explored the feasibility and effectiveness of new technological tools and their design to facilitate stroke rehabilitation due to the advancement of information technologies. Chen et al. [52] conducted a pilot study that demonstrated that telerehabilitation interventions had higher adherence

rates compared to traditional rehabilitation interventions. Similarly, Thompson et al. [53] found that the use of technology-based exercise programs led to high adherence rates among older adults with stroke. In the study, practical support was provided to post-stroke survivors using technology in the form of reminder alarms, reminder messages via push notifications within apps or through SMS text messaging, reminder phone calls, and reminder sheets via diaries or calendars. In addition, Chen et al. [52] found that a home-based interactive telerehabilitation program improved upper limb motor function and increased exercise adherence in individuals with chronic stroke. The common technologies employed include games, telerehabilitation, robotic devices, virtual reality, sensors, tablets, etc. [52]

Role of Teleconferencing on Exercise Adherence among older adults with Stroke

A study conducted in Australia among predominantly home-based older adults with stroke demonstrated an 84% adherence. [54] The intervention was a video-conferencing/phone session which took place for 8 weeks, 3d/week. The exercises were performed in 5-minute blockers with higher and lower intensity intervals. The types of exercises performed during the trial include whole-body exercises targeted at improving cardiovascular health, lower-body exercises such as squats, upper body exercises using light weights and resistance bands. Additionally, repetitions of sit-to-stand exercises were conducted to strengthen the muscles of the lower limbs and improve balance. Safety is a primary concern for stroke survivors using telehealth, hence to curtail injuries caused by falls or other associated injuries, participants in the trial were trained on how to perform the exercises safely and the participant's home or exercise environment was assessed thoroughly for potential hazards. In addition to caregivers being present in case of emergencies, all sessions were supervised virtually via the telehealth platform. Participants were also encouraged to modify exercises or replace them with a suitable alternative if unsafe performance was observed. The exercises were individual–prescribed aerobic exercise programs set at a moderate to vigorous intensity. In addition to the levels of adherence, the VO2 peak of the participants improved by 12.5% from Week 0 to Week 8. Telerehabilitation interventions such as video-conferencing expand on remote monitoring ensuring that stroke survivors can partake in rehabilitation programs, interact with an instructor at the same time and receive the feeling of safety within the comfort of their homes. [54]

Role of mHealth Applications on Exercise Adherence among Older adults with Stroke

In Spain, a study used mobile health applications to supervise the adherence of adults with stroke to exercise programs. [55] The mHealth app was used to provide bidirectional biofeedback with an in-built pedometer to count steps per day. It was also used to assess psychological outcomes such as moods and emotions. The exercise programs focused on aerobic, task-oriented training, balance, and stretching exercises. They took place for 8 weeks, every 2 alternate days a week, 1 hour per session. In addition to the use of the monitoring mHealth applications, WhatsApp, the world's popular messaging platform was used to provide motivation, and feedback to participants and provide a collective identity. The results reveal that mHealth applications can promote adherence to exercise programs. There was a statistically significant increase in adherence to community ambulation by 105% and a statistically significant reduction in sitting time by 30%. [55] Another study developed a mobile application that combined exercise programs, health education and games familiar to older adults to enhance adherence. [56] The creation of mobile health apps (mHealth) is an example of technology used in stroke rehabilitation that should be carefully considered when focusing on achieving specific functional outcomes or stroke deficits. The impact of mHealth apps is further enhanced with the support of face-to-face therapy to aid in stroke recovery. [57]

Role of Interactive Games and Motion-based therapy on Exercise Adherence among Older Adults with Stroke

The use of technology such as interactive games and motion-tracking devices has been found to encourage adherence to rehabilitation programs and improve mobility in stroke patients. Alankus et al. 58 used interactive games and motion-tracking technology, such as Nintendo Wii remotes, to track arm motions in stroke patients and found that these exergames encouraged adherence to rehabilitation programs and had the potential to improve functionality. Additionally, in a case study by Tsekelves et al. [59], the improvement in the participant's upper limb impairment was assessed using outcome measures such as the Nine-Hole Peg Test (NHPT), the Fugl-Meyer Assessment (FMA) upper limb section, the Motor Activity Log (MAL), and Modified Ashworth Scale. There was a significant improvement in NHPT score (from 29s to 7.8s) suggesting a notable enhancement in upper limb impairment post-study. The participant's FMA score also increased from 39 to 47

on a 66-point scale. The MAL used to assess the amount of spontaneous use of the affected arm in daily activities increased from 7 to 10 on a 70-point scale indicating increased functional use of the affected arm. Although there were observed changes in the functional abilities of the arm, there were no changes in the spasticity of the muscles as measured by the MAS. Furthermore, there were notable changes in the Nintendo Wii remote offers high accuracy in tracking upper limb movement through the kinematic mechanisms, allowing precise monitoring. Moreover, the technology allows for exercises to be individually calibrated by the therapist in terms of range of motion, speed, and duration ensuring accurate and tailored tracking. Also, Uzor and Baillie implemented simple exergames for elderly stroke patients, involving exercises such as knee bending, sit-to-stand, and marching exercises, and found that these exergames increased adherence to rehabilitation programs and had the potential to improve mobility. [60] Furthermore, a game-based home therapy system targeting arm joints in chronic stroke patients was shown to motivate players to complete their home exercises.[61] A study highlighted the benefits of gamified rehabilitation exercises, or exergames, in improving exercise adherence among older adults post-stroke. [62] These gamified exercises, which incorporate interactive tasks and entertaining game graphics, increased the attractiveness of rehabilitation exercises for older adults.

Motion-based games, such as those using Kinect technology, have shown promise in motivating stroke patients to perform rehabilitation exercises at home. [63] A study by Chen et al. [64] randomly assigned 20 participants to either the telerehabilitation or conventional physiotherapy groups. The telerehabilitation group received remote monitoring and guidance using a Kinect-based exergaming system, while the conventional physiotherapy group received one-on-one physiotherapy. The study found that the telerehabilitation group demonstrated either superior or equal efficacy compared to the conventional physiotherapy group in improving balance. [65]

Challenges of technology on exercise adherence among older adults with stroke

The use of technology in exercise among stroke patients in older adults has been studied extensively, and it has been found to have several challenges. One of the main issues is that traditional face-to-face rehabilitation programs combine an in-person social support approach which contributes to enhancing long-term health gains. [55] This lack of compliance to solely telerehabilitation approaches is partly be-

cause patients are only used to conventional face-to-face methods. Studies have identified other factors explaining difficulties in long-term adherence to mHealth technology. However, the studies have only examined adherence levels on a short-term basis. For instance, the study conducted by Grau-Pellicer et al. [55] lasted only three months, thus making it difficult to determine future adherence levels. Although the study provides statistical projections, it is still uncertain whether the participants will remain adherent to the technology in the future. Older adults have also reported more difficulties in using smartphones and apps compared to the general population. Technical issues such as internet connectivity, lack of proper devices to access the app, and complicated procedures were the main causes of inconvenience. [66] However, another study reports a contrast to these results, as its participants reported high adherence rates to exercise programs and expanded that prior familiarity with technology, age, and level of disability were not barriers to participating in the telerehabilitation sessions. [54] The participants' reports could be explained by their extensive training in the technical nuances of telehealth tools, along with the remote supervision by physiotherapists during the session.

Despite the challenges, technology tools are increasingly accessible and provide a novel way to offer home exercise programs post-stroke with some benefits. However, frequent support and guidance of researchers and carers are required to ensure the completeness of clinical assessment data and protocol adherence. These tools can be widely used for stroke survivors with the support of formal or informal caregivers. Overall, in terms of efficiency, it can reduce socio-sanitary costs. [55]

Combined Role of Social Support and Technology in Exercise Adherence among Older Adults with Stroke

In a study conducted in Australia, technology meets social support. The intervention combines the mHealth application with a chair-based sensor, a gamified approach and a platform to exchange messages with the therapist and other participants. [67] This combined approach of social support and technology contributed to the high adherence rates of the exercises. In addition, connecting participants with their peers was proposed to have contributed to their increased ambulatory outcomes. The benefits of participation in the study included physical and psychological benefits, such as regaining leg strength, building endurance, improving balance, and improving mood. The exercise intervention was intended to focus on improving walking

and cardiovascular conditioning, but the participants also attributed benefits to the intervention that appeared to be unrelated to the study activities, such as being better able to manage household affairs and regaining the ability to drive.[67]

Conclusion

In conclusion, exercise adherence is a critical factor in promoting recovery and improving the outcomes of older adults post-stroke. However, the majority of stroke survivors are physically inactive, which contributes to cardiovascular deconditioning, social isolation, and reduced health-related quality of life. Social support and technology have been identified as key strategies for promoting exercise adherence among post-stroke older adults. The findings of this narrative review show that technology and social support interventions have a positive impact on exercise adherence and health outcomes among older adults post-stroke.

Group-based exercise programs are more effective social support interventions for long-term exercise adherence than home-based individual programs for older adults. Positive social support from family, friends, or other patients for exercise is also associated with exercise adherence and maintaining exercise behavior in the long term. 68,69 Technology interventions enhance adherence because they give the ability to provide personalized feedback, progress tracking, and necessary support to overcome logistical, psychosocial, and physical barriers. However, there are challenges associated with the use of both social support and technology interventions among older adults post-stroke. These challenges include a lack of access to technology, low computer literacy, and high costs.

Recommendations For Future Research And Implementation

Future research should focus on developing affordable and accessible technology interventions and social support strategies that can be integrated into the post-stroke rehabilitation process to improve exercise adherence and health outcomes among older adults. The use of technology for remote monitoring in stroke-specific rehabilitation has been identified as a promising approach for improving adherence to exercise programs and clinical outcomes among older adults. Likewise, the combined use of social support and technology should be further explored through large-scale, well-destined studies.

We recommend that future research should aim to assess the influence of low-data and seamless teleconferencing tools on the adherence of older adults with stroke to exercise programs because

of their popularity and ease of adoption. Studies have reported more difficulties in using complex but effective technologies independently in the older population compared to the general population. Apps and virtual reality game developers should consider the accessibility and user experience of these platforms to ensure optimal usability by stroke survivors amongst the older population. The accessibility and usability of these platforms without technical issues and complexity will encourage long-term adherence. Additionally, the impact of more telehealth tools on clinical outcomes such as functional capacity, quality of life, and neurological recovery should also be assessed.

To further improve the implementation of technologies in stroke rehabilitation, it is recommended that healthcare professionals be trained on how to integrate these technologies into their conventional practice, as well as how to interpret and use the data generated by these devices in outcomes assessment. This will not only improve the effectiveness of this approach but also ensure that it is used safely and ethically.

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